Processes used by boards of directors in pursuit of organisational ambidexterity in the context of digital transformation

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ABSTRACT

This thesis presents processes used by boards as they explore and exploit in a digital environment. Extant literature posits that organisations that fail to adopt digital transformation may lose competitive advantage and can become unsustainable and risk extinction. Research showed that ambidextrous organisations are associated with longevity, competitive advantage, and superior performance.

The problem is that the ambidexterity literature mainly focuses on two levels of analysis, the individual and organisational. However, most work tasks in organisations are implemented by groups and not only individuals. In fact, leaders play a critical role in achieving ambidexterity. However, extant research has focused on senior management, and omitting boards. There is a notable paucity of research on how boards achieve ambidexterity. Research on boards was concerned about the structure and diversity. Recently, minimal attention has been paid to the role of the board in the digital economy. This is an important omission as boards direct organisations, monitoring disruptive technologies for longevity. This thesis answers the question, "*How do boards of directors explore and exploit in the context of digital transformation?"*

The research used abductive multiple cases of organisations purposefully sampled in an emerging economy, with triangulation of data sources from six boards. It extends the typology of organisational ambidexterity. It also makes a novel contribution to board process research by adding processes used by boards as they explore and exploit. Boards invoke dynamic decision-making, and changing processes with organisational learning. The research extends an existing typology of organisational ambidexterity, based on the scenarios observed in the context of digital transformation. Further, this research introduces a digital adoption framework that organisations can use as they adopt digital transformation.

The thesis is also a response to a call for qualitative research on understanding board processes. Consequently, this research raises a question that requires future research, "What is the strategic role of the board of directors where the founder is leading the organisation"?

Keywords: Boards of directors; Digital transformation; Exploration; Exploitation; Organisational Ambidexterity.

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CHAPTER 1: INTRODUCTION

1.1 Background

In today's highly dynamic environment, organisations need to explore and exploit to survive. Organisations battle with balancing exploitation of the existing business for immediate survival while at the same time, engaging in the exploration of future opportunities for long-term sustainability (Kassotaki, 2019b; Turner et al., 2013). However, exploration and exploitation are argued to be conflicting strategies that compete for scarce organisational resources (Birkinshaw & Gupta, 2013b; Heracleous et al., 2017; March, 1991; Volery et al., 2015). Organisations that achieve this balance are said to be ambidextrous. Ambidextrous organisations are associated with superior performance (Derbyshire, 2014; Mathias et al., 2018). Nonetheless, there is no clarity on how this is achieved (Birkinshaw & Gupta, 2013b). Literature acknowledges the role of leaders in achieving organisational ambidexterity. The top management is known to positively influence organisational ambidexterity (Heavey & Simsek, 2017; Venugopal et al., 2019). However, there is a paucity of research on how boards of directors, who are mandated with leading organisations for longevity, balance exploration and exploitation. Therefore, it is pertinent to investigate how boards of directors explore and exploit.

The same organisations battling to balance exploration and exploitation are operating in a dynamic environment with digital transformation. Organisations must adopt new technologies to remain in the market and serve customers in new ways (Gruia et al., 2020). Failure to do so causes loss of competitive advantage or organisational extinction. Therefore, organisational leaders need to rapidly adapt to digital transformation for the organisation's longevity (Hansen et al., 2011; Main et al., 2018). Digital transformation is argued to have been used to achieve ambidexterity (Li et al., 2018; Svahn et al., 2017).

Digital transformation has been the leading source of transformative turbulence in business and society. In fact, digital transformation is argued to be steering the fourth industrial revolution, abbreviated 4IR (World Economic Forum, 2018). In 4IR, organisations are faced with this rapidly evolving phenomenon and those that fail to respond face the risk of trailing behind (Parviainen et al., 2017; Sebastian, Ross, et al., 2017) and being overtaken by competitors or face extinction.

Unlike organisations that were formed on digital platforms, generally referred to as “born-digital”, organisations formed before the digital era, referred to as “pre-digital” or “traditional organisations”, must change their business models as they adopt digital transformation (Chanias et al., 2019; Tumbas et al., 2018). Examples of born digitals include Amazon, Tencent, Uber, and Airbnb. The lifespan of organisations has been significantly reduced because of environmental dynamism, such as digital transformation. Pre-digital organisations, thus companies belonging to the traditional industries such as retail, banking, and automotive, which existed before digital transformation, are facing existential threats (Sebastian, Ross, et al., 2017; Tumbas et al., 2018). On average, well-established organisations that fail to respond to the rapid changes in the environment can expect their life span to be reduced to as low as six to fifteen years compared to over 100 years in the past when the environment was more stable. This assertion is supported by a seminal study on disruptive technologies by Christensen and Bower (1996). Christensen and Bower’s work identified that most incumbent firms that failed to embrace environmental dynamism, especially rapid changes in technology, were overtaken by new market entrants (Christensen & Bower, 1996). Such examples include Barnes and Noble, which was once known as the largest bookseller in the United States of America, but lost its market share to Amazon, a company that was established on a digital platform to sell books and other products online (Mithas et al., 2013; El Sawy et al., 2016; Snihur, 2018). In that same period, print media was replaced by digital media, including CDs, MP3s, e-books and e-magazines. Borders, formed in 1995 at the same time as Amazon, stuck to its traditionalist organisational identity of a superstore when its attempts to invest in digital business proved expensive. Borders eventually filed for bankruptcy in 2011. The bankruptcy of the movie rental company, Blockbuster, and the sale of Washington Post to Jeff Bezos, the founder of Amazon, is also a result of the digital business models (Hess et al., 2016a). The disruption of the transportation and hospitality industries brought by Uber and Airbnb, and the online market on which Alibaba, Amazon and eBay have built their businesses, show the challenges presented to traditional organisations by companies established on digital platforms. Most examples are from developed countries, yet no sector, organisation (Hess et al., 2016a) or economy is immune to the impacts of digital transformation.

Boards must embrace the dual challenges presented by pursuing long-term strategies that respond to future demands presented by the dynamic environment while running short-term strategies for the business's day-to-day operations, thus organisational ambidexterity. Adapting and surviving through the environmental changes requires symbiotic competencies that allow organisations to explore and exploit new ideas, new markets and new services (Jansen et al., 2008).

However, exploration and exploitation have been found to create multiple and often conflicting strategies. As such, these competing strategies stretch the organisation's finite resources (Junni et al., 2013; Turner et al., 2016). The few organisations that manage to balance these opposing tensions are said to be ambidextrous (Andriopoulos & Lewis, 2010). Many scholars have positively associated organisational ambidexterity with a competitive advantage and superior firm performance (Birkinshaw & Gupta, 2013b; Cao et al., 2009; Derbyshire, 2014; Schnellbächer & Heidenreich, 2020; Uotila, 2018). This is except for a few lone voices that argue that no data has a positive association between an ambidextrous firm and organisational performance, but balancing the competing strategies might undermine performance (Siren, Charlotta et al., 2012; Stettner & Lavie, 2014). This thesis concurs with recent evidence on the positive performance that asserts that the shift to mobile connectivity and collaboration ameliorates the challenge for organisations to provide structures to support the exploration of new knowledge while exploiting existing knowledge (Bresciani et al., 2018; Schnellbächer & Heidenreich, 2020). Therefore, organisations ought to pursue ambidexterity for superior performance. Suppose exploration and exploitation compete for scarce organisational resources and use different processes, structures, and strategies? In that case, the question that it raises is, how do organisations balance the competing strategies in a digital transformation environment to be ambidextrous?

Extant literature on digital transformation observed the challenges that senior executives face whilst handling the risks and opportunities of digital transformation (Bennis, 2013; Singh & Hess, 2017). In examining such context, there is an emphasis on the role of leaders and individuals in achieving organisational ambidexterity (Bonesso et al., 2014; Hill & Birkinshaw, 2014; Probst et al., 2011; Taródy, 2016). However, the focus on leaders ended at senior management, yet the board is at the helm of organisational leadership. There is a significant gap in the current studies in understanding how boards of directors provide direction as they lead organisations to be ambidextrous Of the two research papers identified at the time of this research, which focused on boards of directors and ambidexterity, an academic publication by Kang (2014) examined the differentiation and integration mechanisms of organisational ambidexterity in a franchise environment. The second paper by Oehmichen et al. (2017) examined relations between the board of directors, knowledge heterogeneity and organisational ambidexterity. Both publications acknowledge the dearth in the literature on boards and ambidexterity.

Literature acknowledges the significant role that boards of directors play as the highest level of strategic leadership, entrusted with directing the organisation (Hendry, Kiel, & Nicholson, 2010; Triana, Miller, & Trzebiatowski, 2014). The function of a board of directors is, at its core, to ensure organisational sustainability, consider shareholder value, and mitigate risk for shareholders. Executives are seen as agents, and given an opportunity, they will maximise their private interests at the expense of the shareholder (Zona, Gomez-Mejia, & Withers, 2018). Boards are then appointed as stewards of the shareholder (Kluvers & Tippett, 2011), and will not be concerned about fostering their economic interests as the agency problem holds. Therefore, the board must mitigate agency conflicts between managers and shareholders, and also provide expertise, advice, and guidance for better strategic decisions (Kang, 2014). Thus, it is vital to understand how boards guide organisations to exploit the existing business while exploring digital transformation, thus the pursuit of organisational ambidexterity. This research is focused on understanding the processes used by boards of directors to balance exploration and exploitation as they execute their duties in a digital transformation environment.

If organisations fail to respond to environmental dynamism, including digital transformation, and ensure adequate risk measures are in place, the shareholder value can be eroded. A typical example of the board's accountability surfaced in the case of Target, a large retailer in the United States of America, which adopted digital technologies without taking due care of related information security measures. The firm suffered a major data breach that affected forty-one million consumers and cost the company two hundred and ninety-two million United States Dollars, including penalties and settlements of different lawsuits and other damages (Benaroch & Chernobai, 2017), one of the highest penalties on data breaches. It is not a surprise that the Chief Executive Officer, Board Chairman and Chief Information Officer were held to account and asked to resign (Benaroch & Chernobai, 2017). Despite the significance of the board, scholars have tended to overlook empirical investigation into the processes used by boards of directors mainly because the board is difficult to access (Klarner et al., 2020; Leblanc & Schwartz, 2007).

As such, a significant body of literature suggests that organisations that do not respond to digital transformation can face several risks, while the adoption of digital technologies may lead to radical performance improvement (Henner et al., 2018; Hossnofsky & Junge, 2019; Tumbas et al., 2018). Based on this argument, this thesis, squarely situated in the context of digital transformation, gets inspiration from the community of scholars that observed positive firm performance in ambidextrous organisations because of the compelling argument and the evidence presented.

Whilst ambidexterity, as a construct, has attracted a lot of scholarly interest, there remains a lack of conceptual clarity and consensus, leaving an incomplete guide to its character (Andriopoulos & Lewis, 2010; Birkinshaw & Gupta, 2013a; Mueller et al., 2020). This has made it difficult to compare results across studies (Cao et al., 2009; Simsek et al., 2009). The lack of clarity has also created challenges with attaining consistency in efforts to build on established theory (Turner et al., 2013). In an attempt to improve the focus on organisational ambidexterity research, Simsek, et al. (2009) introduced a typology for the phenomenon with four archetypes that are used when organisations pursue ambidexterity. The four typologies presented are harmonic, cyclical, partitional and reciprocal ambidexterity. However, a weakness lies in the fact that this typology has generic archetypes and does not fully address the context in which these are pursued. Nevertheless, the typology unified the different conceptualisations of organisational ambidexterity, aiding this study and other researchers to position work on ambidexterity within the broad literature. This thesis used Simsek et al. (2009)'s typology as a definition of ambidexterity and to guide the interview questions to understand how boards of directors pursued ambidexterity in the context of digital transformation.

Recently, academic literature has shifted antecedents of organisational ambidexterity at the firm, business unit and senior manager level (Junni et al., 2013; Mom et al., 2009; Papachroni & Heracleous, 2020). Attention has also been drawn to ambidexterity at individual level (Bonesso et al., 2014; Papachroni & Heracleous, 2020; Schnellbächer & Heidenreich, 2020). What has been glaringly absent in organisational ambidexterity literature are discussions on the board of directors as organisational leaders (Oehmichen et al., 2017).

Although the literature on boards of directors is maturing, researchers' attention has been focused on board composition, structure, the monitoring and compliance role of boards of directors, their increasing contribution to strategy and their role in ambidexterity (Barroso-Castro et al., 2017; Machold & Farquhar, 2013; Rejeb et al., 2019). However, given the impact of digital transformation, the way boards of directors strategise needs to be re-examined (Åberg et al., 2017). There is minimal attention drawn to how boards of directors go about providing strategic direction and related tasks for the perpetuity of the organisation (McNulty et al., 2013; Oehmichen et al., 2017; Pettigrew, 2012b). Meanwhile, the wave of corporate scandals over the years and environmental dynamism necessitated the introduction of codes of corporate governance around the world. This includes the King Codes of Corporate Governance in South Africa, which mandate boards of directors to provide not just oversight but a strategic direction to the organisation, including advances in technology that are revolutionising businesses and may cause significant disruption (IoDSA, 2016). Boards are mandated to look at emerging technologies as sources of value creation (IoDSA, 2016).

In conclusion, boards are directing organisations that are operating in a dynamic environment. Boards must direct organisations to be ambidextrous for longevity and superior performance. There is growing evidence that digitally savvy boards that provide sound digital leadership financially outperform their peers (Weill et al., 2019; Westerman et al., 2012). Therefore, it is critical to examine the processes at the board level to understand how organisations explore and exploit in a digital environment.

1.2 Problem statement

The fundamental idea is that organisations need to exploit the existing business to meet immediate demands while exploring future opportunities for long-term survival. When organisations can balance exploration and exploitation, then they are said to be ambidextrous. The ability to achieve ambidexterity is seen as a critical prerequisite to achieving competitive advantage (Mueller et al., 2020). Ambidextrous organisations are associated with enhanced performance and long-term survival. Such balance seems to be achieved by inherently trading off exploration and exploitation using temporal or structural ambidexterity. However, there are different opinions on how organisations achieve this trade-off (Brix, 2019; O'Reilly & Tushman, 2013). No ambidexterity recipe can be implemented in all organisations and succeed as it is context-dependent (Brix, 2019, 2020).

The challenge of balancing exploration and exploitation is exacerbated by the current digital environment where organisations adopt digital technologies, lose their competitive advantage, or face extinction. Digital transformation is said to enable ambidexterity (Åkesson et al., 2018). Similarly, leaders are argued to play a critical role in achieving organisational ambidexterity (Kassotaki, 2019c). Despite the plethora of research output, there are still gaps in understanding the roles of leaders in ambidexterity (Jansen et al., 2016; Luo et al., 2018). Research has focused on management (Koryak et al., 2018; Venugopal et al., 2019) and individuals (Bonesso et al., 2014; Papachroni & Heracleous, 2020; Schnellbächer & Heidenreich, 2020), with minimal consideration paid to how boards of directors pursue organisational ambidexterity (Kang, 2014; Oehmichen, Heyden, Georgakakis, & Volberda, 2017).

Results from recent research show that leadership is a multi-level concept, and therefore different levels of analysis must be used (Jansen et al., 2016; Mueller et al., 2020). This thesis contributes to the body of corporate governance literature on the boards of directors in the countries that are on the African continent, and Information Systems literature on digital transformation.

In the current dynamic business environment, the digital transformation of companies is not about whether they will transform but rather when it will happen (Fonseca & Picoto, 2020). The organisations that do not respond to the changes caused by digital transformation risk being overtaken by traditional competitors and new entrants in the market are referred to as born-digital companies (Tumbas et al., 2018). Extant literature has grouped activities that are done in organisations that respond to environmental dynamism as either exploration or exploitation (Birkinshaw & Gupta, 2013b; Raisch et al., 2009; Venugopal et al., 2019). When an organisation pursues exploitation only, it enhances short-term performance and compromises long-term growth due to a lack of strategic foresight (Jansen, et al., 2009; March 1991; Wilden et al., 2018). Conversely, an organisation that pursues exploration alone will draw its attention to long-term capabilities, which may be distant and uncertain, but may find itself in a short-term competency trap (Wang et al., 2019). The fact that these two concepts are seen as divergent strategies that operate at opposite ends of a continuum, competing for the finite resources in the organisation, poses a challenge to organisations that are seeking to attain and maintain a balance of attention (Carter, 2015), particularly in the context of digital transformation. Organisations that achieve this balance are ambidextrous and argued to be aligned and efficient in their management of daily business demands and adaptive enough to the environmental changes for long-term business demands (Wang et al., 2018). There is consensus in the literature that when an organisation fails to balance these competing competencies, it faces the risk of losing its competitive advantage (Junni et al., 2013; Wilden et al., 2018). Thus, organisations seek to pursue ambidexterity in dynamic environments for survival and sustainable competitive advantage.

Concomitantly, today's organisations are operating in the digital transformation era. The market is exerting pressure on leaders to exploit the traditional organisation and related strategies and explore by anticipating future market demands. The pressure from customers and competitors is pushing organisations to embark on the journey to keep pace with the future implications of digital transformation (Drnevich & Croson, 2013; Vial, 2019) (Altman & Tushman, 2017) while improving existing products and services. Pursuing digital transformation does not mean abandoning the traditional operations of the organisation but requires balancing exploring new demands while exploiting the traditional operations of the business for sustained survival of the organisation. When organisations fail to balance the two, they spend most of their time reacting to unexpected changes instead of anticipating and preparing for them (Hess et al., 2016; Li et al., 2019). This vicious cycle locks a firm into a reactive position, thus putting its survival at risk.

The ambidexterity construct has attracted significant attention in research and has advanced from when it was argued to be ambiguous in its conceptualisation, and an under-theorised phenomenon which is not well understood in 2010 (Andriopoulos & Lewis, 2010; Simsek, 2009). Despite the attention of researchers, empirical evidence further substantiates that although there is consensus on the need to explore and exploit, there is considerably less clarity on the concept, which is used interchangeably (Mueller et al., 2020), and how this balance can be achieved (Birkinshaw & Gupta, 2013b; Fang et al., 2010). Furthermore, although literature understands that leaders play a critical role in achieving ambidexterity, the focus has been on management layers. There is a call for further study at multi-levels as all levels contribute to aggregated behaviour of an organisation (Luo et al., 2018; Mueller et al., 2020; Wang et al., 2018). This thesis contributes to understanding how boards of directors explore and exploit in the context of digital transformation.

Simsek, Heavey, Veiga, and Souder (2009) proposed four types of ambidexterity, which are (1) cyclical, (2) harmonic, (3) reciprocal and (4) partitional ambidexterity. Simsek et al. (2009)'s typology, with over 700 citations, argued that organisations use any one of these types of ambidexterity when pursuing a strategy. The four types of ambidexterity are grouped in two dimensions, thus (a) structural ambidexterity, which is achieved using either independent or interdependent organisational structures and (b) temporal ambidexterity, where the organisation achieves ambidexterity by going through sequential, alternating modes or simultaneously. The typology has provided a framework that guides research on organisational ambidexterity. Nevertheless, extant literature has done very little to explore how organisations pursue ambidexterity despite introducing the typology. Recent literature has started looking at how ambidexterity is achieved in new ventures (Wang et al., 2018).

In reviewing his decade award-winning article on context, Johns (2017) argues that context must be incorporated more mindfully into research. The assumption in March (1991)'s seminal article that made organisational ambidexterity topical was that organisations operate in stable environments, yet today's environment is highly dynamic (Ferreira, Fernandes, & Ferreira, 2019). Leaders need to adopt digital transformation for survival and continuity (Hansen et al., 2011; Main et al., 2018). While exploration and exploitation are argued to compete for resources, the digital era is posited to enable a competitive advantage, change business models and present opportunities to share platforms, thus lowering the costs of adopting digital technologies (Benner & Tushman, 2015; Saarikko et al., 2020). Given the changes brought about by digital transformation, it is pertinent to understand how organisations are exploring and exploiting in the context of digital transformation.

The literature on ambidexterity acknowledges the critical role of leadership in achieving the balance to explore and exploit (Kassotaki, 2019a; Luo et al., 2018). Ambidextrous leadership is not about a single leader at the top but is shared across hierarchical levels (Probst et al., 2011; Zimmermann et al., 2018). There is a significant body of literature that has focused on senior management, middle management, and employees as levels of analysis (Bonesso et al., 2014; Mom et al., 2009; Papachroni & Heracleous, 2020; Probst et al., 2011). However, analysing ambidexterity at one level is insufficient to embody the antecedents of organisational ambidexterity (Constant et al., 2020). There is a dearth of research on how boards of directors, who are on the summit of the organisational hierarchy, explore and exploit. Specifically, there is a lack of research insight into how boards of directors pursue organisational ambidexterity, yet boards function as a mechanism of aligning the organisation with its environment (Oehmichen, Heyden, Georgakakis, & Volberda, 2017).

Over the previous decades, research has shown that the role of boards of directors has moved from simply monitoring to ensure alignment with risk and compliance to being actively involved in providing strategic leadership (Barroso-Castro et al., 2017; Kang, 2014; Klarner et al., 2020; Machold & Farquhar, 2013). In fact, the globalisation and liberalisation of financial markets, laden with corporate governance scandals and demands for transparency, have driven boards of directors to be more involved in providing direction to organisations. However, the debate is still on as to the extent of boards of directors' involvement in strategic leadership; scholars and practitioners have generally acknowledged the importance of boards of directors actively playing a role in matters of long-term sustainability (Barroso-Castro et al., 2017; Kang, 2014). In recent times, the value of the function of boards of directors has been compounded by the threat caused by digital transformation in traditional organisations (Åberg et al., 2017). Therefore, boards of directors must be competent in navigating exploration and exploitation to execute their mandate fully.

Consequently, examining the typologies of organisational ambidexterity and exploring the processes that boards of directors use to pursue ambidexterity for superior performance enhances the understanding of the board's processes. The thesis explored the processes used by boards of directors using the typology ambidexterity defined by Simsek et al. (2009) to guide the interview questions.

In conclusion, this thesis, which sought to understand processes used by boards of directors, makes a novel contribution to the corporate governance body of knowledge by presenting the processes used by boards of directors as they pursued organisational ambidexterity. The thesis also contributes to practice by introducing an ambidextrous digital adoption framework. The framework helps organisations to systematically adopt digital transformation while balancing exploration and exploitation for an ambidextrous organisation. The practical application of Simsek et al. (2009)'s typology on the multiple cases illuminated some blind spots that were observed in the context of digital transformation.

1.3 Purpose statement

Organisations face a common choice problem, where actions suitable in the short term are different from those that work in the long term. Building on **organisational ambidexterity theory**, research has shown that organisations can reconcile their short-term and long-term tensions, but this necessitates managerial endeavours that orchestrate this reconciliation (Wang et al., 2019). The organisations that achieve this balance are said to be ambidextrous, and are associated with a high performance (O'Reilly & Tushman, 2013; Solís-molina et al., 2018). Furthermore, research on organisational change established that all members of the organisation contribute to aggregated behaviour and the corporate outcome at a macro level (Mueller et al., 2020). However, despite the plethora of research on organisational ambidexterity, the focus has been on a managerial level (Mueller et al., 2020; Wang et al., 2018). Very few studies are actually providing insights on how boards of directors explore and exploit. Moreover, boards are responsible for setting the organisation's agenda and strategy (Klarner et al., 2020), yet there is no clarity on how they achieve this.

Boards of directors are responsible for providing strategic direction to the organisations and, therefore, should play their role to ensure a sustainable future (Weill et al., 2019). For the boards of directors to lead successfully in dynamic environments, they need to ensure that the organisation runs effectively in the short term while simultaneously remaining alert to future market demands for business growth, thus exploiting and exploring. The environment dynamism is currently driven by digital transformation, and studies have drawn attention to the increasing influence of digital technologies at the board level as a determining factor of organisational performance (Oliveira et al., 2022). Nevertheless, there is little theoretical and empirical evidence on how boards ensure that a balance of the twin competing strategies, exploitation, and exploitation, is achieved in the context of digital transformation.

Concomitantly, there is a growing impetus for organisations to pursue both exploration and exploitation to improve current operations and harness future market demands presented by digital technologies. However, exploitation and exploration are said to compete for limited resources in the organisation and use different processes, structures, and strategies. Research on organisational ambidexterity has focused on individuals and at the organisational level, yet work is executed in groups. Therefore, there is a need to investigate ambidexterity at different levels (Brix, 2019). Leaders are critical for organisations to achieve ambidexterity, thus extant research focused on management. Yet the agency problem suggests that management is opportunistic, maximising their private interests at the expense of the shareholder (Oehmichen et al., 2016). Boards of directors are appointed as stewards of the shareholder to mitigate the agency problem, yet there is very little that is known about how they direct organisations to achieve ambidexterity.

The main aim of this thesis was to investigate the processes used by boards of directors when they explore and exploit to achieve ambidexterity in the context of digital transformation in organisations listed on South Africa's main stock exchange. The thesis used the four types of organisational ambidexterity presented by Simsek et al., (2009) to inform the data collection. Besides presenting recommended board processes, the thesis introduced a framework that can be used by boards and their stakeholders in similar situations to pursue ambidexterity in the context of digital transformation.

1.4 Research objectives

Having identified the gap in the literature on boards of directors and organisational ambidexterity, the main aim of this thesis is to demonstrate the processes used by boards of directors when they explore and exploit in the context of digital transformation in South Africa.

The specific objectives of the thesis are to i) to perform a processual analysis and present a process model that boards of directors can use as they use temporal ambidexterity to explore and exploit in the context of digital transformation ii) to perform a processual analysis and present a process model that can be used by boards of directors as they pursue structural ambidexterity to explore and exploit in the context of digital transformation and iii) to produce and recommend a digital ambidexterity framework that can be used by organisations as they explore and exploit in the context of ambidexterity. Similar to the value that is derived from frameworks that are used in practice, this framework will be useful for organisational policies considering the way digital transformation is changing the way boards of directors work (Oliveira et al., 2022) Extant studies have produced conceptual frameworks on how digital transformation has impacted board dynamics (Oliveira et al., 2022), a gap on the practical guidance on how they can adopt this new phenomenon. The practical value of this framework is its ability to equip boards of directors and other governing bodies with practical guidance to adopt digital transformation.

1.5 Research questions

The research questions were formulated after reviewing the literature on organisational ambidexterity and boards of directors and the impact of context (Sandberg & Alvesson, 2011) in which organisations are operating. Davis (2015) asserts that one clear sign of advanced is answering an important question. The central question that this thesis answered is:

1.5.1 How do boards of directors explore and exploit in the context of digital transformation?

The following questions direct the research to answer the main research question.

1. How do boards of directors pursue temporal ambidexterity in a digital environment?

a. How do boards of directors decide when to refine existing products, processes and services using existing capabilities (exploit), perform experimentation or investigate new alternatives and create new solutions creating new capabilities (explore), sequentially?

b. How do boards of directors decide when to refine existing products, processes, and services using existing capabilities (exploit), perform experimentation, investigate new alternatives, and create new solutions that create new capabilities (explore) simultaneously?

2. How do boards of directors pursue structural ambidexterity in a digital environment?

c. How do boards of directors decide when to refine existing products, processes, and services using existing capabilities (exploit), perform experimentation, investigate new alternatives, and create new solutions that create new capabilities (explore) using independent structures?

d. How do boards of directors decide when to refine existing products, processes, and services using existing capabilities (exploit), perform experimentation, investigate new alternatives, and create new solutions that create new capabilities (explore) using inter-dependent structures?

3. How do boards of directors determine the level of resources to allocate for exploitation and exploration when operating in the context of digital transformation?

4. What types of ambidexterity emanate from the board's processes as they pursue ambidexterity in the context of digital transformation?

1.6 Definitions and scope of the research

1.6.1 Definitions

Organisations must equip themselves to continuously meet current needs and compete in the current markets while continuously innovating for emerging or unexplored requirements and markets (Wang & Rafiq, 2014). The ability to bring this balance is referred to as organisational ambidexterity. Organisational ambidexterity is when an organisation possesses the capability to harness and reconcile conflicting demands for exploitation and exploration (Kang, 2014). It is what Wang et al., (2019) refer to as a trade-off between exploitation and exploration for an organisation to be competitive in the long term.

Exploitation refers to the current efficient management of business demands through experimental refinement, selection, and re-use of existing routines (Dai et al., 2017; Katou et al., 2020). Exploitation relies on current knowledge and skills, with short-term outcomes.

Exploration is the ability of an organisation to adapt to future requirements through planned experimentation and innovation. Exploration uses capabilities and skills that the organisation does not have. It requires long-term devotion and outcomes.

1.6.2 Scope: Limitations and delimitations

This thesis sought to investigate the processes used by boards of directors as they pursue organisational ambidexterity in the context of digital transformation.

The focus of this study was limited to the following:

i. While literature acknowledges the role played by different levels of management and individuals in achieving organisational ambidexterity, there is barely any mention of boards of directors, and yet this group has the critical mandate to provide strategic guidance for organisational longevity. Boards of directors are the appointed stewards of the shareholder. The thesis presented processes used by boards of directors, thus the level of analysis. Although the findings illuminate some of the processes used at management and team levels, they cannot be generalised to other levels of leadership that are not the board or board sub-committees on the organisational hierarchy.

ii. Boards of directors pursue many strategies as they direct organisations. This thesis specifically focused on investigating the processes followed by boards of directors as they pursued ambidexterity in the context of digital transformation. The research did not pursue other organisational strategies or contexts but remained singularly focused on ambidexterity in the context of digital transformation.

iii. De Haes and Van Grembergen (2009) assert that research must take cognisance of cultural differences. Similarly, empirical research has lamented the paucity of literature on firms in Africa (Barnard, Cuervo-Cazurra & Manning, 2017). Moreover, research has already shown that the single-tiered structure of American boards and their arm's length involvement in the organisation (Weitzner & Peridis, 2011) is different from the structures in emerging economies. This research reduced the scope in geographic terms and is limited to an emerging economy and the companies in South Africa, which are listed on the Johannesburg Stock Exchange and operating in the country of listing. The research focuses on evidence obtained from executive, non-executive directors and board invitees of the listed companies operating in South Africa, which is one of the largest economies in Africa.

iv. Research findings drawn from the identified companies in South Africa may not necessarily be generalisable to other countries and contexts. Future research can therefore seek to test the findings of this study in other countries.

1.7 Importance and benefits of this thesis

1.7.1 Theoretical contribution

Organisational ambidexterity theory argues that organisations must balance exploitation and exploration. Organisations that can balance exploring and exploiting are associated with positive performance (Derbyshire, 2014; Junni et al., 2013). However, exploitation and exploration use different processes and strategies and compete for scarce resources in the organisation (Birkinshaw & Gupta, 2013b). Furthermore, while there is consensus on the need to explore and exploit, there is considerably less clarity on how this balance can be achieved (Birkinshaw & Gupta, 2013b). The lack of clarity on how such a balance can be achieved has contributed to inconsistent theory building and testing of the phenomenon.

Literature acknowledges the importance of leaders in achieving ambidexterity. However, managers are said to be self-interest actors who seek to maximise their returns at the expense of the shareholder when they get an opportunity (Bosse & Phillips, 2016). This is mitigated by the appointment of boards of directors, who act as the principal steward of the shareholder (Kluvers & Tippett, 2011; Obermann et al., 2020). How then do boards of directors, charged by shareholders with directing organisations for long-term sustainability, achieve ambidexterity? How do boards of directors balance resources to allocate to exploitation and exploration?

This thesis introduced a process model and framework that can be used in practice by boards of directors and other stakeholders, including institutions like the Johannesburg Stock Exchange, the Institute of Directors, and the King Committee as they direct organisations to be ambidextrous. The thesis makes a novel contribution to illuminate what is commonly known as the black box of research, and board processes.

This thesis also extended the body of organisational ambidexterity literature by aligning Simsek et al. (2009)'s typology with the relevant processes. The thesis demonstrated the use of Simsek et al. (2009)'s typology by investigating which of the four types of ambidexterity boards of directors use in different contexts, particularly in digital transformation. The thesis examined a previously unexplored process between boards of directors and organisational ambidexterity (Bailey & Peck, 2013), thus shedding light on what is commonly referred to in the literature as the black box of research. Although there have been topical discussions of what boards of directors should be doing, the missing assessment has been the substantive insight into how they go about accomplishing these tasks (McNulty et al., 2013).

Simsek et al. (2009) proposed a two-dimensional view of the types of ambidexterity. This thesis assessed whether the proposed typologies of organisational ambidexterity were exhaustive when considered in the context of digital transformation, thus extending the proposed model to consider the context. Davis (2015) supports this approach, asserting that theory should be cumulative. This thesis builds on literature on organisational ambidexterity, particularly on the typology proposed by Simsek et al. (2009), in the context of digital transformation.

1.7.2 Methodological Contribution

Bartunek, Ireland, and Texas (2006) argued that research must be interesting. It must ask important questions and be guided by methodological rigour to increase its visibility and impact. This research followed the traditions of process analysis, and thus did not produce a static list of things done by boards of directors but rather revealed the underlying mechanisms which drive board-level processes (Pettigrew, 2012b).

Most research on boards of directors used quantitative methods (Bansal, 2013). This may largely be because of the inaccessibility of board members (Leblanc & Schwartz, 2007). Concomitantly, literature lamented the absence of qualitative research on corporate governance (McNulty et al., 2013). Similarly, a new direction in board research has called for qualitative research that examines boards of directors (Brundin & Nordqvist, 2008; Oehmichen, Heyden, Georgakakis, & Volberda, 2017). In fact, McNulty, Zattoni, and Douglas' guest editorial article of 2013 incentivised governance scholars to use qualitative methods.

Recent studies have started contributing to the methodological research gap, by interviewing boards of directors from different organisations., for example, recent publications by Oliveira et al., (2022), who used convenience sampling to investigate how digital transformation affected board members in their ways of working, and Klarner et al.'s 2020 investigation on how board members engage with organisation members for governing long term issues like innovation. However, even as recent as 2020, Klarner et al., titled their publication "Opening the black box: Unpacking board involvement in innovation", acknowledging the scarcity of qualitative research on boards of directors. Therefore the use of qualitative research on multiple boards is a methodological contribution to the body of literature on boards of directors, which rarely uses qualitative research. In addition, interviewing members of different boards for the same research, a group known as difficult to access is a methodological contribution to board research.

1.7.3 Contextual Contribution

As far back as 1970, Rockart emphasised the need for research to observe contextual differences. Extant literature on digital transformation is mainly focused on large successful digital firms like Apple, and Amazon (Hess et al., 2016a), as well as some unfortunate organisations that failed to turn the digital clock, like Borders and Kodak (Chanias et al., 2019; Lucas et al., 2009; El Sawy et al., 2016). However, most of the case studies are of organisations based in developed economies. There has been minimal scholarly attention on digital transformation in emerging economies in Africa. Nevertheless, it is a requirement for rigorous and comprehensive research in Africa (Barnard, et al., 2017), particularly in the context of digital transformation. This research increases the geographical spread of research on organisational ambidexterity and closes the gap in emerging economy contexts.

Pettigrew's (1987) assertion that any study of action and meaning must pay attention to context because behaviour obtains its meaning from the situation within which it is located in time remains valid. Similarly, studies of processes used by boards of directors must be undertaken with due cognisance of context (Pye & Pettigrew, 2005). Evidence already suggests that each board of directors operates within a unique environment consisting of different pressures in which decisions and actions are undertaken. The pressure exerted by digital transformation, for example, varies from one organisation to another. Therefore, the research drew attention to the role played by the boards of directors in each of the organisations that were investigated and analysed the conditions of the organisation under which ambidexterity was pursued. This approach revealed processes and practices followed by boards of different organisations.

In addition, by exploring the process followed by boards of directors in directing ambidexterity in the various organisations, this thesis made a focused contribution to the body of literature on processes followed by boards of directors in the circumstances of digital transformation.

1.7.4 Practice and Policy

The research constructs, organisational ambidexterity and boards of directors are of interest to both researchers and practitioners. In recent years, a consensus was established that supports greater involvement of boards of directors in strategic management (Hendry et al., 2010). However, how organisational ambidexterity is pursued at the board level, the highest rank of organisational leadership remained a dilemma that needed to be addressed. The thesis provides practising directors and board invitees with an understanding of how boards of directors pursue organisational ambidexterity. The findings of this thesis guide practitioners on the processes used by boards of directors, which were refined over the time of the study, from 2017 to 2019. The resultant process model and the enhanced typology have been recommended to form part of basic training for boards of directors. Organisations can develop policies that mandate boards of directors to obtain training on the processes they can use as they lead organisations, paving the way to assessing their effectiveness in their pursuit of ambidexterity. This will improve the efficient adoption of ambidexterity in digital environments, thus contributing to organisations' long-term survival.

1.8 Thesis structure

This section defines how the thesis is organised. The context within which this research is set, digital transformation, is detailed in Chapter 2. It is easier for the reader to understand the arguments presented in the literature review once the context of the study is clearly articulated. Chapter 3 presents the theoretical foundations of this research and positions the gap in the literature on organisational ambidexterity and boards of directors. The research design is presented in Chapter 4. It details the approach to the multiple case studies to interrogate board processes with narrative interviews and the rationale for this methodological strategy choice. Chapter 5 outlines the data collection methods used to execute the research and the philosophical assumptions that underpin the strategies employed to answer the research question. Research ethics considered during this research, data quality and retention thereafter are outlined in Chapter 5. Within-case analysis was performed on the data and was presented in **Appendix D**. This was followed by cross-case analysis, which describes the patterns as observed in the data, is detailed in Chapter 6. Chapter 7 focuses on describing the research findings marrying the extant literature, thus transitioning abstract concepts to build theory. Chapter 8 seals the thesis by concluding the research, summarising the findings and presenting the contributions to the body of knowledge.

CHAPTER 2: RESEARCH CONTEXT

2.1 Background

Today's organisations are operating in an environment laden with digital transformation. This thesis has adopted Sebastian, Moloney, et al. (2017)'s definition of digital transformation, the use of technologies such as social media, mobile technology, analytics, robotics, cloud, and the internet of things. In fact, digital transformation is argued to be the transformative process of an organisation's partial or entire capabilities, its business model and value proposition and management and culture (Borcan, 2021; Sebastian, Ross, et al., 2017) as a result of adopting the above technologies. As digital technologies become embedded, it becomes organisational transformation, where business outcomes and profits are maximised by responding to market demands, becoming agile and attracting customer loyalty (Siachou et al., 2021). Digital technologies that drive digital transformation, have been compared to major innovations like the steam engine and electrification due to their transformative impact in the economy (Jovanovic & Rousseau, 2005 in Borcan, 2021). No sector or organisation is immune to the effects of digital transformation (Hess et al., 2016a). In fact, digital transformation has been described as the "fourth industrial revolution" due to its impact on customers, societies and businesses (World Economic Forum, 2018b in Hossnofsky & Junge, 2019). Organisations should scrutinise their business models, or risk becoming obsolete when digital challengers attack them. There is significant evidence of organisations that have become powerful behemoths by challenging traditional business models. These include Netflix, the world's largest movie house with no cinemas, Skype and WeChat, the world's largest phone providers who do not own significant telephone infrastructure, and more well-known examples which include Airbnb, Uber and Alibaba (Henner et al., 2018). Managers must simultaneously balance exploration and exploitation of organisational resources to transform their businesses (Hess et al., 2016b).

In the past, the view that was maintained was that Information Technology played a back-office role. Therefore the academic focus was driven mainly by an interest in understanding how firms were driving the alignment of IT Strategy with Business Strategy (Anandhi Bharadwaj et al., 2013), and its influence on organisational performance (Oh & Pinsonneault, 2007). However, in recent years, digital transformation, driven by digital technologies, has come to the fore for strategic attention. The main characteristic of the digital revolution is how it transcends all traditional functional areas, embracing both the internal value chain as well as the external socio-economic ecosystem of an organisation. It then ceases to be an IT strategy but business-wide strategy beyond a business unit.

2.2 Digital transformation

Evidence suggests that digital transformation can help firms create competitive advantages or render old advantages obsolete (Mithas et al., 2013), hence the need for organisations to quickly adopt digital transformation and shield themselves from the erosion of competitive advantage. The increasing digitisation of business processes, products and service markets (Mithas et al., 2013) has rendered the pursuit of digital transformation a strategic imperative for organisations. However, digital investments are associated with uncertainty and the costs are substantial. Most traditional organisations are still at an early stage of digital transformation (Sebastian, Ross, Beath, Mocker, Moloney & Fonstad, 2017). Concomitantly, the context of digital transformation is underserved in literature (Matthess & Kunkel, 2020). This thesis sought to understand the processes used by boards of directors in pursuit of organisational ambidexterity in the context of digital transformation.

Strategy, and not just the digital technology, drives digital transformation. Digital transformation is not just about adopting digital technologies but is a transformative process that affects corporate strategy involving the whole organisation (Borcan, 2021). Digital transformation is concerned with the changes in a business model following the adoption of digital technologies (Hess et al., 2016a; Verhoef et al., 2021). It entails leveraging digital technologies to improve the performance and competitiveness of the organisation (Nadkarni & Prügl, 2020). Similarly, literature suggests that organisations that embark on a digital strategy can choose to pursue either a customer engagement strategy or a digitised solutions strategy (Sebastian, Moloney, et al., 2017). Successful investments have shown an increase in cost-effectiveness and created value for customers (Ricci et al., 2020) and have received fast user adoption. For example, what took radio 38 years to reach 50 million listeners, the iPod reached the same number in four years (Gimpel et al., 2018).

The penetration of digital technologies has compelled organisations to be more attentive to their strategies whilst, at the same time, maintaining current operations. Organisations must balance both running of the traditional business as well as the pursuit of long-term demands and capabilities, whilst balancing finite resources in the organisation (Svahn, Mathiassen & Lindgren, 2017). This dilemma is argued to present challenges such as resource distribution across the needs and time horizons (Svahn et al., 2017). Such tension has been observed in different industries, including the automobile industry, where traditional car manufacturers were challenged by digital manufacturers like Tesla (Dremel et al., 2017; Llopis-Albert et al., 2021). Organisations that successfully manage long-term business demands while managing short-term goals are argued to be ambidextrous.

Traditional automobile manufacturers have since incorporated digital transformation, including car assistance, autonomous driving systems, personalised digital services, line maintenance reminders and remote checks (Dremel et al., 2017; Llopis-Albert et al., 2021). Similarly, the digitisation of music, books and movies has disrupted the copyrighted industry. Not only did the cost of music, books and movies drop significantly, but the quality and product choices also increased drastically, making it difficult for commercial sellers to generate the same levels of revenue (Waldfogel, 2017). The graph in the figure below shows a significant decline in revenue generated from America's music industry from 1970 to 2017.

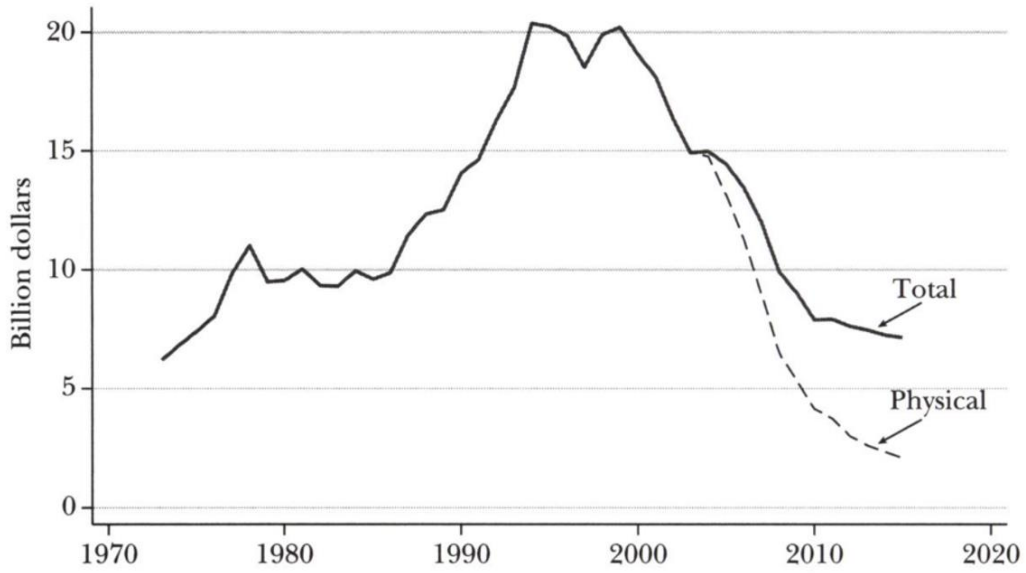


Figure 1: Total value of music shipments in the USA (Adopted from Waldfoldel, 2017)

It is thus not surprising that the digital transformation has been argued to be the primary driver of the new economic revolution, known as the Fourth Industrial Revolution (Hermann, Pentek, & Otto, 2016). Although the Fourth Industrial Revolution is similar to the past four revolutions, which built from the previous revolution, the level of speed, and the measure of changes is unprecedented. While the first two industrial revolutions which were driven by steam engines and oil and machinery, depended on people and their physical bodies to produce goods and services, technology and 4IR depend on the mind, people have no control over the changes that it brings (Xu et al., 2018). 4IR is not just an extension of the technology revolution because of its speed and velocity, the scope and systems impact. It shapes the future and impacts governments and businesses, accelerating economic growth (Xu et al., 2018). This revolution is characterised by turbulence and volatility that pushes business to make faster, and more frequent decisions and corporate success call for new leadership approaches (Lanteri, 2021). There are low barriers between digital inventors and markets, traditional businesses can be easily overtaken by new entrants. In fact, Siachou et al., (2021) argued that traditional businesses that attempt to take up the challenge of adopting digital transformation often face challenges with managing the big shift and disruptions caused by the new technologies.

In a quest to understand how organisations explore and exploit in an environment laden with digital transformation, this research contributes to the literature that articulates the processes used by boards of directors, as they lead organisations to be ambidextrous in this context.

Notwithstanding the current research on digital transformation to date, there is a lack of understanding of the phenomenon and its implications on multiple levels (Vial, 2019; Gray & Rumpe, 2017). Despite the transformative impact of the digital evolution and related technologies, products and services, the context of digital transformation has remained underserved in the literature (Yoo et al., 2010). Whilst digital advancements have rapidly evolved in practice, academic interrogation of the same has lagged. There have been comprehensive studies on digital transformation. Nevertheless, there is scant research investigating how boards of directors pursue organisational ambidexterity in the context of digital transformation, yet they are charged with directing organisations for sustainability. Digital transformation changes existing business models and their value propositions and surely, the board must be clear on how to direct organisations for such an adoption.

Studies have been undertaken, and thus have confirmed various uses for digital transformation. Digital transformation changes firms' competitive environments and digital business strategies (Drnevich & Croson, 2013; Mithas et al., 2013). It changes the way the organisation engages with external stakeholders, to internal processes, down to each individual product (Hanelt et al., 2021). Evidence has shown that digital transformation dematerialises physical products and objects, such as CDs, books and machinery, triggering the transformative capabilities of digital technologies (Nadkarni & Prügl, 2020).

Digital transformation is associated with changes in the organisational structure to be agile and respond quickly through collaboration across business units (Hanelt et al., 2021; Maedche, 2016). When organisations adopt digital, they define a new value proposition for the customer, with augmented products and services (Nylén & Holmström, 2015). Business models have been re-defined through the adoption of digital transformation (Piccinini, 2015; Mokanyane, 2017; Saarikko et al., 2020). With digital transformation, organisations learn through small iterative changes while still focusing on the mainstream goal (Johnk, 2017). Research has shown that distribution channels change and digital transformation creates new customer-facing channels (Hansen & Sia, 2015). The use of sensors has been shown to improve supply chain efficiency (Klötzer & Pflaum, 2017). Value networks are redefined through digital transformation, with multiple stakeholders creating value for the customer (Vial, 2019). In a similar vein, case studies have been used to look at how other organisations have responded or failed to respond to digital transformation and their demise thereafter (Hansen et al., 2011; Hess et al., 2016; Lucas, Henry & Goh, 2009; Sebastian et al., 2017; Singh & Hess, 2017). In all these changes, organisations must find ways of remaining competitive or face existential threats (Sebastian, Moloney, et al., 2017). Although there have been case studies on the adoption of digital transformation, research has primarily focused on developed countries. It is vital to investigate the context of an emerging economy in Africa and confirm whether there is digital transformation (Mutsvairo, Ragnedda, Orgeret et al., 2020) and understand its adoption processes.

Dimensions of perspective have also been limited as the unit of analysis in prior studies has primarily been the organisation. The opportunity to glean insight from various organisational levels that direct strategic decisions remain unexplored. The thesis, therefore, pursued an understanding of how boards of directors of organisations listed on the Johannesburg Stock Exchange, mandated with monitoring disruptive technologies and leveraging their opportunities, have balanced the competing strategies of exploiting and exploring in the context of digital transformation.

2.3 Emerging economy

Although digital transformation transcends all economies, research has shown that there are many differences between developed and emerging economies. There is a raging debate on what are classified as emerging economies since evidence suggests that such classification has not been applied uniformly across different countries (Kynge 2015, in Rana, 2020). However, for the purposes of this research, an emerging economy is a low-income country experiencing rapid economic growth because of government policies and income levels toward economic liberalisation (Rana, 2020).

Extant literature studied organisations operating in developed economies, yet evidence has shown that the operational environment in developed economies is dramatically different from that of emerging economies (Degbey & Pelto, 2021). General characteristic differences between emerging and developed economies include diversity and fragmentation across different markets, availability of technology, education, income, government regulation, infrastructure and logistics (Roberts, Kayande & Srivastava, 2015). Nevertheless, analysis of publicly available information from the Cisco index on digital broadband readiness shows that countries on the African continent are lagging below the global average (Assefa et al., 2021). Some challenges that affect the success of digital transformation in the countries on the African continent include inadequate infrastructure, electricity being accessed by a limited population, the absence of digital literacy and the structure of the market, which has small businesses which are not included in the formal economy (Afshar Ali et al., 2020; Assefa et al., 2021). Despite these hindrances, digital transformation has penetrated countries on the African continent. South African businesses are affected by the spill over of digital transformation in developed countries. Part of the population that they serve has experienced digital services on the platforms offered by developed countries, and they are demanding the same from South African businesses.

In their report on The Digital Economy for Africa Initiative, The World Bank reported that access to the internet remains out of reach for most people on the continent, with only 22% having access in 2017 compared to 80% in developed countries (Zeufack et al., 2021). In the same report, the World Bank identified South Africa as one of the digital economy leaders in Africa, but is still lagging behind developed countries (Zeufack et al., 2021). The International Telecommunications Union's research on Digital Trends in Africa which was done in 2021 (International Telecommunication Union, 2021) shows that South Africa leads the continent in the adoption of digital transformation, particularly Artificial Intelligence. The adoption of 5G,

which was deemed not a reality in Africa, accelerated and was delivered ahead of schedule in South Africa in the wake of COVID-19 (International Telecommunication Union, 2021). Research has shown that more deployments are now mushrooming across the continent, though at the infancy stage. South Africa has the highest telecommunication investments on the African continent. It therefore makes sense for this research to investigate the processes used by boards of directors on organisations listed in South Africa. This thesis investigated how boards of directors, mandated to ensure organisational longevity, pursued organisational ambidexterity in the context of digital transformation in an emerging economy in South Africa.

There is wide diversity and segmentation within emerging markets such that regions within the same country, like rural areas versus urban areas, are at different stages of development (Roberts et al., 2015). Although connectivity is improving in Africa, with South Africa in the lead, this dynamic hides profound disparities among population sub-groups, the rich and the poor, rural and urban communities, men and women (Cariolle, 2020), and in South Africa particularly, educated and the less-educated. Therefore, the appetite for digital products and services would be different, yet such differences in developed markets may be pale. The adoption of digital transformation in emerging economies should not blindly follow the developed country process but must accommodate the context of the environment, including differences in market segments, access to technology, logistics, skills discrepancies, and other dynamics. It was therefore imperative that this thesis investigated processes that are used by boards of directors as they explored and exploited in an emerging economy in the context of digital transformation.

Although there is uncertainty around emerging economies' technological development, policy makers in these countries, including South Africa, have gone ahead and set ambitious goals for digitisation as an enabler for economic growth and job creation (Matthess & Kunkel, 2020).

2.4 Research setting

The World Economic Forum of 2016 alerted nations of the technology revolution, the Fourth Industrial Revolution (4IR), which is driven by digital transformation (Schwab, 2016). At the same World Economic Forum of 2016, the then Vice President, who is now the President of South Africa, positioned 4IR as a key strategy for economic growth and job creation in South Africa. The year 2017 started with the rapid planning and adoption of digital transformation in South Africa. Although South Africa is one of the few countries in Africa with better infrastructure, the commitment to adopt digital transformation was made at a time when not

only the economy was not performing, but the infrastructure was not at an optimal stage. Therefore, it is pertinent to understand the processes used by boards of directors as they directed organisations in this critical period of adopting digital transformation. Data collection for this thesis is from 2017, which marked the formal national journey to the adoption of digital transformation, to 2020.

In the countries in Africa, the use of Information, Communication Technologies, which is critical for digital transformation, remains very low, with an average Internet penetration rate of 34% compared to the developed world of around 56% (Pick & Sarkar, 2015). Therefore, South Africa and the rest of the African countries have been slow in adopting digital transformation. Turning a blind eye to the adoption of digital transformation has not spared the nation from the brunt of the effects of such adoption in the global village. As an emerging economy, at the time of this research, South Africa suffered from a host of challenges including low Personal Computer penetration, lower internet usage rate (Vieira et al., 2019), high data costs, named "#DataMustFall" after people's calls to reduce the cost of data (Moyo & Munoriyarwa, 2020), and a high customer heterogeneity (Alavi, 2016 in Vieira, de Almeida, Agnihotri, da Silva & Arunachalam 2019). Nevertheless, South Africa is one of the few African countries with higher internet penetration rates following the laying of the Seacom cable, a cable that runs under the sea, connecting the African continent to the rest of the world (Cariolle, 2020). However, the cost of data remains an issue. Similarly, the issue of the lack of digital skills is pertinent in South Africa and the rest of the African nations. According to a survey conducted by International Data Corporation (IDC), a market intelligence and advisory services company, on behalf of Microsoft, at least 44% of organisations in South Africa are finding it difficult to recruit staff with digital skills and more than half the organisations are actively upskilling their employees (International Data Corporation, 2019).

Policy makers tend to think that people respond the same way to the adoption of new technologies like digital technologies, despite their socio-economic status (Kaba, 2018). However, this assumption is questionable considering the context of South Africa, where the cost of data was benchmarked by Research ICT Africa and showed that it was at least double the rates of other countries. From 2017 to 2019, there was advocacy by civic rights organisations under "#DataMustFall" to reduce the price of data, network service providers in South Africa started reducing by 25% to 50% (Prior, 2020). Therefore, it is pertinent that board processes used in South Africa be interrogated in the context of digital transformation.

Corporate governance is a relatively new discipline in South Africa amid increasing demands,

and it keeps evolving with the emerging challenges (Natesan, 2020). The King Codes of Corporate Governance are part of an iterative dialectic that has an external influence and has become an integral part of common law (Judin, 2020). The King Codes apply to organisations listed on South Africa's stock exchange, banks, and some state-owned entities. They define governance with a primary focus on leadership, and their ability to discern and judge for dynamic systems which are fit for purpose (Ramalho, 2020). The King Codes take cognisance of advances in technology and how digital technology is driving the Fourth Industrial Revolution (IoDSA, 2016). To this effect, the King Codes assign the responsibility of strengthening organisational processes and responding to new opportunities while managing risks (IoDSA, 2016) to the governing body, thus the board of directors. The Board is therefore mandated to adopt digital transformation and ensure that the emerging risks are managed. It is from this perspective that the King Codes are critical and relevant to this study. The King Codes are the vehicle by which stakeholders can manage the board. There have been many iterations over the years from King I and now at King IV that has been shaped by global influences and issues. The King Codes are now firmly entrenched into the South African Law (Judin, 2020). Whereas there was initially an apply or explain paradigm, this has shifted significantly as many directors have been convicted for non-compliance and therefore directors force application (Natesan, 2020). The King Codes are therefore pertinent to understanding South African boards of directors and how they balance the adoption of digital transformation viz-a-viz running the existing business.

2.5 Conclusions

While developing countries are at advanced stages of adopting digital transformation, most emerging economies are at the early stages of this process. This is primarily because of the different issues that inundate emerging economies. In South Africa, access to infrastructure, including electricity and telecommunication facilities, the cost of data and unavailability of skills, let alone digital skills, create stumbling blocks to the fast adoption of digital transformation. It is pertinent to investigate the processes used by boards of directors as organisations adopt digital transformation in such an environment.

CHAPTER 3: LITERATURE REVIEW

4.1 Introduction

This chapter presents a detailed discussion that identifies and defines the key constructs and concepts that underpin the thesis on boards of directors in pursuit of organisational ambidexterity. The thesis was carried out in an environment laden with digital transformation. Each sub-section starts with the definitions that situate the discussion and guide the reader in making the appropriate linkages between concepts.

The chapter analyses the challenges that organisations are facing. It justifies why the literature on organisational ambidexterity, with a focus on processes used by boards of directors in the context of digital transformation, is the most suitable frame of reference. This is followed by a detailed critical analysis of current literature and its principal themes. The thesis, therefore, details the context of digital transformation in which organisations find themselves. The diagram in Figure 2 below gives a pictorial view of this chapter.

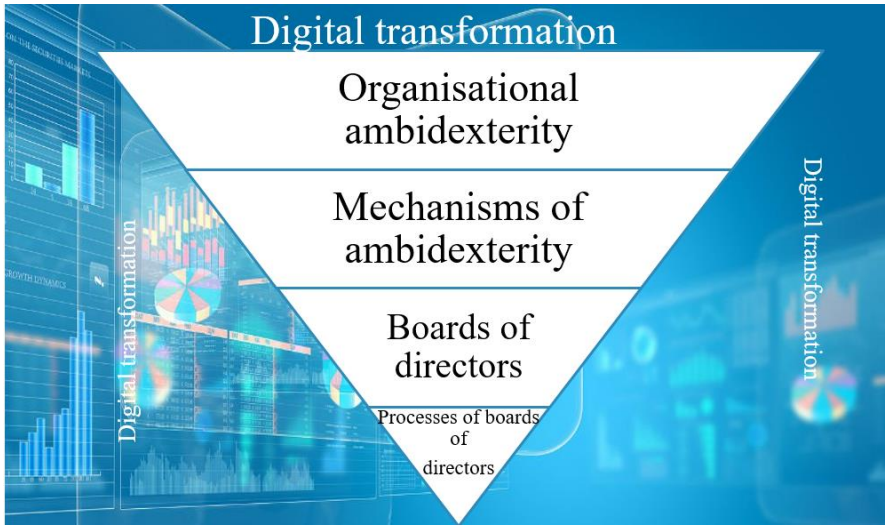


Figure 2: Organisation of literature review: Author's conceptualisation

3.1 Organisational ambidexterity

3.1.1 Definition of organisational ambidexterity

The original meaning of ambidexterity is an individual's capability to be equally skilful with both hands (Birkinshaw & Gupta, 2013b). The metaphor of ambidexterity was extended to organisations to refer to the capacity of an organisation to do two competing things equally well (O'Reilly & Tushman, 2013). This stems from March (1991)'s seminal paper, which defined organisational ambidexterity to be an organisation's ability to pursue two competing objectives equally well (Birkinshaw & Gupta, 2013b; Gupta et al., 2006). This definition considers ambidexterity as a bi-polar construct (March, 1991), where exploration and exploitation are at different ends of a continuum. While March (1991) referred to organisational ambidexterity as exploration and exploitation, subsequent literature has used different terms when referring to the balance sought by organisational ambidexterity. The table below summarises the terms used by various researchers to refer to the pursuit of exploitation and exploration.

Table 5: Terms referring to organisational ambidexterity

Term	Definition	Source
Exploration or Explore	Innovation and problem solving to create new solutions	March, 1991; Andriopoulos & Lewis, 2009 Simsek, 2009
Exploitation or Exploit	Using, refining, and building on existing expertise	
Alignment	Adherence to all activities in the business unit. Working towards the same goal.	Gibson & Birkinshaw, 2004
Adaptability	Capacity to reconfigure activities in the business unit quickly to meet the changing demands of complex tasks.	
Aligned	In line with current business	Raisch & Birkinshaw,

	demands	2008
Efficient	Adaptive to changes in the environment	

Source: Author's conceptual visualisation from various articles

Organisational ambidexterity refers to organisations capable of exploiting existing competencies and exploring future opportunities with equal dexterity (Lubatkin, 2007; Stettner & Lavie, 2014; Wang et al., 2018). This thesis adopted Raisch and Birkinshaw's 2008 definition of organisational ambidexterity, the ability of an organisation to exploit and take advantage of existing markets while exploring to create the capability to meet the demands of future markets. This definition is congruent with the environmental dynamism caused by digital transformation. The research uses the ambidexterity terms presented by March (1991), to explore and exploit. The hybrid approach to the definition is most suitable for this thesis which lifted the lid on what has been generally termed "the black box" of board operations. It provides the best fit for realising the objective of the research, thus, to understand processes used by boards of directors as they directed organisations to ambidexterity in the context of digital transformation.

Ambidexterity is not an event but a process that happens over time, and involves mastering the art of balancing exploration and exploitation. Literature has shown that organisational ambidexterity can be a deliberate strategy process from the organisation's intentions (Zimmermann, Raisch, Birkinshaw, et al., 2015). Ambidexterity can also be an emergent strategy process that results from unplanned improvisations (Sinha, 2019). This research is advocating for boards of directors to deliberately plan to invoke ambidextrous processes as they direct organisations.

3.1.2 Literature on organisational ambidexterity

Nothing breeds complacency like success (Tushman, O'Reilly, 2016). The fundamental problem that organisations are battling with is to engage in sufficient exploitation and ensure current viability while engaging in exploration to ensure future survival (Turner et al., 2013). Scholars who promote a differentiation view assert that exploration and exploitation are incompatible activities that compete for limited resources (Brix, 2020). Organisations that learn to balance these two are ambidextrous and are associated with superior performance (Werder & Heckmann, 2019). While the concept of ambidexterity received popularity from scholars and practitioners, the concept was still not mature because there were no consistent definitions

across different research fields. There was a lot of attention, following the seminal paper of March 1991 to 2013. This was followed by a dearth in literature, with a few ad hoc publications, until 2017 when attention resumed on ambidexterity research.

Similarly, there was considerably less clarity on how this balance of exploitation and exploration could be achieved (Birkinshaw & Gupta, 2013b; Brix, 2019). In their study, Simsek et al., (2009) were among the first authors to identify the fields where organisational ambidexterity was used. The same fields were also identified by Birkinshaw & Gupta, (2013a) and subsequently referred to by Vahlne & Jonsson, (2017) in their study on Ambidexterity as a dynamic capability in globalisation. The figure below shows the different fields of scholars who studied the phenomenon of organisational ambidexterity.

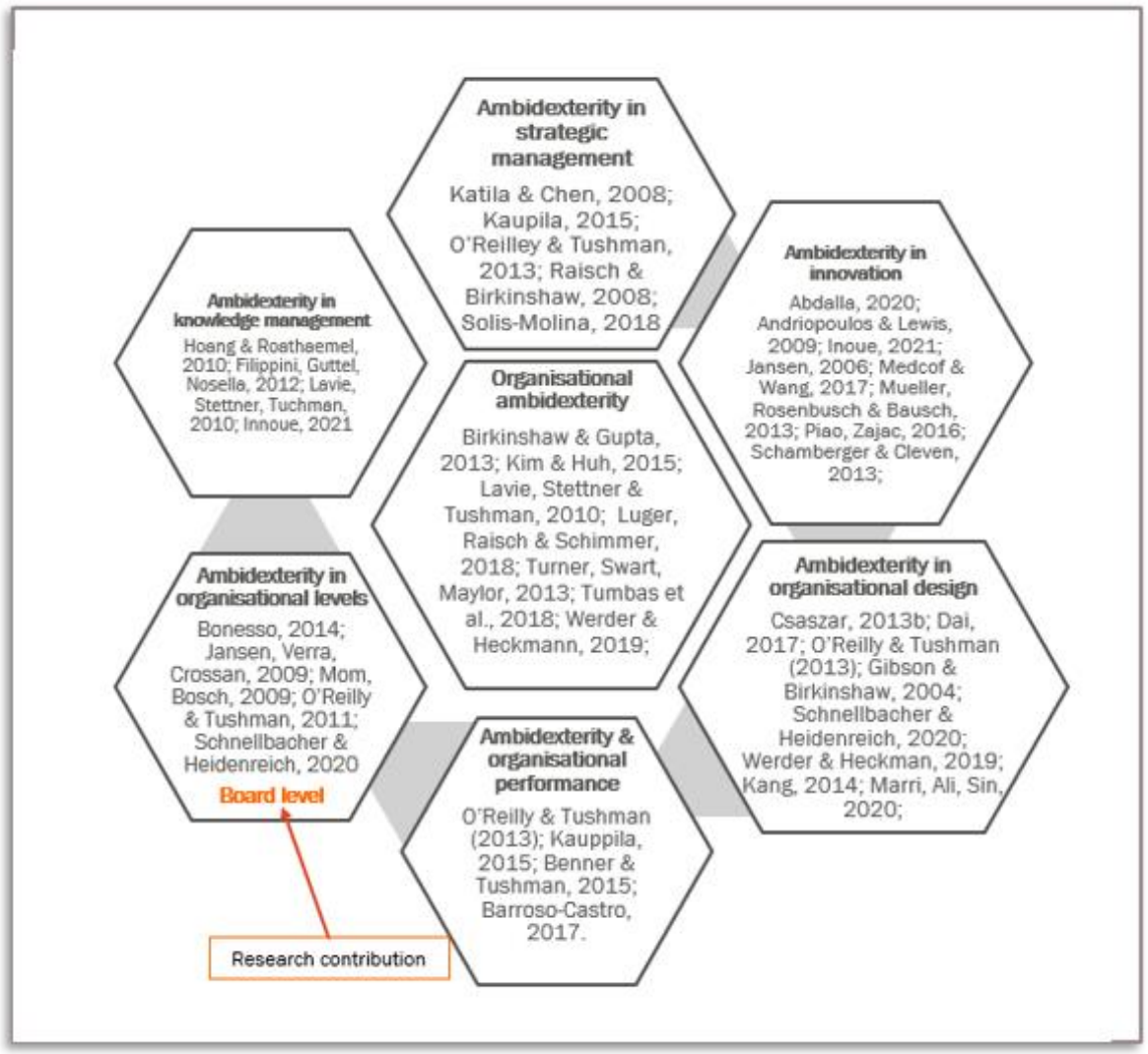


Figure 3: Fields of studies on organisational ambidexterity: Author's conceptual visualisation

Birkinshaw and Gupta (2013) conducted extensive research in the field of organisational ambidexterity and observed that the research had gained popularity and the trend is likely to continue. The authors attributed this to the concept of ambidexterity being considered progressive and versatile. Organisational ambidexterity has been applied in different fields of research, including innovation, knowledge management, organisational learning, organisational theory, organisational design, and strategic management. However, there is no clarity on how the balance of the competing strategies, exploration and exploitation, is achieved (Kim & Huh, 2013). This study contributes to the theory of organisational ambidexterity, as depicted in figure 3 above, by exploring the processes used by boards of directors to pursue ambidexterity.

Organisations can decide to either explore or exploit. Exploitative activities can increase short-term performance by increasing efficiency and adaptation to the environment. However, excessive exploitation can reduce the firm's ability to discover new opportunities (Kim & Huh, 2015). Conversely, exploration enhances the organisation's ability to adapt to environmental changes and reduces the risk of obsolescence (Kim & Huh, 2015). Returns from exploration have been argued to be systematically lower in organisations with incremental change (Luger et al., 2018) than exploitation. On the other hand, while costs are substantial in the current digital environment, digital transformation is argued to bring significant improvements to value chains by boosting efficiencies, reducing costs and generating greater collaboration and innovation (Llopis-Albert et al., 2021; Tumbas et al., 2018). However, with digital transformation, the extent of environmental turbulence undermines exploitation and exploration methods because it devalues prior knowledge and degrades new knowledge (Lavie et al., 2010), thus creating a continuous need for new skills.

Ambidexterity in innovation

Innovation involves intricate knowledge management processes of identifying and using ideas to enhance existing or to create new products and services. Organisations need to pursue explorative and innovation strategies to be viable in an environment with rapid technology changes (Mueller et al., 2013), mainly digital transformation. Research has concluded that exploitation hones in on, and extends the existing knowledge, with relatively low incremental benefits (Andriopoulos & Lewis, 2009; Inoue, 2021). On the other hand, exploration entails the development of new knowledge and experimenting to foster novelty for radical innovation

(Andriopoulos & Lewis, 2009; Inoue, 2021). Exploitative innovation strategies are best pursued without comprehensive external collaborations while the involvement of several partners is the most optimal for exploration (Schamberger et al., 2013).

Research has shown that repetitive exploitation impedes exploration, while incremental exploitation impels exploration (Piao & Zajac, Edward, 2016). Conclusions were also reached that organisations that couple digital transformation with open collaboration and partners had shown an increase in their adaptability (Abdalla, 2020).

Similarly, digital transformation enables ambidexterity, when digital platforms are available to other stakeholders like developers (Inoue, 2021). The availability of digital platforms and openness is argued to enable unlimited innovation and ambidexterity (Inoue, 2021). On the other hand, national culture is argued to influence exploratory and exploitative innovation (Medcof & Wang, 2017). However, there is a dearth in the literature on how cultural differences are enacted (Medcof & Wang, 2017).

Ambidexterity in knowledge management

There is an overlap in literature on organisational ambidexterity in innovation and in knowledge management, understandably so because innovation is a knowledge-based outcome. Organisations must choose the most appropriate ways to innovate, thus using existing knowledge, exploiting, or exploring new knowledge exploration (Solís-molina et al., 2018). The organisations can then distribute and use knowledge effectively in ways that increase their ability to pursue ambidexterity (Heavey & Simsek, 2017). For organisations to unlock the potential of individual ambidexterity, studies argue that organisations need to pay attention to how knowledge is sought after and distributed to fuel exploration and exploitation (Schnellbächer & Heidenreich, 2020). At the management level, such distribution and use of knowledge can be done when the top management team has transactive memory that helps them pursue ambidexterity (Heavey & Simsek, 2017). Recently, Brix (2019) introduced inter-organisational ambidexterity, where there is a transfer of existing knowledge from one organisation to another through partnerships. At the management level, such distribution and use of knowledge can be done when the top management team has transactive memory that helps them pursue ambidexterity. There is a dearth of literature on how boards of directors pursue ambidexterity. This research will illuminate how boards of directors explore and exploit in the context of digital transformation.

Ambidexterity in strategic management

Organisations need to shift their structures to align with strategy (Duncan, 1976). A sequential approach to ambidexterity is more beneficial to smaller firms that operate in quiet environments (Katila & Chen, 2008). However, it might be ineffective in other environments, such as those related to digital transformation, in which the scope of the change required is more dynamic. What is still not well understood though, is how sequential ambidexterity affects the organisation's strategy. The pursuit of exploration and exploitation within different structures, people, processes and cultures allows simultaneous attention to the two strategies (O'Reilly & Tushman, 2013). However, it is more suitable for dynamic environments and must be determined by the organisation's strategy. Conflicting tasks can be reconciled at the senior management level, setting the strategy and allocating resources (Tushman, 2011). The role of management in ensuring the organisation's ability to reconcile and harness the conflicting demands is emphasised in strategic management.

The literature on ambidexterity is also characterised by theoretical work and empirical studies undertaken primarily at the organisational level (Turner et al., 2013b). Although the individual manager's role is acknowledged as important (Mom et al., 2009; Nemanich & Vera, 2009), only limited work on the executive actions in day-to-day operations enables this critical organisational capability. Consequently, O'Reilly and Tushman (2011) called for greater insight into the managerial micro-mechanisms that enable ambidexterity. Turner et al. (2013) suggested studies that help to comprehend how ambidexterity works in practice. Having noted this though, there remains little research attention to boards of directors, their role and how they pursue ambidexterity as they direct organisations (Oehmichen, Heyden, Georgakakis, & Volberda, 2017). There has been a call for research that spans multiple levels of analysis (Raisch & Birkinshaw, 2008). Thunderbird International Business Review issued a call for papers on There was also a call for papers from Thunderbird International Business Review Special Issue on Ambidextrous Organizations in and from Emerging Markets in August 2019. This thesis contributes toward closing the research gap, with a focus to investigate how boards of directors explore and exploit in the context of digital transformation.

Ambidexterity in organisational theory

Although ambidexterity has been associated with superior organisational performance (Jacobs & Maritz, 2020; O'Reilly & Tushman, 2013), researchers have argued that due to trade-offs of exploration and exploitation at an organisational level, sometimes ambidexterity is beyond reach or ineffective (Solís-molina et al., 2018). This line of research concluded that the effect of organisational ambidexterity on performance was positive in firms with a high absorptive

capacity (Kauppila, 2015). On the other hand, organisations with low levels of absorptive capacity did not have enough new knowledge to be applied for commercial returns. They, therefore, benefited more from specialising in exploitation or exploration (Solís-molina et al., 2018). However, researchers argued that due to trade-offs of exploration and exploitation at an organisational level, sometimes ambidexterity is beyond reach or is ineffective (Solís-molina et al., 2018). This line of research on organisational theory concluded that the effect of organisational ambidexterity on performance was positive in firms with a high absorptive capacity (Kauppila, 2015). On the other hand, organisations with low levels of absorptive capacity did not have enough new knowledge to be applied for commercial returns. They, therefore, benefited more from specialising in exploitation or exploration (Solís-molina et al., 2018).

Ambidexterity in organisational design

Researchers have shown particular interest in investigating how organisations become ambidextrous (Kang, 2014). In particular, the issue of what organisational structure supports exploration and exploitation is quite topical in organisational design. Evidence suggests that organisational structure is linked to exploration and exploitation (Csaszar, 2013b). In particular, the use of dual structures is seen as a means of achieving ambidexterity (Heracleous et al., 2017). An organisation's capacity for change is its ability to balance the need to implement changes and the need to maintain daily operations (Raisch & Birkinshaw, 2008; Werder & Heckmann, 2019). The lack of a framework to consolidate and direct ambidexterity research has been an issue. There has, however, been consensus on structure, temporal arrangements, context, and leadership characteristics as the key antecedents to organisational ambidexterity. For instance, organisations may create different units to separately manage exploitation and exploration (Jansen, Tempelaar, et al., 2009) or they may oscillate between exploitation and exploration sequentially (Dai et al., 2017).

Research on the role of leaders in pursuing ambidexterity has been limited (Nemanich & Vera, 2009). Minimal interest has focused on ambidexterity with the organisation, executives, middle managers and the individual as the unit of analysis (Mom et al., 2009; Schnellbächer & Heidenreich, 2020). There remains scant evidence of research on boards of directors and ambidexterity (Oehmichen, et al., 2017), let alone the processes they follow as they pursue organisational ambidexterity in various contexts. Thus, this study is set to contribute to ambidexterity literature by understanding how boards of directors explore and exploit in the context of digital transformation.

Ambidexterity at various organisational levels

In addition to the research on organisational design, the level at which ambidexterity was covered in literature is pertinent. It brings content to this study. Various studies consider ambidexterity critical at different levels (Birkinshaw & Gupta, 2013b). These have focused attention on the organisation, management groups from the Top Management Team, middle managers, and individuals as the unit of analysis. The same studies also acknowledge that the role of management is necessary (Mueller et al., 2020; Turner et al., 2016), yet there is little or no reference to boards of directors, who are charged with directing organisations for longevity. This thesis, therefore, deduces from extant literature that, similar to other group levels in the organisational hierarchy, boards of directors are critical for organisational ambidexterity. In fact, the role of the board is more critical as they direct the Chief Executive Officer and the rest of the Top Management Team on strategic matters (Pugliese, Bezemer, Zattoni, Huse, Van den Bosch, et al., 2009). Literature has shown that ambidexterity is associated with positive organisational performance (Benner & Tushman, 2015). However, little evidence shows the managerial (Turner et al., 2016) and board processes that bring this about. This thesis investigates the processes used by boards of directors as they pursue ambidexterity in a digital environment. Research on ambidexterity to date has focused on large, mature organisations in developed countries. This thesis pursued South African companies that are operating in the country, an emerging economy.

3.1.3 Assumptions of literature on organisational ambidexterity

a) Heterogeneity among all group levels

Studies on organisational ambidexterity have been in the form of longitudinal studies primarily focused on individual firms (O'Reilly & Tushman, 2013) as a unit of analysis, and to some extent, on managerial levels. There is some literature on ambidexterity by level, from individuals to management, with examples of how organisations become ambidextrous (Bonesso et al., 2014). Fewer articles have been identified in recent times (Oehmichen, et al., 2017) that have linked organisational ambidexterity to the boards of directors—assuming heterogeneity across all levels from the individual on the ground level, middle management, top management (Raisch & Birkinshaw, 2008) up to the board of directors. Yet research has shown that leadership oversight accountabilities and approaches are different at each level. Boards of directors are argued to be the integration mechanism, which aims to develop better

business strategies by injecting new ideas and suggestions into the business model (Kang, 2014). This study, therefore, seeks to understand how boards of directors explore and exploit when faced with leading digital transformation.

b) The contextual fit across different economies

Extant research on organisational ambidexterity has focused mainly on large organisations in developed countries, the United States of America and Europe, shying away from emerging economies (De Haas et al., 2021; Jacobs & Maritz, 2020). This assumes homogeneity in the economies (De Haas et al., 2021). Rockart (1970), emphasised the need for academic enquiry into organisational ambidexterity to observe contextual differences. This study not only introduces a new geographical perspective to the debate but also illuminates the impact of emerging market economic conditions on the pursuit of ambidexterity in the digital context. The pace of digital adoption in a developed economy is considerably faster than in developing market environments (Report et al., 2016). The research, therefore, investigates how boards of directors are exploiting and exploring emerging economies in the context of digital transformation.

3.1.4 Antecedents of organisational ambidexterity

Although definitions of the concepts on ambidexterity have somewhat been inconsistent, there is consensus on the antecedents of organisational ambidexterity. Exploration and exploitation can happen by structure, time, or domain. Literature has generally referred to these three high-level approaches as structural, contextual and temporal ambidexterity (Bailey & Peck, 2013; Turner et al., 2013). However, Simsek et al. (2009) consolidated these into two, structural dimension, which captures where ambidexterity is pursued, whether independently or within inter-dependent structures, and the temporal dimension, which captures how ambidexterity is pursued, whether sequentially or simultaneously. Temporal ambidexterity captures the extent to which ambidexterity is pursued over time (Simsek et al., 2009).

3.2 Typology of ambidexterity

The literature review presented in this section is informed by the typology of Simsek et al. (2009), which was developed, based on previous work on organisational ambidexterity. In trying to consolidate previous research, Simsek et al. (2009) introduced a typology that organisations use to decide on a strategy to pursue ambidexterity. In answering the research question, *"How do boards of directors explore and exploit in the context of digital*

transformation", this thesis used Simsek et al. (2009)'s typology of ambidexterity to guide the interview questions. The typology highlights the primary dimensions that differentiate various contexts in which ambidexterity can be pursued. The typology guides a more focused and systematic investigation into organisational ambidexterity (Simsek et al., 2009). Simsek et al. (2009) argued that there are four ways to balance exploration and exploitation, that is, through harmonic, partitional, cyclical or reciprocal ambidexterity.

However, the typology does not address the level at which these choices are made, namely individual, the management or board of directors. It generalises the antecedents used across different levels within the organisation. Consequently, Simsek et al. (2009) acknowledge the need for further research on the underlying nature of ambidexterity. This thesis investigates the processes used by boards of directors as they pursue ambidexterity and simulates the typology of ambidexterity used at this level, thus aligning the processes used by boards of directors with the type of ambidexterity. The thesis, therefore, directs attention on the processes of boards of directors as the unit of analysis. This thesis is in response to several calls that have been made advocating for research on ambidexterity to extend into multiple levels of analysis (Raisch & Birkinshaw, 2008; Raisch et al., 2009; Turner et al., 2013). It also addresses the current gap in the literature to understand how ambidexterity is achieved.

Simsek et al. (2009)'s typology is underpinned by two distinct and overarching conceptualisations and antecedents from ambidexterity literature, highlighting the primary dimensions that differentiate how ambidexterity is used. These are temporal and structural ambidexterity. The temporal dimension considers whether ambidexterity happens simultaneously or sequentially, while the structural dimension captures whether or not ambidexterity is realised in independent business units or inter-dependent units (Simsek et al., 2009). The figure below shows a two-by-two typology of organisational ambidexterity, with the dimensions mapped adjacent. This research investigates processes that align with each typology as boards of directors explore and exploit the organisations they direct.

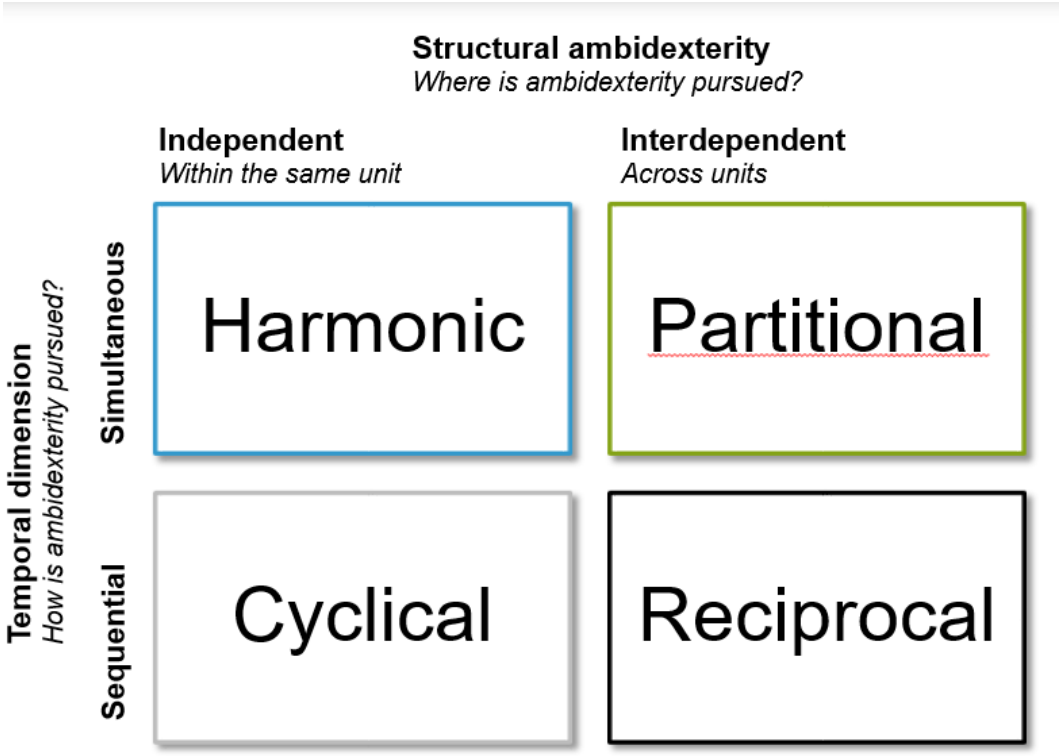


Figure 4: A typology of organisational ambidexterity (Simsek, et al., 2009)

Each of the types of ambidexterity presented in Figure 4 above, is unique and is grounded in prior literature. The analysis below presents each typology, where and how it is used and its relevance to this research. This thesis sought to understand Simsek et. al. (20017)'s typology by investigating which type of ambidexterity is used by boards of directors operating in digital transformation environments and identifying any other concepts that may be unique to this group of leaders operating in the context of digital transformation.

The multi-faceted typology used two overarching dimensions that are synonymous with organisational ambidexterity. These are temporal and structural dimensions.

3.2.1 Structural dimension

This section was used to identify the gap in the literature and informed the research question relating to boards of directors and structural ambidexterity processes. Structural ambidexterity is when an organisation separates exploration and exploration across different units, with targeted structural integration; for example, the manufacturing department is different from research and development (Turner et al., 2016). In structurally ambidextrous organisations, exploitation units are generally more significant than exploration units. The exploration units

are typically small, decentralised, with a different culture and processes, sometimes physical location as well, distinctive learning methods and rewarding systems, and usually different management is appointed to lead these units (Jansen, George, et al., 2009; Lavie et al., 2010). Partitional and reciprocal ambidexterity pursue a structural dimension. The key lies in transferring knowledge across the different units.

Recently, research has shown that such knowledge sharing is not only intra-organisational but inter-organisational. In an inter-organisational environment, organisations explore by collaborating with new partners without prior relationships (Brix, 2019). Exploitation in the inter-organisational context refers to the collaboration between organisations with similar attributes to the parent organisation (Brix, 2019). In addition, as part of governance, boards of directors use a capabilities-based approach, where they establish sub-committees that focus on a specific area (Prasad et al., 2010), in this case, digital transformation. Therefore, each organisation will establish its structures in the context of its strategy and governance mechanisms. The King Codes of Corporate Governance mandate boards of directors of organisations listed on the Johannesburg Stock Exchange to monitor disruptive digital technologies, and leverage the opportunities presented by such technologies (IoDSA, 2016). This thesis investigated the structures that were used in the cases that were sampled to understand how boards of directors explore and exploit in the context of digital transformation.

3.2.2 Temporal dimension

Empirical research on temporal ambidexterity was used to answer the research questions on the context and timing of ambidexterity. Organisations operating in a dynamic environment face a common problem. Actions suitable in the short-term are seemingly different from those that work in the long term, thus exploration and exploitation, respectively (Wang et al., 2019). Organisations that manage to reconcile these tensions are ambidextrous (Wang et al., 2019). Some organisations achieve ambidexterity through sequential alternating modes (Zimmermann, Raisch, & Birkinshaw, 2015a) of exploration and exploitation, according to market requirements. However, there are still arguments that posit that ambidexterity must be pursued simultaneously to attain competitive advantage and long-term survival (Csaszar, 2013a). In trying to shed more light on how organisational ambidexterity is achieved, Simsek, et al. (2009) consolidated the temporal dimension and defined it using two approaches, simultaneous and sequential ambidexterity. The sections below detail the characteristics of each approach, and the typology that is associated with the approach.

a) Simultaneous approach

Exploitation and exploration can be pursued simultaneously or sequentially. The simultaneous approach is in line with March (1991)'s argument that activities around exploration and exploitation happen concurrently, reinforcing each other. Building on March (1991)'s work, Hill and Birkinshaw (2006) observed that in corporate venture capitals, the units that were exploited and explored simultaneously delivered the most significant strategic benefits to their parent companies. Similarly, organisations that promote creativity, or have team-based structures, have been shown to promote the simultaneous pursuit of exploration and exploitation. Harmonic and Partitional ambidexterity use a simultaneous approach but differ in where ambidexterity is executed.

b) Sequential approach

Organisations follow temporal cycles through periods of exploitation and exploration (O'Reilly & Tushman, 2013; Wang et al., 2019). Unsuitable switching between exploration and exploitation phases in sequential ambidexterity may incur unnecessary costs (Liu & Leitner, 2012).

Temporal and structural ambidexterity is mapped into a two-by-two typology that differentiates four types of ambidexterity, harmonic, partitional, cyclical and reciprocal, which are discussed in the sections below (Brix, 2019; Simsek et al., 2009).

i. Harmonic Ambidexterity

Harmonic ambidexterity refers to the simultaneous pursuit of exploration and exploitation within a single organisational unit, for example, a business unit (Brix, 2019; O'Reilly & Tushman, 2013; Simsek et al., 2009). It is about making a judgement on how to divide time between the conflicting demands. Harmonic ambidexterity is about maintaining an optimal balance of exploitation and exploration within the sub-system. However, achieving this harmony is inherently challenging because each sub-unit competes for resources, leading to conflicts, contradictions and inconsistencies (Brix, 2019; Datta, 2011). This may cause a challenge when exploration and exploitation are already argued to compete for stretched resources in the organisation. Harmonic ambidexterity can only be achieved when individuals agree that the unit is aligned without specifying mechanisms.

Harmonic ambidexterity is grounded in the organisational context and culture. The context of digital transformation, for example, must allow a stretch, discipline and trust (O'Reilly &

Tushman, 2013), and it models the behaviours of the individual. A good example provided by Adler (1999) in O'Reilly and Tushman (2013) is Toyota's production system. Employees are expected to do their routine tasks, exploit, and simultaneously continue to change their jobs, thus exploration (O'Reilly & Tushman, 2013). Toyota's management system and culture support such practices with programmes like Total Quality Commitment.

While organisational outcomes of harmonic ambidexterity are still emerging, extant research has considered it rare, valuable and costly to imitate the resources, creating a competitive advantage within an organisation (Yang, Atuahene-Gima, 2007). Simsek et al. (2009) attest to the strategic benefits of harmonic ambidexterity. The sub-units that built new capabilities and simultaneously use their existing capabilities, are argued to create breakthrough innovations, invest in disruptive innovations, develop relationships with key stakeholders and fund themselves. It is not surprising that customer satisfaction is very high in these units.

The harmonic typology is aligned to contextual ambidexterity (Gibson & Birkinshaw, 2004), which is prominent at the individual level or within a sub-unit of the business. It concurs with the other antecedents on the need to explore and exploit, but not through the structure or temporal separation. It achieves the balance by building a business unit context that encourages individuals to judge how best to divide their time between conflicting demands (O'Reilly & Tushman, 2013). It is dynamic, depending on the context in which the task is being executed. It allows individual judgement, which removes the pressure to co-ordinate but submits to management guidance. This eliminates coordination problems between business units. However, it is critical to understand how ambidexterity is pursued at the group level, particularly on boards of directors in dynamic environments.

Bearing this in mind, this research analysed the cases under study to understand the types of ambidexterity adopted by boards in the context of digital transformation.

ii. Partitional Ambidexterity

Partitional ambidexterity is the simultaneous pursuit of exploration and exploitation across different and independent sub-systems, for example, business units or even organisations (Simsek et al., 2009). It is achieved by creating separate units for exploration or exploitation, each unit with distinct operating processes, culture and incentives (Datta, 2011). It assumes that exploration and exploitation are bi-polar constructs at different ends of the continuum and compete for resources. The focus is on the role of the dual structure of initiation and implementation (Datta, 2011). Partitional ambidexterity implies a dual structure in independent

units for exploration and exploitation, each with its strategy. Therefore, there is a need for an overarching strategy to which both sub-systems subscribe (O'Reilly & Tushman, 2013), and a management team that can co-ordinate activities across the teams, ensuring knowledge integration (Wang & Rafiq, 2014).

Partitional ambidexterity can be pursued within or across organisations, including in strategic alliances and network partners (Brix, 2019; Tiwana, 2008). The alliance's initial charter may focus on exploration or exploitation (Lin et al., 2007). However, these relationships benefit from developing ambidextrous knowledge processes in the long term (Zimmermann, Raisch, & Birkinshaw, 2015a). One, therefore, argues that such organisations are using strategic alliances to achieve organisational ambidexterity. The question is, how do boards of directors achieve this in the context of digital transformation?

Partitional ambidexterity has its roots in organisational design, where concepts of structural partitioning originated. Large organisations have created new products without hampering traditional business (O'Reilly & Tushman, 2013). This argument is more aligned to ambidexterity, where an organisation balances optimal levels of exploitation and exploration. Partitional ambidexterity has been associated with innovation, breakthrough products and positive financial outcomes. This thesis identified cases where boards of directors used partitional ambidexterity to allocate resources to bring about such a balance.

The challenge with partitional ambidexterity lies in co-ordinating the strategies across the different sub-units, which may be departments, divisions or organisations. Senior management must also agree on the need for both exploitation and exploration and deal with conflicts that this raises, including costs. This study reflects what partitional ambidexterity means for boards of directors who are challenged with running the traditional business and pursuing digital transformation. While other cases formed separate board sub-committees that focus on exploration, most cases had dual oversight on both exploration and exploitation.

Literature review showed that some organisations established Information Technology (IT) Governance committees. A typical example of such a committee in South Africa is the IT Steering Committee. This committee was typically chaired by a top executive and staffed by both IT and business executives (Prasad et al., 2010). The committee met periodically to discuss the technological direction of the organisation, approved, and ranked projects, reviewed performance, formulated or approved technology policies, determining resource levels, and recommended major initiatives (Earl, 1993). However, effective IT Governance

requires boards of directors and top management team members to actively manage and govern their IT investment (Ali & Green, 2012; Prasad et al., 2010). The study observed that IT Board sub-committees are mushrooming in South African companies. These committees direct and provide oversight of the strategic direction for IT in the organisation. What was observed though, is that while some organisations' adoption of digital transformation was a business matter (Nadkarni & Prügl, 2020), it was still largely referred to as Information Technology.

iii. Cyclical Ambidexterity

Cyclical ambidexterity is the sequential pursuit of exploration and exploitation within a sub-system like a business unit (Simsek et al., 2009). The notion of “Cycling” implies that ambidexterity is created through the sequential alternation of long periods of exploitation and short bursts of exploration (Gupta et al., 2006). These cycles will need to be integrated with business processes for a smooth transition and ensure delivery. This should include rules that are applied when switching and mechanisms for managing conflict during a transition from cycling transitions to exploration to exploitation cycles. Cyclical ambidexterity is typical in technology firms, where a product is developed using experimental methods and may need improvements, which will be achieved through exploitation (Simsek et al., 2009). However, this can be argued to be reactive because product development is not continuous and can be quickly overtaken by the competition.

Literature suggests that cyclical ambidexterity is primarily adopted in organisations that are proactive in acquiring and/or developing new technologies and innovation firms (Simsek et al., 2009). Such organisations follow an S-shaped curve, showing dominant periods of designing a product then exploitation periods once the design is established. However, there comes a time when exploitation is no longer effective and a new cycle of exploration starts (Katila & Chen, 2008).

Simsek et al. (2009) posit that sequential ambidexterity is only effective in stable environments. Environments with digital transformation are pretty dynamic, therefore, not suitable for cyclical ambidexterity. However, organisations that use acquisitions as a growth strategy, and alliances, are also argued to use sequential modes of ambidexterity. When an organisation has a new acquisition, it goes into the exploration stage to break out of the inertia state before it transitions into a long period of exploitation before starting a new cycle by going into another acquisition (Chen & Katilia, 2008).

iv. Reciprocal ambidexterity

Unlike partitional ambidexterity, which relies on pooled inter-dependency between units performing exploration and exploitation, exploration and exploitation are done sequentially in reciprocal ambidexterity. Outputs of business Unit A become inputs of business Unit B, and Unit B's outputs are cycled back as inputs fur Unit A (Simsek et al., 2009). This requires continuous information exchange, collaborative decision making and problem-solving between the different units. There is a need for ongoing information exchange between organisational units that explore and those that exploit (Datta, 2011) for reciprocal ambidexterity to work.

This can also mean that an organisation extends its experience to another with a strategic alliance. Such situations may be complex and require in-depth knowledge to explore and exploit. The way organisations explore, and exploit depends on the nature of their partnerships and alliances over time.

3.3 Conclusion and gap in the literature on organisational ambidexterity

In conclusion, the need to explore and exploit is accelerated by the dynamic environment, which is primarily driven by digital transformation in this context. While Simsek et al. (2009)'s typology provides a framework to classify the plethora of literature that seeks to understand ambidexterity, very little is known about how this is achieved, especially by boards who sit in organisations operating in dynamic environments.

3.4 Boards of directors

3.4.1 Definition of boards of directors

The board is a group of executive and non-executive directors mandated to direct organisations for longevity (Turner et al., 2013). The shareholder appoints boards to oversee the long-term performance of an organisation. Their appointment is based on each individual's expertise. Boards play an essential role in the governance of organisations as they separate ownership from corporate control of the organisation.

The importance of leaders in organisational ambidexterity is acknowledged in literature (Kassotaki, 2019a; Luo et al., 2018). However, extant research focused on management, and little is known about the processes that are used by boards of directors. Management is argued to be opportunistic and seeks to maximise their self-interest, generating agency benefits. Digital transformation is known to be costly, risky, and takes time for the value to materialise.

It is therefore imperative that the Board of Directors, who are the appointed stewards of the organisation, direct organisational ambidexterity in the wake of digital transformation. The board, in this case, also acts as a resource for management. There is an ongoing debate in literature on agency and stewardship theories. However, this research is purely focused on understanding the processes used by boards of directors as they balance exploration and exploitation in the context of organisational ambidexterity. Reference to the agency problem and stewardship is mainly to position the argument on why it is important to study the processes at the board level in this context and not just management level.

The agency problem presents that there is tension between the executive and non-executive directors because of what is argued as the self-interest behaviours of managers (Obermann et al., 2020). This agency problem favours a majority of independent non-executive directors (Huse, 2007; Rashid, 2011) as management is seen as conflicted. South Africa's King Codes of Corporate Governance concur with the agency problem and stress that most board members should be independent non-executive directors, as this reduces the possibility of conflicts of interest (King Committee, 2016).

Boards in the United States of America, the United Kingdom and Japan operate a one-tier board, integrating decisions, management and control into one body (Bezemer et al., 2014). On the other hand, in two-tier boards, which are common in South Africa, executive directors are responsible for the daily operations of the organisation while non-executive directors play a supervisory director role (Bezemer et al., 2014; Staikouras et al., 2007; Jung mam 2006; Millet-Reyes & Zhao, 2010). In addition, while the board is accountable for corporate governance, for corporate governance, research has shown that the efficacy significantly depends on the institutional environment (Oehmichen, 2018). The review of the context of emerging economies compared to developed economies detailed in Section 2 has already illuminated the differences in the institutional environments.

Some boards appoint a sub-committee that is focused on providing the technology direction of an organisation. Past appointments on technology boards received a positive market response (Lunardi, Lerch et al., 2014). However, the appointments of sub-committees depend on the role of the board in the respective organisation. Nevertheless, the board is key to an organisation's corporate governance and is the centre of the strategy (Rejeb et al., 2019). Therefore, it is expected that the board plays a significant role in an organisation pursuing ambidexterity.

In the same breath, considering the complexity and dynamics that organisations are going through in the digital era (Åberg et al., 2017), the board of directors must be involved in digital transformation because it is fundamentally not about technology but strategy (Warner & Wäger, 2019). This thesis investigated the processes used by boards of directors to explore and exploit in the context of digital transformation. The rest of the section illuminates literature on the role of boards of directors and how their processes fit in, focusing on the research gap.

3.4.2 A critical literature review on boards of directors

The literature on boards of directors has predominantly dwelt on the areas shown in Figure below and has not paid much attention to how boards of directors achieve their roles.

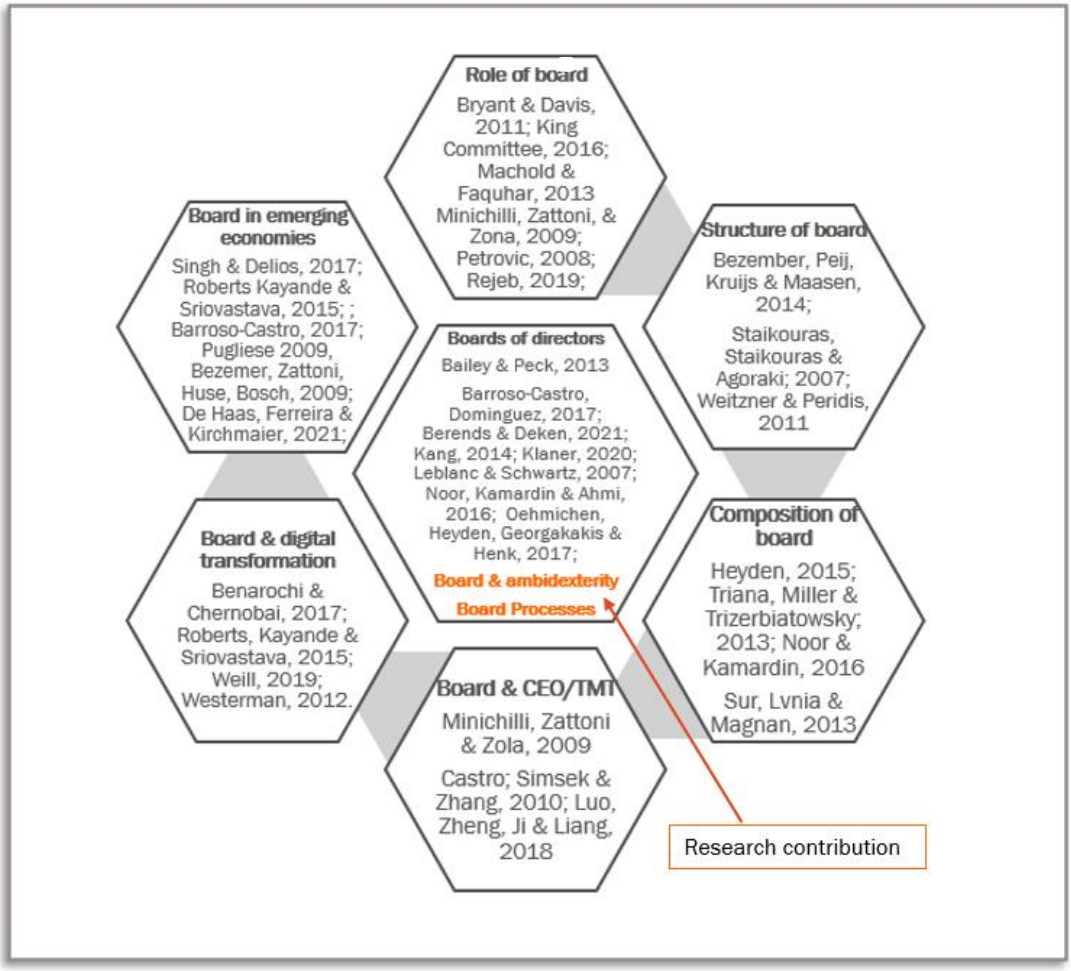


Figure 5: Summary literature domains on boards of directors: Author's conceptualisation

The figure above shows the different domains to which literature on boards of directors has

branched. This research contributes to the core literature on boards of directors, focusing on their ability to pursue organisational ambidexterity and the processes they use.

Over the past decades, studies have moved from the perception that boards are ornamental (Machold & Farquhar, 2013) to focus on improving corporate governance, which has increased as a response to a series of scandals. Literature has evolved from researching just the role of boards of directors to detailed granularity, which includes composition, ownership, structure (Sur, Lvina & Magnan, 2013) and relationship to the performance of the organisation and strategy decision-making (Bailey & Peck, 2013). Despite the increasing attention of management scholars on boards of directors, there has been minimal attention paid to understanding the processes that are used by boards of directors to make these decisions; an area still referred to as the "black box" of boards of directors (Klarner et al., 2020; Leblanc & Schwartz, 2007). Thus, the evolution of literature has not considered how boards of directors pursue exploration and exploitation in the context of digital transformation. Instead, empirical evidence has focused on the composition, structure, relationship of board structure with the performance of the organisation and the relationship of the board of directors with the Chief Executive Officer (Minichilli et al., 2009).

In addition, several studies have investigated the antecedents of board tasks, yet there are still disagreements in the context of the actual tasks and how these are operationalised (Machold & Farquhar, 2013). This could be attributed mainly to prior research's reliance **on agency and resource-based theories** and focus on financial performance without getting close to process-oriented research. However, agency and resource-based theories outline the board tasks but lack process orientation to investigate how this is achieved (Barroso-Castro et al., 2017; Minichilli et al., 2009). This research is not pursuing the debate on agency and resource-based theories but is focused on understanding the processes used by boards of directors.

Therefore, what was still unknown about boards of directors are the details on the board processes and how they explore and exploit in the context of digital transformation. After being accused of being afraid of technology, (Huff et al. 2006), digital transformation has forced boards of directors to realise that information technology is no longer restricted to the back office (Noor, Kamardin, & Ahmi, 2016; Posthumus, von Solms, & King, 2010), but is integrated with business strategy. Growing evidence posits that digitally mature boards that provide competent digital leadership outperform their peers (Weill et al., 2019; Westerman et al., 2012). The King Codes of Conduct acknowledge the way digitalisation is transforming businesses. The codes mandate governing bodies to be proactive about leveraging technology as a

building block to the digital business value chain and monitoring disruptive technologies (King Committee, 2016). Therefore, it is critical to understand how boards are directing organisations to explore and exploit in the context of digital transformation.

While it was still unclear how boards of directors lead organisations, this research concurs with other observations that some boards establish monitoring committees, where the bulk of board work is conducted (Platt & Platt, 2011), while others outsource exploratory work. These models were investigated in participating organisations and the results include a process model that boards of directors can use to explore and exploit. The thesis contributes to addressing a gap in the body of literature on boards of directors and ambidexterity.

The role of boards of directors

The interrogation of board processes is dependent on the role that they play in the organisation. Early research was primarily concerned about the structure and composition of the board (Machold & Farquhar, 2013), without paying much attention to their roles (Petrovic, 2008), let alone how they achieve these roles. However, following several corporate scandals of the 1990s and early 2000s, including Enron, Tyron International, and WorldCom, different countries passed various acts that changed the roles, responsibilities, and accountabilities of boards of directors (Bryant & Davis, 2011). The board is regarded as a valuable source of knowledge and expertise that can contribute to the strategy and decision-making process, thus actively initiating, monitoring, and evaluating strategic decisions (Sellevoll, Huse, & Hansen, 2007). There has been a growing emphasis on the need for the board to pay attention to their changing role in the digital economy (Åberg et al., 2017; Valentine et al., 2014). The board's involvement in an organisation's strategy is increasingly viewed as a core contribution to the firm's value creation process (Åberg et al., 2017; Pugliese, Bezemer, Zattoni, Huse, Van den Bosch, et al., 2009). In fact, the research argued that when the board is involved in strategy-related activities, it will help organisations adapt to environment discontinuities (Hoppmann et al., 2019). This is quite relevant in the current environment where digital transformation has either created havoc in organisations that turned a blind eye or opportunities for those that latched on to it. Emphasis is placed on the board not just ratifying, but being involved in formulating strategic decisions, as well as shaping which decisions are to be taken in particular contexts (Machold et al., 2011). Boards of directors are legally responsible for establishing organisational strategy (Judge & Talaulicar, 2017).

The basic assumption of the agency problem is that boards affect strategic choices by preventing managers from acting opportunistically at the expense of the shareholder. Chief Executive Officers are argued to become attached to past strategies, with preferences to achieve industry norms (Haynes & Hillman, 2010). However, the board's breadth and depth have a direct impact on the strategic change as they are argued to provide advice and counsel on substantial matters such as strategy formulation (Haynes & Hillman, 2010), in this case, the adoption of digital strategy. Boards of directors are stewards appointed by the shareholders and are charged with the primary role of protecting the interests of the shareholders (Hambrick et al., 2015). While the debate is still on about the opportunistic nature of managers, it is not the focus of this research. This research is focused on illuminating the processes used by boards of directors who are appointed as principals of the organisation.

Boards of directors in emerging economies

Studies have shown that firms in emerging markets structure their boards by keeping in mind the board's resource dependence and advisory role, rather than just monitoring the role of the board (Singh & Delios, 2017). In this context, board members help firms pursue growth strategies. Research in emerging economies shows that independent board members help firms with pursuing risky growth strategies (Singh & Delios, 2017), unlike in developed countries. This suggests that context plays a critical role in ascertaining governance arrangements.

Managing in emerging economies has been seen to provide challenges and opportunities (Roberts et al., 2015). Companies spanning different markets must cater to different business models to manage differences in market segments and product affordability and access (Roberts et al., 2015; Saarikko et al., 2020). This research was done in South Africa, an emerging economy, where directors are argued to pursue risky growth strategies. Therefore, directors in this market must pursue ambidexterity, which has been associated with a positive performance and adopt digital transformation, which creates a competitive advantage but can also expose the organisation to extinction, if ignored.

This research leans towards the notion that boards of directors act as a resource that is responsible for providing a strategic direction and monitoring activities of the executives, to ensure positive performance and continued sustainability of the organisation (Barroso-Castro et al., 2017; Pugliese, Bezemer, Zattoni, Huse, Van den Bosch, et al., 2009). As the boards of directors provide strategic direction, they need to ensure a balance of exploration and

exploitation for the organisation's sustainability. This research aims not to clarify arguments around general strategy formulation but to contribute towards the resource-based views by zeroing in on processes used by boards of directors as they provide strategic direction to pursue organisational ambidexterity.

This research adds to the scarce literature on boards in emerging markets, which was also observed by De Haas et al. (2021). While much of the insights on boards rely on publicly available information, this research uses structured interviews to contribute to the nascent literature on board processes, which is commonly referred to as the black box of board research.

Boards of directors' involvement in strategy should be focused on decision making, pro-activeness and joint value creation, which are important antecedents of the board's strategic contribution (Zona & Zattoni, 2007). Boards of directors cannot just watch while executives implement strategies that are not suitable for the organisation, particularly in the era of digital transformation. Yet, the board is at the helm and is held accountable for the failure. A typical example is Target, which had the most significant data breach. Then, the board chairperson resigned due to the fallout (Benaroch & Chernobai, 2017). This research investigated how boards of directors exploit and explore as they gave strategic direction to organisations, acting as a resource for monitoring the environment (Heyden et al., 2015). While literature and the popular press are littered with examples of boards of directors that were fired because strategy went wrong, the research is mainly from developed markets. However, board organisations in emerging economies are equally accountable, hence the need to understand their processes.

Boards of directors and ambidexterity

The notion of exploration and exploitation has been investigated at various levels of analysis, from the individual (Bonesso et al., 2014; Mom et al., 2009; Schnellbächer & Heidenreich, 2020), group level, largely to top management (Cao et al., 2010; Jansen et al., 2006) and middle management (Mom et al., 2009; Turner et al., 2016), organisational level (Turner et al., 2016), and at inter-organisational level (Lavikka et al., 2015; Lin et al., 2007). However, research at the group level failed to focus on boards of directors as the level of analysis. There are two research publications identified on boards of directors and ambidexterity. In the first publication, Kang (2014) defined the role of boards of directors in organisational ambidexterity. Kang (2014) defined boards as an integrated mechanism that participates in major strategic decisions, but there was no reference to board processes. In the second paper, Oehmichen

et al. (2017) advocated for organisational ambidexterity to be embedded at the highest level of strategy in knowledge-intensive firms. This gap in the literature on boards of directors and organisational ambidexterity is concerning, considering the fiduciary duty of boards to provide strategic direction for the organisations they direct. This thesis contributes to closing this gap by investigating processes boards of directors use as they explore and exploit.

Boards of directors represent the highest level of strategic leaders entrusted with the well-being of the organisation. Even the typology of organisational ambidexterity introduced by Simsek, et al. (2009) based on extant literature, which has over 750 citations, was focused on the organisation as the unit of analysis and does not give a perspective of how it unfolds at the board level. The authors recommended further research to understand the alignment between senior role leadership and the type of ambidexterity pursued (Simsek et al., 2009). The researchers also emphasised the need for future research to investigate the contingent role of the environment and organisational variables (Simsek et al., 2009). Considering the critical role of boards of directors, this thesis defined processes used by boards of directors. The research questions were based on Simsek et al., (2009)'s four types of ambidexterity, thus harmonic, cyclical, reciprocal and partitional ambidexterity. The thesis investigated the processes used by boards of directors to decide whether to pursue ambidexterity using independent structures, inter-dependent structures, sequentially or simultaneously.

Processes followed by boards of directors

Literature has shown that organisations with digitally savvy boards outperform their peers (Weill et al., 2019; Westerman et al., 2012). Therefore, in line with this argument, boards of directors must direct organisations to achieve ambidexterity and it is pertinent to understand their processes.

There is minimal focus on what exactly is monitoring or how the board does it. The resource-based views posit that while contributing their knowledge resources to inform strategy making, boards may sharpen or broaden strategic orientation through the heterogeneity of the background experiences they bring to the table (Heyden et al., 2015). As such, boards of directors assist managers with strategic planning and accessing resources from the external environment (Zona et al., 2018). The King Codes of Corporate Governance (2016) posit that the governing body should provide strategic direction; give effect to strategy by approving relevant policies and frameworks; give oversight to the implementation of the strategy; and demonstrate accountability and transparency on activities of the organisation (King Committee,

2016). Although the King Codes of Corporate Governance mandate companies listed on the Johannesburg Stock Exchange (JSE) in South Africa to comply or explain, most organisations apply it as a guide for best practice. The King Codes of Corporate Governance define the primary role of boards of directors to make decisions and influence organisational outcomes (King Committee, 2016). Similarly, the Sarbanes Oxley Act enacted in 2002 following a wave of corporate scandals that led to bankruptcies, has stringent measures on accountability of executive managers and boards of directors. Therefore, boards of directors must pursue ambidexterity, considering the risk that organisations face with digital transformation, which can erode an organisation's value.

Although boards of directors play a central role in the organisation, there is little insight into their decision-making process (Bailey & Peck, 2013). Scholars have made calls for further research on boards of directors, with a specific focus on understanding the processes they use as they execute their roles (Oehmichen, Heyden, Georgakakis, & Volberda, 2017), commonly referred to in the literature as shedding light on the "black-box" of board operations (Klarner et al., 2020; Leblanc & Schwartz, 2007; Minichilli et al., 2009). This research zooms in to understand the processes boards use as they pursue organisational ambidexterity in the wake of digital transformation.

One can argue that the processes that boards of directors use, and the typology can be determined by the role that they play in the organisation. There are disagreements on the delineation of the role of boards in organisations (Minichilli et al., 2009; Valentine & Stewart, 2013). While the literature has progressed in defining roles and tasks, with disagreements on several tasks, there are still many dark corners that are yet to be explored. Ever since Mace concluded that most boards were ornamental in 1971, researchers have been unpacking what boards do (Machold & Farquhar, 2013). There is a clear distinction in roles between boards of directors and management (Pugliese, Bezemer, Zattoni, Huse, Van den Bosch, et al., 2009). Therefore the extent to which the boards of directors are involved in providing strategic direction in the context of digital transformation is on a continuum of levels of involvement (Machold & Farquhar, 2013).

The research took a processual view (Langley, Smallman, Tsoukas, & Van de Ven, 2013) of the mechanisms used by boards of directors over three years, from 2017 to 2019, as they explored and exploited in the context of digital transformation. Borrowing from Langley, Smallman, Tsoukas, & Van De Ven, (2013)'s observations, a process study is an investigation of how things emerge, develop or terminate over time. The investigation can reveal the events

and experiences, revealing how each event arises from other events. In this case, the research seeks to understand the events that occurred at the board level when the digital transformation was adopted in various organisations. The research involves an in-depth analysis of these events, focusing at the board level until the process was birthed. While the board is the level of analysis, investigations showed there were multiple levels of interactions that birthed the digital adoption.

Being a processual study, this thesis presents a sequence of explorative and exploitative events that unfolded from 2017 to 2019 in the cases under study, with a focus on the adoption of digital transformation (Berends & Deken, 2021). Participants were asked to narrate the processes used by boards, their experience over the three years, and the progress that was made with achieving ambidexterity in that period. The research enumerated the processes used by the board to become dextrous. The proposed process model was recommended, which can be used as part of boards of directors' training through organisations like the Institute of Directors and other induction-related training offered in the organisations.

3.5 Research questions

Following the analysis of extant literature, the figure below gives a pictorial view of the body of literature under study, and where this research is located.

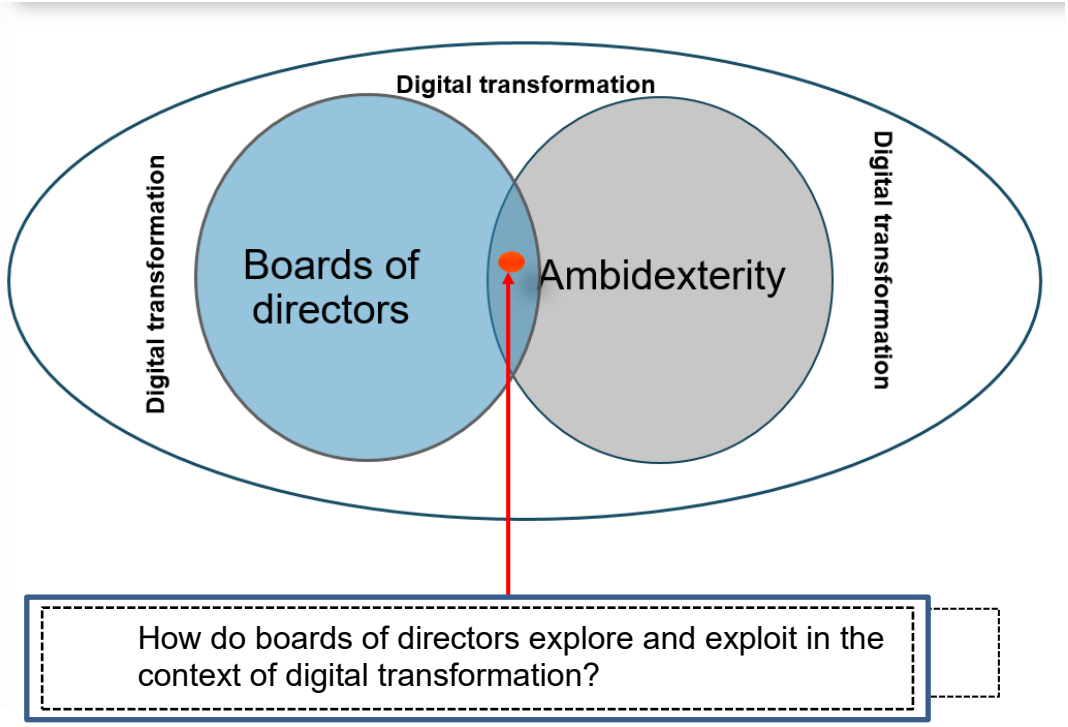


Figure 6: Overview of literature review and research contribution: Researcher's conceptualisation

Following an analysis of extant literature, the research questions assist with answering the main research question.

Research question 1

The main argument for improved performance and adaptation over a long time is for organisations to balance exploration and exploitation (Brix, 2019; Junni et al., 2013). This is the ability for organisations to commit to different business models simultaneously, both traditional and emerging businesses. While literature acknowledges the role of leaders in achieving ambidexterity, research focused on the management level and is silent on the board level (Oehmichen, 2017). Boards are responsible for the longevity and sustainability of organisations. In addition, King IV, the Code of Corporate Governance used in South Africa, assigns the responsibility of monitoring digital technologies, managing related risks and capitalising on opportunities that they present to the board. This is in addition to ensuring that existing business operations continue to function to meet customer expectations and regulatory requirements. It is therefore imperative to understand how boards of directors explore and exploit in such an environment. The first research question then is:

How do boards of directors explore and exploit using temporal ambidexterity in a digital

environment?

Research question 2

Extant research also argued that exploration and exploitation can happen by structure, time, or domain, which (Simsek et al., 2009) coined structural and temporal ambidexterity. Structural ambidexterity separates exploration and exploration across different units (Turner et al., 2016).

The question that bears the is:

How do boards of directors explore and exploit using structural ambidexterity in a digital environment?

Research question 3

The need for ambidexterity has been accelerated by the present demands for businesses to transition into new models, especially given digital transformation (Saarikko et al., 2020). This was also observed in research in emerging economies, which confirmed that independent board members help firms with pursuing risky growth strategies (Singh & Delios, 2017), unlike in developed countries. This suggests that context plays a critical role in ascertaining governance arrangements.

How do boards of directors determine the level of resources to allocate for exploitation and exploration when operating in the context of digital transformation?

Research question 4

There is consensus in the literature that it is difficult to balance exploration and exploitation, which are argued to be different strategies that compete for finite organisational resources (Svahn et al., 2017). A balance of exploration and exploitation is not necessarily equal resources for exploration and exploitation, but an optimal point of balance (Harvenmans, Harton, Keegan & Uhi-Bien, 2015). Organisations that fail to achieve this balance lose their competitive advantage (Wilden et al., 2018) or risk obsolescence (Kim & Huh, 2015). In the same vein, boards of directors can achieve ambidexterity through sequential alternating modes, yet other arguments posit that ambidexterity must be pursued simultaneously to attain competitive advantage and long-term survival (Csaszar, 2013a; Zimmermann, Raisch, & Birkinshaw, 2015a).

What types of ambidexterity emanate from board processes as they pursue ambidexterity in a digital environment?

3.6 Conclusions of literature review

Successful organisations are ambidextrous and are associated with longevity and positive performance. Organisations that operate in dynamic environments, and fail to be ambidextrous, face the risk of survival, in the worst case, or losing competitive advantage. However, today's environment is characterised by digital transformation. Therefore, organisations are left with no choice but to balance daily operations with transforming digitally, thus ambidexterity. While the role played by boards of directors may vary from one organisation to another, they are charged with providing strategic direction for organisational perpetuity. This thesis investigated how boards of directors pursued ambidexterity in environments laden with the need for digital transformation. This research was framed by Simsek, et al. (2009)'s typology on ambidexterity, which proposed four antecedents: harmonic, partitional, cyclical, and reciprocal ambidexterity. This research positioned boards of directors as a pivotal role in organisational ambidexterity. It, therefore, investigated the typologies that boards of directors use as they pursue ambidexterity in a digital environment.

In order to obtain an in-depth understanding of board processes and enrich the understanding of various types of dynamic phenomena, ambidexterity (Simsek, et al., 2009), the research took a qualitative approach. Chapter 4 motivates the research philosophies and methods underlying this study, the research design, the unit of analysis, how the data was collected and data analysis methods.

CHAPTER 4: RESEARCH DESIGN AND METHODOLOGY

4.1 Introduction

This chapter outlines the methods that were used to answer the study's primary research question, *"How do boards of directors explore and exploit in the context of digital transformation?"* The methods that were used sought to investigate the "black box of research", thus board processes (Pye & Pettigrew, 2005), as they lead organisations to be ambidextrous in the context of digital transformation, with a focus on documenting processes that have been improved by various organisations over the years and recommending a framework. The research design and methodology are anchored on Simsek et al. (2009)'s typology and the quest to get insight into how boards of directors explore and exploit a digital environment.

This research joins a handful of studies that have made a methodological contribution by using qualitative methods to investigate multiple boards. Such studies include Smith and Smith (2015), who used multiple boards and informants, Oliveira et al., (2022) who used convenience sampling to understand how digital transformation affected board members' ways of working, and Klarner et al., (2020) in their investigation of board's engagements with organisation's members for governing long term issues like innovation.

4.2 Research methods of ambidexterity in board processes

Literature acknowledged that leaders play a critical role in ambidexterity (Tushman & O'Reilly, 2011). However, there is considerably less clarity on how boards of directors, at the helm of organisations, achieve ambidexterity. Understanding board processes is critical (Leblanc & Schwartz, 2007).

Research acknowledges that ambidexterity is a reasonably new construct (Gibson & Birkinshaw, 2004; O'Reilly & Tushman, 2013; Simsek, 2009). While organisational ambidexterity was defined as early as 1976, March popularised the construct in 1991. However, inconsistencies in the conceptualisation (Turner et al., 2013) contributed to the slow progression of research on organisational ambidexterity. Therefore, it is consistent with new concepts to adopt qualitative research to get closer to and emphasise meanings that occur naturally (Morgan, 1980). While most of the research on organisational ambidexterity adopted a quantitative approach, this research adopted a qualitative approach to obtain a deeper understanding of the processes (Bluhm et al., 2011a) used by boards of directors in their

decisions to explore and exploit as they direct organisations. This research is, therefore, a processual analysis based on interviews and archives as sources of data. The research used semi-structured interviews and the questions were guided by Simsek et al. (2009)'s typology for organisational ambidexterity. The research investigated processes used by boards of directors that led to decisions on the types of ambidexterity that were pursued over time.

Concomitantly, scholars observed that boards of directors are a closed group that is secretive and difficult to access (Klarner et al., 2020; Zona & Zattoni, 2007). This has promoted the dominance of quantitative studies for this group of people. The ease of access to data, especially on public companies and their boards (McNulty et al., 2013), has made it easier for researchers to pursue quantitative studies on boards of directors. Most scholars use organisations that have information databases or send questionnaires as the primary sources of information. However, quantitative research is distant from the subject and does not allow an in-depth understanding of processes.

In a quest to illuminate processes used by boards of directors, this research adopted a qualitative multiple case study. Qualitative research brings insight and discovery into organisational phenomena (Bluhm et al., 2011a) and is more suitable for answering the "how" questions presented in this research. Pettigrew (in Pye & Pettigrew, 2005) called for more process studies that address the dynamics of boards in 1992, but there continues to be a glaring gap. In their review of qualitative research, McNulty et al. (2013) challenged governance scholars researching boards of directors to collect and analyse qualitative data to get a richer understanding of processes leading to decision making. Qualitative research is still not dominant in the study of boards of directors. In the few cases where qualitative research was performed, prior research used single boards and not multiple boards, which is insufficient to build theory and distil the patterns and trends of boards (Leblanc & Schwartz, 2007). This research, therefore, contributes toward responses to separate calls made for qualitative research on boards of directors (McNulty et al., 2013; Pugliese, Bezemer, Zattoni, Huse, Van den Bosch, et al., 2009; Zattoni et al., 2013) and literature on organisational ambidexterity (Raisch & Birkinshaw, 2008).

4.3 Processes of boards of directors

4.3.1 Processual study

The research took a processual view of the mechanisms used by boards of directors over three years to achieve ambidexterity in the context of digital transformation. Process studies address

the questions about how and why things develop and terminate over time. Furthermore, process research focuses on evolving phenomena, and it incorporates the temporal progression of the activities (Langley, Smallman, Tsoukas, & Van de Ven, 2013). Processual studies connect concepts and explain empirical cases using data that is arranged in temporal units (Berends & Deken, 2021). This research focused on the temporal progression of board processes of six boards from 2017 to 2019 (Berends & Deken, 2021). Process research includes changing interactions between the organisation and its environment, in this case, the board of directors pursuing ambidexterity in a digital environment. Although the literature on process studies points out that change is a result of both managerial choice and environmental dynamism, there is a possibility of unintended consequences that inadvertently shape the future of the organisation (Mackay & Chia, 2013). This research, therefore, streamlined the processes used by boards of directors to explore and exploit an environment with digital transformation, and the outcome. The resulting process model will give guidance to other board members on processes that had experience with harnessing the conflicting demands to explore and exploit in the context of digital transformation.

In the review of his seminal article of 1987, Pettigrew (2012) proposed that a process study must have four characteristics. The first characteristic is that a process study must clearly define and delineate, both theoretically and empirically, the set levels of analysis. This research focused on the processes as the unit of analysis and the board as the level of analysis.

This thesis analysed the actions, forms of interactions, responses and adapting as boards of directors pursued organisational ambidexterity. The thesis also interrogated the processes pursued in digital transformation and how they evolved in the period under review, from 2017 to 2019. It also sought to understand if there were any plans to improve the processes in future. This aligns with the second characteristic required for a contextual analysis of processes as a continuous system, with a past, present and future. The analysis was done at the level of the actor, in this case, the individual who sits on the board of the organisations under study as a member or invitee.

In line with the third characteristic of a process study, the research used organisational ambidexterity as the theory that drives the human model, in this case, the board members and board invitees in the study sample, to underlie the research. Moreover, the study finally investigated the processes used by boards of directors at the highest level of an organisational hierarchy. Literature has shown that some of the boards of directors have formed board sub-

committees that focus on technology-related strategies and investments made in that regard (Prasad et al., 2010). This has been driven by IT Governance, defined as the responsibility of boards of directors and top management to ensure the organisation has leadership, structures and processes that guide the organisation's investments in technology (Prasad et al., 2010). Therefore, the research investigated any sub-structures that the board may have used to pursue ambidexterity, if they exist, and how they interacted with the board of directors (Pettigrew, 2012a), in line with the fourth characteristic of a process study.

4.4 Research philosophy

Research philosophy is the researcher's belief of how data on the board processes must be gathered. This research uses interpretivism as the research paradigm. With interpretivism, the researcher sought to understand existing processes, contextualise, illuminate the uniqueness of each case, and interpret as part of building blocks in theorising. The digital environment formed part of the primary context of this study. This research took an ontological assumption, which acknowledges that there are multiple realities (Leitch et al., 2010) as individuals and different board processes are being studied. The research used participants' interpretations of the processes under study. Participants narrated the processes based on how they had experienced them in the period under study, 2017-2019.

4.5 Research strategy

The thesis is a qualitative study that focused on an in-depth investigation to capture the processes that the board members used over time and laid a foundation for an in-depth analysis of the pursuit of ambidexterity in the context of the environment in that time case, digital transformation.

There has been limited research on how boards of directors explore and exploit (Oehmichen, Heyden, Georgakakis, & Volberda, 2017) in the context of digital transformation. Also, organisational ambidexterity is argued to be a new phenomenon largely because of inconsistencies in conceptualisation and a lack of clarity on how the balance to explore and exploit can be achieved (Birkinshaw & Gupta, 2013b). A concept facilitates communication clearly and unambiguously. According to Chimezie and Osigweh (1989), a precise concept to allow researchers to define it in a wide range of situations is said to be universal and travelling. A clear definition of concepts allows explicit differentiation of similar terms used to identify different subjects or objects. There has not been a consistent definition of the concept of ambidexterity and, therefore, the need for qualitative research.

Qualitative research is essential for uncovering organisations' processes and understanding how these processes unfold over time (Bluhm et al., 2011a; Rashid et al., 2019). Therefore, the research leverages the strengths of qualitative research to answer the questions by getting closer to the subject, understanding how boards of directors explore and exploit. The researcher needed to understand the processes used by boards of directors as they explored and exploited. Hence it was critical to obtain textual data drawn from semi-structured interviews and to analyse archival manuscripts (Bansal, 2013; Gibbert & Ruigrok, 2010) that may have been published by the organisation or about the organisation. Such data is textured, nuanced and open to multiple interpretations (Bansal, 2013).

4.6 Research design

This multiple case study sought to understand practices (Soin & Scheytt, 2006) as the board directed the organisation to explore and exploit a digital environment. The research took a narrative approach to tell the story of the processes used by boards of directors as they made decisions to explore and exploit. Interpretive research using the narrative approach enabled the researcher to place herself at the interface between persons, stories, and organisations. It placed the researcher in the organisational context. Such an approach is considered a constructive act of creating a plot that infuses the story with expressions of the narrator's feelings, values, norms, and beliefs (Soin & Scheytt, 2006).

4.7 Unit of analysis

The unit of analysis for this research was the processes used by the board, as defined by the participants. Research has shown that one of the challenges in conducting qualitative data analysis is deciding on what piece of the data constitutes a meaningful unit to analyse (Chenail, 2012).

As McNulty and Pettigrew observed (1999), there is a need to get closer to boards and collect primary data on contribution processes. It was pertinent for the researcher to identify critical informants, knowledgeable of board processes (Zattoni, Gnan, & Huse, 2015). This was supported by literature that advocated for deeper insights into the inner workings of the board, which are the so-called "black box" of board operations (Huse et al., 2011). The researcher understood that access influences the research process and results thereafter (Riese, 2019). Access was therefore negotiated and re-negotiated throughout the research process (Riese, 2019) as participants who formed the unit of analysis were difficult to access. This thesis contributes to closing the literature gap by understanding the processes used by the board of

directors as they pursue ambidexterity.

4.8 Level of analysis

The focus was on the board as the level of analysis. The informants were board members and executives involved in board processes related to digital transformation. The informants were informed by the structure of boards of directors for the listed organisations. The organisations listed on the Johannesburg Stock Exchange use a two-tier board, in line with the King Codes of Corporate Governance. Non-executive directors form the first tier and executive directors form the second tier. Both executive and non-executive directors are involved in board processes, including attending board meetings.

The notion of exploration and exploitation has been investigated at various levels of analysis, from the individual employees (Bonesso et al., 2014), group level (Mom et al., 2009), organisational (C. O'Reilly & Tushman, 2013), and inter-organisational (Lin, Yang & Demirkan, 2007). However, research at both individual and group levels failed to focus on boards of directors as the level of analysis, yet this group is the highest level of organisational hierarchy and provides strategic direction. The theoretical findings from this thesis contribute towards closing the hole of boards of directors and ambidexterity.

In South Africa, the King Codes of Corporate Governance stress that the board should include a balance of executive and non-executive directors, with a majority of independent non-executive directors, reducing the possibility of conflicts of interest (King Committee, 2016). In the two-tier system standard in South Africa, executive directors are delegated to run day-to-day work. All non-executive directors play a supervisory director role (Staikouras et al., 2007). The role of executives is to generate strategic alternatives, and directors choose which alternatives to follow or to recommend new strategic initiatives that management should implement (Castro et al., 2009). It was also observed that most directors referred the researcher to the Chief Digital Officer (CDO) or Chief Information Officer (CIO) for further information. In most organisations, the digital programme owner was either the CDO or the CIO. Both were standing board invitees and had detailed insight into the board processes to which they actively contributed. From this perspective, the research interviews were performed with CIO, CDO, and executive and non-executive directors to explore the processes they used to pursue ambidexterity.

4.9 Sampling method

The research used purposive sampling, thus limiting the sample to members and invitees of boards of organisations that have adopted digital transformation, which was the context of this study. Targeting companies that started adopting digital transformation provides an opportunity to address the rapid pace of strategic decision-making with greater board involvement (Westerman et al., 2012).

Boundary conditions were defined as part of the sampling method. The boundary conditions refer to the who, where and when of the theory. The narrative below gives details of the boundary conditions that were considered when sampling participants.

Who

The researcher identified members and invitees of boards of organisations that were purposefully sampled. The researcher ensured that there were at least two participants from each organisation to corroborate the findings (Eisenhardt, 1989; Gibbert & Ruigrok, 2010). The information was triangulated using archival reports. The process allowed triangulation and corroboration of processes during within-case analysis and comparison of findings in cross-case analysis in the different organisations and distilled patterns and trends of boards of directors (Leblanc & Schwartz, 2007; Natow, 2020).

The organisations had to be from companies listed on South Africa's Johannesburg Stock Exchange which has a defined King Code of Corporate Governance (2016) that gave reporting guidelines, especially on technology investments. Literature has already lamented the difficulty of accessing this group of board members (Klarner et al., 2020; Leblanc & Schwartz, 2007; Ma et al., 2021). Therefore, the researcher expected difficulty gaining, securing, and maintaining access to the purposively identified participants.

Extant literature emphasised the vital role of gatekeepers in negotiating and gaining access (Peticca-Harris et al., 2016). Gatekeepers are argued to be influential people or have the power to provide or deny access to research participants (Kawulich, 2011; Riese, 2019). Although the researcher thought she would leverage on the researcher's academic institution, Gordon Institute of Business Science (GIBS) relationships as gatekeepers, this was not successful. The researcher eventually leveraged her professional relationships established over the time she worked in South Africa. Once the researcher gained access, the activities were monitored through progress review presentations and feedback from the supervisor. The researcher conducted the interviews herself.

Where

The awareness of challenges with the complexity of access helped the researcher to make conscious and deliberate decisions (Riese, 2019). The participants were interviewed in their places of choice that presented a natural setting for them, at times that suited them.

When

The interviews were performed in 2019 and 2020 after obtaining ethical clearance. The participants narrated, from their perspectives, the processes that were used by boards of directors for three years, from 2017 to 2019. The researcher, therefore, identified participants who had direct experience with the board processes as they pursued ambidexterity in a digital environment (Leitch et al., 2010; Ma et al., 2021; Natow, 2020) in that period. The period, 2017 to 2019, coincided with the South African president's decision to adopt digital transformation for economic growth.

In addition, the three-year period was because, in an interview, participants were asked to recall specific processes that happened in the past (Leitch et al., 2010), and it may be difficult for participants to recall events of more extended periods. There is also a recall bias, where the accuracy of information recalled depends on, in this case, the exposure of interest of respondents (Coughlin, 1990). In addition, digital transformation is associated with fast innovation and implementation. Therefore organisations should sense and respond with speed (Bharadwaj, Sawy, & Pavlou, 2013). What happens at any time is affected by what happened before and what may come after (Berends & Deken, 2021). The write-up includes an overview of what happened before 2017. There were instances where participants remembered events outside the three-year time horizon that were relevant to the research. These were included in the analysis to capture the context of the process evolution.

4.10 Sample size

Sample sizes are a rule of thumb for experimental data (Hennink et al., 2017). In addition, sample size can also be determined by information power, the more information a sample holds, relevant for the actual study, and the lower the number of participants required (Malterud et al., 2016). Board members and executives fall into the category of elites and are argued to give valuable information (Natow, 2020). The researcher determined a sample size of sixteen participants from the six sampled organisations to achieve both data and code saturation. In addition, three-year data was also collected from the archival reports of identified organisations

that had shown that they had adopted digital transformation (Hennink et al., 2017). The corpus was large enough to capture a range of experiences but not so large as to be repetitious (O'Reilly & Parker, 2012). Previous qualitative research on boards of directors primarily relied on a critical informant knowledgeable of board processes (Zattoni et al., 2015). This was due to difficulties with access to processes and data on boards of directors, hence the reliance on a single respondent (Minichilli, 2012).

Qualitative research relies on the quality of data and not necessarily the number of participants, and one needs to reach saturation, which is an iterative process. Participants who sit on the board and executives are considered good sources of quality information. Moreover, the sample size in a processual study is not the number of cases but the number of temporal observations to reach saturation (Langley, Smallman, Tsoukas, & Van de Ven, 2013).

Saturation can only be operationalised during data collection, and the sample size needs to be determined upfront (Hennink et al., 2017). While some authors assert a dearth in the literature on operationalising saturation in qualitative research, there is disparate evidence from prior research on when saturation is achieved (Malterud et al., 2016). Guest and Johnson (2006) observed that when undertaking focused research using a semi-structured interview guide in a homogenous population, saturation can be reached by twelve interviews. This concurs with Namey, Guest and McKenna's observation made in 2016 that data saturation will be reached between eight and sixteen interviews, while code saturation is reached within nine or fewer interviews (Malterud et al., 2016).

In the same breath, saturation has different meanings. Theoretical saturation refers to a point in data collection where no new insights emerge from data, and it begins to repeat (Hennink et al., 2017). At this stage, the researcher will have heard it all. Theoretical saturation can be reached with nine interviews. On the other hand, meaning saturation is when the researcher understands all that they have heard and is reached by sixteen to twenty-four interviews (Hennink et al., 2017). The sample size and saturation point are also determined by the length and number of interviews (Onwuegbuzie & Leech, 2007). The challenge with identifying a sample size that is too large is reaching saturation and wasting resources on other data that will not be used. A sample size that is too small would fail to reach the phenomenon, thus reducing the validity of findings and wasting resources used for the research. It is ethical to use the right sample size and not waste resources by accessing larger samples than necessary (Hennink et al., 2017).

Companies listed on the Johannesburg Stock Exchange are mandated to publish their activities on Information Technology and monitor and report on disruptive technologies. The table below shows the characteristics of the organisations that were sampled as cases under study and the type of archival data obtained.

Table 6: Characteristics of sampled cases

	Industry	No of employees	Revenue	Research participant	Archival data
1	Financial services	31 277	R 1,04 trillion	NED CDO	Annual Reports LinkedIn
2	Financial services	44 916	R1,217 trillion	ED CIO	Annual Reports Digital Awards LinkedIn
3	Insurance	9200	US$10,7 billion		Annual reports Social media individual profiles
4	Oil	30 100	R 21,78 million	NED CDO	Annual reports
5	IT Services	1 237	R 59,3 Million	ED COO	Annual reports
6	Automotive logistics	19 745	R 20,2 billion	ED CDO	Annual reports
7	Mining	191 100	R 45 billion	CDO	Annual reports Aborted after first interview

The researcher identified participants who could provide information that answered the research question (Gill, 2020). Participants who had “direct and personal knowledge” (Sandelowski, 1995, p. 180) of the study topic and could share and reflect on the experience of interest were recruited. These included executive and non-executive board members and Chief Digital Officers, and Chief Information Officers who played a critical role in board processes, as shown in the table below.

Table 7: Profiles of interview participants

Profiles of participants	No.
Non-executive Directors	4
Executive Directors (CEO; COO; CDO)	4
Chief Operating Officers	3
Chief Information Officers	3
Chief Digital Officers	2

It was observed that most non-executive board members referred the researcher to the Chief Digital Officer or Chief Information Officer for a more detailed account of the processes. Both resources were invitees to the board and were key participants in the board processes. There were eight executive and non-executive directors interviewed, and the rest were invitees to the board. The research followed Gehman (2013)'s approach, the interview questions leaned more on events around digital adoption to protect against retrospective bias. The researcher identified events and/or digital products that were published in the annual reports of the period under review and triangulated these across the data sources. These were corroborated by two participants. The interviews zoomed in to understand the patterns and sequences that emerged and followed up on the processes around other events that emerged during the discussion.

Although there is still debate on who should be in charge of digital transformation, Chief Executive Officer, Chief Information Officer and Chief Digital Officer (Matt et al., 2015), the researcher observed that their involvement varies in each organisation. Each interview was 50 minutes to an hour.

Data saturation was reached at the thirteenth interview. By then, the researcher had three pending interviews with participants from different organisations. The researcher had to go through the remaining three interviews to ensure more than one participant per organisation

and corroborate the process information obtained.

In conclusion, this study leveraged the qualities of qualitative research to determine the sample size that would give data and meaning saturation. The section below details some of the ethical considerations made while planning for data collection.

4.11 Research ethics and integrity

The Research Ethics Committee has gained increasing importance to ensure that research is conducted in a responsible manner (Davies Simeon EH, 2020), and prohibits unethical research. This was following the malpractice scandals that shocked the international community on the experiments carried out Nazi doctors (Bain et al., 2018). The Gordon Institute of Business Science (GIBS) is one such university with an established Doctoral Research Ethics committee that reviews all research as part of its quality review process. The committee ensures that the research continues to represent societal values and complies with legislation, for example, the Bill of Rights in South Africa (GIBS, 2020).

The constitution of the Research and Ethics Committee and its qualifications have been debated in the literature. The GIBS Ethics Committee is constituted under the University of Pretoria regulations (GIBS, 2020). The members include the Professor(s) responsible for Research Methods, the Director of Doctoral Research, and the Research Supervisor.

The committee reviews the following to ensure the integrity of the research: Any harm that could be paused to research participants, privacy, confidentiality and data security, informed consent, pressures, any incentives given to participants or conflict of interest and ensuring that a common language is used during data gathering (Gibson & Birkinshaw, 2004).

The submission to the Ethics Committee also outlined the approach that would be taken to protect the identity of participants. This research anonymised research participants and assigned pseudonyms for both the participant and the organisation to ensure anonymity (Saunders et al., 2015). Besides their safety, anonymisation was also in line with the Protection of Personal Information Act (POPIA) enacted in South Africa POPIA (Republic of South Africa, 2013). The data would also be kept in the GIBS database for any future requests or for further studies.

Data collection commenced only after obtaining approval from the committee.

4.12 Conclusion

In conclusion, in a quest to answer the primary research question, how do boards of directors pursue organisational ambidexterity in the context of digital transformation, the plan was to use a qualitative approach to get closer to data and contribute towards illuminating the black box of research, board processes. In trying to identify who could provide suitable information for the research, the researcher used different approaches to overcome known issues of board members and executives not being accessible. This is because board members and executives, who fall into the category of elites, are argued to provide valuable information (Natow, 2020). The Doctoral Research and Ethics Committee approved the process and the data was collected using semi-structured interviews and archival data. This approach is based on sound arguments in literature as described in the chapter. Chapter 5, 6 and Appendix D provide details of the findings provides details from data collection. Chapter 7 analyses the data and Chapter 8 provides research conclusions and contributions to theory and practice.

CHAPTER 5: APPROACH TO DATA COLLECTION AND ANALYSIS

5.1 Introduction

Literature has observed that case studies typically combine different data collection methods such as interviews, archival data, observations, and questionnaires (Eisenhardt, 1989). Data collection was primarily focused on obtaining data through semi-structured interviews and archival data for 2017, 2018 and 2019. The focus was on multiple cases purposefully sampled to answer the research question (Folkman et al., 1985). Literature laments the lack of an audit trail that allows any observer to trace the course of the research and decisions made in the process (Carcary, 2009). The remainder of this chapter provides details of how data was collected from the identified cases until it was analysed.

Data for the case study was collected through a two-pronged approach, semi-structured interviews, and archival reports. Archival information was used first to identify organisations that had reported the use of digital technologies in their annual reports. The sections below detail the processes used and decisions made during data collection.

5.2 Researcher-participant relationship

The researcher is a practitioner in the financial industry with years of experience in Information Technology. At the time of data collection, the researcher was a Chief Information Officer, and led conversations on Digital Transformation, sat on board sub-committees, and led conversations on digital transformation. It was, therefore, necessary to continuously self-evaluate as she performed data analysis.

5.3 Interviews

Interviews are argued to be one of the most important sources of case study information. The researcher asked key participants about events that led to digital transformation and narrated the processes pursued by boards of directors to explore and exploit. The research used semi-structured case study interviews for collecting primary data. This method is supported by Yin, (2018), who argued that case study interviews resemble guided questions rather than structured queries. The interviews resembled guided conversations geared towards obtaining in-depth information on the processes used by boards of directors as they direct organisations to achieve ambidexterity in South Africa.

The interviews were performed from November 2019 to May 2020. This data collection period overlapped with the outbreak of a global pandemic known as the Corona Virus (COVID-19). The pandemic exhibited itself in the form of a "flu'-like" disease that had infected over 37 million people and killed over a million people worldwide by the time of this report and still counting. South Africa itself was in the top five most infected countries in the world, the highest on the African continent, with over 700 000 infections and 17 500 deaths. Social distancing became a norm, a term that was understood to mean limiting face-to-face contact with each other to reduce the spread of the COVID-19 disease. At one time, over 53% of countries were under lockdown, with strict "stay at home" rules. Face-to-face interviews had a high risk of contracting COVID-19, which was deadly and had no cure and contravened state regulations to complete the studies. There was no choice in this period and the researcher used remote interviews.

In South Africa, the King Codes of Corporate Governance (King Committee, 2016) define the board composition as a balance of executive and non-executive directors, with a majority of independent non-executive directors. The Codes of Governance argue that this balance reduces the possibility of conflicts of interest (King Committee, 2016). In a two-tier system that is commonly used in South Africa, executive directors are delegated to run the day-to-day work, while non-executive directors play a supervisory director role (Staikouras et al., 2007). This research, therefore, identified both executive and non-executive directors and board invitees who could participate in answering the research question, *"How do organisations balance the competing strategies, exploration, and exploitation, in an environment with digital transformation?"* The approach to an interview of both executive and non-executive directors also helped with testing the genuineness of views with other respondents who may have held different perspectives (Yin, 2018). The approach is also supported by literature that posits that the elite provides valuable information from the perspective of power (Natow, 2020). Literature has presented different descriptions of 'the elite'. In this case, the elite refers to decision-makers who have extensive and exclusive information and can influence critical organisational outcomes, either alone or jointly (Aguinis & Solarino, 2019). The participants were sources of information for the case and were not the case itself (Verschuren, 2003).

The initial plan was to couple the following relationships to get easier access: social networks and known gatekeepers; the researcher's University, Gordon Institute of Business Science (GIBS) network; the researcher's employer network. However, neither the University nor employer networks yielded favourable results. The requests for consent to perform the research that were sent using the two organisations were either not responded to despite several follow-ups or were declined. This is synonymous with literature that asserts that gaining

board members can be challenging (Huse et al., 2011; Kumar & Zattoni, 2014; Leblanc & Schwartz, 2007).

The researcher subsequently leveraged the use of social networks developed over the years of the researcher's career, a senior professional with 14 years of working in the South African market. The researcher also used gatekeepers to negotiate and gain access (Peticca-Harris, deGama, & Elias 2016).

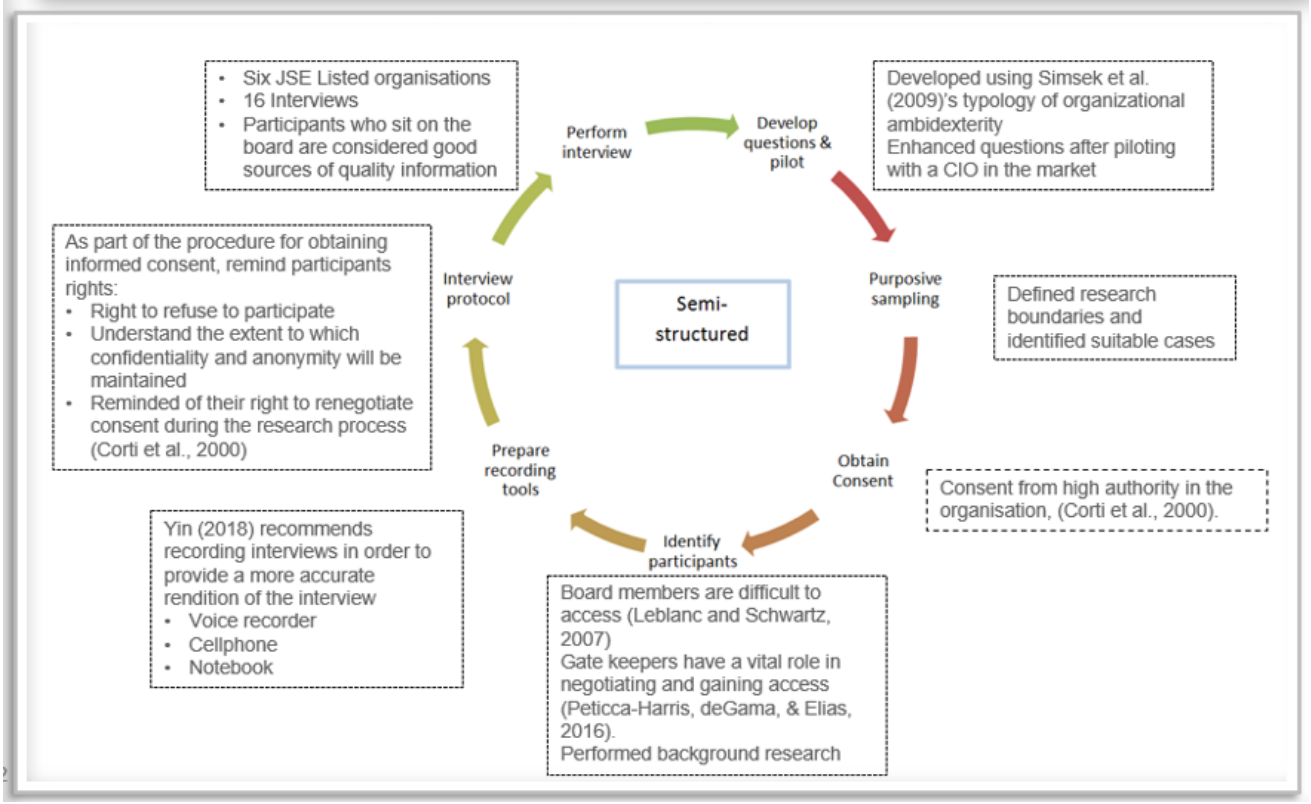


Figure 7: Researcher's visualisation of interview preparations

- First, the semi-structured interview questions were developed using the typology of organisational ambidexterity which asserts that ambidexterity is achieved using either the structural dimension or the temporal dimension (Simsek et al., 2009). The questions were worded in business language to ensure a common understanding between the researcher and the participant.
- Second, the researcher performed a content analysis on the annual reports of organisations listed on the Johannesburg Stock Exchange to identify those that had adopted digital transformation. A list of listed on the Johannesburg Stock Exchange companies was obtained

from the IRESS database. The researcher then obtained the latest annual reports for the companies and directed content analysis, searching for keywords on the reports that would confirm the adoption of digital transformation (Hsieh & Shannon, 2005). The keywords were identified from the literature on digital transformation and included “Digital”, “Digital Transformation”, “Cloud”, “Robotics”, “Artificial Intelligence” and “Internet of Things”. Six organisations that were aligned with the research problem and the phenomenon under study were purposive sampled (Creswell, 2013, p. 156).

- Third, informed consent was obtained using the researcher’s network and gatekeepers. This involved telephone calls and requests via email to gatekeepers and other board members in the researcher’s network, whose organisation had been identified through purposive sampling. At this stage and the fourth stage, the evidence of empirical research became clear, board members are difficult to access (Leblanc & Schwartz, 2007). The difficulty encountered with accessing this group and the anxiety around signing an informed consent took the most time. This stage took six months, the longest time in the data collection and analysis phase. The researcher was given different reasons for board members and executives not being available. Some of the reasons included:

  “It is our year-end, can we move this to next month”, “it is almost time for a holiday, can we do this later”, “the meeting has been cancelled Precious due to travel”.

  “*Can we reschedule, there is another urgent meeting which has come up” or of late, “can we do this after the COVID-19 lockdown”*.

  The researcher understood why previous research lamented the challenges to access board members and had relied on one key informant or quantitative data (Huse et al., 2011). Despite these obstacles, consent was obtained from seven organisations which yielded sixteen participants. The seventh case was aborted as it did not suit the research profile, despite having shown signs of digital adoption. Per Welch et al. (2002)’s recommendations, the researcher used personal connections and obtained influential sponsors wherever possible. Such consent was given by either a board member or an executive in the organisation. In most cases, the person authorised to give consent to the research also became a participant.

- Fourth, once a research sponsor was identified, it was easier to identify possible participants who were best placed to answer the questions (Creswell, 2013, p164). However, getting their time remained a hurdle with which the researcher needed to deal. Again, from the sampled organisations, the researcher used the network created over the years and gatekeepers.

During the interviews, the participants also referred to other board members from sampled cases who could contribute to the research. Research recommends that it is essential to understand responses from any particular respondent for bias (Huse et al., 2011). The researcher, therefore, took a necessary step to ensure there was a balance by getting at least two respondents from each organisation, complemented by archival reports. The third and fourth steps took six months to confirm and perform sixteen interviews, which was much longer than the initial plan.

Through the process of obtaining informed consent from participants, the fourth process was performed, confirming the mode of interview. Sometimes the request was sent through the gatekeeper, who would subsequently send it to possible participants. At times, the researcher contacted the participants directly. In most cases, participants were insulated by what Marland and Esselment (2019) termed “walls of staff”, and the researcher went through several layers to access them.

- Recording interviews provides a more accurate rendition of the interview Yin (2018). The fifth process involved the purchase of a digital voice recorder and relevant accessories and understanding its usage. The cell phone was used as a backup recorder in the event of a technical failure. All interviews were audiotaped, except one where the participant did not give consent.

- Sixth, the researcher reviewed the interview protocol, which was a form with semi-structured interview questions, the first page of the form required administrative information on the interview itself and the participant. An example of the form has been attached in **Annexure A.**

- The interview protocol had been validated by the Research Supervisor and the Doctoral Research Quality Committee (RQC) of GIBS, University of Pretoria.

- The eighth process involved close liaison with the participants to confirm the interview's date, time, and place. Most preliminary interactions were with Personal Assistants who were part of the “walls of staff” around board members and executives (Marland & Esselment, 2019).

  The researcher had planned to perform the traditionally accepted face-to-face interviews with all participants. However, this was deemed not feasible after many participants indicated that they were only available for remote interviews due to their busy schedules or location. This is synonymous with empirical research, which acknowledges limitations that arise in instances where one needs to access the “hard-to-reach” groups (Creswell, 2013, p164). Face-to-face

interviews were eventually rendered impossible on the pronouncement of a national disaster and the lockdown that was instituted in South Africa and the rest of the world as the World Health Organisation declared an International Emergency and recommended stringent measures in trying to curb the spread of the Corona Virus, also known as COVID-19. The researcher adopted remote interviews, which were in line with the international guidelines on keeping a social distance until the pandemic was over. When the interviews were performed between March 2020 to May 2020, there was no cure for the virus and therefore no foreseeable date as to when social distancing would be lifted, and remote interviews became the only choice. Social distancing was still in place in October 2020 at the time of writing this report.

- In line with the research on elites, the researcher performed extensive research on the organisation, the participant, and the work they had done (Natow, 2020; Stephens, 2007). During the interview, any pending consent was obtained from the participant by signing the form or emailed consent in the case of remote interviews. The interviews, both face-to-face and remote interviews, started with small talk, jokes, and other polite routines to create rapport (Irvine et al., 2013). It was observed that face-to-face interviews had more small talk than remote interviews (Vogl, 2013). In face-to-face interviews, most participants offered refreshments, and remote interviews broadly talked about the lockdown, escalating infection rates, and new ways of behaviour and collaboration in the wake of COVID-19. The interviewer then directed the small talk to any professional background of the participant based on background performed and used the opportunity to confirm accuracy. In one of the interviews with a board member, the interviewer said:

  "*Talking about all the information on various platforms regarding the pandemic, it still did not overshadow the Lifetime Achievement Award you received in 2016. Congratulations, Sir".*

  This allowed the transition from the general talk to a more focused discussion on the participant's background and their role in the organisation.

  During the interviews, the researcher used reflexivity (Perera, 2020). While most of the research is on post-interview reflexivity, the researcher had opportunities for real-time reflexivity (Perera, 2020), particularly with one participant. The participant, a non-executive board member, had written a book on the roles of boards of directors. During the interview, the researcher observed that although the research questions referred to board processes, the participant's responses were aligned to the role of boards of directors as in the published book. The researcher changed the line of questioning and probed further to get details of the

processes used when exploring and exploiting in the context of digital transformation. Although the role of the board as mandated by the King Codes of Corporate Governance (2016) was clear, particularly on digital transformation, the line of questioning was to determine how the board achieved its role, especially in monitoring disruptive technologies and ensuring that the organisation utilised opportunities presented by digital transformation. The responses were corroborated by other participants and triangulated with archival data (Natow, 2020; Yin, 2018).

An initial sample size of sixteen was determined upfront (Hennink et al., 2017). The researcher performed preliminary analysis, where collected data and analysed at the same time to generate a codebook (Elo et al., 2014). The analysis started after the third interview on Altas ti, a software tool that is used for coding and analysing data. While the use of the software is not the sole determinant of systematic coding, Atlas ti contributed to achieving consistency in the coding process (Geisler, 2018). The researcher applied process coding mostly because this is a process study. The first-cycle codes were identified using abductive analysis. Abductive coding involved the use of data in tandem with theory (Gioia et al., 2013; Kovács & Spens, 2005). The process started from a code book generated from the concepts from theory, particularly Simek et al., (2009)'s typology. New codes emerged from data as coding progressed The first six interviews generated most codes, while others were identified in the coding process. As interviews and analysis continued, additional codes and categories were identified and added, though they became fewer and fewer through the interviews.

Past definitions from the literature on organisational ambidexterity were maintained wherever possible, and there were cycles and iterations of coding and review, moving codes around until the researcher was satisfied that there were in the right category. This process continued until saturation was reached on the thirteenth interview when the point in data collection where no new insights emerged from data began to be repetitive (Hennink et al., 2017). Saturation refers to the point in coding where no new codes are observed in the data. Although no new codes were identified, the last three interviews were performed to complete corroboration in the case (Yin, 2018) and were included in the data analysis. Each interview took about fifty minutes to an hour.

Literature has shown that past qualitative research on boards of directors was on one board and relied on a critical informant knowledgeable of board processes (Zattoni, Gnan, & Huse, 2015). This was due to difficulties with access to board members (Minichilli, 2012). This research joins a few studies that made methodological contributions using qualitative methods

and thick data obtained from different boards and sixteen informants involved in board processes. Such studies include Smith and Smith (2015) who investigated how leaders make decisions in paradoxical situations, Oliveira et al., (2022) and Klarner et al., (2020).

5.3.1 Face-to-face versus remote interviews

Qualitative interviews are traditionally conducted in person. Rubbin and Rubbin (2012) posit that conducting an interview remotely is not the preferred way. However, such conclusions were reached when research on interview mode effects was less developed. Therefore, it is difficult to assess whether one mode of an interview is superior to another (Johnson et al., 2019).

There are two schools of thought on using face-to-face versus remote interviews, which include telephone, Skype, or the use of other technologies. One school of thought argued that face-to-face encounters are often required to create and maintain rapport, while remote methods vary from acceptable to necessary (Cachia & Millward, 2011). Empirical research, which supports this school of thought, argued that a breakdown of communication could quickly arise by being apart (Irvine et al., 2013). Similarly, the arguments posit that face-to-face interviews illuminate homophily, where the participant is attracted to a similar person, assessment of interviewer's credibility, contextual data, observing emotional and visual cues (Johnson et al., 2019), which may indicate that a follow-up probe is in order. However, the importance of these cues may vary, depending on research objectives. This research is focused on understanding processes used by boards of directors in organisational ambidexterity, and therefore emotional and visual cues are not as critical as research in social sciences which may have emotionally sensitive questions.

The second school of thought observed no difference in the nature or depth of telephonic versus face-to-face interviews. This is supported by Vogl (2013), who asserts that there is no evidence to support the views presented by traditionalists. Unlike in the past, participants now own telephones, have access to remote conferencing solutions, and are comfortable with such interviews, especially the targeted participants in the elite group. This research, therefore, asserts that the superiority given to face-to-face interviews has been largely attributed to scholarly tradition. People are now well used to communicating remotely using different technologies, unlike in the old days where traditional research could have drawn its bias. Evidence that supports this assertion argues that, with careful listening enabled by the telephone, the interviewer can draw cues, line sarcasm, curtness, tears, or rapid speech (Irvine

et al., 2013). Concomitantly, researchers also argue that conversation must pique interest to build rapport, whether telephonic or face-to-face (Johnson et al., 2019). The interviewer used a carefully crafted interview guide, probing and listening to what is said and unsaid, methods which Johnson et al. (2019) argued that these could generate a fine-grained understanding of respondents. The interview guide has been included as Annexure A of this thesis. Besides, participants that have a sense of altruism will respond positively despite the interview mode, knowing that their contribution will benefit others (Cachia & Millward, 2011).

Extant literature recommends that when reporting interview results, researchers should note the use of remote interviews because the differences in the modes of interviews are non-negligible. This research, therefore, confirms the use of five telephonic interviews and eleven face-to-face interviews. In line with empirical research, which acknowledges that there are instances where one needs to access the "hard-to-reach" groups (Creswell, 2013, p. 164), potential participants who were reluctant to participate in face-to-face interviews either for safety concerns or busy schedules, were comfortable with telephonic interviews. Some of the key drivers for the telephonic interviews were:

- Board members are known to be a complex group to access (Leblanc & Schwartz, 2007). However, some were available only for telephonic interviews. This was evidenced by the fact that in the two cases where remote interviews were used before COVID-19, it was at the request of the board member, due to a busy schedule.

- Board members are also known as secretive groups such that even when one gets access, they are reluctant to share information (Huff et al., 2006). The researcher took note of this, and when access was obtained, participants were assured of anonymity.

- The participants travelled, and one of the interviews was performed when one of the board members was *en route* on a long holiday. Despite the travel, there were no interruptions to the fifty-minute telephone conversation, attesting to technological advancement.

- When performing the research, the COVID-19 pandemic, which hit the whole world in 2019, infecting over 2 million people by the 15th of April 2020, was deemed to be at its peak. Infections were over 37 million by October 2020, and still counting, at the time of finalising this report. The outbreak of this disease triggered what was commonly known as "lockdown", which put restrictions on movement and face-to-face contact to minimise the risk of being contaminated with the deadly disease, which had no cure at that time. Therefore, the researcher needed to perform remote interviews based on the health risks caused by face-to-

face interviews and to preserve the research endeavour.

When the transcriptions were completed, the researcher concluded that there were minimal differences observed in the data collected from face-to-face interviews and telephonic interviews, mainly because of the following:

-The interviewed participants were well used to communicating using remote technology, which was either telephone or voice conferencing systems (Irvine et al., 2013). The Companies Act (2009), one of the governing laws for South African companies, accommodates electronic communication when attending board meetings. Therefore, the participants, who are board members and executives in board processes, have experience with using electronic communication technology.

-The researcher probed carefully, listening to what was said and unsaid, ensuring that all questions were answered (Irvine et al., 2013; Johnson et al., 2019). The researcher used acknowledgement tokens, signalling to the participant the researcher's interest and attention during the interview. In the absence of visual options, this served to vocalise indication that what the participant was saying was being heard, understood, and was relevant to the research (Irvine et al., 2013). Much attention was paid to clear articulation and ensuring clarity of questions in the absence of facial gestures. While there was no facial identity for either interviewer or participant during the telephone interview, the interviewer had done preliminary research before the interviews. Most of the information obtained from the professional platforms on the internet was accompanied by a photo of the participant and their professional background.

The researcher found participants eager to contribute to the research, as evidenced by the following questions from two participants during remote interviews.

"I hope this was helpful. If you need more information, I can introduce you to another colleague in the organisation".

"I am glad I could help. As you write your thesis, if you find any gaps that you need more information, do not hesitate to contact me".

When the data had been gathered from interviews and recorded on electronic devices, and memoing was done, the next step was to transcribe.

5.4 Archival data

The use of archival data is shared in qualitative research. The researcher systematically sampled archival data, mainly from the company websites, and analysed it before the interviews (Harvey, 2011). The data that was sought consistently from various sources, is as shown in the table 4 below:

Data Sources	Type of data obtained	Alpha	Beta	Gamma	Delta	Theta	Zeta
Annual Reports	• Digital transformation structure • Goals • Achievements	√	√	√	√	√	√
Other company archival reports on website	Awards received on digital	√	√	√	√	√	√
News articles	Industry context in which the organisation is operating	√	√	√	√	√	√
Social Media	Background of participants obtained before interview	√	√	√	√	√	√
Interviews	Primary data used to understand processes used by boards to explore and exploit in a digital environment between 2017-2019	√	√	√	√	√	√

Table 8: Data sources for each case

Archival data was used to prepare for interviews and also to triangulate primary data obtained from interviews.

5.4.1 Annual Reports

Literature observed that interviews are extensively used in collecting data, in case study research, there is an emphasis on triangulation (Eisenhardt, 1989) for the research to have a more significant impact (Bluhm et al., 2011b). In this case, archival records were used in conjunction with other sources of information (Yin, 2018). The researcher performed a content analysis of three annual reports per company, for the financial years 2017, 2018, and 2019, to uncover the processes used by boards of directors in the context of digital transformation.

Although archival records are deemed necessary in research, the literature on the impression management of discretionary narrative disclosures asserts selectivity in annual reporting (Leung et al., 2015). Impression management is argued to involve 'including' or 'omitting' certain items of information to manage impressions. The researcher established the accuracy of the published information, and the context in which the information was produced, before interpreting the usefulness and accuracy of the records. Such validation of accuracy was done

through triangulation with the data collected during interviews. All cases under study directed the researcher to additional reports published on their websites. Synonymous with Eisenhardt's (1989)'s observation, such a scenario presented controlled opportunism, which the researcher welcomed to get a detailed understanding of each case individually.

5.4.2 Other records

During interviews, some participants highlighted digital transformation awards that their organisations had won. The researcher requested the documents of such awards. This and other archival documents were available on the organisation's website.

5.5 Data analysis

Analysing qualitative data is argued to be a complex, dynamic, intuitive, and creative process (Leitch et al., 2010). Qualitative data analysis aimed to determine the assumptions, categories, and relationships that inform participants' views (Leitch et al., 2010) of the processes used by boards of directors to pursue organisational ambidexterity in the context of digital transformation. The figure below is the researcher's conceptual view of how data analysis was performed.

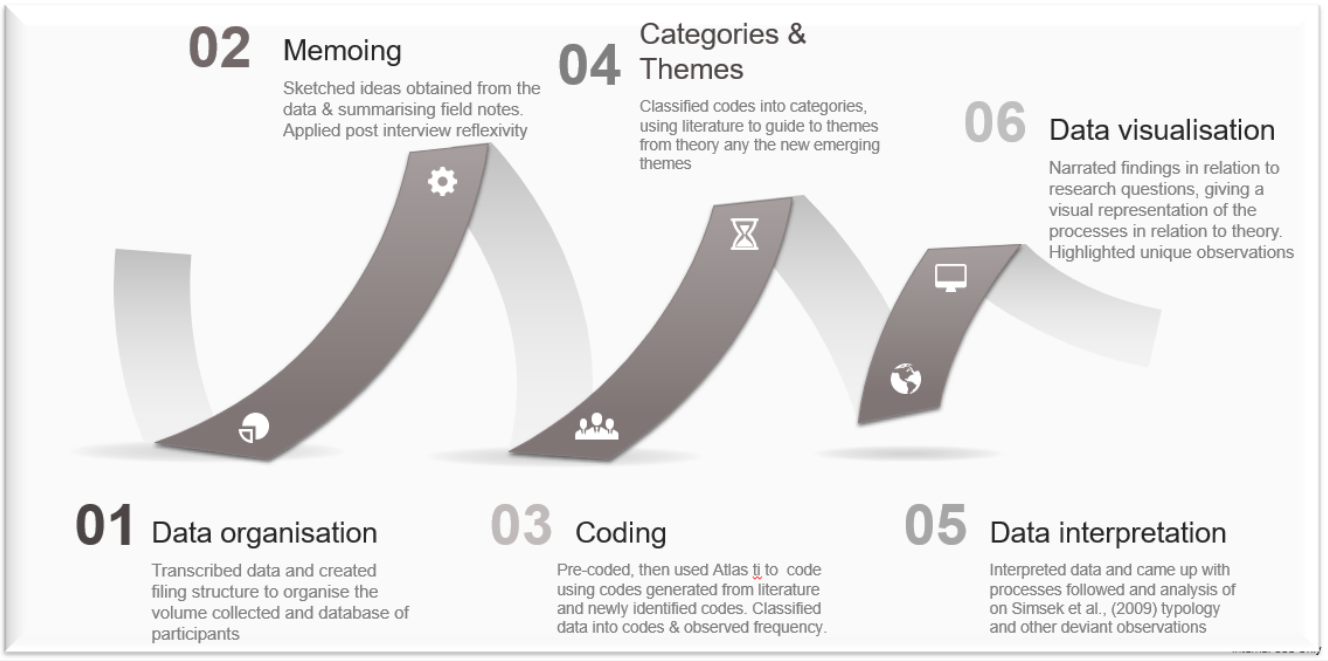


Figure 8: Researcher's conceptualisation of data analysis: Adapted from Creswell (2013)

5.5.1 Content Analysis

Data analysis started before the interviews, with content analysis of eighteen annual reports from the six cases under study (Gaur & Kumar, 2018), three annual reports per company, 2017, 2018 and 2019. The focus was to identify keywords, including digital, digitisation, robotics, artificial intelligence, cloud, and mobile technology. This was done to understand the organisation's work on digital transformation and exploitative initiatives and bring context during the interview (Mikecz, 2012). Preliminary research also showed that adequate homework was done and created a positive impression and respect with the participant (Harvey, 2011). The reports were rich with information on what the organisation had done. While examining the annual reports, the researcher performed relational analysis and the following are examples of the statements from the annual reports that were relevant for this study:

"As the Fourth Industrial Revolution dawns on us, bringing innovation and disruption, we have initiated projects through our Digital Project Slow and Digital Project Fast capabilities that will improve our response to the digitisation and position us in the growing online environment".

"These opportunities to embrace digitalisation cover the full spectrum from advances in automation, big data analytics, predictive maintenance will be pursued with a clear focus on the best balance between cost, risk, value and return considerations".

"Each of these touchpoints has the possibility of digitalisation. The digital initiatives in the Business line A dealerships have focused on two key thrusts, technology-enabled solutions and e-commerce. In close collaboration with Business line A, significant progress has been made in both these areas".

"Delta makes extensive use of IT systems and digital technology in its operations and to deliver services to its customers".

Annual reports were published in Adobe Acrobat. These were imported into the Atlas ti software tool. Although the Atlas ti software tool offers a more efficient way of processing textual data, the researcher still played a vital role in preparing, importing, analysing, and interpreting the data (McLellan et al., 2003). The researcher used theory-based coding at this stage, based on the literature on digital transformation, boards of directors and organisational ambidexterity. Drawing on literature allowed the researcher to accumulate a cohesive body of knowledge (Gaur & Kumar, 2018). Seventy-three code phrases were identified, and some themes started emerging from content analysis. By the time the researcher performed the interviews, she had some background information in most cases. Some of the codes identified

include the following:

Improve response to digitisation; grow online presence; digital for maintenance; reduce the cost of operations; digital for customer service.

Although themes started emerging, these were only finalised after the interviews were transcribed and coded. One of the main themes identified was digital products, which emerged from most annual reports and was corroborated during interviews. Digital products had the highest code occurrence in the annual reports, thirty-two in total. Organisations bragged about digital products, which included:

Confirmation from the Chairperson of Theta that the organisation has released market-leading digital solutions, which included an account for a specialised group, which integrated their ecosystem with the other stakeholders. New solutions included a digital payment system for a school ecosystem and products for the youth to send and receive money without using a complete bank account.

Gamma's subsidiary also uses proprietary technology combined with robotics process automation to provide a comprehensive range of solutions.

Adoption of electronic and digital signatures as an alternative to manual signatures, allowing stakeholders to sign documents and still comply with South Africa's Electronic Communications and Transactions Act. It included rolling out underground wireless connectivity using intelligent devices for communication and data capturing for underground activities.

"As part of our digitalisation efforts, we are rolling out a pilot project to enable wireless connectivity underground. Here, we installed Wi-Fi and enabled smart devices for mobile communication and data capturing".

The utterances were mainly in the Chairperson or the Chief Executive Officer's section of the annual report. Stanton and Stanton (2002) assert that annual reports are created to manage the image of the organisation and may be skewed towards marketing documents. To curb this bias, the statements on digital products that were launched were corroborated during interviews and there were at least two participants from the same organisation. Besides, the content analysis that was performed was relatively free from the researcher's and informants' bias (Gaur & Kumar, 2018).

5.5.2 Transcription

Following the interviews, the researcher started transcribing the interviews verbatim from voice to text to reflect that there was no bias, without reducing data unnecessarily (McLellan et al., 2003). Transcription was focused on how the information was communicated, following the sequential mechanisms and the telling roles that came up in a narrative interview (De Fina & Georgakopoulou, 2008). A uniform transcription protocol was used, preserving the naturalness of each transcription (McLellan et al., 2003). The researcher first sought human transcribers, but this option proved too expensive for the eventual 170 pages of transcribed data. The next option was to look for software that transcribes. The researcher tested otter.ai and trint transcribing software and these did not produce accurate transcriptions. Eventually, the researcher used Temi transcription software. Temi produced about 75% accuracy, and the researcher completed the transcriptions by listening to the recordings and notes. Attempts to outsource the final transcriptions proved a challenge, especially when participants stammered while trying to express themselves and eventually expressed themselves later. Other transcribers failed to understand and connect the response because of a lack of the research context.

Although the researcher transcribed the data almost verbatim, it represented the intended meaning and did not focus on the “uhm”, “er” and the like, which show disfluencies that occur within the flow of speech (Collins et al., 2019). This is because the sound string can mean something different during the interview than when transcribed (Collins et al., 2019).

The table below gives a summary view of the transcription process that was followed.

No.	Transcription principle	Research approach	Reference
1	Preserve the morphologic naturalness of transcription	The word forms for the transcriptions were maintained, and editing was done in areas where there was disfluency in the flow of speech to focus on the central message conveyed.	McLellan, et al., (2003) Collins, et al., (2019)
2	Preserve the naturalness of the transcription structure	Transcription was verbatim, and text was maintained in a movie script, with markers showing words from participant and interviewer. Like any other transcription to text, it missed the non-verbal nuances like nodding, laughing, sarcasm and inflection.	McLellan, et al., (2003) Parameswaran et al., (2020)
3	The transcription should be an exact reproduction	The transcriptions are in word format, which can be used by both humans and computers. In fact, the transcriptions were used in Atlas ti	McLellan, et al., (2003)
4	The transcription rules should be universal	There was no special skill that the researcher needed to transcribe the interviews. Everyday language was used.	McLellan, et al., (2003)
5	Transcription rules should be complete	While literature allows multiple transcribers, this research was transcribed using Temi software, which produced about 75% accuracy, and the rest was finalised by the researcher. Therefore there was consistency in applying the transcription rules.	McLellan, et al., (2003)
6	Transcription rules should be independent	Transcription was done by the researcher and therefore independent, understandable and applicable.	McLellan, et al., (2003)
7	Transcription rules should be intellectually elegant	Used very few simple and easy rules	McLellan, et al., (2003)

Table 10:Transcription process used in this thesis: Adapted from Mclellan et al. (2003)

There was no data reduction during transcription, except removing “Uhm” and “Er”s to preserve the meaning of what was communicated as such disfluencies in speech indicate far more uncertainty in the speaker when transmitted in text than on a recorded sound (Collins et al., 2019). The researcher converted audio recordings to text using Temi software and completed the process with manual verification using notes and audio. There were 170 pages of transcriptions from the sixteen interviews that were performed.

As soon as transcription was completed, the researcher created a database to anonymise the interview data, mapping cases under study and participants to pseudonyms. True anonymity is never achievable because primary researchers know who the participants are (Saunders et al., 2015). Researchers will not only know the participant, in this case, but the researcher also met face-to-face with most of the participants. However, the fact that the researcher knew the participants did not negate the need to disguise and protect participants’ identities while maintaining the integrity and value of the data.

5.5.3 Interpretation

Before coding, the researcher sought to understand and determine what was found in the data collected during interviews. Aberbach and Rockman (2002) compared elite interviews with real estate, where the maxim for picking property is “location, location, location”, in elite interviews, the maxim for obtaining results is “purpose, purpose, purpose”. As such, the focus during coding was on the purpose of the study. Coding was done after transcribing the interviews.

The transcription process was followed by an iteration of the finalisation of second-order coding. Coding did not just involve labelling data but linking the data to the idea and identifying patterns that answer the research question (Saldana, 2016). Different methods of coding were invoked to answer the research question. Similar to the transcription process, the steps taken to code the data collected are shown in the table below. Although the researcher used solo coding, there were frequent consultations with a senior faculty member to validate findings (Saldana, 2016). Such interactions also helped identify emergent ideas and make new insights into the data. The table below summarises the approaches that were taken to code data.

Table 9: Coding approach used

No.	Coding techniques	Research approach	Reference
1	Solo coding	Solo coding coupled with iterative reviews with senior faculty member to articulate internal thinking process and identify emergent ideas and make new insights into data	Saldana, 2016
2	Content analysis	This was used on annual reports in preparation of interviews. It was also reviewed during coding of all data sets after interviews	Gaur, Kumar, 2018
3	Line by line analysis	To drive focus on portions of the data that had potential as qualitatively meaningful undivided units to analyze	Chenail, 2012
4	Abductive coding	Used to provide insight from both the data and literature. Used to discover something that is under specified theoretically, or something that is new or unexpected.	Arino, 2016 Gioia et al., 2012
5	Categorisation	Grouped codes into phrases that describe a segment of the data that is explicit	Saldana, 2016
6	Themes	Involved grouping categories into overarching theoretical dimensions and new untheorized dimensions	Saldana, 2016

The iterative process was done to identify new codes until these stopped emerging and there was no new meaning to the data that was being collected. Instead of a purely inductive approach, the researcher used descriptions from previous literature to inform some of the concepts for initial data coding, and also allowed new codes to emerge (Arino et al., 2016; Gioia, Corley & Hamilton, 2013) The researcher also used abductive coding, reading line by line in Altas ti, to adjust focus when analysing the data (Chenail, 2012). This was followed by an observation of the data to identify any patterns that were emerging. An example of codes deduced from the literature includes “Sequential execution”, “Simultaneous execution”, “Interdependent structure” and “Independent structure” derived from Simsek et al. (2009)’s typology of ambidexterity. Codes of the same family were then grouped into categories and subsequently mapped to themes (Seal, 2016). An example of such codes is shown in the figure below.

Data reduction was then employed to reduce bulk codes that had a high number of occurrences. For example, the code “Digital transformation approach”, had sixty-two occurrences, and was broken down into three different codes,” In-source”; “Outsource” and “Partnership”.

Consistent with narrative interviews, an abductive analysis was then performed, where the data was grouped abductively using key themes from literature and observing news that

emerged from the data. The primary goal was to generate an understanding of the participants' sense-making (Leitch et al., 2010) of the processes that were used by boards of directors in their pursuit of organisational ambidexterity in the period under research. The figure below shows an example of the transition from codes to categories and themes. The complete codebook was generated as part of the process, and the associated definitions.

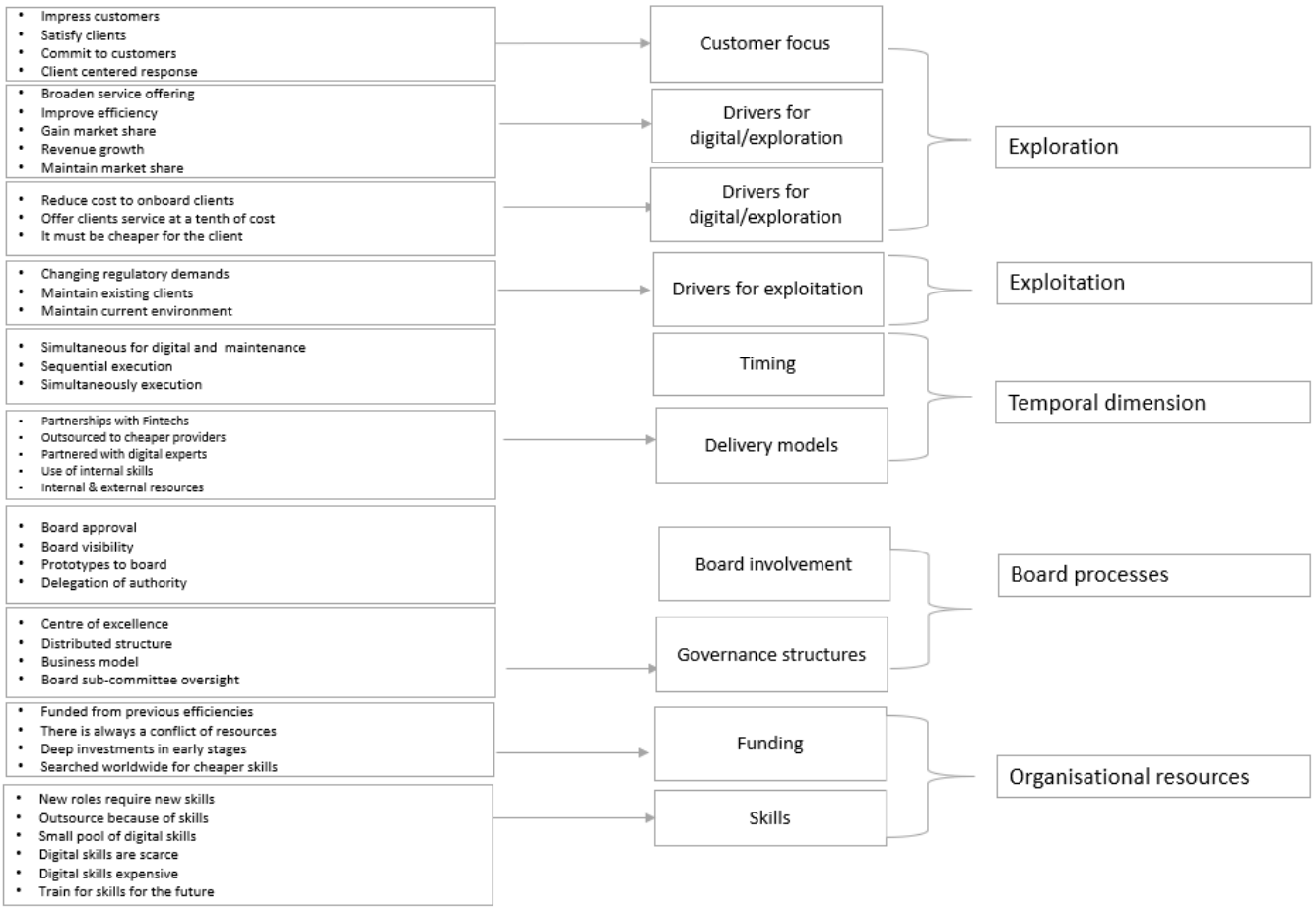


Figure 9: Example of codes, categories, and themes

The researcher used real-time reflexivity during interviews (Perera, 2020), and post-interview reflexivity during data analysis. Reflexivity is commonly viewed as the process of continual internal dialogue and critical self-evaluation of the researcher's positionality as well as active acknowledgement and explicit recognition that this position may affect the research process and outcome (Berger, 2015). The researcher's characteristics, such as gender, age, affiliation, immigration status bias, and others, needed continuous reflection on the researcher's profession and position in the market. The researcher worked for a large asset management

company, which invested on he listed companies on JSE. The context was mostly the asset manager that the researcher worked for had invested in one or another organisation that the participant was involved in. Even though the researcher focused on her academic status and the institution she was studying with, some participants created a small talk about the work context during introductions. The researcher used real-time reflexivity whenever this context started to cloud the focus of the academic research. In two interviews, the researcher observed that the participants were hesitant to provide details of what went wrong with digital investment. The researcher quickly observed this and quickly used real-time reflexivity and re-assured that this was academic research which would be anonymised and was not shared with the employer (Perera, 2020). In one of the interviews, the participant digressed and started giving evidence of a company that she had sold, and not necessarily the sampled case study. The researcher invoked real-time reflexivity and navigated the conversation back to the focal case (Aguinis & Solarino, 2019; Langley, Smallman, Tsoukas, & Van De Ven, 2013). Although the conversation was recorded and transcribed, there was an opportunity for the researcher to perform post-interview reflections (Perera, 2020) on this data during the first cycle of coding.

Once the analysis was done, the quality of the research was exhibited in case reporting, not "making oval pegs seem rounder" (Pratt, 2008, p. 497). The research has "story-like" writing and includes case description, participant's description, description of participant's role in the organisation, field protocols and material interpretation and analysis of the data before concluding (Rashid et al., 2019). The rest of the quality checks are detailed in the section below.

5.6 Quality assurance

There is no singular way to measure quality as it is diverse (Guba & Lincoln, 2005). One way of ensuring the quality of case study research is defensibility, which refers to sampling adequacy to provide a depth of data rather than frequencies' transferability (M. O'Reilly & Parker, 2013; Spencer et al., 2003), dependability, transparency, thus details on how the data was collected (Meyrick, 2006), and credibility. While defensibility is adequately addressed in the sampling discussion, the rest of the data quality considerations are discussed in the sections below.

5.6.1 Dependability

In order to achieve dependability, the researcher ensured that there were explicit coding decisions, which are detailed in the definitions of the codebook. This made it easier for

research supervisors to validate the work and make the same coding decisions. The researcher was coding solo and involved the supervisor in regular reviews of the work during analysis to validate findings thus far (Saldana, 2016). The data were analysed using a constant comparative method (Gibbert & Ruigrok, 2010). Efforts were made to corroborate patterns throughout the data collection process, from archival data to interviews. There is a clear audit trail of the data from voice recording from the interviews, field notes, transcription, transferring to Atlas ti, coding up to data analysis and reporting (Garside, 2014). The audit trail is presented in this report and complemented by field recordings filed in the Gordon Institute of Business Studies Information Centre.

5.6.2 Transparency

An essential aspect of transparency is that the criteria are not mutually exclusive but create a cumulative effect on the trustworthiness and replicability of the research (Aguinis & Solarino, 2019). Chapter 5 of this report details the sequential aspect of this research, from research setting, design, data collection, characteristics of participants and interactions with them, challenges with access, how saturation was reached, opportunities used, power imbalance which presented itself in one of the interviews, data analysis through coding as shown in the Code Book and reporting (Aguinis & Solarino, 2019). This report also discloses how data was anonymised and where the raw data can be found.

Aguinis and Solarino (2019) identified twelve transparency criteria, which enable the replicability of the research. The table below summarises the transparency characteristics of this research and the relevance of each criterion to replicability.

Table 10: Transparency criterion: Adapted from Aguinis and Solarino (2019)

No.	Transparency Criterion	Definition	How this research was conducted	Criterion is necessary for replicability because:
1	Kind of qualitative method	The particular qualitative methodology used in the research (Creswell, 2018, Yin, 2016)	This research used multiple case study	A method's assumptions and values affect theory, design, measurement, analysis and reporting choice and interpretation of results
2	Research setting	The physical and social and cultural milieu of the research, e.g., firm conditions, participants' social status (Bhattacharya, 2008)	Focus was on organisations that adopted digital transformation and participants were board members and executives involved in board processes	It clarifies the structure, sources and strength of the pre-existing conditions in the research setting
3	Position of the researcher along the insider-continuum	The researcher's relationship with the organisation and study participants (Griffith, 1998)	The researcher had no relationship with fourteen participants. There were two peer PhD students who were interviewed. The researcher had no direct relationship with the organisations identified.	Illuminates the researcher's relationship with the organisation and participants, which can alter accessibility to data, what participants can disclose and how the information that is collected is interpreted
4	Sampling procedures	Procedures used to select the cases and participants for the research	The researcher used purposeful sampling	Clarifies variability that the researcher is seeking and presence of possible biases
5	Relative importance of participants/cases	Relative importance of participants or cases	Cases are companies listed on the JSE and have adopted digital transformation. Participants are board members and executives, referred to in literature as elites	It allows identification of participants or cases with similar characteristics as original study
6	Documenting interactions with participants	Documentation and transcript of interviews (e.g., audio, video, notations)	Audio recordings and transcriptions were submitted to GIBS Information Centre as required in the fulfillment pf PhD studies	Different means of interactions may alter willingness of participants to share information
7	Saturation point	It occurs when there are no new insights or themes of collecting data	Saturation was reached at participant 13	Helps with including judgement call on the part of the researcher
8	Unexpected challenges and opportunities	Unexpected opportunities and challenges encountered during data collection	Interviews for the last organisation was cancelled due to COVID-19. Replaced by a different one. Used remote interviews for five participants due to COVID-19	The way in which researchers react to these unexpected events can affect data collection and subsequent conclusions

5.6.3 Credibility

The researcher spent time in the field during data collection in the settings of the participants, conducting interviews to allow time for trust to be established with participants. This enabled the researcher to gather rich and thick data and identify any distortions. Distortions and salient points could be clarified during interview reflexivity or followed up post-interview to ensure clarity (Perera, 2020). The researcher also triangulated information obtained from interviews with archival data, from the popular press and annual reports (Garside, 2014). In addition, the researcher corroborated information obtained between participants, hence the need for two participants from each identified case.

5.6.4 Confirmability

The researcher used step-wise verification during data gathering and performed data correction during the collection and analysis processes. The audit trail was maintained as part of this research, which allows confirmability of the researcher's findings and the interpretation of the collected data (Garside, 2014; Ashworth & Lucas, 2000, Sin 2010).

5.7 Ethical considerations

Ethical issues can arise at any stage during this research. The Gordon Institute of Business Science (GIBS) had a robust ethical clearance process that seeks to promote the goals of the

research; ensure the credibility of research findings; reinforce professionalism; ensure students adhere to ethical conduct during collaboration and data collection and protect the reputation of the institution, participants, and the scholar (GIBS, 2020). The GIBS ethical process also ensures the well-being of the scholar and protects the researcher and participants from hurt or exploitation, especially during and after data collection. The submission and approval of data collection methods were resented to the Doctoral Research Ethics Committee and attached in **Appendix E**. The rest of section 5.7 presents the ethical considerations that were made during the research in line with the requirements of the GIBS ethical process.

The research investigates processes used by boards of directors and if the information is not handled within agreed parameters, it could hurt the participant or the organisation. Such considerations also preserved the rights of the participants.

5.7.1 The goals of the research

The researcher designed, implemented, analysed, reported and presented the findings rigorously to benefit institutions and organisations in the environment, particularly academia and in practice in emerging economies. These were presented and considered by the GIBS ethics committee as part of the ethical review process.

5.7.2 Informed consent

Consent is a negotiation of trust and requires continuous negotiation (Kvale, 1996). The researcher sought informed consent from the cases under study and the participants before the interviews and received confirmation on hard copies or email. Consent was confirmed again at the beginning of each interview. The researcher and the University of Pretoria preserved and protected the privacy, dignity, well-being, and freedom of research participants.

5.7.3 Privacy and confidentiality

This research ensured that potential threats to privacy, confidentiality and anonymity of research participants were preserved by assigning pseudonyms for both the participant and the organisation to ensure anonymity. Assigning pseudonyms also aligns with the Protection of Personal Information Act (POPIA) enacted in South Africa POPIA (Republic of South Africa, 2013). The data collected has been kept in confidence to ensure good practice and confidentiality of discussions. Any documents provided for archival information are held with

care to preserve the documents and make sure they are handled with due care. These were kept because, despite the need for confidentiality, qualitative research requires confirmability (Orb et al., 2000). Therefore, documentation of all activities has been kept.

5.7.4 Data security and preservation

Data will be kept for a minimum of five years to fulfil any requests for data that may seek to validate the research. The data can be disposed of after a maximum of ten years. The figure below shows the chain of custody of the data.

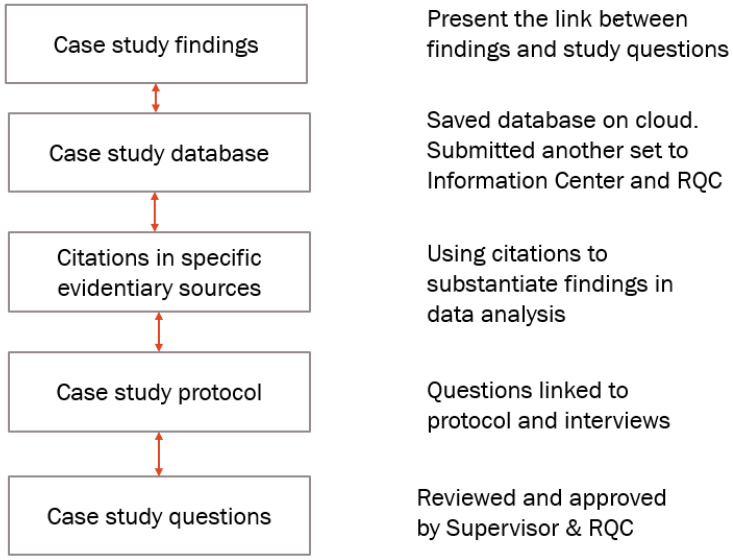


Figure 10: Maintaining chain of custody: Adapted from Yin (2018)

5.7.5 Data Dissemination

In conclusion, data analysis was focused on answering the research question, *"How do boards of directors pursue organisational ambidexterity in an environment with digital transformation?*" Therefore, the process started with content analysis in preparation for interviews, transcriptions, iterations of coding, categorising, and identifying main themes, determining what was influential throughout the process. The next chapter, within and cross-case analysis, details critical areas extracted from the data.

CHAPTER 6: CROSS-CASE ANALYSIS

6.1 Introduction

Following data collection and transcription, the researcher performed a within-case analysis. The emerging themes have been detailed in within-case analysis in **Appendix D**, with empirical examples extracted from the data.

This chapter presents a cross-case analysis, which examines the themes identified in the six cases. The themes presented are a result of an in-depth analysis of similarities and differences that emerged across the cases that were under study. The cross-case analysis is presented in a way that shows the temporal coherence of events that unfolded in the data (Berends & Deken, 2021) as organisations adopted digital transformation. The researcher identified the processes within each case and then looked for common themes that transcended the cases (Yin, 2018). The themes are presented in tables and diagrams, using evidence from the data (Berends & Deken, 2021). The analysis generated a codebook with the codes and categories that were extracted from the data during analysis.

The researcher used analysis maps during the coding process, which presented a summary of the codes and categories extracted from each of the six cases in within-case analysis, and the processes and the structures that were established to execute the board processes in each of the cases. The maps are presented in **Appendix D**, within-case analysis.

Cross-case analysis that was based on sixteen participants, showed that boards of directors for the six companies listed on the Johannesburg Stock Exchange in South Africa ensured that organisations leveraged digital technologies to address existing problems and the opportunities these presented. The Johannesburg Stock Exchange charged the boards of listed companies with the responsibility of ensuring that there is continued sustainability of the current business, including the risks and opportunities presented by digital technologies. The Stock Exchange enforced this through the King Codes of Corporate Governance for the Exchange, which mandated boards of directors to:

> *"Monitor appropriate responses to the developments in technology, including the capturing potential opportunities and the management of disruptive effects in the business and its business model",* (King IV, pg. 63).

The same responsibility was expressed by Theta's executive director who said:

"The team at the top understands the need to balance the future and the current. That is well understood by the board. The board is responsible for the current business, and they are also responsible for the future that we are building. For example, if something goes wrong with the regulator, they will go to the board, and the board will lean on management in order to provide adequate responses. So, it's very important that committees are fully aligned with strategic direction as well as the details of the execution of that strategy".

As such, evidence suggested that boards are accountable for continued exploitation and also sustainability and exploration, ensuring that the organisation is responding to digital transformation. Cross-case findings show that boards achieved this by 1) realising the need for organisations to adopt digital transformation, 2) deciding on digital oversight, mostly this was delegated to a board sub-committee, 3) prioritising explorative digital initiatives, ensuring a balance with exploitation, 4) approving and resourcing proof-of-concepts, 5) ensuring digital transformation practice is embedded in the organisation, and 6) setting performance targets and monitoring performance of such. The six processes and related activities have been summarised in the figure below. It was clear from the evidence that although the processes used by boards of directors were entangled with the rest of the organisational processes, boards directed the adoption of digital transformation by deciding on the direction, approving priorities thereof and the level of investment that would be made in exploration and exploitation. The case of Alpha, as explained by the Chief Digital Officer, exhibits this concept:

"You can see in the way that the board looks at it. It's kind of the board's investment. It's taking the established organisation businesses, and it's reinvesting the profits from those investments into the emerging businesses. So, for instance, the bank, I mean, that's a digital bank. So, thinking about digital transformation and watching an entirely digital bank, that's being funded through the profits from the established businesses".

Therefore, this chapter focuses on presenting the evidence of the processes used by boards of directors only, as presented by the sixteen participants and archival data. Where the analysis intertwines with organisational processes, it is merely to give context to the environment in which boards of directors explored and exploited.

The rest of the chapter answers the research question, *"How do boards of directors pursue organisational ambidexterity in the context of digital transformation?".* The chapter draws from the processes and process activities shown in the figure above, with examples drawn from the cases that are detailed in **Appendix D**. The research questions were guided by Simsek et al. (2009)'s typology of organisational ambidexterity. The rest of the chapter is therefore structured according to the research questions. The ambidexterity types are presented as they relate to each research question, with examples of the processes and related activities that informed the board's decisions. There was a deviant case that was observed that did not fall into any of these pre-defined quadrants.

6.2 Processes used by boards of directors

During cross-case analysis, when answering the research question, *"How do boards of directors explore and exploit in the context of digital transformation?",* it was observed that the degree to which the board takes responsibility for digital transformation differs, depending on the mode of ambidexterity and maturity of digital adoption within the organisation.

The board was actively involved in the first cycles of realisation, transitioning, and deploying digital products and services. In these first cycles, the whole organisation went through stages of learning how to adopt digital transformation. It was observed during analysis that in the early stages, the board led the process of digital adoption in an organisation. When the digital transformation practice was well established, the board delegated most decisions to management and would monitor at arm's length. The board re-engaged in instances where the level of investment in digital was significant and would transform the organisation.

For example, Beta and Gamma's boards identified the risk of business continuity due to digital disruptions, and the opportunities presented by the phenomenon. Both boards led the establishment of digital and defined delivery mandates for the practice. In fact, Gamma's board led the recruitment of a Chief Executive Officer who was digitally savvy, set performance targets which included creating a new revenue stream from digital, and was monitoring performance against those targets. On the other hand, Alpha's board actively directed analysis of how digital transformation could address the regulatory requirements, especially on carbon emission, the capital required viz-a-viz organisational sustainability.

The board ensured the organisation had adequate resources to perform proof-of-concept and scale up successful initiatives. This researcher observed that harmonic ambidexterity was associated with the establishment of digital competency within an organisation. Literature has already shown that organisations can ignore digital transformation at their peril. In the same breath, digital transformation is known to be costly, is associated with a high rate of failure and the skills are scarce. As such, the board of directors, who are accountable for organisational sustainability, directed digital adoption using harmonic ambidexterity. A typical example was observed in Alpha, where digital transformation was mature in most areas of the organisation, but the board was actively directing the establishment of a digital bank. Similarly, Gamma's board was directing the adoption of digital to establish new business practices to increase revenue and to enhance traditional business for their preservation and improved profitability.

6.3 Research question 1

6.3.1 Question 1.1: Sequential ambidexterity

Finding an appropriate response to ambidexterity depends on the context in which the organisation is operating. Using cross-case analysis, this research question sought to understand the context in which boards of directors decided to alternate between long periods of exploration and short bursts of exploration, thus sequential ambidexterity. The section also analyses the conditions where boards' processes were pursued using sequential ambidexterity. Was this in the same business unit, thus cyclical ambidexterity or across units, reciprocal ambidexterity?

The first research question was divided into exploration and exploitation sections as shown in the table below.

Research Question No.	Research question
1	How do boards of directors pursue organisational ambidexterity?
1.1	How do boards of directors decide when to refine existing products or processes and services using existing capabilities (exploit), perform experimentation or investigate new alternatives and create new solutions creating new capabilities (explore), sequentially?

Analysing the evidence from within-case analysis in Appendix D, the cases showed sequential ambidexterity in the organisation that was mature in adopting digital transformation and realised the need to introduce a digital skill that they did not have. Beta, Delta, Gamma and Theta exhibited simultaneous ambidexterity as they were in what this thesis considered as the early stages of digital adoption. Evidence from Zeta showed that sequential ambidexterity occurred in an organisation that had fully embedded digital products and services and had transitioned products and services from exploration to exploitation. Based on the evidence, such an organisation would monitor the market to assess any new digital technologies that would enhance their products and services. Once there was a realisation of the need for new digital skills, the board, or management, would make suggestions on the explorative direction that the organisation should pursue. Therefore, this cross-case analysis showed that only one organisation shed light on the conditions that drove sequential ambidexterity.

The board also reviewed and approved management requests to establish a Centre of Excellence to explore again. The Centre of Excellence would focus on developing the new products and services, from piloting until the board approved deployment across the business units. Business units would then be trained, and the digital skills, together with the products and services, would be embedded across the organisation. Thereafter, the business units start exploiting the deployed digital products and services.

On the other hand, Alpha, which was also known as an industry leader in the health sector for deploying digital products and services from the 1990s, had moved from sequential to simultaneous ambidexterity in 2017 after a long period of using the sequential mode. Explaining this transition, the Chief Digital Officer said:

> *"Alpha was one of the first organisations to launch a corporate website in the late 90s. And now most of the work that gets done, most of the product innovation work that happens in our R&D functions results in some kind of digital customer experience. So, we've invested quite heavily in digital channels.*

The transition for Alpha happened after the organisation had gone through embedding its digital products and services. Thereafter, when the skills, products and services were fully embedded, the board of Alpha was confident that management could continue deploying digital initiatives without close monitoring. The board diverted its focus on investments that required large investments for exploration and exploitation. One participant, Alpha's board member, confirmed that their focus was now on the new digital bank and management focused on other digital investments, hence the shift to simultaneous ambidexterity in 2017.

Unlike Zeta, which completely stopped exploiting the digital platform when they went into exploration, Alpha could continue exploiting the digital products and services that were deployed while developing new ones through their Research and Development functions. This was because Alpha had multiple platforms for digital products and services. In addition, even though Alpha had a Centre of Excellence, they had multiple Research and Development teams across the organisation that released different digital products and services. For example, when Alpha launched a digital bank, thus detailed focus on exploration, while the rest of the organisation continued with exploration and exploitation, thus simultaneous ambidexterity.

Cyclical ambidexterity

As observed in cross-case analysis in the above section, sequential ambidexterity was more apparent in an organisation that was experienced with adopting digital transformation. The findings showed that the organisation had developed digital products and services and embedded them in its processes, entered into cycles of long periods of exploration and short periods of exploration. The cycle in such an organisation started with realising the need to adopt a digital product or service for which they did not have skills. This was followed by transition processes. Transitioning involved delegating authority of oversight to the board sub-committee, appointing a digital owner, approval from the board to establish a Centre of Excellence and related resources, then deploying and embedding the skills, products, and services to the rest of the organisation. The Centre of Excellence went into a cyclical mode, establishing the new digital practices, and after embedding, these practices would then be dissolved and absorbed into exploitation processes. Thereafter, the organisation would be in an exploitation mode, and the board would mandate monitoring the emergence of new digital technologies in the market.

In the six cases, Zeta was the only organisation that was pursuing sequential ambidexterity, particularly cyclical ambidexterity, as presented in within-case analysis details in **Appendix D.** Findings from the three years reviewed showed that Zeta had adopted digital technologies earlier than 2017. The bank launched its digital platform and won "Best banking application of the year" from 2011 and held the award until 2019 when this study took place. Zeta's annual reports of 2018 and 2019 consistently reported on this award as shown by the extract below.

Analysis of data from Zeta also showed that the bank had accumulated digital capabilities over the years and exhibited digital maturity by 2019. However, in 2016, when the King IV Code of Corporate Governance for listed companies was published, coupled with the discussions from the Davos conference on the Fourth Industrial Revolution in 2016, there was a realisation of a need to pay focused attention to digital transformation. The board appointed an IT board sub-committee to have oversight of digital transformation. The processes followed by the bank's board sub-committee from 2017 to 2019 can be grouped into the five headings 1) realising 2) transitioning 3) prioritising 4) proof-of-concept 5) embedding digital and 6) monitoring. The details of how the bank executed each process are articulated in the rest of the section.

a. Realising

Early in data analysis, it was evident that boards of directors realised the need for adopting or improving the adoption of digital transformation. For Zeta's board, it was the latter. The organisation had adopted digital transformation before 2017, periods outside the data collection period of this thesis. However, as the board continuously monitored the environment, they realised the 'hype' of the Fourth Industrial Revolution, powered by digital transformation from 2016, following the Davos conference. In the period under review, Zeta's board realised that most organisations were going to join the digital race and as such, needed to change their approach in order to maintain digital leadership. The realisation was a response to the Davos conference of 2016, the related commitment that was made by the South African President on how the nation will join the fourth industrial revolution and digital transformation as the key driver and the incorporation of disruptive technologies in the King IV Code of Corporate Governance. In fact, Zeta was already lamenting about competition as evidenced by the board sub-committee Chairperson when he said:

"*And also if you look at the unsecured loans market, that has also been a big threat to banks. So the thing that they have to do because they have big old organisations, is to modernise the IT systems. And I mean that's obviously part of the digitisation process because they've gotta be part of the game. Zeta can't sit and look at other people eating their lunch because they have modernised their systems"*.

Although the IT board sub-committee existed before, the Chairman confirmed that it gathered momentum in 2016, when he was appointed.

"*No, it's been there for some time. You know, since I joined after my retirement and got involved with these committees, it was a focus at the time, but it's really gained a lot of momentum".*

As such, the continuous monitoring of market changes on digital transformation made the board realise the need to change its approach to digital transformation.

b. <u>Deciding</u>

When Zeta's board realised the imminent wide adoption of digital transformation and increasing competition, the organisation decided to change its approach to digital adoption. From 2016, the board established an IT board sub-committee, the IT Risk Committee. Although there was an IT Committee before, it was a management committee and there was minimal visibility of its activities at the board level. As part of its mandate, the committee was responsible for directing digital transformation in Zeta. The non-executive director, who was the Chairperson of the committee, explained this change and said:

"Now, once you're a sub-committee of the board, people put a totally different focus on it. And you know, when I got involved at the start, IT was not that well developed and structured because they've not been used to having to report to the board. And once you report to the board, you also report to the regulator and the bank regulators. It becomes very much more formalised. So, I would say, that it was there as a committee, but it was not as important as it became when it was a sub-committee of the board".

The accountability structures to the IT Risk board sub-committee involved each business owning its digital developments on the platform. In the same period, the board of directors appointed a digitally savvy Chief Executive Officer to take the reins of Zeta. On instruction from the board sub-committee, the Chief Executive Officer appointed a Chief Digital Officer (CDO). The Chief Digital Officer was also the Chief Executive Officer of one of the core business lines and therefore held a dual role. In his explanation of the context of the role, the CDO said:

"*So, I'm responsible for all activities from entry-level customers, you know, offering all the way to our private banking offerings. In addition to that, I also sit on the Zeta's Strategy Committee for the group and am also the Chief Digital Officer at the Zeta Group level. We've had an approach that tried to put businesspeople in responsibility for driving their overall digital transformation journey. So, while digital is critical to organisations, we don't want it to be seen as Tech led. It must be business-led and making the right business decisions between what do we do now versus what are we doing later? How does one balance the challenges of running a large organisation as well as trying to drive platform and digital initiatives?*

This concurred with the board sub-committee Chairman's statement when he said:

"And I think it's because digital is part of how they do business when they report back on the business performance. Digital projects are part of the business report and not an IT report".

Both the Chief Executive Officer and Chief Digital Officer were members of the board sub-committee that was responsible for managing the adoption of digital transformation. The new structure allowed new explorative initiatives to be delivered through a Centre of Excellence. Once the digital capability was developed and embedding, deploying were done within each business. Therefore, Zeta continued to monitor the rapidly changing landscape of digital transformation, and management would seek approval from the board sub-committee to appoint a Centre of Excellence as and when a new capability was identified. The Centre of Excellence was a team with digital skills and expertise identified and necessary for deploying digital solutions. Such a centre included partners with the skills required at that time.

The structure that was established in 2016 following the appointment of a board sub-committee, up to 2018, when a digitally savvy Chief Executive Officer and Chief Digital Officer were employed, ensured that the board sub-committee only focused on the governance of digital projects and not on operational matters, as explained by the Chairperson:

"So, after that, for example, it goes through the COMPANY Y structure and to the Group Exco. Only then does the IT Risk board sub-committee get involved. So, the projects that come there are for governance and not for operations."

As part of their decision process, the board considered the resources required for exploration, given commitments for exploitation and the proposed benefits. The board was therefore responsible for prioritising the organisation's commitments.

c. <u>Prioritising</u>

At the time of doing this research, the board would authorise establishing a Centre of Excellence when a new capability was required. This involved allocating resources to the Centre of Excellence. However, the organisation had embedded most of its digital transformation practices across the organisation and prioritisation was largely delegated to the business units. Prioritisation for Zeta was mostly focused on ensuring that the resources were available for both exploitation and exploration. The Chief Digital Officer, who was a member of the board sub-committee, explained the pain of finding such a balance and said:

"The reality is that whatever number of people we have, it means that there's always a conflict for resources, not just between the running change but also between multiple initiatives on either side. So, that's where we drive a lot of the initiatives by allocating business owners to prioritise so that we are not doing IT or digitalisation for the sake of it"

The board approved priorities given the benefits as presented by the business leaders. He went on to explain how the approval process was done:

"And I mean those are ongoing decisions that we want businesspeople to make, yes, informed by insights and experience from very strong technologists. And sometimes we get it right and sometimes we don't".

The comment suggests that prioritisation was a consultative and ongoing process for Zeta. The prioritised initiatives would then be tested through a proof-of-concept.

d. Proof-of-concept

Zeta practised cyclical ambidexterity when the board would release funding for a proof-of-concept for an identified business. Once the proof-of-concept was developed and functional, the board, through the board sub-committee, approved scaling up of the initiative and rolling it out to other businesses. As such, the board approved the roll-out of initiatives that would have been successful in proof-of-concept.

e. Embedding digital

Embedding digital in this thesis can be described as the process of rolling out digital products, services, and related skills from the Centre of Excellence to the rest of the business. This was done to ensure that the digital processes and services were part of daily processes. Once explorative digital initiatives were embedded, it was observed that most of the work, thereafter, was focused on improving the existing products and services that had been released, thus exploitation. However, there were periods when the organisation required new digital capabilities to implement requirements for the future.

Embedding digital was observed in Zeta in its processes from 2017 to 2019, Zeta had embedded digital transformation in the organisation. In such periods, Zeta's board sub-committee would approve the establishment of a temporary Centre of Excellence to build the new capability and deploy the required solutions to relevant businesses.

Although most of Zeta's work was on exploiting digital technologies that the organisation had invested in in the past, it was interrupted by intermittent explorative initiatives to maintain the leading position in the market as evidenced by requests to the sub-committee board for approval to establish Centres of Excellence. Although this process has similarities with cyclical ambidexterity, where the organisation engaged in short periods of exploration, deploying the initiatives for the future and while establishing digital capability, there is a difference in that the cycles of exploration ran in parallel to exploitation. The organisation continued to exploit during the bursts of exploration. Once the explorative initiatives were established, the businesses would continuously improve these solutions using the embedded capabilities, thus exploitation.

As such, when Zeta went into bursts of exploration, typical of cyclical ambidexterity, the organisation did not stop exploiting, synonymous with harmonic ambidexterity. This new type of ambidexterity, which happens simultaneously and cycles as observed in this research, extends Simsek et al. (2009)'s typology of ambidexterity, which observed harmonic and cyclical ambidexterity.

Digital embedding was also seen in Alpha when digital products and services went through the transition from exploration to exploitation. Most products and services in Alpha were seamlessly integrated with their traditional business at the time of data collection. The products and services were rolled out to business units once they were ready for use. In order to obtain high usage, the rollout was associated with extensive training to impart digital skills and knowledge. This process of taking the digital products and services to the rest of the organisation, with training, is what this thesis has introduced as digital embedding.

Both Alpha and Zeta started their digital journey before 2017, with Alpha having introduced its digital platform in the early 2000s and Zeta launching its first digital application in 2011. Digital embedding was well established to the extent that most digital products and services had moved from exploration to exploitation in the business units, thus in use and going through continuous improvement. The chairperson and non-executive director of Zeta, responsible for digital transformation and Information Technology commented:

> *"So, business as usual and new initiatives are actually very much intertwined because a lot of your changes that you want to make is changing what you're currently doing to what you want to be doing".*

The evidence suggests that with digital maturity, digital products and services started as exploration, where the organisation would be experimenting, taking risks to develop products and services using new skills they did not have. When the products and services are ready for use, the rest of the organisation was trained to have these skills for them to use and improve them. This process of rolling out the digital products and services birthed in exploration to the rest of the organisation is digital embedding. Once the products and services, and related

skills are fully embedded, business units start using and improving them, which is synonymous with exploitation. The Chief Digital Officer of Zeta gave examples of such a transition and said:

"So, to give you a practical example, as you know our subsidiary was the first bank to launch an App in the country going back then in 2011 and that is the most advanced platform in the country today. Certainly, that's what the analysis and the reviews tell us. But with all that, the developments happened, they were not done by one team, we have sort of built a platform that allows business units to build their functionality on top of the platform so that we've effectively liberated the business by not having to go to the queues to get onto the app. Because you know, we've allowed the teams within the various business units, once they are certified to be able to add functionality, to be able to build out their own capabilities, you know, without having to go to a central team'.

This journey that is explained by the Chief Digital Officer of Zeta shows that exploration is done at the onset of the development of the digital initiative when the capability is new to the organisation and needs new skills. Once the digital product or service is established and skills are now within the organisation, continuous improvements start becoming part of the business, thus exploitation. This transition is herein referred to as embedding digital transformation in organisational practices. Another example from Zeta was explained by the Chief Digital Officer who said:

"So, it's a combination of where we have a mature capability, leading business units and functions and features onto the platform. And where the platform is not yet mature or needs to be built from scratch by the digital team, honing on that as an enterprise initiative to make sure we build the platform. But the intention is always to get it to a point where we can develop it back to business units and them being able to leverage on it or to build out the experiences across the business dimensions of our business".

Therefore, this thesis introduces digital embedding as a process that happens when digital products and services established through exploration are released for use and become mature, stable and can no longer be distinguished from the traditional business processes.

One of the ways that organisations determined whether a new initiative was exploration or exploitation was through validation of the skills required and whether something similar existed in the organisation. The Chief Digital Officer of Zeta went on to explain:

"So, if something is not yet mature or if it's not yet at scale, to my earlier point, let's put the A-Team, let's put a team together that we believe has our best people to actually make sure we build out something that can be reused across the organisation. So, we use that Centre of Excellence to create new things where we believe we need to reinvent something. And then to the extent that it's a mature capability, coming back again to my earlier point, we then look to see how do we actually democratise it, if you want, by allowing every business in the bank, business unit in the bank to access that platform, to start adding their own features onto it".

In both organisations, some of the digital products and services were in a shared corporate platform, where different teams introduced continuous improvements of the platform, thus exploitation. In parallel, the organisation could appoint new teams to introduce new products and services that were completely new, that used new products and services.

f. <u>Monitoring</u>

Cross-case analysis showed that boards of directors played an active role in monitoring exploration, through the adoption of digital, identifying environmental changes and new trends for the future. Simultaneously, boards kept an eye on exploitation, ensuring business continuity. Such monitoring was evident in five of the six cases, Beta, Delta, Gamma, Theta, and Zeta. In Beta, Delta, Gamma and Zeta, the board had delegated such monitoring to board sub-committees and subsequently report to the main board. On the other hand, the director of Alpha emphasised that the board's focus was on exploring digital transformation for establishing new businesses, and trusted management to continue exploring and deploying other smaller-scale initiatives.

She took time to explain this position and said:

"So, they wouldn't need to come to the board for example and we will introduce an app. They will just come and show us the improvements that they have done. And we can say so and

so and has done this and they will say ooh we have already done that".

This was corroborated by one of the participants from Alpha who said:

"So how do we now make a banking offering part of that ecosystem? And so, the board's decision then was to say, we believe that there is a strong business case for us to launch a digital-only bank. And so, from the ground that bank has been designed to be digital. So, we've got a fully digital on-boarding process".

Consequences of lack of board oversight were observed from the story told by Theta, where management invested in the internet in the 1990s, without board involvement. The whole investment was eroded by the internet dot com crash of 2000, as seen in the figure below. This investment nearly rendered Theta unsustainable, yet the board is accountable for organisational sustainability.

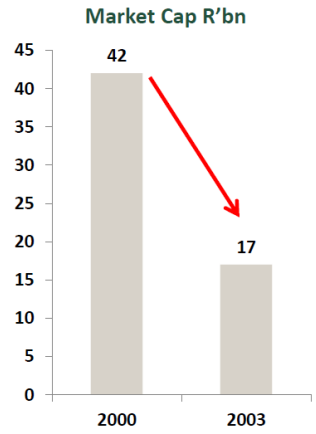


Figure 11: Theta's stock price before and after the dot com crash

From thereon, Theta's board of directors, which was accountable for organisational sustainability, directed most of the digital investments. Similar Beta, Gamma, Delta, and Zeta monitored the performance of prioritised digital initiatives. Evidence from this thesis suggests that boards of directors for these five cases set performance targets for their organisations. Such targets would vary from organisation to organisation. For example, Beta explained how the targets for digital transformation were managed:

"So, they have different KPIs that we actually measure from a digital perspective. I think value is always one of the measures. So, you measure bottom line, cash value related to digital. But there are other also important KPIs that we look at. A very important KPI is your NPI, Net Promoting Index. So basically, it talks about customer experience and employee experience because digital is supposed to enable you to know, so very important. The other big indicator that we measure is capability building. So, if you look at digital, it comes with lots of different types of skills in the organisation" explained the non-executive director of Beta.

The board also monitored the targets that they set for management. Market leadership was one of the visible targets that were monitored, as evidenced in the Board Chairman's annual report. Zeta wanted to remain a market leader according to the Chief Digital Officer who said:

"I mean, you would have heard about us being the most innovative bank going back to 2012, to winning various awards for being the best app, local and Africa awards, the most innovative company".

One of Zeta's limitations with maintaining its market leadership position was the rigid legacy technologies they had. As new banks entered the market, they did not have legacy systems and would immediately introduce digital solutions, thus luring some of Zeta's clients. As such, Zeta continued to explore to maintain its leadership position. The board sub-committee Chairperson articulated this position and said:

"So, the competition in the market was to have the best app. And Zeta has always been at the forefront, I think it's very much known. And if you are in the front, you need to keep running, otherwise people chasing you will catch you. And that's what they've managed to do today. Obviously, everybody catches up at some stage, but then you need to have something new again".

In addition to the market leadership, boards monitored benefit realisation through the Profit Before Tax. Zeta bragged about using a different financial method that allowed the Chief Executive Officer of each business unit to assess benefits realised versus the cost invested in exploration through Profit Before Tax. The Chief Digital Officer said:

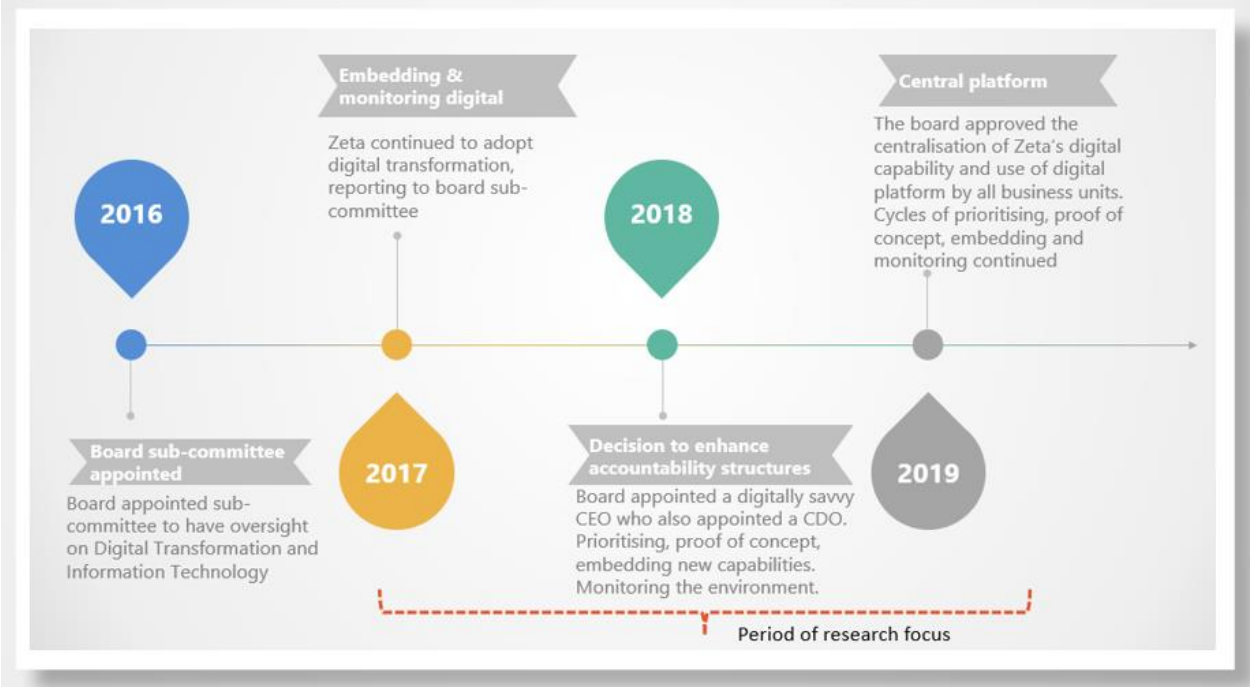
"For us it's, investments in digital transformation are in the tune of two to three billion because we have a quite a strong philosophy around taking most of the digital spend to the income statements. So, the CEOs that are making these digital benefits, they can see the benefit on the income statement. Those that are over-investing, as well as if there are under-investing, given that digitalisation is a key lever in terms of unlocking cost as well as growing revenue".

It was the accountability structure that enhanced the board's visibility on the performance of digital investments in each business unit and ensured management accountability.

Results also showed that Alpha did not have a board sub-committee responsible for digital transformation or Information Technology like other organisations. What was observed from this deviant case was that although Alpha was listed on the Johannesburg Stock Exchange, the founder was the Chief Executive Officer, who led the management team.

In summary, Zeta's temporal progression in adopting digital transformation can be summarised in Figure 13 below:

Figure 12: Temporal progression of digital adoption processes



In the three years, 2017 to 2019, evidence showed that the board of Zeta, together with other organisations, enhanced their accountability structures to get visibility on the adoption of digital

transformation. This enhanced the board's visibility on whether the business was meeting the performance targets for exploration and exploitation initiatives, thus improving their decision-making process. It was evident that Zeta used cyclical ambidexterity because digital transformation was embedded in its processes and was largely in exploitation. Exploration was only triggered when digital initiatives which required completely new skills arose.

It can therefore be concluded that boards of directors set targets and monitored the performance of the investments that were made in digital initiatives. Although the key performance indicators varied from company to company, the targets were meant to ensure that the success of the digital initiatives was managed effectively. It can also be concluded that the board of directors identify opportunities for improving the focus on the adoption of digital transformation through monitoring.

6.3.2 Question 1.2: Simultaneous ambidexterity

Ambidextrous organisations can pursue disparate goals simultaneously or sequentially. This section seeks to understand how boards of directors decide when to explore and exploit simultaneously.

Research Question No.	Research question
1	How do boards of directors pursue organisational ambidexterity?
1.2	How do boards of directors decide when to refine existing products or processes and services using existing capabilities (exploit), and when to perform experimentation or investigate new alternatives and create new solutions creating new capabilities (exploit), simultaneously?

When analysing the cases, five of the six cases under study explored and exploited simultaneously. The cases illustrated that both exploration and exploitation were critical for the sustenance of the organisations. This was because organisations needed to maintain or grow the business for short term sustainability, and still, adopt digital capabilities

for the long-term survival of the business. Evidence from within-case analysis of the five cases suggests that between 2017 to 2019, exploration was largely focused on adopting digital transformation.

Similar to question 1, the rest of this section is structured on how boards of the different organisations executed the following processes, which were observed in most cases, 1) realising 2) deciding 3) prioritising 4) proof-of-concept 5) embedding digital and 6) monitoring the performance thereof.

a. Realising

Digital transformation could not be ignored as it was threatening the current and future sustainability of the cases in this study. In fact, some of the organisations were starting to suffer from the consequences of the late adoption of digital transformation. This was evidenced by the statement from a non-executive director of one of the organisations who said:

> *"They've gotta be part of the game. They can't sit and look at other people eating their lunch because they have modernised their systems",* said the director of Theta.

Theta's clients were moving to recently launched banks, which used digital technologies. Theta was inundated with old technology that was risky and took a long time to replace.

On the other hand, in 2016, Gamma's Risk board sub-committee realised that digital transformation caused a survival risk for its core business. The organisation immediately decided to appoint a Chief Executive Officer who had been leading a digital organisation.

> *" I am sure Golf told you that his sole mandate from the board when he was appointed in 2016 was to transform this company leveraging on digital technologies",* said an executive director at Gamma.

Although it was not clear during interviews what drove this realisation at the board sub-committee in 2016, the period and context suggest that it was similar to other cases, where digital awareness increased following the Davos conference held in the same year, and the

commitment by the Vice President of South Africa to use digital transformation to drive the economy.

The table below summarises when the organisations realised the need to introduce or change the digital adoption model and the decisions taken thereof.

Table 11: Summary of realisation and decisions taken

No.	Organisation	Driver for realisation	Evidence	Decision taken
1	Theta	Customers migrating to other banks	*"They've gotta be part of the game. They can't sit and look at other people eating their lunch because they have modernised their systems"*, said a non-executive director of Theta.	Appointed digital owners and related accountabilities Decision to implement a digital transformation program was made in 2016 focused on replacing old systems In 2018, a decision was made to add another digital transformation program focused on fast release of digital products and services
2	Gamma	Ignoring digital transformation paused an existential risk for Gamma	*" I am sure Golf told you that his sole mandate when he was appointed in 2016 was to transform this company leveraging on digital technologies", said an executive director at Gamma.*	Appointed a Chief Executive Officer with experience of adopting digital technologies Decided to introduce a new revenue stream based on digital
3	Delta	Change in customer behaviour	*"If you are going to buy a big asset like a car, you are going to use technology to do the research, to compare pricing and get a graphic view of the car. However, you still need brick and mortar human touches to finish your decision"*	Decided to change the role of Chief Information Officer to Chief Digital Officer to focus on digital adoption Introduced a Digital Governance Committee Board decides on risk appetite for digital technologies
4	Alpha	Re-action to proposed strategy Pre-defined innovation cycles	*"The board is reactive to what management puts on the table. So as the Board, we provide oversight, we monitor on a quarterly basis and see how far we have come with this initiative and that initiative"* explained Alpha's non-executive board member. *"So, we've invested quite heavily in digital channels. So, in our mobile app development, our website development and the development of products such as Sub-division ID which has called for doctors, and our assets for our broker environments. So, we've, for many years, I've been investing in these. And these are Board priorities. So, they they're looking at what is our innovation cycles. So, it's a very important component".* Chief Digital Officer	In 2017, the board approved management's recommendation to appoint a Chief Digital Officer Board decides to re-invest revenue from other businesses to investment in a new digital business Board approves priorities that are committed at annual launch cycles The board monitors delivery of digital priorities
5	Beta	Davos conference of 2016	*"When the CEO came back from Davos, he asked me to define the relevance of digital in Beta"*, explained the Chief Digital officer, who was transitioned from Strategy to CDO after decisions were made. According to the non-executive director interviewed, the board sought to use digital technologies to respond to market pressures and to solve business problems like carbon emissions	Appointed Chief Digital Officer in 2018 The board approved the scope and focus of digital, solving problems in their current business Board approved metrics that will be monitored, Net Promoter Index, Return on Capital and benefits versus cost

b. Deciding

As the different boards of directors made decisions to explore digital transformation, this was done simultaneously with decisions for exploitation. Cross-case analysis shows that the decisions of most boards were informed by looming competition, customer demands, the need to manage the risk presented by digital technologies and to leverage the opportunities presented by these technologies to grow their businesses. It was evident in the data that the organisations operated in an ecosystem where customers were accessing digital products and services on global platforms. For other organisations, the decision for digital adoption began after the Davos conference and the commitment from South Africa's Vice President that the country will use digital technologies for economic growth.

For example, in 2016, Theta's board approved a management recommendation to invest in an

explorative programme that sought to digitise the bank's old technologies. The board mandated an existing IT board sub-committee to have oversight of the digital transformation programme, which became the centre of exploration in the organisation. The same sub-committee had oversight of the maintenance of the legacy systems for regulatory reporting and sustaining existing business. Theta's digital transformation programme was established in response to competition, to meet demands from existing customers and sustain the future of the bank.

One of the key decisions observed in the cases under study was the appointment of a digital owner at the executive level. This was observed in all the cases. For example, in Theta, the board appointed a Chief Operations Officer, an executive director, and mandated him with oversight of digital transformation and organisational strategy. The Chief Operations Officer assigned the execution role to the Chief Information Officer. As such, where other organisations appointed a Chief Digital Officer, Theta assigned the responsibility to the Chief Information Officer and made him a member of the IT board sub-committee.

On the other hand, the digital owner in Gamma was the newly appointed Chief Executive Officer. The Managing director explained the Chief Executive Officer's appointment and said:

> *"So, my understanding is that the reason why Gamma's board hired Golf was to enable the digital business. Because Golf was coming from Company E which is a digital business.*
>
> *He was hired to transform the business into digital. So, Board sat in 2016 and then hired him to come and succeed the previous CEO and enable the digital business. Then over that period, he got together with the management team, formalised the strategy and put in place the initial steps for that".*

The CEO's role, as mandated by the board, was to create a revenue stream from digital transformation while managing the risk it caused in the organisation's business model. There was an existential threat to Gamma's documents and records management business. In Alpha, the organisation appointed a Chief Digital Officer in 2017, who reported to the Chief Information Officer. At Delta, the Chief Information Officer, who was appointed in 2017, was converted to Chief Digital Officer in 2019. She explained this transition and said:

"The appointment is on a new position, but the name can be confusing. So, what I do is I run both the traditional IT and Digital. So, I run the two IT roles. I've got CTOs that are working with business units that report to me".

It was evident from these cases that although there was a realisation of the need to appoint a digital owner, the boards' decisions on whom the owner was varied across the cases under study.

The appointment of the digital owner did not stop the need for the organisations to exploit. In fact, exploitation was the revenue stream that funded exploration. For example, concomitant to the appointment of the digital owner, Theta was expected to meet its existing business obligations. This was done by maintaining existing processes, making exploitative improvements to align with what Theta lamented as "*ever-changing regulatory requirements*". This can also be confirmed in Theta's annual report of 2018, which highlighted both exploration, which was driven by digital programmes, and exploitation as follows:

- **Strategic**
  - Retail main-banked clients up 7% & market share up to 13.1%
  - Retail NPS score increased 11% – the largest among all SA banks
  - 30 primary transactional client wins in CIB
  - Good progress on delivery of Digital project Slow and Digital Project fast
  - Ongoing delivery of regulatory change programme
  - Level 1 BBBEE contributor

The board therefore could not choose exploration in place of exploitation or vice versa. To this effect, IT board member said:

"*There are two things that live in that wheel, there is the regulatory reporting. And then the current value is coming from the current business. What we are building is the future value and not the current value"*.

Analysis showed that in five of the cases, Alpha, Beta, Delta, Gamma and Theta, organisations could therefore not execute this need sequentially due to the pressure to comply and pressure to meet digital demands and fulfil regulatory requirements to keep the business licence.

Similarly, Beta was under regulatory pressure to comply with carbon emissions, a task on which they made exploitative improvements. The board decided that they would address the compliance requirement through an explorative investment in digital technologies. At the time of this research, Beta had prioritised this explorative investment but was going through financial constraints. On the contrary, Gamma's records management business was enabled by regulations, which kept changing in favour of the organisation. South Africa's Protection of Personal Information Act, which was enacted in 2019, mandated organisations keep personal information for different periods. Therefore, Gamma had to grow its business capability for its customers to retain documents and records for longer periods. However, such retention could be achieved using explorative digital platforms, which if Gamma ignored these, would cause an existential risk. As such, the boards of Theta, Gamma and Beta were aware that the businesses were exposed to digital transformation and failure to make decisions could mean that they would lose their competitive advantage or risk extinction.

On the other hand, five cases illustrated that meeting customer expectations was a major force that moved them to explore through the adoption of digital transformation. Theta's executive director reflected on this and said:

> *"And the reason for that is that Digital transformation is largely exogenous to our economy. It is driven by global innovation. So, the clients that we are serving are procuring from the likes of Apple, Amazon, and domestically from Takealot. And then they are assessing you against their global experience, "I go to Amazon to buy this and Amazon, tells me, other people that bought this, also bought this" so this will raise the interest of other products. You go to Netflix and watch a movie, and it will suggest other movies that may be of interest to you"*.

Such evidence suggests that the demand for digital products and services by Theta's customers was such that if the board had not approved the digital programmes in 2016 and 2018, the organisation's operations would have been at risk in 2020 during the COVID-19

pandemic when businesses were forced to operate remotely.

In conclusion, the evidence presented showed that as part of their processes, boards of directors made decisions on the adoption of digital transformation. Some of the critical decisions included appointing a board sub-committee to own the adoption of digital transformation, the appointment of a digital owner, who was largely the Chief Digital Owner. The organisations also pursued exploration and exploitation simultaneously to have revenue funding future needs of the customer and to mitigate risk caused by competition.

c. Prioritising

Evidence from analysis of the cases showed that as boards of directors reviewed proposed priorities from management, they had to consider both exploration and exploitation initiatives. Analysis of Theta and Zeta showed that failure to explore and exploit would have meant that the organisation failed to exploit and meet its regulatory obligations or did not explore, thus not respond to customers. Both stances caused existential risks. Theta then identified digital priorities, which would run simultaneously to exploitative initiatives.

Similarly, Gamma's board of directors prioritised new digital revenue streams, and improvements on existing records management processes. Some of the improvements used existing skills and technologies, thus exploitation, while introducing exploration through the use of robotic process automation, which required a completely new skill and new digital technologies.

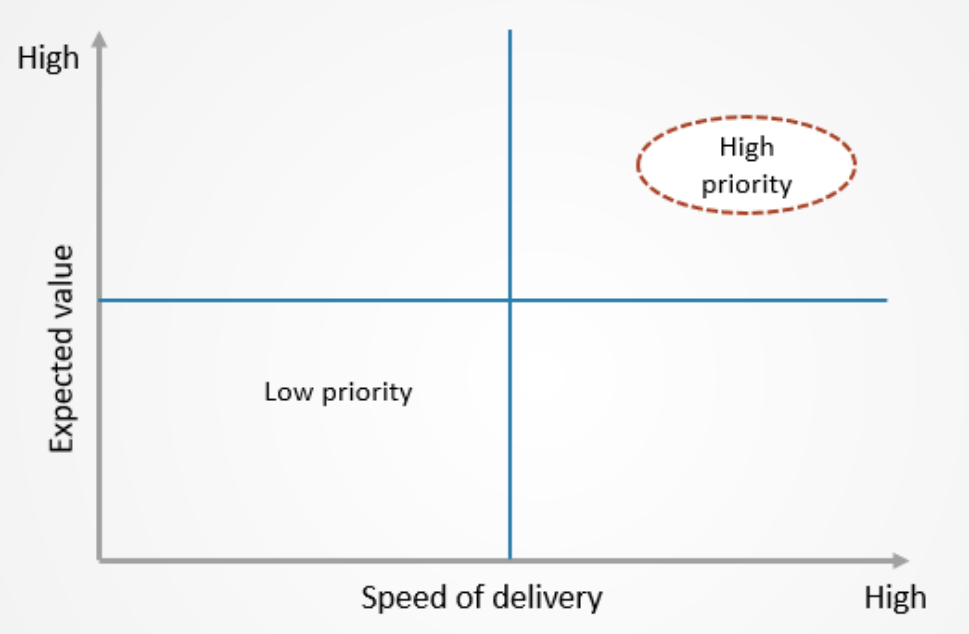
In their prioritisation, the board of Beta considered business sustainability as the organisation was already going through financial pressure. The digital priorities that were approved by the board enabled employee and mining processes. Beta's non-executive director emphasised the need to be selective and said:

"I don't think we are as risky as we would like to be, but also for us, I mean you've seen our financial results recently, but we are also in a space where we need to be quite selective as to where we spend our money. So, I think we do pursue specific activities that are going to give us value".

In view of the financial constraints, Beta's board also considered the proposed cost of digital

versus expected value. The matrix below shows the researcher's consolidated conceptual view of the prioritisation process emerging from the cross-case analysis.

Figure 13: Prioritisation matrix



Once those parameters had been applied, boards then went through other considerations to streamline the list. The Beta's board member articulated this phase and said:

> *"There's also in terms of ROI, so when you look at, let's say you put 10 projects to do, right? You have to prioritise them using different frameworks to see which one is most critical now and prioritise accordingly. And prioritisation is defined by many things.*
>
> *Where the business cycle is at, what the market is doing, what regulation is doing, you know? So, we apply all those lenses and for different projects".*

Likewise, in their prioritisation, Delta ensured that the business continued to operate effectively and the proposals for digital investments were sound. Delta's Chief Digital Officer, who chaired the Digital Governance Committee elaborated:

"The traditional business must be optimised so that you are able to innovate without burdening the end customer at the end of the day".

She went on to explain how Delta considered its priorities:

"So, on the other areas, for example, let's say operational excellence, and let's say we put our RPSs in place and something that used to take us nine days now takes us two days. That's so quick to see the result. So hence it makes sense if you're funding digital from the existing business. But for new business models, you need to make a conscious decision that we are venturing into this area. As such, we now need to make an investment and really know that you are exploring with at least a sound business case".

Therefore, based on the empirical evidence from the cross-case analysis that was presented in this section, although organisational contexts differ, most boards of directors prioritised initiatives based on the value that could be achieved, the speed with which such value is achieved, required investment and business sustainability.

d. <u>Proof-of-concept</u>

Analysis showed that boards of directors invested in the Proof-of-concept process first before approving a full investment in explorative initiatives. Beta's non-executive director explained the board's process and said:

"So, the way you would do it is if you decide you have an idea that you'd like to take forward. So let me take RPA as an idea. You would run what you call a pilot or a POC, to first see that it works. Once you've decided it works, you can then run multiple instances in parallel. But I think you always start with making sure that you prove that it works, and once it works then you can scale, we call it scaling". And you can do multiple programmes as well because it's really dependent on whether you have the capability and the enablers to drive that programme.

The proof-of-concept was also established in Delta, which was explained as below:

"So we do have a delivery model that we've adopted, which gives us the edge that we need. It goes through experimentation. It's into discovery and then we have experimentation and then we have scaled up. So, when we experiment, we tend not to over-invest in the experiment. We just want to see whether the concept is right. So that way it allows us to fail fast", said the chairperson of the Digital Governance Committee.

What was evident was that the board prioritised both exploration and exploitation for simultaneous execution. It considered the value proposition of digital transformation, the speed of delivery and the time to achieve the value. The board also considered initiatives that would ensure continuity and improvements in the current business. Such proofs-of-concept could run simultaneously. It was in view of these competing business demands that the board mandated proof-of-concept for digital initiatives. The full investment would only be approved for successful proof of concept.

Based on the evidence from within-case analysis, five of the organisations, Alpha, Beta, Delta, Gamma and Theta explored and exploited simultaneously due to environmental forces. Digital transformation was embedded in Zeta's processes and as such, the organisation explored and exploited sequentially. Exploitation was driven by the need to maintain the existing business while exploration emerged as a result of digital pressure from the environment. Therefore, the organisations had to use different strategies to balance exploitation and exploration.

e. <u>Digital posturing</u>

One of the prominent themes that emerged was that there was digital posturing. Digital posturing is in this context, a process where the organisation put every effort into misleading, either by impressing or pretending not to be doing much. During cross-case analysis, archival

reports showed different accolades that Alpha, Gamma, Theta, and Zeta had won in their digital adoption journey. However, during interviews, it was observed that Gamma and Theta over-emphasised the accolades while Alpha and Zeta, who had been in the digital space for longer, underplayed the work that they were doing. For example, Theta's Chief Information Officer's emphasis on digital products that were launched recently and digital accolades:

"So, one can manage your local investments as well as your international investments and do banking. It literally is a full suite that does your banking, your investments, your international investments, your shares, your savings accounts, and your rewards. It literally is wealth banking in a box. And I think what makes it superior is that this app internationally came second in terms of private wealth apps".

Conversely, during the interview with the Chief Digital Officer of Zeta, and trying to understand why the bank does not make as much emphasis on its digital products, he said:

"We've always tried to be a bit of an underdog, you know. We would rather focus on getting things done rather than, you know, shouting from the rooftops. And we do perceive some of our competitors because they're playing catch up, you know, they try to make a lot of noise about specific things which arguably we will have already done".

It was evident that Zeta used an underdog advantage, where they pretended not to be doing anything, yet evidence showed that they were in continuous cycles of exploration and exploitation. The statement below shows Zeta's continued focus on delivering digital products and services:

"For example, we will have a cheque account, we will have a foreign exchange offering, we will have a credit card offering, we will have EFT and card related activity and cash related activity that all needs to fall out of the transact pillar. But we don't want clients to experience the EFT functionality different to the card functionality, different to the FX functionality, especially as we start to get to a client-centric platform experience. So, we are increasingly

starting to drive our platform initiatives and our alignment around a pillar to ensure we deliver a unique, consistent client experience for all if you transact through us".

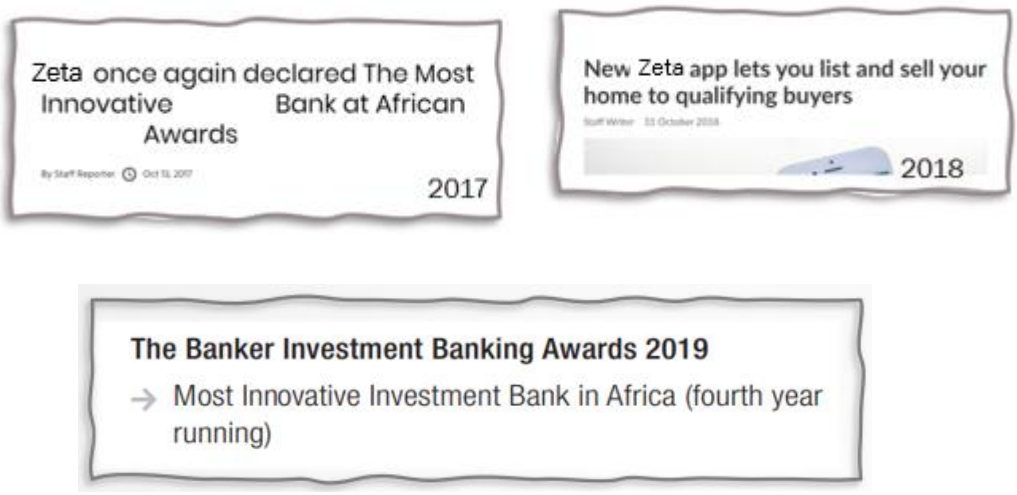
The statement below from Zeta's board-sub-committee chairperson confirms that the organisation was in a continuous cycle of exploring and exploiting to maintain its first-mover advantage:

"And Zeta has always been at the forefront of that curve. I think it's very much known, and if you are in the front, you need to keep running, otherwise, people chasing you will catch you".

Analysis of the four cases showed that while other organisations were making noise about digital products and services, it did not necessarily mean that they were market leaders. On the other end, the silence of cases like Alpha and Zeta, who had digital products that had been long-standing in the market, and continued exploring, did not mean that there were laggards. The researcher referred to this as digital posturing.

What was evident from the data was that the accolades were from different accreditation bodies, and it was not apparent which accreditation carried greater weight. What was clear though was that Zeta had won digital accolades from 2012, much longer than the rest of the organisations. Zeta's digital products and services had been on the market for much longer than Theta, which was the other bank interviewed. Besides the accolades for its applications and awards for the best digital platform, Zeta's annual reports for 2017, page 57, 2018 page 51 and 2019 page 67 show that Zeta won "The most innovative bank in Africa" and "The best digital bank" in the three years under review, yet Zeta kept a low profile as shown in the figure below.

Figure 14: Extracts from Zeta's annual report



Similarly, although they also played the underdog card, Alpha had a mature digital transformation platform and programmes that it extended to its clients, employees and partners. At the time of data collection, Alpha had recently launched a digital bank that was giving competitors a run for their money. Alpha's board member made this comment as she explained how competitors were trying to imitate the digital bank:

"They may copy but still, I think there is still recognition that Alpha is a leader in digital transformation".

Evidently, digital posturing was one of the processes that were observed at the board and management level to either position the organisation as a market leader or to make competitors think that no activity is happening.

6.3.3 Structural Ambidexterity

Ambidexterity literature shows that organisations can explore and exploit using independent or interdependent structures. Analysis of the case studies illuminated similarities and differences in the structures that were used in the six cases. All six organisations were listed on the Johannesburg Stock Exchange and therefore the boards of directors were mandated by the code to monitor disruptive technologies.

Research Question No.	Research question
2	How do boards of directors pursue structural organisational ambidexterity?
2.1	How do boards of directors decide when to refine existing products, processes and services using existing capabilities (exploit), perform experimentation, investigate new alternatives, and create new solutions creating new capabilities (explore) using independent structures?
2.2	How do boards of directors decide when to refine existing products, processes and services using existing capabilities (exploit), perform experimentation, investigate new alternatives, and create new solutions creating new capabilities (explore) using inter-dependent structures?

Table 12: Research question Number 2

a. <u>How the boards decided on the structure to explore and exploit</u>

Analysing the six cases, there are both similarities and differences in how the different boards decided to explore and explore using dependent and independent structures. The most instrumental determinant that the boards used on the structure for exploration was the availability or unavailability thereof of digital skills within the organisation. Using data from the period of the research focus, 2017 to 2019, it was evident that the cases were at different stages of digital adoption and therefore the experience varied across the cases.

For example, evidence from Alpha and Zeta suggests that they were the most experienced, based on the early years that had started adopting digital transformation. Both organisations had embedded digital products, services, and related skills in the business. Nevertheless, the structure at Alpha was different from that used in Zeta. Alpha had a permanent Centre of Excellence that serviced the whole business. This was complemented with other Centres of Excellence that were dispersed in the business. Alpha was in a continuous exploration and exploitation mode.

"So, for instance, in my team, I've got a small team, but it's basically a group function. So, we

primarily provide an advisory role to the business on digital," explained the Alpha's Chief Digital Officer.

He went on to elaborate the structure and said:

"From our team, we have the initiatives that we lead. And other teams have R&D labs and innovation teams and they've got their own focus. We simply support them where it makes sense. So, for instance, in the data science lab, we'll say, the teams that we've got could work together with your teams. So rather than giving them ideas or things like that, we just say, you know, let's collaborate on some of this".

On the contrary, Zeta had embedded its products, services, and skills in the business. The organisation was in a continuous exploitation mode, with short cycles of exploration. Zeta only established a temporary Centre of Excellence when it identified explorative skills that it did not have.

When data collection was performed, the two organisations had long-established digital skills internally and would outsource only when a new skill and capability that did not exist in the business emerged. Evidence suggests that when the digital transformation was introduced, the organisations used independent structures with centres of excellence, which were complemented by service providers to empower internal resources with digital skills. Partnership with financial technology companies (FinTechs) also expedited delivery. In that regard, the non-executive board member of Zeta explained how management would partner with FinTechs and said:

"So they also come to the board with FinTechs. Yes, FinTechs develop a lot of digital. Those guys have the idea but don't have the database, so they come to the bank for the database and roll it out. The bank has an idea but sometimes does not want to carry the risk of development, and sometimes our developments take long, and it's easier to partner with a FinTech for the development" she said.

The board sub-committee chairperson of Zeta echoed the skills shortages and said:

"But the effect is the shortage of skills in South Africa. It's very difficult for all your initiatives in South Africa to get the necessary skills. I mean, what you need is data scientists and they are extremely difficult to come by. A lot of the expertise has emigrated. And people in other

countries know that they're good. So, they just, you know, make them offers they can't refuse".

The partnership with FinTechs empowered Zeta with the required skills to the extent that the later deployments were done internally, without the need for Centres of Excellence embedding digital. On the other hand, at the time of data collection, Alpha continued to have partners in different countries.

"So, to date, sometimes our Alpha group product business outsources some of their work to kind of offshore development teams, but it's still the products that are in our grip. So, we have some, yes, some development partners and in some cases, we do have strategic partnerships. So, for instance, there's a company called Company Q in Australia, which does some data science analytics. They've got some digital platforms that we've used. We've integrated with the digital platform on the Alpha Sub-division side with a company called Digital H", explained Alpha's Chief Digital Officer.

In the rest of the cases, Delta established an internal Centre of Excellence, while Gamma completely outsourced digital adoption processes. Gamma's Chief Executive Officer lamented on this approach and said:

"The only problem is that none of the internal resources can sell these digital products and services".

Theta, on the other hand, used a cocktail of Centre of Excellence with partnering with other service providers; a process referred to in this thesis as digital partnering. The Chief Information Officer estimated the amount of work outsourced to partners and said:

" So, I have been in IT for a long time. The ratio let's say a decade ago, was that you would have about 70%, internal resources, 30%, vendors and third parties. Now in this transformation, we are closer to 60% of external and 40% of internal resources".

Outsourcing 40% was above the traditionally known statistic of a maximum of 30%. This shows that there was no consistency in how each board determined the structure for exploration and exploitation. What was consistent was that one of the determinants on whether digital transformation was adopted using independent or interdependent structures was the availability of digital skills. Organisations used independent models where internal digital skills were limited. In such cases, the boards of directors approved the establishment of Centres of Excellence to deliver digital transformation. On the contrary, when organisations had matured in digital adoption, initiatives were implemented using inter-dependent structures.

The rest of the cases were still in a set-up where they used independent structures as the internal resources still needed to obtain digital skills, which were scarce in most organisations in South Africa at the time of this research. This phenomenon of partnering or outsourcing digital was observed in the six cases and can be represented by the figure below.

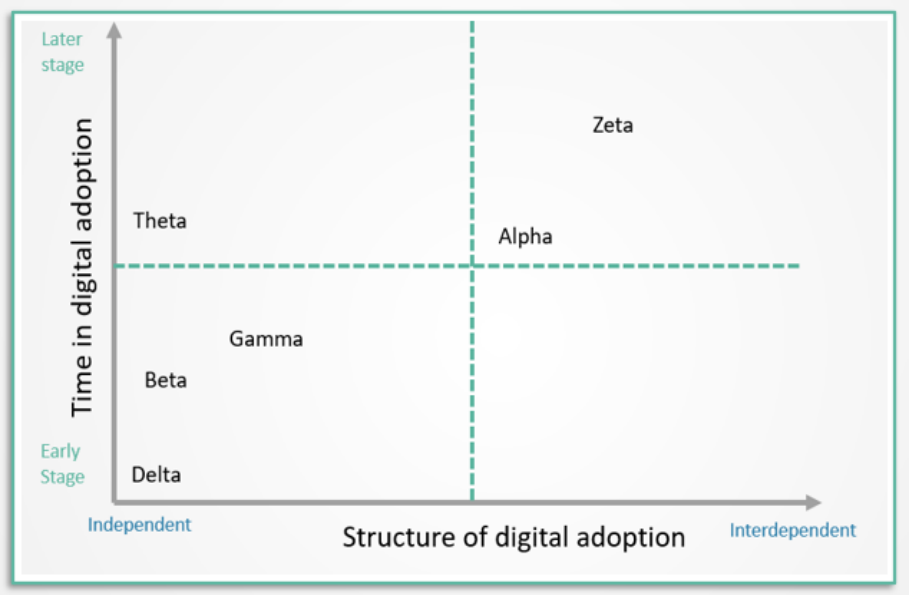


Figure 15: Researcher's synthesis of structures used in digital adoption

The figure above shows that in the early stages of digital adoption, when organisations largely relied on skills from partners and other third parties, boards of directors approved the use of centres of excellence, which included internal resources and digital partners, thus independent structures. As time progressed, and as digital skills were embedded across the business units, models used for partnering evolved as organisations matured in digital adoption. As some organisations matured in digital adoption, they demanded that business units account for their digital delivery. A typical example was narrated by the Chief Digital Officer of Zeta:

"We have identified 20 odd big initiatives that we are tracking across business units. We identified these as initiatives that will bring material change to the face of the business. So we don't leave the accountability to one business unit, but we track them across business units. There will be accountability at a business unit level to achieve it, but it's being tracked and prioritised and funded at a strategic level".

Beta's non-executive director concurred and elaborated on how the board considered partnerships:

"So, in terms of insourcing and outsourcing, it depends on the capability that we're talking about and the level of expertise within the business. Like if you have a wedding, you are not going to bake your own cake, you will hire someone who will do your cake, even if you bake in your own home. Some cakes are hard some are okay. So, you may bake your own birthday cake but you will not bake your own wedding cake. So basically, what we insource and outsource is based on capability, whether we have the skills internally or not, and also capacity. So, you may be able to do your wedding cake but because you are running with so many things, you can decide to outsource it. So, it's a function of capability and capacity".

It can therefore be concluded that where the skills existed and digital was embedded in the organisations, it was easy for the board to approve an inter-dependent structure. However, independent structures were synonymous with cases where there were inadequate skills, and the organisations were in their early stages of adopting digital transformation.

Concomitantly, at the board level, in four of the six cases, board sub-committees were appointed to oversee the adoption of digital transformation. Beta and Delta's board sub-committees were dedicated to digital transformation, thus independent structures were established at the board level in the two cases. The other three board sub-committees, which were mandated with oversight for digital transformation, had other responsibilities and therefore covered this responsibility as part of their routine. This suggests an inter-dependent structure. Alpha's Chief Digital Officer reported to the Chief Information Officer and the organisation did not have a board sub-committee. While it was very clear that boards of directors authorised the use of partners because of inadequate digital skills in the

organisations, the evidence was not consistent on how the organisations made a determinant on whether to use independent or inter-dependent structures at the board or sub-committee level.

Digital Owner

In parallel to the decisions on structures, boards of directors appointed or mandated the appointment of a digital owner. In most cases, it was the Chief Digital Officer, who was responsible for the delivery of digital transformation in the organisations. For example, five of the cases appointed Chief Digital Officers to own and drive digital transformation in their organisations. In four cases, it was the first time for the organisations to introduce the title of Chief Digital Officer.

However, it was observed that the background and the role of the Chief Digital Officer varied across the organisations. In three of the five cases, the Chief Digital Officer was from the business and not from Information Technology, synonymous with the literature that asserts that digital transformation is about the business of the organisation and not just technology. Gamma assigned ownership and delivery of digital strategy to the Chief Executive Officer. In the fifth case, the responsibility of the Chief Digital Officer was assigned to the Chief Technology Officer whose role was converted to carry dual responsibilities. She was responsible for both traditional Information Technology and Digital Transformation. This was similar to the sixth case, where the Chief Information Officer doubled up and led both the traditional Information Technology and Digital Transformation. Even though all six cases assigned digital ownership to an executive, evidence shows that in some of the cases, the owner was not dedicated to digital transformation only, but was also responsible for other duties in the organisation, suggesting interdependent ambidexterity and the board level. An example is the role of Zeta's Chief Digital Officer:

"So, my primary role is running the retail and private banking private bank. So, I'm responsible for all activity from entry-level customers, you know, offering all the way to our private banking offerings. And that's what my primary day job is. In addition to that, I also sit on the Zeta Stratco for the group the Chief Digital Officer at the Zeta Group level. And that is really to drive the strategic influence of how we actually digitise, the Zeta business model across the various franchises".

However, Alpha and Beta had dedicated Chief Digital Officers. In fact, the Beta Chief Digital Officer was responsible for the business' strategy before she was appointed to lead the organisation into the digital era. She explains the background and core focus of the role:

"If you look at the CDO role, why it was created the organisation saw that there were a lot of potential opportunities to improve how we do business using technology. But your approach must be a business-first approach. So what that means is that you want a team that has specific business experience and focus on business problems that they solve, to which you would use technology as an enabler, as opposed to just lumping it into a traditional CIO role which is more of an IT role".

On the other hand, Delta started adopting digital transformation in 2017, according to the annual report, and only appointed a Chief Digital Officer in August 2019. There is minimal evidence of the traction that the organisation made from 2017 to the time of the appointment. Digital ownership is therefore critical as organisations embark on the journey to adopt digital transformation.

Board's typology of ambidexterity

While Simsek et al. (2009) argued that each typology of ambidexterity is synonymous with the type of organisation, evidence from cross-case analysis in the context of digital transformation suggests that typologies of ambidexterity differ according to the maturity of exploration and exploitation in the organisation. An important finding from the analysis is that boards used harmonic ambidexterity. Evidence from five cases, Alpha, Beta, Gamma, Theta, and Delta, showed that the board, its sub-committees, and the executive committee pursued harmonic ambidexterity, while the execution team adopted partitional ambidexterity. Thus, the board and its sub-committees embarked on exploration, in this case, the adoption of digital transformation, which simultaneously exploited the existing products and services and explored digital transformation. Evidence suggests that the board and its sub-committees needed the context of the organisation when they made decisions on digital adoption and

therefore got involved themselves and not a specialist team at the board level. In addition, Beta, Gamma, Theta, and Delta were adopting digital transformation under pressure, where customer expectations, market trends, loss of market share and the organisational risk of survival were key influencers.

On the other hand, Zeta adopted cyclical ambidexterity largely because the adoption of digital transformation was mature and in exploitation. Therefore, whenever a new explorative initiative was identified, that required new skills and capabilities, Zeta would switch into exploration mode until it is embedded, then resume exploitation. From the analysis, the adoption of digital transformation was supposed to address existing business problems and risks that were identified, and also leverage opportunities created by digital for organisational sustainability.

Both board and its sub-committees were mandated to direct the organisation on the adoption of digital transformation and in exploiting the existing portfolios as part of the Johannesburg Stock Exchange corporate governance requirements. This was largely observed in Beta, Gamma, Theta, and Zeta, which can be categorised as organisations that had established a rhythm of digital adoption but were not yet fully matured in the practice. For example, the Chief Digital Officer of Beta explained the role of the sub-committee and said:

"Digital is becoming quite an important topic even at a board level right now. So, if you look at Beta, we actually have a sub-committee of our main board, which is a digital board, so it's a digital IM and hedging board. So, it's a sub-committee that mainly looks at digital, in addition to Information Management and Hedging".

A board member from Beta concurred and elaborated on the structure and related processes:

"So, there is a Capital Investment Committee, a board sub-committee that looks at any large-scale capital investment project. Okay. It goes through internal approvals within the business until they get to the Exco and then they move to the Capital Investment Committee. These will then be presented to the main board if it's over a certain amount within certain benefits".

As she continued to reflect, she added:

"And then there's also the digital committee called the IM & Hedging Committee, which was also a board sub-committee, where there is an overall discussion about the impact of technology, how it can be used to address problems and where we can use it for growth opportunities. So, there are two board sub-committees from a governance point of view that would have an element of technology from an investment point of view as well as from the digital thinking in itself".

Similarly, Gamma's Risk Management Committee, a board sub-committee, was also responsible for exploration and exploitation, as evidenced by the explanation of the origins of digital transformation below:

"So, the Risk Committee identified Business Continuity as a risk and identified the need to re-look at the business strategy and that drove the conceptualisation of the new strategy. Let's discuss in more detail how this strategy is being operationalised especially from a digital perspective" explained one of the executive directors.

What was evident was that the board and its sub-committees did not require digital transformation skills for them to decide for the organisation to adopt digital. In fact, specialist skills only started with the operationalisation of the decision. For example:

"Although Gamma had strategies all along, digital business so to speak but there was a re-focus in terms of shaping to say we are now going into this as a business. So, my understanding is that the reason for the Risk Committee of Gamma hiring Golf was to enable the digital business. Because Golf was coming from Company E which is a digital business", the executive director went on to explain.

As such, it was evident from the data that skills required at the Board level were largely focused on ensuring that digital capabilities were established, providing adequate resources, and

ensuring organisational sustainability while balancing both exploration and exploitation. The board complimented its skills and knowledge by including digital owners in the board sub-committee. On the contrary, execution teams used partitional ambidexterity as specialist skills were required at execution levels. The execution skills were complemented by partnerships, which included FinTechs.

This was the rule, except at Alpha which did not have a board sub-committee assigned with oversight on the adoption of digital transformation. The main board of Alpha was responsible for both exploration and exploitation. In her explanation, the board member of Alpha emphasised that the board had completely delegated digital to management. The board only directed digital initiatives to establish new businesses, like the digital bank.

This study found that board and management layers were adept with reviewing, approving, and refining the existing portfolio while pioneering new products and services using new skills. The four cases showed that the boards had board sub-committees and management committees that were delegated to manage digital transformation simultaneously with their normal exploitive duties. While Alpha, Gamma, Theta, and Zeta appointed the Executive Committee responsible for management oversight of the adoption of digital transformation, Beta appointed its Strategy Committee and Delta appointed a Digital Transformation Committee, as shown in the table below. Both committees at Beta and Delta were chaired by the Chief Digital Officer and reported to the Executive Committee and the board sub-committee. The table below captures a high-level view of the digital transformation governing committees and execution teams and the output from each organisation. Each of the board sub-committees was responsible for processes that led up to the boards of directors as they explored and exploited.

Table 13: Summary of digital governance structures

No.	Company	Board sub-committee	Management Committee	Digital delivery team	Digital Products & Services
1	Alpha	None Exco and CDO reported directly to Board	Executive committee	• Outsourced • Partnered with companies with desired digital skills • Central Center of Excellence • R&D teams in business units	Portfolio of products and services, some of which won international awards
2	Beta	Capital Investments committee	Strategy Committee	Central Center of Excellence	2% Return on Invested Capital Increased Net Promoter Index
3	Delta	None	Digital transformation committee	No specialized team for digital. This was done by the normal IT department	Two digital products launched
4	Gamma	Risk Committee	Executive Committee	Outsourced digital to company with required skills	Digital products and services contributed 25% of revenue
5	Theta	IT Committee	Executive Committee	Partnered with FinTechs Partnered with international companies with desired skills	Portfolio of products and services, some of which won international awards
6	Zeta	IT & Risk Committee	Executive Committee	Center of Excellence was erected as and when required Business teams exploited on embedded digital products	Portfolio of products and services, some of which won international awards

All six cases under study, Alpha, Beta, Delta, Gamma, Theta, and Zeta, had a digital Centre of Excellence below the Executive Committee as shown in the table above. The Centre of Excellence was responsible for several digital processes, including data migration to digital platforms. However, unlike other organisations where this responsibility was carried at board sub-committee level, in Delta this was done at a Management Committee level as shown on the table. Within case analysis showed that management and board layers explored and exploited using independent structures, in cases where a board sub-committee was assigned with oversight of exploration and exploitation within the same committee. These would report to the main board. Theta's Digital Project Slow and FastDigital teams may not have been called Centres of Excellence but they served a similar purpose.

Contrary to the other five cases, the board of Delta mandated a dedicated digital transformation executive committee, which was constituted by executives from the organisation's business lines. The Digital Transformation Committee was not a board sub-committee in that it had executive directors and other executives only. The committee also reported to the executive

committee (Exco). In addition, the chair of the digital transformation committee, the Chief Digital Officer, was not a board member and therefore reporting on digital to the board was through Exco. This structure of a team that focuses on exploration at the management level was unique to Delta. Another unique observation of Delta was that it had only two digital products on the market, compared to the rest of the organisations, Alpha, Beta, Gamma, Theta and Zeta which had portfolios of products. In fact, Beta, Gamma, and Theta's performance measurements had a percentage of profit that was attributable to digital products and services.

Based on these findings from within-case analysis, the processes of ambidexterity relating to Simsek et al. (2009) can be represented by the figure below:

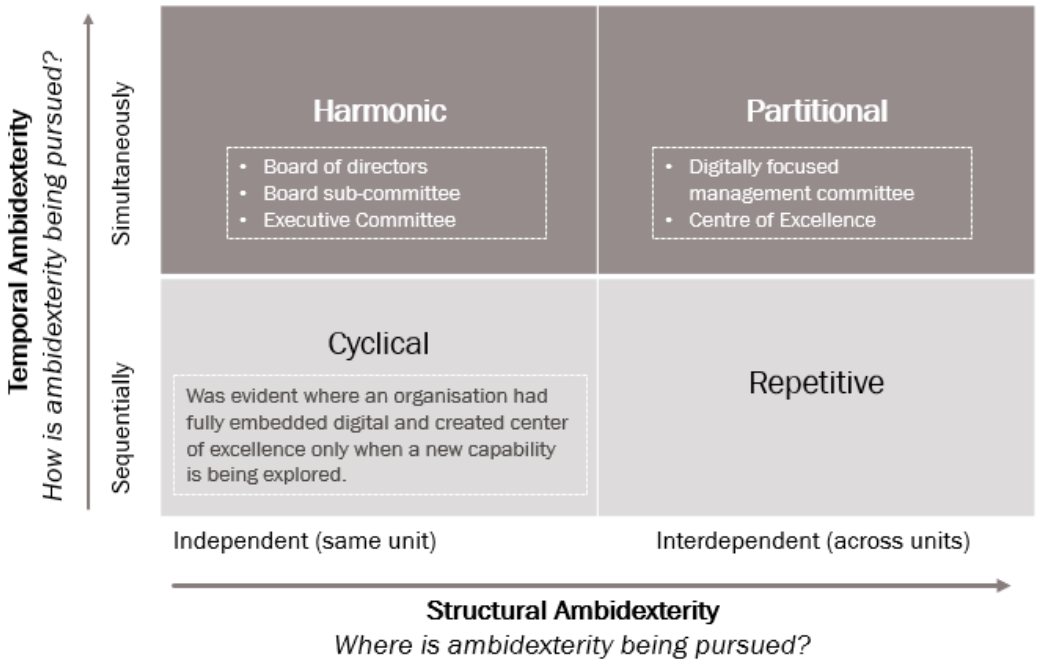


Figure 16: Typology of ambidexterity: Adapted from Simsek et al. (2009)

In conclusion, what was evident was that there was no one type of ambidexterity used in each organisation, as proposed by Simsek et al. (2009). Empirical evidence from the six cases listed on the Johannesburg Stock Exchange showed that each organisation adopted a type of ambidexterity that aligned with its context. Despite these differences, what was also very clear in the evidence was that all the boards in the six cases used harmonic ambidexterity. Analysis

of the evidence showed that boards of directors understood the business problems and directed organisations to explore how digital transformation could address these problems, and also leverage opportunities that were presented by digital transformation. Boards did this to ensure that there was no disconnection between the adoption of digital transformation, which was known for its high costs and risk of failure, with the problems on the ground. Similarly, boards analysed the opportunities presented by digital transformation based on the context of the organisation.

The main boards delegated the focused responsibility of directing digital transformation to existing board sub-committees who did this, in addition to their standard duties. Once this focus was assigned, board sub-committees then delegated implementation to management committees for a specialised focus across different business units. In the cases studied, it was evident that boards of directors did not need specialised digital skills, hence could direct the adoption of digital transformation within the same board structure. The board and relevant sub-committees then approved partnerships to empower Centres of Excellence and outsourcing strategies, where deemed necessary, to obtain the specialised digital skills.

While the board, its sub-committees and the executive committee adopted harmonic ambidexterity, the Centre of Excellence explored digital adoption while the rest of the organisation exploited the existing business, thus partitional ambidexterity. This allowed organisations to learn digital skills and continue to run the existing business simultaneously. In addition, executive teams were complemented by a digital owner with the digital skills required for a focused adoption of the digital strategy.

Only one organisation, Zeta, exhibited traits of cyclical ambidexterity. Analysis showed that Zeta had adopted digital transformation and it was no longer considered exploration but exploitation. As digital evolved, when Zeta identified new skills required to enable new digital initiatives, they would change the cycle from exploitation to exploration, establishing Centres of Excellence to bring in the new skills. Based on this evidence this thesis, therefore, posits that organisations can transition from one mode of ambidexterity to another as their context changes. When an organisation is establishing digital skills, the board uses harmonic ambidexterity and the rest of the teams use partitional ambidexterity, with Centres of Excellence establishing digital skills and embedding them across the organisation. Once digital is embedded in the organisation, the board remains in harmonic ambidexterity while implementation teams transition to cyclical ambidexterity.

b. How boards decided when to explore and exploit

When analysing the context in which the boards of directors explored and exploited, the evidence from the cross-case analysis suggests that the boards of directors exploited under two conditions, as part of the standing business strategy for sustainability or under duress to comply with regulatory requirements. In the cross-case analysis of Alpha, Theta and Zeta, directors lamented the ever-changing regulatory requirements as a key trigger for exploitation. Zeta explained triggers for both explorative and exploitative decisions and said:

> *"So, it's no use having new systems if your current business is suffering. And then another big factor in the bank needs the banking system. As they do that, there are regulatory requirements and demands. These are disproportionate in terms of what it should be because you know that the regulations of the regulator and the Reserve Bank and all the structures that they formed now are very demanding on the banking sector. So, your IT spending is totally disproportionate because of our regulatory developments to comply with what the government wants and not what the bank wants"*.

Another key trigger for exploration was to improve processes, particularly using digital technologies. This was observed in Gamma and Alpha. Gamma's CEO gave examples and said:

> *"I mean, there's no need for anyone to be in the warehouse now. Better a robot to manage the movement of boxes, the physical, right?".*

The same sentiment of maintaining current business through exploration and unlocking future value through exploration was echoed by Theta's director when he said:

> *"Two things live in that wheel, there is the regulatory reporting. And then the current value is coming from the current business. What we are building is the future value and not the current value".*

In addition, boards of directors determined when to explore and when to exploit, based on organisational priorities and available funding. Beta, which was facing liquidity challenges, aligns with the board member's comments when she said:

"*But we had to look at what period should we do this in, which plant requires immediate attention, what is the impact in terms of reduction of carbon emissions. That flows into the Ethics and environmental committee. It also flows into the Capital Investment Committee you know, and also the digital committee because of this latest technology that has the cleaner emission. So, in a lot of projects touch different committees from different approaches"*.

It was therefore evident from the analysis that the six cases explored were due to either market pressure coming from customers or competitors, increase revenue by leveraging on digital transformation or operational efficiency, improving operational efficiency or digital posturing.

During data collection, the researcher experienced the results from Beta's digital programme that was aimed at improving customer and employee experiences.

"YET is our digital programme for operations. We use it quite extensively to improve customer experience as well. We've used it to improve the employee experience. We've implemented an in-touch app. Even when you came in, the applications that you use to see the safety videos and stuff. All of those things are part of the drive and a lot more that's been used in operations in mining".

Beta defined its performance metrics, which the board used to monitor as part of its processes. Examples of such metrics which showed improvement in the annual reports were:

"So, they have different KPIs that we actually measure from a digital perspective. I think the value is always one of the measures. So, you measure the bottom line, cash value related to digital. But there are other also important KPIs that we look at. A very important KPI is your NPI, Net Promoting Index. So basically, it talks about customer experience and employee experience because digital is supposed to enable that, you know, so very important"

elaborated the Chief Digital Officer.

Another typical example of pursuing digital to improve customer experience was given by Theta's director who said:

> *And the reason for that is that Digital transformation is largely exogenous to our economy. It is driven by global innovation. So, the clients that we are serving are procuring from the likes of Apple, Amazon, and domestically from Takealot. And then they are assessing you against their global experience, "I go to Amazon to buy this and Amazon, tell me, other people that bought this, also bought this" so this will raise the interest of other products. You go to Netflix and watch a movie, and it will suggest other movies that may be of interest to you. So, they are forever improving their services and sales by showing other ancillary services they can sell to the client. Customers are expecting similar services from us".*

Gamma presented a typical example of an organisation that was pursuing digital transformation for dual objectives, to improve customer experience and also increase revenue.

> *"So, we also we have also been moving gradually into digital, but in the back of our relationship with customers, it hasn't been and non-customer facing. So, our strategy has always been let's monetise experiences that we've had with our customers".*

On the other hand, it was clear during the interview with participants from Alpha that the organisation focused on improving operational efficiency through the use of digital technologies. The Chief Digital Officer explained one scenario:

"Take a look at the frustration that members experienced or that our call centre agents have to kind of do just navigating the systems and size. So, for the existing ones, there is this very conscious drive to see how we can digitise existing processes. For teams, which are inside the business who are doing manual processing, we are looking at ways we can leverage other automation technologies, such as robotic process automation to start, taking the very manual and rules-based steps that they currently perform and seeing if we can automate them so that they can then start focusing on the more value-adding tasks and be more customer-focused. So, they're less back-office activities".

This was corroborated by the director, who applauded Alpha on one of its digital products and

said:

"Bank had to start right. We said no paperwork and what a view. But we started right, and other banks started to copy. I was so angry. For example, Company Y had this thing that you can open and switch your accounts with a selfie. That was three weeks after the board had approved the same for our digital bank".

From the director's reflections, one can conclude that operational efficiency was a key objective not only for existing products but new digital initiatives as well. Evidence from the case study shows that board processes for exploitation were invoked to ensure continued sustainability by complying with regulatory requirements and continuously improving to meet the demands of customers. Concomitantly, meeting customer expectations from digital experiences, improving operational efficiency and increasing revenue were key digital drivers.

6.4 Balancing resources

Exploration and exploitation are known to compete for the organisation's limited resources, and no organisation has unlimited resources. How then do boards of directors balance the organisation's resources?

Research Question No.	Research question
3	How do boards of directors determine the level of resources to allocate for exploitation and exploration when directing in the context of digital transformation?
4	What type of organisational ambidexterity emanate from the board processes as they explore and exploit in the context of digital transformation?

Simultaneous pursuit of exploration and exploitation is known to demand organisational resources. Looking at the codes and categories that emerged from this theme, the main resources that boards of directors needed to balance were financial resources, and human resources.

6.4.1 Balancing financial resources

Analysing the cases studied, it is evident that organisations used different processes to balance financial resources allocated for exploration and exploitation. Some of the cases thought that they had adequate reserves to explore and exploit without many limitations. However, when COVID-19 hit the nation, the relevant boards of directors reviewed their processes, streamlined funding that was available for different initiatives and could no longer fund other explorative programmes. The following sections give a detailed cross-case analysis of how the organisations balanced financial resources between exploration and exploitation.

a. <u>Prioritising initiatives</u>

Evidence from the cross-case analysis showed that in five of the six cases, one of the processes that were used by the board was prioritising the initiatives that required funding. This was evident in most of the cases. The Chief Digital Officer of Beta commented to this effect and said:

"We need to be quite selective as to where we spend our money. So, I think we do pursue specific activities that are going to give us value".

The non-executive board member of Beta, Foxtrot, concurred and said:

"There's also a good business sense in terms of what should we be doing as a business in terms of advancing technology. There's also in terms of ROI, so when you look at let's say you have 10 projects to do, right? You have to prioritise them using different frameworks to see which one is most critical now and prioritise accordingly. And prioritisation is defined by many things.

Foxtrot unpacked the process further:

"So, I think what we do in order to understand where we need to focus on is, we've created a prioritisation matrix. It looks at obviously value, but it also looks at how quickly you will be able to achieve an outcome. So, based on that, we then decide how we dedicate our resources to the organisation to actually drive the specific initiatives".

She went on to give an example of where the process was used when reviewing the investment in a large digital project and said:

"We had to look at affordability. It had to remain within our Capex budget because R25 billion is affordable. So, it had to make the rounds in different board sub-committees in terms of affordability and it had to remain within our own Capex budget because we don't have unlimited resources. And it had to fit the need for the latest technology".

Even an organisation like Theta, which started by pledging abundant resources from previous savings, had to review that position.

"But as we scaled up digitisation, we went from 800 million to 2 billion Rands. So, it was literally, almost a 250% increase in the investment" elaborated the Chief Information Officer.

Evidence showed that Theta's board of directors subsequently reduced the budget for digital transformation and exploitative initiatives downwards by 40% for the organisation's survival in the wake of the COVID-19 pandemic. The rationale that was used by the board was to ensure there were adequate funds reserved for business continuity and disaster recovery, given COVID-19. This was evidence of dynamic decision making. It was not clear though whether the board mandated proof-of-concept before prioritising, or prioritised first then mandated proof-of-concept.

The prioritisation process was discussed in Section 6.2 above. As the board considered balancing the resources, evidence suggests that different organisations considered different aspects which include 1) feasibility of the initiative, 2) return on investment, 3) value that will be derived, 4) required capital outlay, 5) regulatory requirements, 6) what the market was doing, 7) stage of business cycle, 8) speed of delivery. The table below summarises the evidence of when each of the priority considerations was used, as explained by participants.

No.	Priority	Evidence	Source of evidence
1	Results from piloting	Hence that governance framework that allows discovery, experimentation then scale up. So there will be, "Is this worth scaling up"?	Delta Chief Digital Officer
2	Return on investment	There's also in terms of ROI, so when you look at, let's say you put 10 projects to do, right? You have to prioritize them using different frameworks to see which one is most critical now and prioritize accordingly	Beta non-executive director, Foxtrot
3	Value that will be derived	There's also good business sense in terms of, what should we be doing as a business in terms of advancing technology. So its value generated, the actual bottom line cash value, NBI score and upliftment in scales. And often we don't think it's necessarily the size of the investment or the amount we spending. We believe it's the effectiveness of the spending.	Beta non-executive director, Foxtrot Bata Chief Digital Officer Zeta executive director and Chief Digital Officer
4	Required capital outlay versus strategy, budget , or organisational sustainability	*We use a set of benchmarks in terms of What of percentage of revenue should be invested for growth capital or for maintenance capex* *We align that investment to our strategic objectives. So it is an area of expansion. There are investments that we do that support or enhance the traditional business so to say.* *"But in all of this, the biggest restriction is money. So every company has limited resources. No company has unlimited financial resources*	Tango, Gamma executive director Golf, Gamma's CEO & executive director
3	Regulatory requirements	*Some would just threaten to close Factory X down and remember when you close Factory X down you close that town down then there is no business. Environmentalists will want that, to just shut the doors, but you just can't shut the doors. Neither can we just replace the entire plant in a year.* *Then also just to make sure that all the controls are in place, we look at audit findings.* *The regulator will start to issue fines because the regulator requires this information in the traditional form*	Beta non-executive director, Foxtrot Zeta's non-executive director, Papa Theta's executive director
4	What the market is doing/competitor activities	Where the business cycle is at, what the market is doing, what regulation is doing, you know? And I mean that's obviously part of the digitisation process because they've gotta be part of the game. They can't sit and look at other people eating their lunch because they have not mordenised their systems. We look at emerging trends like artificial intelligence, which is sort of new on the horizon for everybody.	Beta non-executive director, Foxtrot Zeta's non-executive director, Papa
5	Stage of business cycle	We don't want to invest in any old plant technology. Any new country we get into and any new plant we are building, we are not going to invest in old plant technology. . I mean if you live in the 20th century, you're not going to buy a car that was made in the 1960s, right?	Beta non-executive director, Foxtrot
6	Speed of delivery	And prioritisation is defined by many things. Where the business cycle is at, what the market is doing, what regulation is doing, you know? So we apply all those lenses and for different projects. We realised that digital needs a bit of speed for delivery. If you don't speed up decisions in digital, you can miss what you want to achieve.	Beta's non-executive director, Foxtrot Chief Digital Officer of Delta

Table 14: Evidence of prioritisation considerations

When the priorities were determined, the board approved thresholds within which management can approve. Approval for funding was taken to the board when it reached a determined threshold.

"Remember you don't employ management and they can't make decisions. A certain threshold is for CEO approval and a certain threshold is for GM approval and it filters up to Board", said Zeta's non-executive director.

It can therefore be concluded that boards of directors used prioritising as one of the key processes to balance finances. Such prioritisation considered both exploitative initiatives. For

example, maintenance and improvement initiatives are driven by regulatory requirements, to explorative requirements, which would first go through feasibility, which is proof-of-concept or experimentation. However, the considerations used during prioritising differed from one organisation to another as evidenced in the above table.

b. <u>Proof-of-concept</u>

Digital is known for its high rate of failure. Proof-of-concept was meant to experiment with the concept and confirm whether it would be feasible when scaled up, thus protect the organisation from paying for a full investment that may fail.

"So, before you move from discovery to experiment, you need to present to the Digital Review Board and the digital review board needs to give a nod of the concept. And you need to tell us how much money it takes to do this experiment", said the Chief Digital Officer of Delta.

In Delta, the organisation measured its success by the number of initiatives that failed and those that succeeded because experimentation was prominent. Lima, the Chief Digital Officer explained the main difference between exploration and exploitation and said:

"The Digital Review Board wears a different hat. It's about risk tolerance and they need to cap the amount of risk they can take, and, in the old traditional IT is about risk aversion because you're also protecting existing revenues on the old IT".

She went on to explain the difference between IT Governance and digital governance.

"Also, with digital you also need the ability to accept failure. So, you know old IT governance frameworks are risk-averse. We are said to manage risk. The other one for digital is more about how much risk can I tolerate".

The scene for Theta is set at the onset by the description of when the organisation adopted digital transformation in the early 2000s and did not involve the board of directors. The investments failed and archival reports showed that the share price plummeted from R42 per share to R17, eroding the organisation's value. In 2016, when Theta decided to put its foot back in digital investments, it involved the board. The non-executive member lamented about the failures and said:

> *"So, we had massive failures in the past and so we are naturally inclined to be much more cautious with technology investments",* said Sierra, Theta's Chief Information Officer, responsible for digital.

The process of proof-of-concept was confirmed by Lima, who explained the process at Delta:

> *"So, before you move from discovery to experiment, you need to present to the Digital Review Board and the digital review board needs to give a nod of the concept. And you need to tell us how much money it takes to do this experiment",* said Lima, Delta's Chief Digital Officer of Delta.

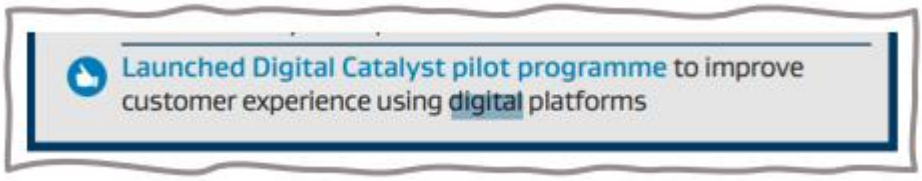
The same proof-of-concept that has been discussed in Section 6.2 of this report was used to confirm the viability of the digital initiatives. Organisations used this process to validate where to allocate funds for exploration based on the success of their initiatives. When describing the process that the board of directors for Delta used when investing in digital technologies, the Chief Digital Officer said:

"It goes through experimentation. It's into discovery and then we have experimentation and then we have scaled up. So, when we experiment, we tend not to over-invest in the experiment. We just want to see whether the concept is right".

The non-executive board member of Beta echoed the same sentiment:

"The first thing is it's important to understand that in digital, a lot of the work that you do is innovative work, where you are trying to implement something new. So, you have to have some level of risk tolerance with regards to saying you're going to go ahead with a minimum viable product without having 100% sound business case".

This was corroborated in the annual report of 2018 in the Board Chairperson's report, where he highlighted:



Therefore, proof-of-concept was used to expose a much smaller financial investment to the risk of failure, and to only commit funds when the concept succeeds. The figure below summarises the process extracted from the cases from discovery until the initiative is fully developed and embedded in the organisation.

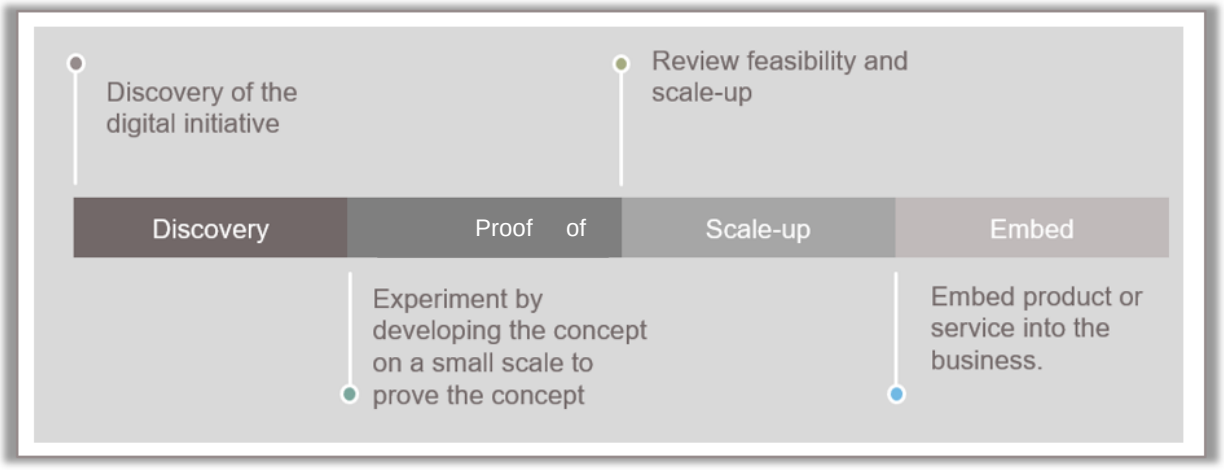


Figure 17: Researcher's conceptualisation of the process

In the same breath, it came to light that the approach that was used for delivering initiatives drove a different culture from implementing traditional IT. Digital adoption accepts and expects failure as part of the delivery process while traditional IT deters it. The Chief Digital Officer of Delta illuminated this difference and said:

> *"Even including the number of failures because even if you cap, although you cap, you need to report on the number of failures because that's part of changing the culture from failure is a bad thing to failure is a good thing".*

She continued to elaborate and said:

> *"That's already a different language for digital and it's completely different from traditional IT, where failure is a bad thing. Failure is also costly in traditional IT. Over-running a project, for example, goes into millions. But digital, we adopted agile methodology, so you are able to change course in the middle of the way, depending on whether you see things differently. It actually allows you to get closer to the delivery and decide which way to go".*

Unlike traditional IT, the use of proof-of-concept in digital implementations, therefore, allowed self-adjustment when the initiative would fail. Proof-of-concept was, therefore, a closely monitored process that would validate whether the initiative was viable, suitable and affordable, before deploying to the rest of the organisation.

In conclusion, one of the determinants of digital funding was a successful proof of concept. The rest of the evidence on proof-of-concept has been presented in the rest of the report. The board approved funding for digital initiatives that will have shown successful proofs-of-concept. These were then be scaled up for implementation.

6.4.2 Balancing human resources

When boards of directors decide to explore and exploit simultaneously, evidence from this research showed that the organisations may not have adequate human resources required to execute the two competing strategies simultaneously. Evidence suggested that there were inadequate digital skills in all six cases from the Johannesburg Stock exchange, Alpha, Beta, Delta, Gamma, Theta and Zeta, to adequately deliver on the digital initiatives. Sentiments from the interviews confirmed the dilemma of balancing human resources which was expressed in

at least four of the six cases.

"So, for the delivery of that initiative, resources must come from the business. But there comes the challenge with innovation. To innovate, you must take the best people to provide new solutions, and yet you still need the best people to run the traditional show" lamented Theta's executive director, Sierra.

Foxtrot echoed the same sentiments and said:

"No company has unlimited financial resources. And on people. No company has an unlimited number of people".

Evidence from Gamma and Delta below confirmed the need for skills.

"Digital is centred around the right people, you've got to have the right people, otherwise, you know, you're not going to write a fantastic software application," said Gamma's executive director.

"And they're probably not as agile to adjust to the business now, because the digital environment changes quite a bit. And I think there's also a lot of trial and error, which if you talk to very rigid people, sometimes it's a bit more difficult to get through" weighed in Kilo, Delta's Chief Technology Officer.

This study identified two main processes that the organisations used as they were adopting digital technology, re-skilling for a digital workforce and partnering to deliver digital products and services. While the use of internal resources continued, working with partners to establish digital skills, there were two key problems that were observed. Firstly, it emerged from Theta

cases during interviews that the board did not have ways of rewarding digital teams. The executive director of Theta lamented on this situation and said:

"So, who is responsible for rewarding them at the end of the year? Because some of these team members must move on, developing new solutions. The question is, who do they work for? Who is responsible for managing them day-to-day? Who is responsible for rewarding them? moaned the executive director.

The second issue was the culture clash that was illuminated during interviews:

So, there is a culture clash, because you have a high-speed team positioned to deliver quickly, but they can only deploy through the traditional team that still has a waterfall mindset. Not only that, the rules, the existing rules, policies, everything, are still in the traditional organisation.

In conclusion, exploration and exploitation teams were different in culture and delivery practices and therefore there is a need for the board to mandate different methods of rewarding exploration and exploitation teams.

a. <u>Re-skilling for a digital workforce</u>

Results from the within-case analysis showed that inadequate digital skills were one of the most frequent codes that were identified during data analysis. The cases found different methods of addressing this gap, which included re-skilling employees and using digital partners. This position is supported by remarks from different participants, which include:

"I would say the main driver was that there is such a critical shortage of digital skills in South Africa. In fact, the shortage is worldwide, but South Africa and Africa, the continent of Africa has got a critical shortage", lamented Yenkel, the Chief Information Officer of Theta.

"Re-skill them for a more competitive South Africa", concurred the executive director of Theta.

"The competency requirements for the new business model are very high. We are having to scale up very quickly. Scale-up in an environment where there are skills shortages. We all chase a small pool of these skills, and we are raising the costs of that skill in the process. Okay. So, we must deal with that", explained Yenkel, Theta's Chief Information Officer.

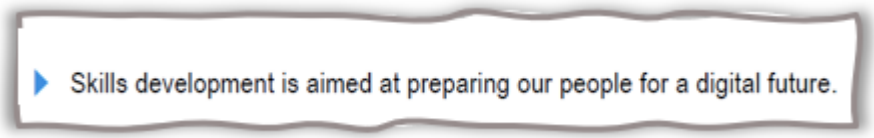
To address the Theta's competency requirements, Yenkel said:

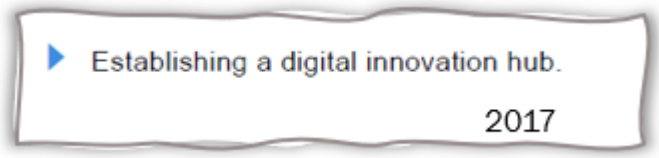
"So, we went to the best people we could find in the world, and we needed more digital engineers".

The non-executive board member of Beta explained the process that informs the organisation to decide in the circumstances of skills shortages:

"So basically, what we insource and outsource is based on capability, whether we have the skills internally or not, and also capacity".

Gamma's Chairman report confirmed that the organisation had committed to the following work to address digital skills shortages:





Re-skilling was done for different target groups. Results showed that Beta, Delta, and Theta

started embarking on digital transformation after attending a World Economic Conference that educated directors and executives on the relevance of digital transformation in the economy. On the other end, Alpha and Zeta, which had already adopted digital transformation reviewed their strategy and introduced a Chief Digital Officer after the World Economic Conference. That can be argued as the first step that organisations took to re-skilling their stakeholders.

The next step was to re-skill the teams that develop digital products and services and the rest of the organisation's employees. When boards approved priorities, and decisions were made on the delivery model, the teams that were involved in the development were trained to empower them with the skills required for the relevant initiatives. This was an iterative process as the initiatives varied across the different organisations. A case in point was Theta, which appointed standalone teams that were knowledgeable to lead the execution of its digital programmes. These teams were skilled in the identified programmes.

"September 2018 Theta collaborated with various digital partners and ran digital learning pilots in key environments. An international learning programme was piloted in Retail and Business Banking and Group Technology", The Board Chairman's report.

Through the digital education programme, Theta won the Best Culture of Learning award in 2018 from a well-recognised global institution as shown below.

In their analysis, Theta attributed the wide adoption of digital products and services to the training provided to different stakeholders. According to Theta's Chief Information Officer, creating skills and digital capabilities for its employees, clients and other stakeholders has unlocked other benefits:

"So, this has allowed us to compete. We are now thinking of what the bank of the future is going to look like, from a physical footprint perspective. In fact, we are busy now with what has been named Project Imagine that will do exactly that. To know what our branch footprint

will look like", he elaborated.

On the other hand, Zeta constituted a team as and when they required new capabilities. Evidence suggested that these teams would be trained at the time of that project as the skills varied from project to project. Once digital products and services were released, the rest of the organisation was re-skilled to be a digital workforce. In its partnership with the digital learning platform, Theta extended the training beyond the core employees to other stakeholders with an objective to skill for a digital South Africa. The organisation had this to say about the re-skilling programme:

"Then you may have another category of people that you are re-skilling, not just for Theta but for South Africa Incorporated, to fuel the economy. Re-skill them for a more competitive South Africa, more agile, more modern. And in the context of COVID-19, given the toll it has placed on this economy, a new economy will emerge out of this experience. What will that look like, and what will my role and my contribution in making this a success", said Theta's Chief Operating Officer and executive board member.

Both Alpha and Theta were very clear about extending their digital training to value-chain partners and clients. On page 36 of the 2017 annual report, the Chief Executive Officer of Alpha remarked and said:

"It's not enough to provide digital channels, you must help people to be confident that they can transact through these channels through handholding".

Based on evidence from empirical data, it was observed that it is critical to identify the stakeholders that should be trained. Failure to do so can limit the success of the digital transformation programme. For example, Gamma, which used an acquisition model for digital adoption, lamented the use of outsourcing skills and said:

"So not only does it affect product development, but it also affects the sales of the organisation. Very few people within the organisation can sell the digital products we produced through outsourcing. And so that is a journey that is still in the process of evolving for us to get to a point that we want to".

Based on the evidence presented, the figure below gives a consolidated view of the stakeholders that the cases re-skilled as they explored and exploited.

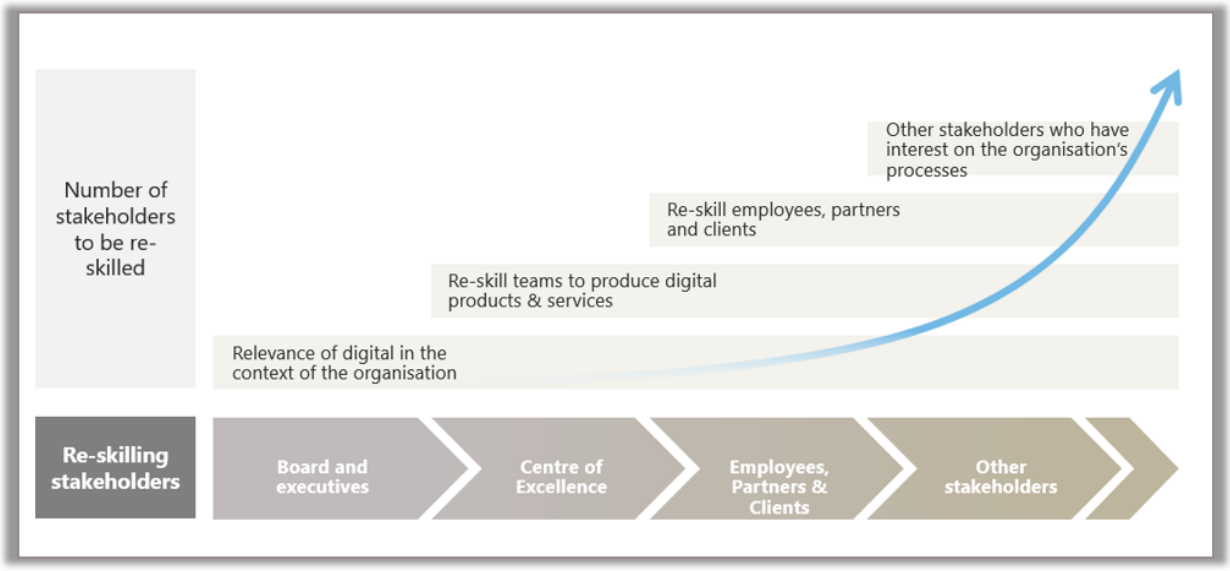


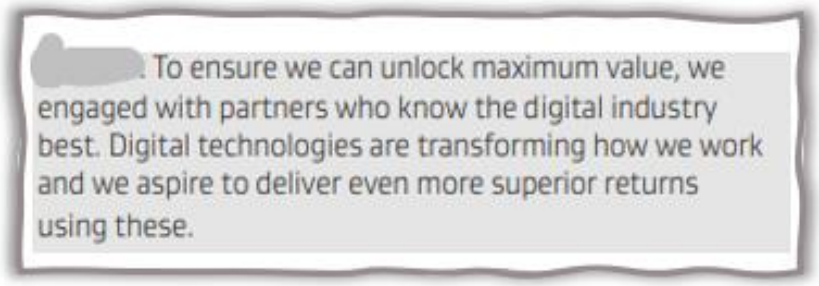
Figure 18: Skilling stakeholders

It was therefore evident that it is important to identify the right stakeholders, which included board members, executives, management, employees, and customers, to re-skill across the entire value chain for a sustainable success of digital transformation. The results from the cross-case analysis show that this is not a once-off exercise but a recurring exercise as digital capabilities may differ.

Another model that was used to deliver digital transformation initiatives was through partnering with digitally competent service providers. The next section discusses partnering for digital, and how boards of directors used this model to deliver the prioritised digital initiatives.

b. Partnering for digital

In trying to bridge the skills gap, boards of directors of the six cases in this thesis approved the use of partnering, outsourcing or mergers and acquisitions in parallel to re-skilling their stakeholders. Besides the shortage of skills, partnering assisted the organisations to deliver the prioritised digital initiatives faster. In the annual report of 2017, Beta's board chairperson announced the organisation's decisions and said:



Like the other five cases, Theta was forced to use outsourcing and partnership models to supplement its skills for speedy delivery. In fact, Theta ended up outsourcing some of its digital work to FinTechs whom they considered competitors. In response to the request to elaborate on how financial technology firms compete with banks, the executive director said:

> *"… they are agile, less handicapped by bureaucratic processes and tend to be driven by entrepreneurs. If they understand that data faster than your traditional organisation, they will out compete you using agile digital technologies. They have a very rapid early growth, and then they struggle to scale up so they can be easily bought by big organisations and go with your knowledge".*

Such partnerships had to be approved by the board because of the strategic risk to which organisations were exposed. The non-executive director of Zeta aired the following on partnerships:

> *"Another area highlighted by Risk is partnerships. So, they also come to the board with FinTechs. Yes, Fintechs develop a lot of digital. Those guys have the idea but don't have the database, so they come to the bank for the database and roll it out. The bank has an*

idea but sometimes does not want to carry the risk of development, and sometimes our developments take long, and it's easier to partner with a FinTech for the development".

While partnering presented a quick and fast model of adopting digital transformation, it created unintended consequences in some of the cases. Theta ended up outsourcing 60% of its digital environment to FinTechs, whom they considered a risk. In the same vein, Gamma realised that their internal resources could not sell the digital products and services that had been developed by their partners, the internal resources did not understand the products. This showed an obvious lack of embedding digital skills and practices in the organisation.

One can then conclude that boards of directors approved for the organisations to invest in re-skilling internal resources and partnering for expedient delivery of digital transformation are board processes that the cases used to balance human resources for simultaneous exploration and exploitation. Partnering allowed a balance of human resources for exploitation and exploration to varying degrees within each case.

6.5 Summary of processes used by boards of directors

The chapter aimed at conducting cross-case analysis and identifying patterns matching across the examined cases. Based on analysis of the sixteen participants and archival information, it was evident that the six cases were at different stages of adopting digital transformation. Although the cases were at different stages, and from different industries, it was apparent that five of the boards followed similar processes. The processes can be summarised as realising, prioritising, proof-of-concept, resourcing, up-scaling and embedding of the digital products and services in organisational processes.

The figure below synthesises the key processes that were identified during cross-case analysis. What distinguished the processes from one board to another was mainly the years of experience that the organisation had with digital deployments and the extent to which the board of directors delegated their duties on digital disruption to other committees.

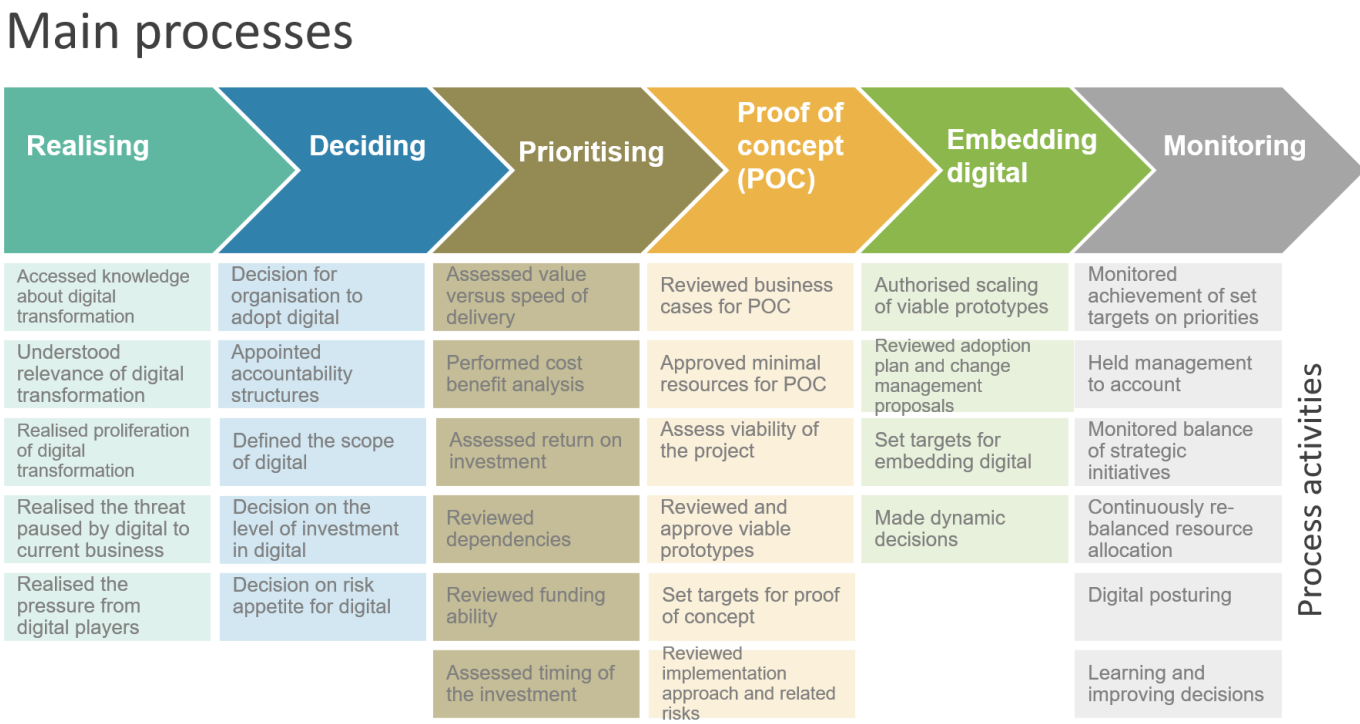


Figure 19: Key processes and related activities used by boards of directors

The processes and related activities that were identified created the context of digital transformation in which boards of directors made decisions to explore and exploit. Therefore, in answering the research questions, this thesis continuously refers to the above processes and related activities to substantiate the decisions made as boards explored and exploited. The context was focused on the research period, 2017 to 2019, except for cases where background from prior years informed the decisions made in the period of research focus.

Thereafter, the board monitored the use of the initiatives, which then transitioned to exploitation. These results are key to providing answers to the research question, “How boards of directors explore and exploit in the context of digital transformation”.

The next chapter discusses the research findings, marrying them to extant literature and identifying the implications for scholarship.

CHAPTER 7: DISCUSSION OF RESEARCH FINDINGS

7.1 Introduction

Chapter 6 is a cross-case analysis that describes patterns based on the details from the within-case analysis. The analysis was based on observations, archival data, and narrations from structured interviews with the sixteen participants drawn from the six cases under study. The focus was to investigate how boards of directors explore and exploit in the context of digital transformation. The presentation in the chapter was based on the premise that data describes empirical patterns that were observed (Sutton & Staw, 1995). However, data by itself is not theory (Weick, 1995).

This chapter focuses on the discussion of findings and discusses the research findings related to the extant literature. While the previous chapter presented the transition of the data from codes and categories to themes and findings, this discussion chapter presents the next level, transitioning to abstract concepts to build theory. The theory comes last as it summarises the relations seen in the data (Weick, 1995). Therefore, the primary focus of this chapter is to extend existing concepts and develop theory through the process of abduction. The chapter is structured according to answers to the research questions to maintain the flow of the thesis.

Although there has been a significant focus on research on organisational ambidexterity from March (1991)'s seminal paper, literature is silent on how leaders, particularly boards of directors, achieve this (Carter, 2015; Warner & Wäger, 2019). Despite the critical role attributed to leaders in managing ambidexterity (Kang, 2014), literature has paid limited attention to the board (Oehmichen, Heyden, Georgakakis, & Volberda, 2017). There is a dearth of literature on how boards of directors achieve this role (Oehmichen, Heyden, Georgakakis, & Volberda, 2017).

This is except for three published studies on boards of directors and ambidexterity at the time of this research. The first investigation on boards and ambidexterity was presented by Oehmichen et al. (2017), who examined the boards of directors' knowledge heterogeneity and organisational ambidexterity. They concluded that the board's knowledge heterogeneity benefits outweigh costs beyond a particular threshold. Thus, bringing boards and their characteristics in ambidexterity is essential. Further research was recommended on external pressures that could influence decisions made by strategic leaders that may lead to over-

explore or over-exploit (Oehmichen, Heyden, Georgakakis, & Volberda, 2017). Unlike Oehmichen et al. (2017)'s research which investigated the board's knowledge heterogeneity, this study used the context of digital transformation, which is an external factor that informed the processes used by boards of directors. Scholars also called for a multi-level analysis because organisational ambidexterity is a nested construct spanning different levels in an organisation (Taródy, 2016), which is covered in this study.

The second research on boards of directors and ambidexterity was done by Kang (2014), who argued that the number of outside directors and their average tenure, when combined with the adoption of franchising, improves performance in an ambidextrous organisation. The last paper analysed the contribution of the board of directors' roles in ambidextrous innovation (Rejeb et al., 2019). The question, "*How do boards of directors explore and exploit?"* remains unanswered and cannot be ignored, especially now that organisations are operating in a digital environment that demands ambidexterity.

7.2 Background

Important highlights from the literature review are that research on organisational ambidexterity is still in its infancy. Following March (1991)'s seminal paper, research in the early 2000s focused on defining ambidexterity in different fields (Gibson & Birkinshaw, 2004; O'Reilly, & Tushman, 2004; O'Reilly & Tushman, 2013). Ambidexterity literature has since transitioned to showing the impact of ambidexterity on firm performance (Junni et al., 2013; Lubatkin et al., 2006; Schnellbächer & Heidenreich, 2020) and how individuals (Bonesso et al., 2014; Mom et al., 2009; Papachroni & Heracleous, 2020) and managers achieve ambidexterity. In the same vein, literature acknowledged the importance of leadership in achieving organisational ambidexterity. However, the focus has been on how this is achieved at an individual and management level (Luo et al., 2018; Oehmichen, Heyden, Georgakakis, & Volberda, 2017; Zimmermann, Raisch, & Birkinshaw, 2015b).

This thesis is based on a multiple case study that was used to observe standard organisational practices. The research used data from sixteen board members and executives who represented six purposively sampled cases (Eisenhardt, 1989; Creswell, 2013, p.56). The other data was from archival reports, including annual reports from 2017 to 2019, which was the period of research focus.

The researcher performed detailed planning and preliminary analysis of available data before

the interviews to ensure adequate corroboration and avoided going to-and-from the participants. Data analysis started with content analysis of 18 annual reports for the six companies, from 2017 to 2019, and other archival reports. The content analysis considered sources of such data and its trustworthiness (Elo et al., 2014). Although annual reports are highly regulated reports (Laskin, 2018), this thesis took cognisance of selectivity and bias that is associated with annual reports and the information obtained from the reports was corroborated through other data sources to address any impression management (Leung et al., 2015; Stanton & Stanton, 2002).

At least two participants from each of the six cases were interviewed for corroboration and to address any faulty memory and self-serving statements associated with interviewing elites (Natow, 2020). Though dated, Morse's argument of 2002 is still valid; select participants that are best placed to answer the research questions, which is the approach used in this study. Before the interviews, extensive background research was done and the information from various sources was used for corroboration and triangulation (Natow, 2020). Extant literature has lamented the difficulties of accessing board members and executives (Leblanc & Schwartz, 2007; Mikecz, 2012). Given this position, this study structured the operationalisation of the interviews in a way that minimised the challenges (Ma et al., 2021). Interviews were both face-to-face and remote due to contact limitations from COVID-19 induced lockdowns and safety measures. There were negligible differences experienced in the data collected using face-to-face and remote interviews.

The following section summarises the findings of the processes used by boards of directors to pursue organisational ambidexterity in the context of digital transformation. The findings may be influenced by the empirical context, organisations from different industries that are listed on the Johannesburg Stock Exchange. Literature on digital transformation posits that the impact of change varies across industries (Bharadwaj et al., 2013). Future research could investigate organisations in the same industry or public organisations operating under a different code of corporate governance.

7.3 Discussion of research findings

To answer the main research question, "*How do boards of directors explore and exploit in the context of digital transformation?"* the thesis presents four research questions as structured in the table below. The empirical findings are summarised alongside each of the questions in the

Table below.

Question No.	Research Question
How do boards of directors pursue organisational ambidexterity	
1	How do boards of directors pursue temporal ambidexterity in a digital environment?
2	How do boards of directors pursue structural ambidexterity in a digital environment?
3	How do boards of directors determine the level of resources to allocate for exploration and exploitation when operating in the context of digital transformation?
4	What types of ambidexterity emanate from the board's processes as they pursue ambidexterity in the context of digital transformation?

Table 15: Research questions

7.3.1 Processes of boards of directors

The first research finding is that the board gives direction to exploration, exploitation, and subsequent adoption of digital transformation. However, the rest of their processes are entangled with the rest of the organisational processes. Unlike in Information Technology, where the board is known to take a back seat, in the context of digital transformation, the board gives direction to the adoption of digital transformation as digital is the business.

The board of directors is involved in digital strategy. The level of involvement varies with the impact of the digital initiatives. Theta showed that the organisation started involving the board of directors in digital transformation based on lessons learned from previous experience, where decisions investments in digital transformation were made by management and led to a significant loss to the tune of over 50% drop in share price. While the board is accountable for organisational performance, in this case, management took the brunt of the decision. Digital transformation has been proven to produce new business models (Weill et al., 2019) and therefore the board of directors must lead the transition of the business model. Literature on boards of directors acknowledges the complexity and dynamics that organisations are facing due to digital transformation (Åberg, Kazemargi & Bankewitz et al., 2017). As such, boards are increasingly involved in strategy (Klarner et al., 2020; Pugliese, Bezemer, Zattoni, Huse, Van Den Bosch, et al., 2009) and significantly impact strategic outcomes. Papachroni and Heracleou (2020) concur with these assertions. In fact, this was quite evident in the cases under study, where each organisation had the board driving the adoption of digital transformation in one form

or another. Therefore, unlike Information Technology, which is operational and serves as a back office, the adoption of digital transformation is strategic and is led by the board of directors.

7.3.2 The process of balancing exploration and exploitation: Temporal and structural ambidexterity

This section answers the first two research questions on structural and temporal ambidexterity, which are worded as follows:

The first research question is, "*How do boards of directors explore and exploit using temporal ambidexterity?"*

The second research question reads, *"How do boards of directors explore and exploit using structural ambidexterity?"*

The researcher used the typology of ambidexterity to guide research questions because it unifies various conceptualisations of the multifaceted construct, ambidexterity (Simsek et al., 2009). This section details the processes of boards of directors about the typology of organisational ambidexterity as they realised the need to adopt digital transformation.

Strategic change is frequently viewed as emanating from the purposeful choices of organisational actors' intention on achieving a pre-specified goal against a backdrop of existing environmental forces (Mackay & Chia, 2013). In summary, this research has shown that organisations act in unison at management and board levels, rallying towards a shared vision and using different typologies at lower levels, depending on the stage of digital adoption that they are in.

Findings reflect that the role of the board differs from one organisation to another. Nevertheless, most boards showed that they play an instrumental role in directing improvements in exiting a business and introducing new products and services requiring new skills, mainly digital transformation. Their determination on when to explore or exploit was informed by market trends, the need for organisational sustainability, and meeting the customers' future needs. The results exhibited characteristics of three different types of ambidexterity, which are described in the sections below. These are harmonic ambidexterity

at the board level, partitional ambidexterity, particularly used by the execution teams, and cyclical ambidexterity, synonymous with the digitally mature organisation. There was a new type of ambidexterity that is different from Simsek et al. (2009)'s typology, which resembled a combination of cyclical and partitional ambidexterity.

a. Harmonic ambidexterity

The first key finding from this research is that boards of directors of five of the six cases used harmonic ambidexterity as they directed the adoption of digital transformation. Thus, the boards directed both exploration and exploitation within the same structures at the same time. Harmonic ambidexterity has been considered challenging because exploration and exploitation are competing for scarce resources, which create conflict and inconsistencies at the same time within the same team (Simsek et al., 2009). Harmonic ambidexterity is argued to demand alignment and adaptability within the unit, in this case, the board (Simsek et al., 2009). While boards of directors did not necessarily choose harmonic ambidexterity, the context of their organisations left them with no choice but to consult as a united team and confront the imminent disruption and leverage the opportunities that digital transformation presented.

Concurring with what the Davos World Economic Forum of 2017 illuminated as the changes that digital transformation has brought, some of the cases under study had already lamented their "market share being eaten for lunch by digital banks", "customers working on international digital platforms and demanding similar experiences locally", "risk of organisational sustainability in records management", "addressing regulatory requirements using digital technologies" and "need to create new revenue streams". The same boards were accountable for exploitation, which included regulatory compliance and ensuring continued business sustainability. Although digital transformation is used to reduce costs through performance improvement (Nadkarni & Prügl, 2020), the cost outlay of digital itself was high, accompanied by a high rate of failure to benefit from the initiatives (Hossnofsky & Junge, 2019).

While there is not much illumination to this effect, this study concluded that the decision by boards of directors to explore and exploit simultaneously was to ensure that the adoption of digital transformation was aligned with the organisation's priorities. Such an alignment would harmonise the seemingly contradictory requirements and lead to a consensus at the board level on resource allocation as the members had sight of the competing demands in exploration and exploitation.

The long tradition of research in organisational theory suggests that a consistent balance can

be maintained by building a set of processes that enable the board and its sub-committees to judge allocating resources between the conflicting demands (March, 1991; Zimmermann et al., 2018). The choice available to individuals to decide on alternating exploration and exploitation was not available to the board (Hill & Birkinshaw, 2014); they did both simultaneously.

b. Partitional ambidexterity

Evidence from the cross-case analysis shows that the boards of the six cases made structural changes when they realised the need for digital adoption.

In four of the six cases, board sub-committees appointed a digital owner, the Chief Digital Officer, to drive digital adoption. In those four cases, the Chief Digital officer was a new position that was created at the time of realisation. The other two organisations appointed the Chief Executive Officer and Chief Information Officer as digital owners.

The appointment of Chief Digital Officers was to provide management leadership in digital adoption is consistent with research on digital transformation, which observed the emergence and increase of the Chief Digital Officer role (Firk et al., 2021; Kunisch et al., 2020; A. Singh & Hess, 2017; Tumbas et al., 2018). Although the professional background of the Chief Digital Officers was not uniform across all the cases, its mandate from the board was similar, to provide leadership at the management level on the adoption of digital transformation. The Chief Digital Officer's role was to accelerate and coordinate digital transformation (Firk et al., 2021). They became the central role that responded to the challenges of adopting digital transformation (Firk et al., 2021). Wade et al. (2017) compared the Chief Digital Officer's role to a maestro of a digital orchestra. Also, Maedche (2016) found that the Chief Digital Officer enables the business to drive efficiency and productivity, resulting in a bottom-line impact. Therefore, the findings from this research are consistent with extant literature on the need for the role of the Chief Digital Officer when adopting digital transformation.

The argument that was presented by the organisation that appointed the Chief Executive Officer as the digital owner is that although it is a document and records management company, it operates as a technology company. As such, they found the Chief Executive Officer to be most suited to lead exploration through the adoption of digital transformation. While titles may differ, one can argue that what is required to achieve the purpose of the role is the mandate and delegated authority from the board of directors to adopt digital transformation.

In two of the cases implementing digital transformation initiatives for at least five years before

this research, the Chief Digital Officer was appointed in 2018. One may argue that this appointment followed the landmark Davos World Economic Forum of 2017, which focused on the 4th Industrial Revolution and digital transformation as the key driver. The appointment of the Chief Information Officer was intended to also carry a dual role as Chief Digital Officer.

Following the appointment, results show that in four of the six cases, the digital owner appointed an independent and dedicated implementation team, the Centre of Excellence, that focused on an exploration through the delivery of digital transformation. Although team members varied across organisations, they were constituted mainly by members from different business units that had the skills required to deliver digital initiatives. Literature on partitional ambidexterity argues that establishing ambidexterity requires structurally independent units, each having its structures, strategies and cultures (Ismail et al., 2017; Simsek et al., 2009; Taródy, 2016). Such a structure represents compartmentalisation and synchronisation that happens with exploration and exploitation within different units as observed in the literature (Simsek et al., 2009; Tushman & O'Reilly, 1996). This research was confirmed by these observations from Simsek et al. (2009) and Taródy (2016) on partitional ambidexterity and presents empirical evidence void in extant literature. The appointment of the digital owner and Centre of Excellence marked the first steps of an organisation moving from just realising the need to structuring and transitioning into the adoption of digital transformation.

On the other hand, Zeta, which used cyclical ambidexterity, only appointed the Centre of Excellence when they identified a capability that did not exist in the organisation. Gamma used an acquisition strategy for focused attention to achieve the delivery of its digital initiatives.

Despite the independent structures at the lower levels, it was evident in all cases that both the exploration and exploitation teams subsequently reported to the executive committee, and the board was ultimately accountable for the process. The board of directors had oversight of the exploration teams introducing digital transformation and the exploitation teams that were maintaining and improving the existing business. Studies on organisational ambidexterity assert that although exploration and exploitation teams are independent, there is a need for congruency at the management level to ensure that both exploration and exploitative teams are working towards the same vision and strategy of the organisation (Simsek et al., 2009; Taródy, 2016; Porfirio et al., 2021). Similarly, Constant et al. (2020) argue that the more an organisation differentiates its structure, the less effective co-ordination is between the actors. The authors refer to managerial ambidexterity, where managers decide how to allocate resources between the two divergent strategies, exploration, and exploitation. In this case,

boards of directors made decisions for the organisation on the resources to be allocated for exploration and exploitation. In this case, board members acknowledge the tension associated with managing the two competing strategies (Smith, 2014). However, the more experienced leaders allocate resources to explore and exploit, the more they are flexible with shifting resources around (Smith, 2014). Therefore, evidence from this thesis supports the dual oversight, with both management and board of directors both exploring and exploiting. However, extant research focuses on the need for management oversight and is silent on the board of directors.

Evidence from the cases showed that the board sub-committee was mandated with oversight of digital transformation and exploitive initiatives in five of the cases. The board sub-committee then reported to the main board. In the other case, the executive committee reported directly to the board. These findings show that there is consolidated oversight of exploration and exploitation from the executive committee, board sub-committee up to the board. In this context of digital transformation, managers and board members are expected to manage towards multiple outcomes through parallel thinking and provide divided attention between exploration and exploitation. This concurs with literature that posits that leaders working in a strategic paradox should have a dynamic decision-making capability (Smith & Smith, 2015).

Studies have shown that only some boards shape strategy (McNulty & Pettigrew, 1999) and that executives seek advice from the board (McNulty & Pettigrew, 1999; Åberg et al., 2017; Zattoni et al., 2015). The board is argued to act as a source of knowledge and expertise because they use their relational networks to gather information and resources from stakeholders (Rejeb et al., 2019; Zattoni et al., 2015). Evidence from this thesis showed that five of the six cases firmly support extant literature that boards of directors act as a source of knowledge, directing matters of digital transformation through their board sub-committees. Therefore, extending extant literature on dual leadership oversight, the current research found that dual oversight on exploration and exploitation in the context of digital transformation extends to the board of directors. Evidence showed that most cases report to the board of directors on both digital transformation initiatives and exploitive initiatives, which included improving the existing environment for regulatory reporting and strategic growth. Furthermore, this research also extends literature in organisational ambidexterity by presenting that the board of directors introduced mechanisms to enable it to perform dual monitoring of exploitation and exploitation in the context of digital transformation through delegating adoption of digital transformation to the board sub-committee and the Chief Digital Officer.

Analysis of patterns in the six cases showed that in one of the cases, remuneration and reward systems were still aligned to the old structures; thus, individuals who were seconded to the Centre of Excellence would perform their duties in that team, reporting to the Centre of Excellence team leaders and the digital transformation structure. When it came to performance evaluation and rewards, this would be done in the individual's original business unit, which was a misalignment. Empirical research posits that motivation by enhancing human resources practices, such as financial incentives, significantly influences employees' productivity and performance (Ahammad et al., 2015). Employees with high abilities are argued to take advantage of both incentives for past and future performance, thus enhancing productivity (Ahmmad et al., 2015.) As such, this thesis complements extant research on culture in organisational ambidexterity in the context of digital transformation. The thesis asserts that as organisations transition into the deployment of digital products and services using specialised Centres of Excellence, the board must address management processes that impact digital adoption, like performance management.

In conclusion, based on the evidence, the cases that realised the need for digital transformation and started transitioning into the adoption process appointed independent teams to focus on exploration. The rest of the organisation continued exploiting existing strategies. These teams were synchronised at the executive committee, board sub-committee and Board. The approach is synonymous with partitional ambidexterity, where an organisation uses independent teams to explore and exploit. Both teams then report to senior management and to the board to ensure a common vision. This research extended current research to include transparency on management reporting to the board of directors when introducing digital transformation. In order to fulfil their duties on digital transformation, the boards of directors appointed board sub-committees to monitor the adoption.

c. Cyclical ambidexterity

The results showed that organisations that had adopted digital transformation had launched digital platforms and established core products and services used by various stakeholders. Once these digital products and services were embedded in the organisation, Centres of Excellence were dissolved, and the people returned to their business units. Further developments were mainly improvements on the existing digital products and services, thus exploitation. Intermittently, when management identified new digital capabilities in the market required in the organisation, they started the cycle, establishing Centres of Excellence. The evidence from Zeta suggests that the Chief Digital Officer then appoints a Centre of Excellence

when such a need is identified, and resources are released to develop the capability, resembling exploration. When the new products and services were deployed to business units, they were embedded, and the Centre of Excellence was dissolved after that.

Scholars assert that when pursuing cyclical ambidexterity, it is a management imperative to know when and how to switch focus between exploration and exploitation (Simsek et al., 2009). When such a need is identified, ambidexterity is achieved by structural partitioning, when the organisation appoints separate teams that explore and exploit sequentially. This cycle of temporary cycles of exploration followed by long cycles of exploitation is referred to as cyclical ambidexterity (Simsek et al., 2009). This part of this pattern is what was observed in Zeta, where the organisation established a temporary Centre of Excellence as and when a need to introduce a new digital capability was identified. The appointment of the Centre of Excellence on a need-to basis could be referred to as dynamic teaming (Matthews et al., 2012).

However, the pattern that was observed in Zeta was not wholly aligned with cyclical ambidexterity. Although the case showed the short bursts of exploration when new digital capabilities were identified, for which independent structures were established, Zeta's business units did not stop exploitive improvements. Zeta could not stop improvements in the business as some of them related to the changing and compulsory regulatory requirements, thus simultaneous ambidexterity. The board was accountable for regulatory reporting and could face steep penalties if exploitation stopped. This concurs with the recommendation from Havernmans et al. (2015), who argued that when responding to external stimuli, leaders need to shift between practices and keep a high level of both exploration and exploitation. The actual optimal point of exploration and exploitation may depend on the environmental dynamism (Havernmans et al., 2015). This thesis, therefore, extends Simsek et al. (2009)'s observation on cyclical ambidexterity by introducing a simultaneous execution of both exploration and exploitation. The cycle that was observed in Zeta can be represented in the figure below.

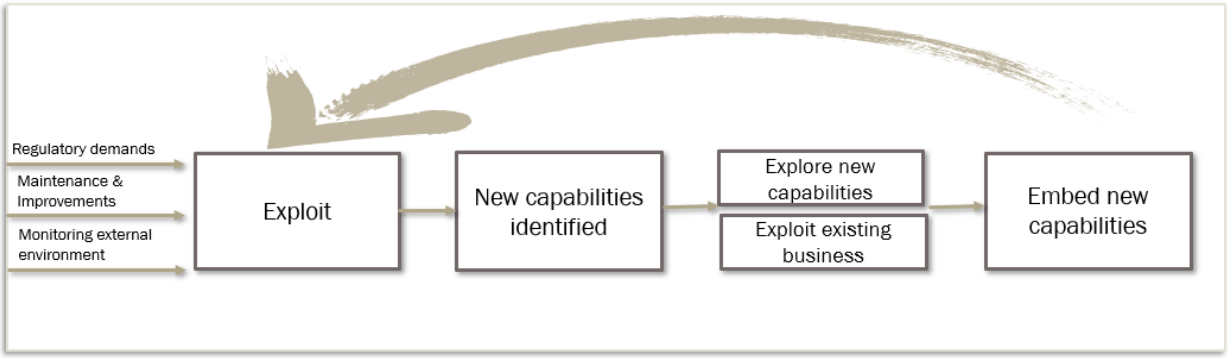


Figure 20: Zeta's exploitation and exploration cycle: Researcher's conceptualisation

It can therefore be concluded that this thesis extended the typology of ambidexterity by adding another view of cyclical ambidexterity, where short bursts of exploration were executed simultaneously with exploitation.

d. A new type of ambidexterity

There was a deviant case that was observed during the cross-case analysis. Alpha established digital transformation early in its business, and this was now embedded in the organisation. According to the evidence, the organisation had both incremental improvements and radical innovations within each business unit as part of their business. Business units were explored and exploited within the same structure across the business. In 2018, Alpha's Chief Executive Officer appointed a Chief Digital Officer. The timing of the appointment suggests that this was triggered by the famous World Economic Conference of 2016 and the pronouncement in 2017 by the President of South Africa that the nation will formally adopt digital transformation. The Chief Digital Officer then established a Centre of Excellence, which played an advisory role and fed other business units' exploration teams new digital research and knowledge. The Centre of Excellence also received requests from the business to develop new digital capabilities and deploy these to relevant business units. Concomitantly, the Centre of Excellence also established new digital capabilities unrelated to existing problems, but digital opportunities, and recommended them to relevant business units. In its delivery, Alpha networked with alliances and partners, which increased its capabilities and enabled the organisation to capitalise on new digital opportunities. The figure below shows the researcher's representation of Alpha's engagement with digital transformation.

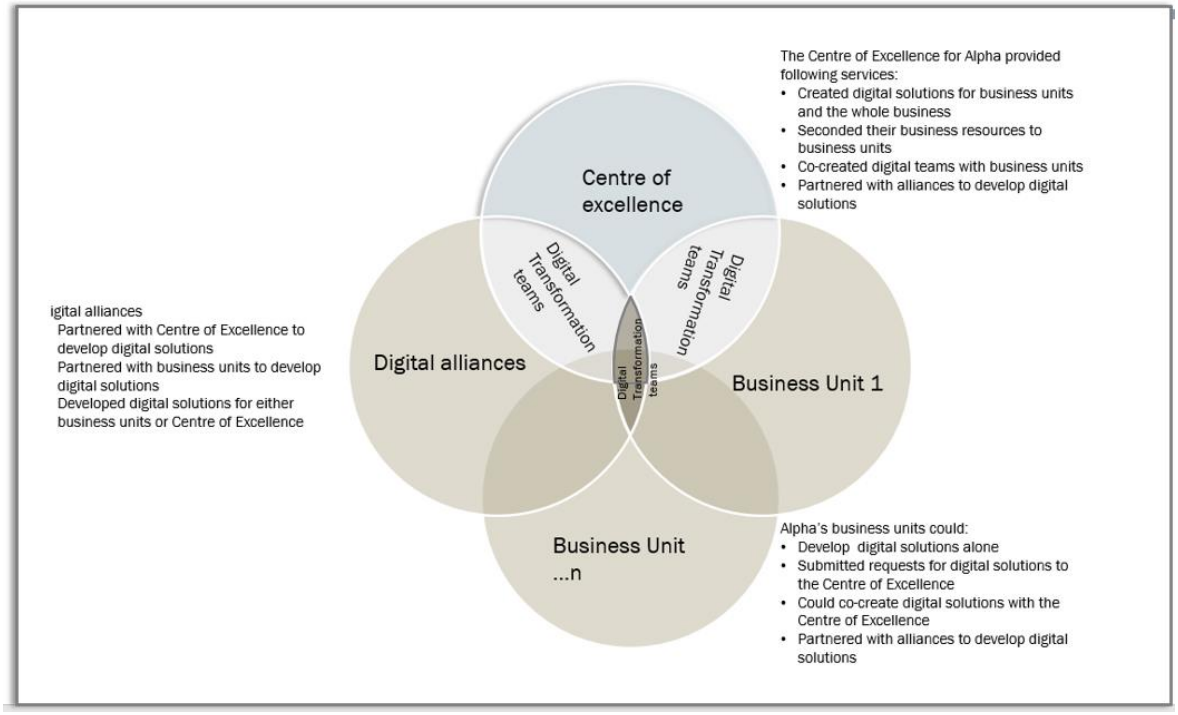


Figure 21: Alpha's engagement with digital transformation: Researcher's perspective

The figure above shows the researcher's perspective of how the board and the appointed Chief Digital Officer, who was responsible for the Centre of Excellence, interacted with the rest of the stakeholders.

Literature on the typology asserts that reciprocal ambidexterity is synonymous with teams exchanging knowledge, where outputs of exploitation fed into exploration (Simsek et al., 2009; Taródy, 2016) and this happens sequentially. However, evidence from the case suggests that the cycles in Alpha leveraged improvements in current business and digital opportunities. These were done either with the Centre of Excellence, one of the Business Units, several Business Units and the Centre of excellence and with digital alliances Exploration of new opportunities and exploitation of business issues were done simultaneously in both independent and inter-dependent structures. Simsek et al., (2009) argued that partitional ambidexterity was associated with alliances and inter-firm mechanisms. They argued that one unit's exploration would be complemented by exploration in the other unit. The authors argued further and concluded that partitional ambidexterity is more successful in launching breakthrough products. There is no doubt that Alpha was releasing several breakthrough technologies in its business, as evidenced by the digital bank that was inaugurated at the time

of this research. However, these were not achieved using partitional ambidexterity. This research observed instances where exploration is not in one unit but multiple units, yet it was also in the designated Centre of Excellence business unit whose mandate was solely to adopt digital transformation. As if that were not enough, the Centre of Excellence also delivered digital initiatives either alone, with people seconded from other business units, or with an alliance. The reality on the ground, in this case, is more complicated than what is presented in Simsek et al., hence the argument to extend the typology as presented by the original authors. The process that was observed could also not fit within reciprocal ambidexterity, where output of one business unit becomes input to another business unit. Stettner & Lavie, (2014), argued that this was achieved in inter-organisational alliances. However, Alpha has both inter-organisational and intra-organisational alliances. Cyclical ambidexterity, which is argued to be associated with business units with a strong technological orientation, was far from this observation although Alpha's business units suited the "business units with a strong technological orientation" description (Simsek et al., 2009). Cyclical ambidexterity is associated with sequential ambidexterity yet Alpha did not stop exploitation when it explored with different models.

Therefore, the research asserts that another type of ambidexterity was observed in Alpha, where an organisation explores and exploits different business units. Thus, independent ambidexterity also relies on a dedicated structure, inter-dependence, to explore and exploit. This researcher argues that another type of ambidexterity explores and exploits simultaneously, using both independent and inter-dependent structures. Therefore, the thesis extends the literature on organisational ambidexterity by adding to Simsek et al. (2009)'s typology of the observation of independent and inter-dependent ambidexterity being executed simultaneously.

7.3.3 Conclusion

In conclusion, the findings of this research extend the literature on the oversight of boards of directors on exploration and exploitation by presenting the oversight role of the board and the process that they used. Similarly, evidence from this research suggests that the simultaneous execution of cyclical ambidexterity is an extension of the literature on the typology of ambidexterity. Lastly, building on extant literature on organisational ambidexterity, this thesis extends Simsek et al. (2019)'s typology of organisational ambidexterity, which presents that organisations use either an independent or inter-dependent structure. However, Alpha showed that an organisation could use both independent and inter-dependent structures while

exploring and exploiting simultaneously. The figure below summarises the findings and the gaps that were observed in Simsek et al. (2009)'s typology of ambidexterity.

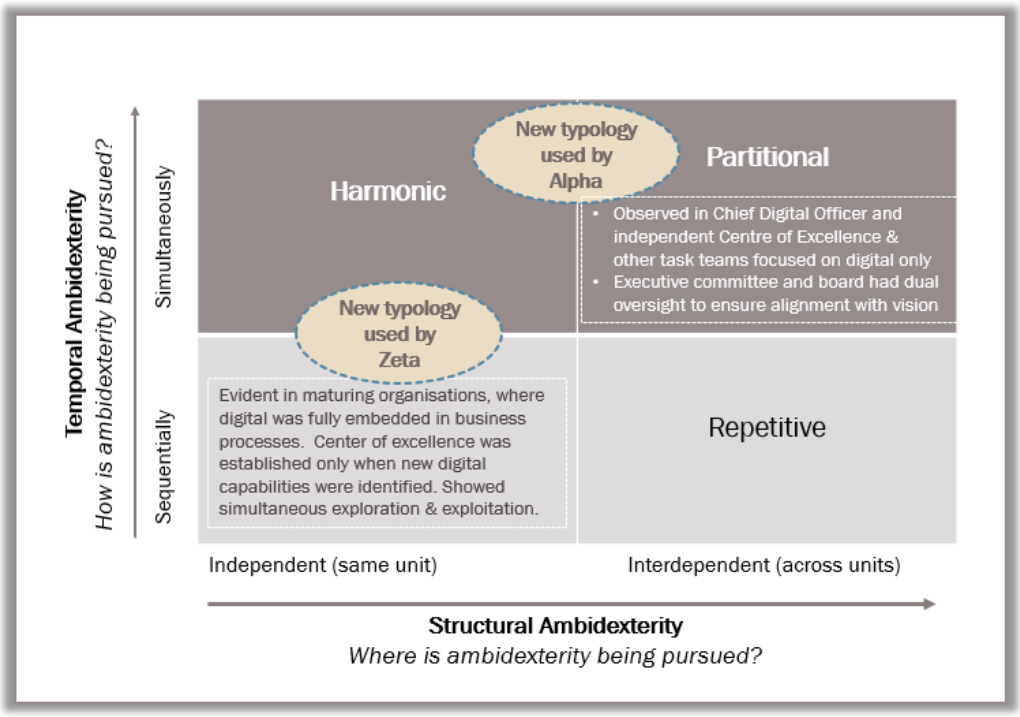


Figure 22: Research findings on the typology of ambidexterity: Adapted from Simsek et al. (2009)

Whenever organisations explored and exploited simultaneously, there was a need to balance organisational resources. The next section discusses extant literature and the empirical findings of how these cases balanced the finite resources as boards of directors pursued ambidexterity in the context of digital transformation.

7.4 Balancing resources

From the findings in the cross-case analysis, the researcher found evidence of balancing resources. This was primarily observed in cases that were in their early stages of digital adoption. The most criticised resources were financial resources because organisations do not have a finite provision of human resources because of inadequate digital skills. Literature confirms that resource allocation issues forced leaders to make trade-offs between allocating financial resources and human resources (Smith, 2014). The rest of this section discusses these observations concerning extant literature.

7.4.1 Balancing financial resources

Empirical findings showed that balancing exploration and exploitation is a dynamic and not a static process. This was observed in the cases under study. For example, Gamma was reflecting on the decision to outsource the adoption of digital transformation and said:

"So not only does it affect product development, but it also affects the sales. Very few people can sell digital products. Thus, that is a journey that is still in the process of evolving for us to get to a point that we want to".

Similarly, Theta's board of directors reduced the budget for digital transformation by at least 40% following the outbreak of COVID-19 and concerns for immediate organisational sustainability. There is consensus in the literature that exploration and exploitation stretch the organisation's resources (Raisch et al., 2009; Simsek et al., 2009; Zimmermann, Raisch, Birkinshaw, et al., 2015). The optimal balance between exploration and exploitation depends on environmental dynamism therein (Havernmans et al., 2015).

This thesis, therefore, concurs with Havernmans et al. (2015) and asserts that exploration and exploitation is a dynamic process and requires continuous review and re-aligning. In addition to continuous review, the cases under study used the processes defined in the sections below to balance financial resources. This means that in practice, as part of their processes, boards of directors should introduce regular reviews to analyse whether the external and internal environments still warrantee the resources allocated to the two competing strategies, exploration and exploitation. The board can review such allocation, thus allowing practical dynamic decisions in balancing financial resources between the twin strategies. This observation that boards reviewed and re-aligned resources between exploration and exploitation enhance extant knowledge by showing the validity of what Havernmans et al. (2015) concluded.

a. Modelling priorities

Research findings from the cross-case analysis showed that one of the processes that were used to balance financial resources as organisations explored and exploited simultaneously

was modelling priorities on which the organisation wanted to embark. At least three cases showed that they were under pressure to deliver digital products and services. One may argue that the organisations were under pressure due to stakeholder expectations that had changed over time and were not met. In their arguments, participants emphasised that when organisations prioritise, it will allow a rational allocation of funds and human resources. Modelling priorities also clarified critical deliverables, thus laying the ground for skills assessment, and partnering for digital. Participants gave examples of some considerations that were used when prioritising, which included 1) return on investment, 2) required capital outlay, 3) contribution to stakeholder requirements, for example, regulatory compliance requirements, 4) time it takes to obtain value from the investment, 5) net promoter index, and 6) any dependencies with other initiatives.

The priorities were presented to the board subcommittee and the board for approval. Unlike in Information Technology, where organisations practised risk avoidance, participants highlighted that organisations must tolerate risk in digital transformation. Prioritisation was critical as it formed part of the transitioning process to the development and deployment of digital transformation.

There is consensus in ambidexterity literature that exploration and exploitation compete for an organisation's limited resources, hence the need to create a balance (Birkinshaw & Gupta, 2013b; Stettner & Lavie, 2014; Turner et al., 2013). Studies have shown that managers can promote major organisational changes through decisions and investment options because they have the technical, product and market knowledge.

The findings suggest that prioritising is one of an organisation's processes to balance exploration and exploitation in a digital environment. Practically, boards must therefore introduce prioritisation in their processes and evaluate proposed initiatives using the prioritisation matrix that considers the speed of delivery and the value expected from the digital initiative. Resources can then be allocated to prioritised initiatives, thus balancing resources. While prioritisation considers the speed of delivery and expected value, implementing digital initiatives is associated with risks that cannot be completely avoided. Therefore, in practice, boards of directors must define an acceptable level of risk for initiatives that will be approved for resourcing. Literature on digital transformation is at its infancy stage. While the risk of digital initiatives is already spelt out, literature has not emphasised the need for prioritisation, yet that is prominent in practice. This finding, therefore, enhances the literature on digital transformation by introducing the need for boards of directors to prioritise digital initiatives, thus

balancing organisational resources.

b. Proof-of-concept

Once an organisation has identified its priorities, the following process that was evidenced from the research is proof-of-concept or digital piloting. Cross-case analysis showed that four cases performed digital piloting, also referred to in this research as proof-of-concept or experimenting. In these organisations, a proof-of-concept was one of the critical processes that boards of directors approved when the organisation started to deploy digital transformation. While piloting is not a new phenomenon, it was used mainly selectively for different projects, including Information Technology projects. Unlike in other projects, the implementation of digital technologies has many unknowns because it is new. The risk of failure is high, and yet the cost of implementation is equally high. Therefore, to mitigate the risk of failure after paying for an entire investment, the board of directors introduced digital piloting. It involved implementing the digital initiative at the smallest possible size. The board only paid for initiatives that had shown digital piloting success, thus saving funds in cases where such an initiative would have failed. Proof-of-concept involved developing the concept at a small scale to validate whether the initiative would be successful. The initiatives with a successful proof-of-concept would be scaled up, thus saving resources where this would fail.

It formed the first step in the deployment of a digital initiative. Evidence shows that digital piloting involved developing a miniature scale version of the proposed digital initiative. This process allowed the proposal to be investigated further using a miniature scale version, allowing them to “fail fast” as one Chief Digital Officer explained. Although it did not eliminate the risk of failure, evidence from this research suggests that piloting reduced the risk of organisations investing in digital initiatives that would fail after scaling up.

A small budget was allocated for digital piloting. The execution team in the Centre of Excellence developed miniature versions of the prioritised initiatives and submitted the results to various committees for approval. For example, in 2019, at the time of the interviews, Beta was running a pilot project to enable underground wireless for integrated mining operations and more accurate and timeous monitoring of people as part of their endeavour to improve mine safety and align with the related regulations. On the other hand, Gamma ran an incubator programme to manage the risk of losing customer data. Evidence from the findings suggests that a pilot would confirm the feasibility and suitability of the initiative and allow a more accurate budget of required funding, skills, and time to be compiled. It was only when the pilot was

deemed successful that full resources would be released for the deployment. The release of complete resources also aligned with suitable timing for the digital solution to be effective. For example, Beta finished piloting charging stations for electric cars. However, the board determined they would not scale up immediately but monitor deployment to coincide with when electric cars become available in South Africa.

Statistics have shown that adopting digital transformation has its challenges. Recent estimates have shown that 66% to 84% of digital transformation projects fail (Correani et al., 2020), which is significant considering the high cost of digital resources. Therefore, Gruia et al. (2020)'s recommendation that before starting digital transformation, organisations must identify use cases and prioritise them is worth adopting. However, the analysis showed that prioritisation could only be done during the transition when organisations have realised the need for digital transformation. This thesis, therefore, makes a novel contribution to the body of literature by introducing the practice of performing proof-of-concept in digital initiatives as a way of determining the feasibility and resources required to deploy digital transformation. Although proof-of-concept is not a novel phenomenon it was not spelt out in the adoption of digital transformation, which is a significant omission considering the cost and risks associated with digital transformation. This research observed that in practice, boards of directors mandate this practice to minimise the costs invested in an initiative without certainty of whether it would succeed. The rate of failure in digital projects and the associated costs of adopting digital necessitated boards to enforce proof-of-concept for digital initiatives.

In practice, proof-of-concept, therefore, becomes one of the critical steps in the processes that should be performed by boards of directors in the adoption of digital transformation. This step mitigates the risk of digital failures, thus mitigating the risk of losing resources, which are already argued to be inadequate in most organisations. it Literature has already observed that there is no immediate pay-off when an organisation adopts digital transformation, and the return on investment is uncertain (Llopis-Albert et al., 2021). However, it is silent on the need for proof-of-concept. This thesis introduces sheds light in the processes used by boards of directors by introducing and substantiating the need by boards of directors to perform a proof of concept as they explore and exploit in the context of digital transformation.

c. Improving process efficiency

This empirical research shows that more than half the participants raised the need to improve

process efficiency in exploitation and use the cost savings to fund digital transformation initiatives. Two directors explained that the main driver for process efficiency was to ensure that the cost of explorative initiatives is not passed on to the customer. On the other hand, all cases observed improved process efficiency when digital products and services were introduced. The results suggest that improving process efficiency is a cycle that can be represented by the figure below.

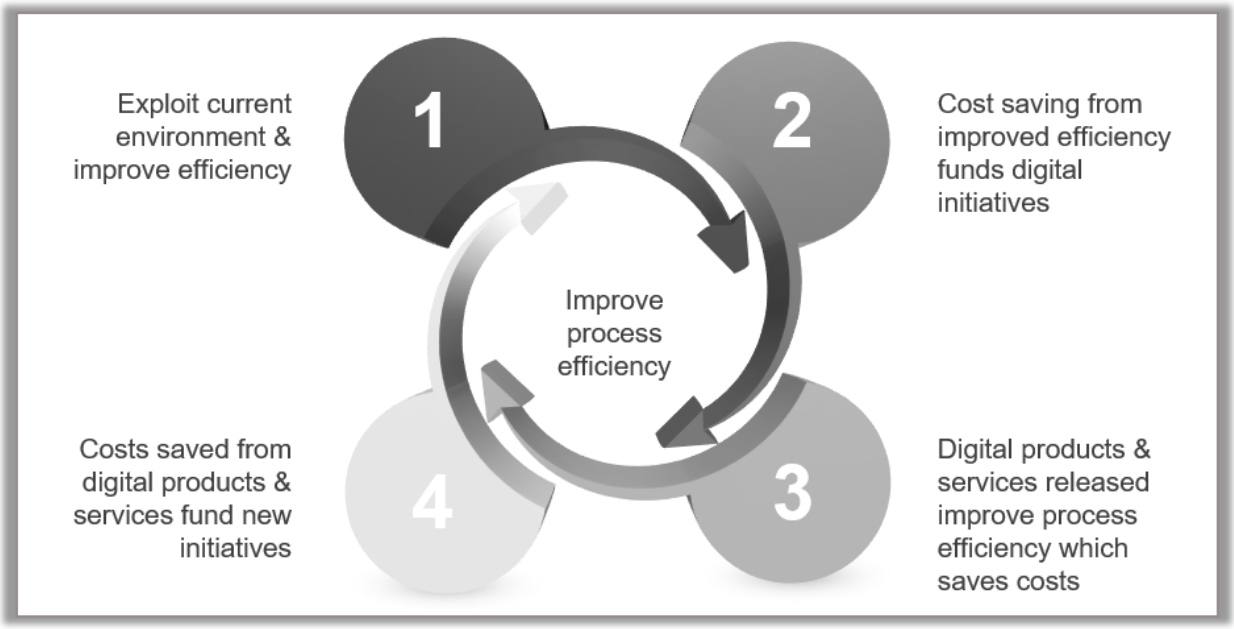


Figure 23: Cycle to improve process efficiency to fund digital transformation: Researcher's conceptualisation

The analysis shows that improving process efficiency through exploration and exploitation gave the organisation a competitive advantage. Beta's Net Promoter Score increased significantly when the organisation improved process efficiency through the adoption of digital transformation. Furthermore, the results showed that digital products and services went through short development phases, which participants referred to as agile developments. The new method hastened the release of new products and services and, therefore, process improvement. An example of process improvement was the application for a new bank account demonstrated by Alpha's board member, who described it as a straightforward and quick process. However, the director's irritation on "digital copycats" could not be suppressed. Other digital products and services that improved efficiency as described by participants

include sending money using a digital facility called eWallet, making payments using a “tap” facility, withdrawing money with no bank card, retrieving documents from a digital archive, and the list goes on. The evidence from the cases suggested that cost savings created during process efficiency in exploitation funded digital transformation. This concurs with literature that argues that adopting digital transformation reduces the cost burden on organisations (Correani et al., 2020; Llopis-Albert et al., 2021).

In a quest to understand how boards balance exploration and exploitation, this thesis contributes to the body of literature on organisational ambidexterity by arguing that improving process efficiency is one of the ways that assisted the board with balancing financial resources. In practice, as boards direct the adoption of digital transformation, detailed attention should be paid to process efficiency, with an emphasis on complimenting funding from the savings from the efficiencies. Improving process efficiency becomes one of the activities on the processes of boards of directors that will be embedded in practice.

7.4.2 Balancing human resources

a. Restructuring for digital

This research found that in all six cases, the board appointed a digital owner, a Chief Digital Officer in most instances. The exceptions were Gamma, which appointed a Chief Executive Officer from a digital company to fulfil this role; Theta appointed a Chief Information Officer to wear two hats and be the digital owner as well. This role of Chief Digital Officer is an executive position placed in the Executive Committee and was an invitee to the board sub-committee for digital transformation discussions.

The appointment of a digital owner concurs with extant literature that observed that organisations have increasingly implemented this functional executive role (Kunisch et al., 2020; A. Singh & Hess, 2017). Research confirmed that the Chief Digital Officer is a critical role that orchestrates the adoption of digital transformation in an organisation (A. Singh & Hess, 2017). Literature also observed that the role played by the Chief Digital Officer varies from one organisation to another (A. Singh & Hess, 2017). Therefore, the appointment of a Chief Digital Officer concurs with extant literature, thus supporting a more focused delivery of digital transformation.

Once the Chief Digital Officer was appointed, evidence suggests that after the organisation approved the digital adoption process, he/she appointed Centres of Excellence, which would

deliver the digital products and services. These were employees who had other roles in the organisation but were being seconded for a specific purpose, to deliver digital transformation as a team as observed in the section above on partitional ambidexterity. While these employees had specific job descriptions, following secondment, they had a new mandate. Their jobs changed for that duration until they were released to go back to their business units. The duration of this secondment varied from one organisation and one initiative to another. In addition, this research observed that the digital owner insisted on the business unit executive to be part of the digital adoption programme, failing to de-prioritise that business unit. The restructuring process was instrumental to digital transformation success because the new structures led to the adoption and execution of the strategy.

Literature suggests that ambidexterity is achieved by creating separate units, with each unit embodying distinct strategic and operational logistics (Birkinshaw & Gupta, 2013b; Simsek et al., 2009). Such structures allow organisations to pursue both exploration and exploitation simultaneously (C. O'Reilly & Tushman, 2013; Simsek et al., 2009; Taródy, 2016). Literature even argues that when organisations integrate these two divergent structures at the management level, they are called ambidextrous. Therefore, the formation of digital transformation structures, which was observed in the cases under study, directly supports what literature has named structural ambidexterity. In practice, the proposed process directs boards to introduce structures that support digital adoption, with clear accountabilities and responsibilities. While there was a mixture of Chief Information Officers and Chief Digital Officers being appointed as digital owners in the cases studied, this thesis recommends a practice to appoint Chief Digital Officer as the owner to separate responsibilities of Information Technology with Digital Transformation.

b. Reskilling for digital

Analysis showed that all the organisations under study lamented the shortage and cost of digital skills. When the organisations re-skilled their employees, they needed to introduce ways of retaining them or risk losing them. One case gave an example of a whole team within the Centre of Excellence that was offered good jobs and relocation to Australia, leaving a significant gap in that area. Despite surface similarities of inadequate digital skills in organisations, the gap shown in cases that had adopted digital transformation in the earlier years, which may be deemed more mature, seemed to be much smaller than in the other

cases. The evidence suggests that organisations can accumulate digital skills in their employees over the years of implementation.

Literature on digital transformation acknowledges that the rapid technology change also changes the way people work and, therefore, the skills required (Gruia et al., 2020). Literature on skills-based-technology-change (SBTC) concluded that the introduction of new digital projects increases the demand for skilled workers because the employees with digital skills are required to use the new technologies correctly to realise the benefits (Borghans & Ter Weel, 2011). Similarly, in their analysis of skills required to build the digital workforce, the Organisation for Economic Co-operation and Development (OECD) report of 2020 concluded that unique digital skills requirements are determined by society, the economy, and other factors. The skills required by the digital workforce in the emerging economy for digital transformation can therefore be argued to be different from those required in the developed economy. The OECD report advocates for governments to provide digital skills education across all levels, with clear responsibilities for each ministry (OECD, 2020). However, following apartheid in South Africa, a political regime that discriminated against most blacks from accessing education and training for developing skills, national skills planning continued to be a challenge (Powell et al., 2016). There was still a big gap between the skills required in the labour market and the supply from the education and training system (Daniels, 2007; Powell et al., 2016) besides the extensive skills development programmes introduced post-1994, when South Africa became independent (Powell et al., 2016). Therefore, the research findings are congruent with extant literature, where the organisations experienced significant challenges obtaining digital skills in the South African market.

Although it was not observed in this research, previous research also indicated that managers who are not exposed to digital transformation could leave the organisation and pursue other opportunities that give them exposure to digital transformation. When adopting digital transformation, boards of directors need to take this observation into practice and ensure there is exposure at every level for skills retention, as they direct organisations for digital skills development.

As part of the realisation process, the board understood the need for digital transformation skills for employees and other stakeholders in the digital value chain. Examples include when Gamma lamented on the skills gap within its internal team, who could not sell the digital products and services that a digital partner developed. Gamma was therefore looking at ways of re-skilling its employees with the required capabilities to own the digital products and

services developed. There is an acknowledgement in the literature that tensions arise when organisations attempt to integrate products and services that a partner developed into their operations. This evidence contributes to the extant examples of where such tension was observed.

Similarly, Theta discussed its strategy of changing most of its branches countrywide to learning centres to skill its clients and other stakeholders in using the digital platform. Literature posits that while many core leadership skills remain the same, digital transformation demands a certain new skill for stakeholders to navigate the digital world (Kane et al., 2019). Research advocates for the right digital skills at all levels, and bringing these in from outside will support the organisation (Kane et al., 2019). Kane et al. (2019) argued that one of the critical skills required is to lead a network of people and teams rather than leading via hierarchical structures. The findings from this thesis support extant literature on the need for digital transformation skills across all levels and stakeholders.

The analysis also showed that organisations leveraged partners, outsourcing and acquisitions of digital start-up companies to access digital skills. For example, as Theta introduced digital products and services, it partnered with other organisations outside its value chain, including a grocery store, financial technology companies and co-competitors. Therefore, Theta's partners needed to understand how the digital platforms worked and, as such, needed the relevant skills. Theta indicated that the organisation monitors its digital products and services and improves them continuously for optimal performance. This adoption of digital transformation was an ongoing process that was enabled by the existence of digital skills. As such, this thesis recommends that the board establishes and allocates resources for digital re-skilling as a continuous process for all stakeholders.

It is essential to understand the context of the environment. In this case, adopting digital transformation in South Africa, an emerging economy, had different dynamics from developed nations. According to the Africa competitiveness report of 2017, over the past five years, business leaders in Africa consistently rated the workforce at an inadequate level of education, thus skills are among the top six most problematic issues for doing business (Africa Competitiveness Report, 2017). In this period, it was observed that South Africa increased its enrolment of students in secondary and tertiary education to improve the nation's skills (Africa Competitiveness Report, 2017). Despite this increase, the report observed that skills levels were not improving sufficiently (Africa Competitiveness Report, 2017). This was exacerbated by the fact that digital transformation requires new skills, which exist in organisations. The

report suggested that nations roll out a recommended curriculum to develop skills for digital transformation, thus national skills for the 4th industrial revolution. Although the organisations under study embarked on programmes to equip stakeholders with digital skills, the programmes that were used were not divulged in the cases under study. One of the cases, Theta, received a Culture of learning award in 2018. Theta had partnered with an international learning platform for digital skilling programmes. This allowed employees and other stakeholders to log in and go through self-driven training on different curricula for digital transformation at anytime from anywhere.

This thesis therefore recommends that in practice, when organisations are adopting digital transformation in South Africa, boards of directors should allocate resources towards skilling stakeholders for digital. This can be a continuous practice of skilling stakeholders because digital skills change rapidly. Although literature laments the shortage of digital skills worldwide, it is largely based on studies from developed economies. The context of South Africa, an emerging economy, and its apartheid background which deprived the majority of the population from accessing good education, poses a unique position which requires consideration both in practice and in theory. The historical skills gap, and the known gaps in digital skills, call for additional resources to be considered in organisations in South Africa, compared to what developed countries would allocate. This thesis makes a theoretical contribution on digital skills by shedding light on the need for boards of directors to pay additional attention to the need of digital skills in South Africa based on its background.

c. Digital partnering

Digital partnering was one of the key processes that boards adopted for the organisations to deliver digital products and services. However, digital partnering has its risks, which must be managed. Although the findings show that all six cases lamented the unavailability of digital skills and the exorbitant cost of the limited skills that were available, partnering was most evident in Alpha, Gamma, Theta, and Zeta. Boards of four of these cases used acquisitions, alliances, partners, or outsourced some of the digital transformation work, all of which have been generally referred to as digital partnering in this thesis. The cases showed that boards approved selective partnering, depending on capacity and capability, and monitored associated risks.

Although most cases used similar strategies, the details of how each case embarked on digital

partnering showed that digital transformation was a unique journey for each organisation. For example, Gamma outsourced the development of digital products and services to fast-track the development. However, as discussed earlier, the approach presented unintended consequences where none of Gamma's employees could sell the products and services that were developed. This created a risk of continuity which the Chief Executive Officer was trying to manage through insourcing the development of digital products and services. In parallel, Gamma acquired a digital organisation to create an entirely new business line and revenue stream in a new market. This was a successful strategy, as evidenced by the revenue from the financial reports. The organisation was working on expanding this new business line in other markets.

On the other hand, Theta partnered with a myriad of digital companies across the world. FinTechs were among Theta's local partners. The Chief Information Officer of Theta reflected that at least 60% of digital developments were outsourced to partners across different countries. This approach of outsourcing most of the organisation's work can create risks that organisations should manage. For example, in Theta's reflections, partnering with FinTechs was a risk because FinTechs were small entrepreneurial start-ups that competitors could buy. Similar to Theta, Zeta was also exposed to the same risk of FinTech buy-out. The explanation was that both organisations used FinTechs because this was a readily available source of digital skills in an environment where there were scarce digital skills in South Africa. Alpha used strategic alliances, where the partner would also leverage Alpha's data to succeed in its digital products and services.

Recent studies on ambidexterity show that organisations aim to explore using a broader network of firms through strategic alliances (Stradler et al., 2014; Heracleous et al., 2017). Further, researchers observed that organisations rarely rely on internal resources only but use alliances regularly (Wassmer, 2010). Digital partnering became a critical alternative where the use of internal resources for attaining the dual and seemingly conflicting strategies, exploration, and exploitation, seemed to be a challenge (Wassmer, Li, Madhoc, 2017). The literature suggests that organisations assess their resources for capabilities (Hess et al., 2016a) before deciding on what skills to develop internally and what work would be assigned to their parties. Even though the assessment of skills was not observed directly in research findings, when the organisations identified suitable partners, they ought to have known the skills gap they had. Therefore, findings if this research suggests that, congruent to the extant literature, organisations must assess their capabilities before identifying partners. In practice, boards of directors should ensure that as part of digital partnering, organisations should identify

the digital skills gap to ensure that the partners complement the internal team with the required skills.

Also, extant literature asserts that organisations that pursue alliance strategies have shown superior performance (Wassmer, Li, & Madhoc, 2017). Synonymous with Thakor (2020), boards of directors for Theta and cases sampled from the financial sector approved the use of FinTechs in particular, not only to bring digital skills in financial services but to unveil cheaper ways of delivering digital transformation. This approach is argued to reduce services cost and improve productivity and the customer's welfare (Thakor, 2020). In alignment with extant literature, Theta and Zeta, cases in the financial services industry, confirmed that they possess digital skills. Although both Theta and Zeta knew that FinTechs were a risk, they confirmed that they possess digital skills that left the organisations with minimal choice but to partner with them. Findings from this research, therefore, support extant literature by offering examples of cases in the financial services that were forced by the shortage of digital skills in an emerging market, to use a risky option, partnering with FinTechs. In practice, boards of directors may have a limited risk appetite, however, there is a need to assess the need for digital partnering, particularly with Fintechs, considering the opportunities that will be lost if such partnership is not pursued. Financial institutions view Fintechs as risky, and as such, practical risk-mitigating practices must be embedded in the digital partnering process. In some of the cases, Fintechs would be given access to the information that they are digitising only (Lee & Shin, 2018).

On the other hand, companies that partner in ecosystems were said to have received more revenue from digital activities (Weill & Woerner, 2015). The findings from this research concur with the body of knowledge and provide evidence of the use of different types of digital partnering across different organisations. In practice, boards must interrogate the type of partnership for digital engagements to mitigate risk and maximise profitability.

Another finding from this research was that boards of directors approved partnerships with other companies that were not in the same industry. Theta's partnership with a supermarket is a typical example. The organisation had an existing partnership with one of the big supermarket chains in South Africa. From 2017 to 2019, the research period of this study, when the adoption of digital transformation started accelerating in South Africa, the products and services from this partnership were enhanced. Theta's clients could buy from the supermarket's online store, paying with the bank's digital services, thus exposing Theta's clients to the supermarket. The service came with significant discounts for Theta's clients. It improved the digital offerings from both Theta and the supermarket, thus increasing digital

options available to customers. In addition, Theta's clients could benefit from what the organisation termed "till point functionality" from any of the supermarket's outlets at a minimal cost. This facility allowed Theta to leverage the supermarket's assets, reducing Theta's need for dispensing machines and enhancing its competitiveness. Both organisations enhanced their security on digital services. This evidence suggests that Theta and the supermarket shared their vision for the digital platforms so that there was congruency in the shared services and developments thereof.

There is consensus in the literature that organisations cannot succeed without using the business ecosystem (Sebastian et al., 2017). With the turmoil caused by digital disruption, organisations must evaluate threats and opportunities and start charting more connected digital ecosystems (Sebastian et al., 2017; Weill & Woerner, 2015). In doing so, organisations must not limit themselves to existing value chains but think broadly about partnering with other stakeholders, including competitors (Weill & Woerner, 2015). Therefore, Theta's partnership with a supermarket allows researchers to have a broader insight into digital transformation is evidence of such an alliance.

Furthermore, Lanzolla (2019) also argued that digital technologies enact new mechanisms that might affect the organisation's scope. This was evident in most cases in the study. For example, Gamma's board sub-committee mandated the Chief Executive Officer to create a new revenue stream using digital, thus new products and services, using new technologies for smart cities when their clients could not find records for City Plans. Gamma's entry into a new market with a new business line shows that the new business line was feasible because of digital technology.

7.4.3 Balancing time

The research findings showed that one of the limited resources that were observed in the different cases was time because of the late adoption of digital transformation. For these organisations, late adoption meant delays in fulfilling customer expectations, delays in reducing costs and delays in increasing revenue. However, the organisations leveraged prioritisation and partnering, which were discussed at length in the above sections. There were very few codes that referred to time. In this case, time mostly referred to the delivery lead time of digital initiatives during the selection and prioritisation process. Prioritisation ensured that digital initiatives were streamlined, and teams could focus on the key priorities. When the organisations went into partnerships, they increased the resources involved in delivery, hence

reducing the delivery lead time of deploying digital products and services.

In practice, organisations try to find a balance of time for exploitation of existing products and services versus the priorities for digital transformation. Boards of directors should review and align the resources required for digital transformation regularly to align with the delivery lead time and priorities set for digital partnering in a given period. The need to review time for delivery, therefore, becomes one of the practical steps that the board should do as they adopt digital transformation. Failure to consider time can lead to inadequate resources being allocated and the delivery being completed much later than expected. The inclusion of contributes to the extant literature on digital transformation, thus allowing boards to allocate required resources for the delivery of digital initiatives.

7.4.4 Conclusion

This thesis provides evidence of organisations that used different ways to achieve the balance of time that is required when exploring and exploiting in a digital environment. Simsek et al., (2009) observed organisations explore and exploit either independently or inter-dependently. This research makes a novel contribution by extending Simsek et al.,'s 2009 findings after observing that organisations can explore and exploit independently and inter-dependently concurrently. Boards of directors explored and exploited within the same structure thus inter-dependent while execution teams exploited and exploited independently. The thesis also contributes to the body of knowledge in organisational ambidexterity by mapping the processes of boards of directors, in the digital context, which we before not defined or documented. It therefore contributes to corporate governance literature on boards of directors by adding these defined processes to the black-box of research.

7.5 Processes of the board in pursuit of digital ambidexterity

This section seeks to answer the last research question, *"What are the processes used by boards of directors as they explore and exploit in the context of digital transformation?".*

Board members' role is to help organisations create advantages for long term sustainability (Main et al., 2018). The current environment includes understanding the risks and opportunities presented by digital transformation (Main et al., 2018). The relationship between ambidexterity at a higher organisation level and performance is stronger than at a lower level (Junni et al., 2013). Therefore, it is critical to understand the processes used by boards of

directors, the organisation's apex, as they pursue ambidexterity. While the focus was to understand board processes, it was not feasible to focus on board processes without understanding the processes that feed into the board. The importance of the analysis of board processes is evident in the presentation throughout data analysis to the discussion. It was evident from the results that board processes inform management processes. Results also showed that the digital owner, the Chief Digital Officer, is critical to the board's exploration of digital transformation.

Findings from this research showed that at least four of the six cases, Beta, Gamma, Delta, and Theta realised the need for digital transformation following the discussions at the World Economic Forum in 2017 and the commitment by the South African President for the nation to adopt digital transformation. Pattern searching in the cases revealed these four of the six boards delegated oversight of digital transformation to a board sub-committee. The finding concurs with the body of knowledge advocating for boards of directors to be involved more in strategy (Jain & Zaman, 2020). Digital transformation is known to change business models (Llopis-Albert et al., 2021; Saarikko et al., 2020), and there is broad consensus on the importance and influence of leaders in the processes (Yokoi et at., 2019; Porfiriro, & Carrilho, 2020) to create new opportunities for organisations or to increase sustainability. Despite the dearth of literature on the board's role in enabling ambidexterity, it was evident that most boards of directors in the cases under study gave direction on the adoption of digital transformation. Moreover, the analysis showed that digital transformation requires significant financial and human resources (Hossnofsky & Junge, 2019). This finding, therefore, contributes to the body of organisational ambidexterity literature by adding to the roles of boards of directors a new responsibility, directing the adoption of digital transformation for organisational sustainability.

Four of the analysed cases showed that board sub-committees appointed a digital owner, mostly a Chief Digital Officer (Van Den Berghe & Baelden, 2005), an executive who formed part of the executive committee. Maedche (2016) argues that the role of the Chief Digital Officer is to create top-line impact, focusing on driving superior customer experience, exploring new digital business models, and constructing digital ecosystems. The appointment f Chief Digital Officer is in line with Pittaway and Montazemi (2020)'s observation that there is a need for managers with the know-how to lead the implementation of digital transformation, in the absence of which such adoption will be stagnant. The analysis showed minimal progress on Delta's digital transformation from 2017 until 2019 when they appointed a Chief Digital Officer. The same was observed in Epsilon, which was subsequently aborted because of the lack of

continuity of digital adoption. Epsilon still did not have a digital owner at the time of the interviews. The observation is in line with literature that posits that the lack of such a role leads to piecemeal initiatives, missed opportunities and false starts in adopting digital transformation (O. A. El Sawy et al., 2016). Delta presented the piece-meal initiatives referred to in literature until the appointment of the Chief Digital Officer.

Previous research showed that the emergence of the role of Chief Digital Officer started in 2003 and became prevalent in 2010 (Kunisch et al., 2020). Of these Chief Digital Officers, 84% of those appointed in the cases were the first to hold the title in their organisations (Kunisch et al., 2020). However, this study was based on research performed in developed countries. Evidence from this thesis, which was based on the South African context, showed that this role started emerging in 2017, following the World Economic Forum that accentuated the role of digital transformation in economies. Besides, 100% of the Chief Digital Officers were the first to hold such a position in their organisations. Based on the finding, this thesis, therefore, contributes to corporate governance research by adding the responsibility of the adoption of digital transformation to the role of the board. This is coupled with the appointment of a Chief Digital Officer to lead the adoption of digital transformation.

Despite the similarities in the four cases, this research noted a deviant case, where a non-executive director confirmed that the board "rubber-stamped" what management presented on digital adoption. It was also observed that the founder of Alpha was the individual majority shareholder of this deviant case and was also the Chief Executive Officer. Results also showed that there was no board sub-committee with delegated responsibility for digital transformation. Although literature asserts that the roles of boards of directors vary across organisations (Barroso-Castro et al., 2017; Valentine & Stewart, 2013), digital transformation changes business models, thus exposing organisations to a risk of sustainability (A. Singh & Hess, 2017; Snihur, 2018; Weill & Woerner, 2015). The deviant case contradicted what was observed in other cases where boards directed digital adoption and monitored progress closely through sub-committees. The question that remained unanswered was, "Could Alpha's deviation from the processes observed in the other five cases be linked to the organisation being led by the founder?"

The most frequently observed finding was that the digital owner, who mainly was the Chief Digital Officers, established Centres of Excellence to execute the work. Members of the Centre of Excellence were seconded from various business units. This finding speaks directly to Maedche (2016)'s recommendation that functions must work together while the Chief Digital

Officer drives digital transformation adoption (Kunisch et al., 2020; A. Singh & Hess, 2017). The research findings also showed that the executive teams in the digital Centres of Excellence were using agile methods for rapid experimentation and deployment of digital products and services. In addition, findings showed that such execution teams reported to the board through various sub-committees. Management followed the Delegation of Authority to the board of directors to seek approval to upscale digital initiatives that had successful proof-of-concept. Research has shown the need for the rapid deployment of digital products and services and the benefits of the first-mover advantage from digital adoption (Chanias et al., 2019). First-mover organisations are seen as the most innovative in the industry (Chanias et al., 2019).

7.6 Processes used by boards in pursuit of ambidexterity

This thesis answered the question, *"How do boards of directors explore and exploit in the context of digital transformation?".* Based on the above analysis, the first novel contribution to the organisational ambidexterity and corporate governance literature is the presentation of the processes used by boards of directors in pursuit of organisational ambidexterity in the context of digital transformation.

Given the research findings presented in the previous chapter, this thesis can conclude that boards direct the way exploration and exploitation happen in an organisation, in the context of digital transformation. The figure below is the recommended board process, consolidated from the findings in cross-case analysis and arguments in extant literature. The figure shows processes with activities that will be performed through four stages of the recommended digital adoption journey.

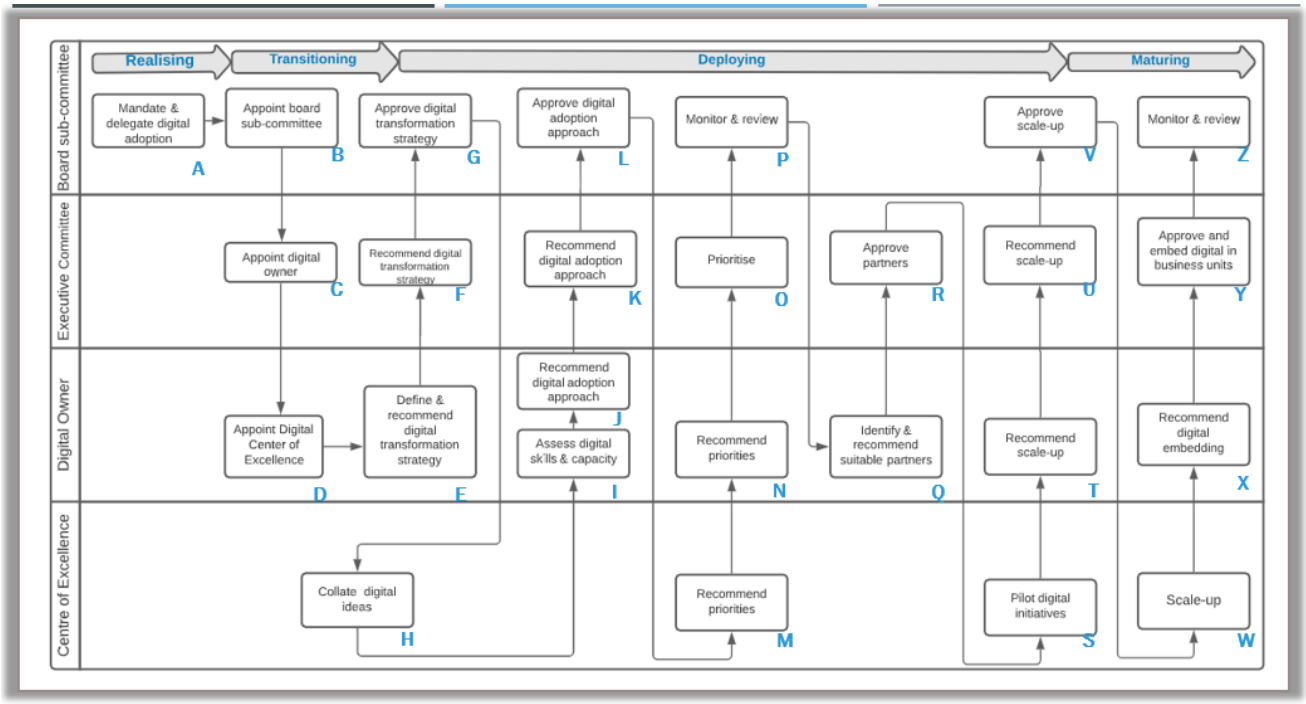


Figure 24: Process for boards of directors in pursuit of ambidexterity in the context of digital transformation

The proposed processes show that **A)** an organisation goes through the realisation of the need for digital transformation. **B)** The board then appoints a sub-committee or mandates an existing committee to lead the adoption process. **C)** Most organisations then appoint a digital owner, mostly a Chief Digital Officer, a newly emerging position that focuses on rolling out digital transformation. This marks the beginning of a transitioning process to digital adoption. **D)** The use of structural ambidexterity has been common, especially for immature organisations. They appoint a Centre of Excellence, a dedicated and digitally skilled team constituted by members from across the organisation, focused on developing and deploying digital products and services. **E)** Although this was not observed in the cases, based on extant literature, it is recommended that the Chief Digital Officer works with the Centre of Excellence to produce a Digital Transformation Strategy. **F & G)** The strategy, which articulates strategic priorities among other things, goes through approval by the executive committee, board sub-committee and the board. Approval of the strategy marks the end of a transitioning process and the beginning of the deployment stage. In parallel, the approving committees will manage and lead the usual business, characterised by exploitative initiatives. Both the executive committee and the board continuously monitor the balance of exploration and exploitation based on environmental changes. **H)** The Centre of Excellence collates ideas for digital

initiatives from different sources. **I)** The Chief Digital Officer initiates a digital skills assessment for the capability to deliver identified initiatives then recommends a digital adoption approach. **J, K, L**) The recommendations are approved by the board. **M, N, O**) Prioritising digital initiatives is essential for balancing resources between exploration and exploitation. No organisation has infinite resources. At this stage, each organisation can define a prioritisation matrix in the context of its environment. The priorities are presented by the Chief Digital Officer, for approval through the Executive Committee to the board sub-committee and the board. **P)** The board sub-committee monitors and continuously reviews the balance of exploration and exploitation based on internal and external environmental changes. **Q)** Organisations use digital partnering to address digital skills shortages and leverage the partners to deliver digital products and services expediently. Therefore, they identify and make use of suitable partners and alliances to deliver prioritised initiatives. **R)** The board reviews proposed partners as they may expose the organisation to different risks. Approval to appoint partners can also be at the board sub-committee and board depending on the level of envisaged risks. **S)** Digital initiatives have been shown to have a high risk of failure. Therefore, it is crucial to perform digital piloting, which is done with minimal possible resources. **T, U, V**) The board approves scaling up initiatives that are successful in piloting. **W)** Once approved, the board releases funding and other resources and the initiatives are then rolled out across the relevant business units. **X, Y)** Organisations must identify strategies to embed each digital product and service in their stakeholder's processes. This includes re-skilling relevant stakeholders. **Z)** Lastly, the board continuously monitors the digital strategy's delivery, makes improvements based on lessons learned, and makes dynamic decisions in instances where the environment calls for changes.

An organisation matures in its digital transformation process through various iterations of digital adoption and continuously improves its processes. Therefore, this thesis recommends this as the process that boards of directors use in pursuit of organisational ambidexterity in the context of digital transformation.

7.7 Digital adoption framework

Based on the evidence from cross-case analysis and gaps in literature, the researcher introduced the second contribution to the body literature for organisational ambidexterity, a digital ambidexterity framework. Organisations must continually monitor the environment and devise ways to remain competitive in the wake of digital transformation or face existential threats (Sebastian, Moloney, et al., 2017). This thesis found that organisations must first

realise the digital environment in which they are operating and the risks caused by failure to respond to digital transformation. While other organisations started early, they went through iterations of learning and re-adjusting. Based on the research findings, this thesis introduces a framework that different organisations can use to explore and exploit. Using this framework in practice will provide guidance and related steps that other organisations have proved effective as they refined the pursuit of ambidexterity in the context of digital transformation.

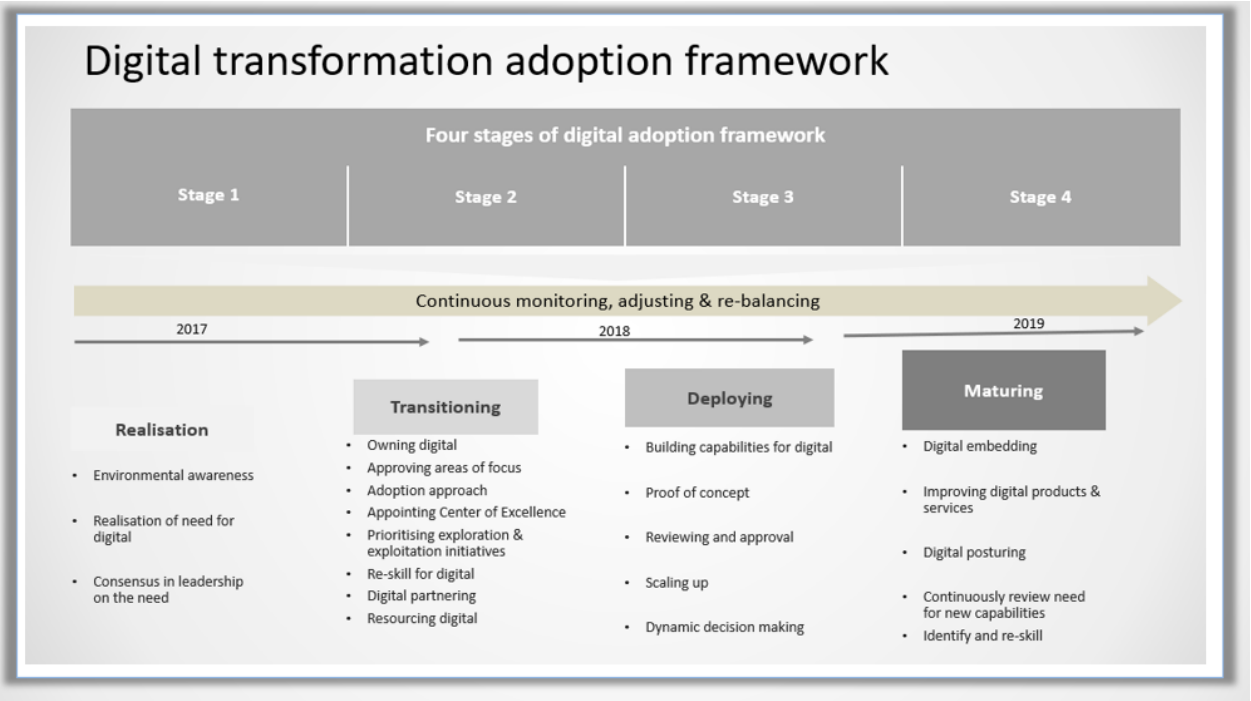


Figure 25: Digital ambidexterity framework: Researcher's conceptualisation

Stage 1: Realisation

Digital transformation affects industries in different ways (Appio et al., 2021) and continued awareness of what is happening in the environment is critical. The six cases went through realisation in different ways because digital transformation affects organisations in different ways and there is no understanding of which organisational choices are more effective for traditional organisations. Four of the six cases started investigating the need for digital transformation following the World Economic Conference of 2017, which was anchored on the 4th Industrial Revolution driven by digital transformation. Other cases realised the need for digital adoption when customer expectations changed. They needed different strategies to grow the business or lose their competitive advantage, "watched competitors eating their lunch" as one board member presented it.

Given the disruptive nature of digital, this thesis presents that there must be a consensus between the board and management on the need to capitalise on the new business models that are presented by digital (Warner & Wäger, 2019). For example, Theta and Zeta started simulating their portfolio and offered the products and services online, presenting what industry and empirical studies have coined "The Digital Twin". An organisation's digital twin represents data flows, assets, people activities and their interactions on a digital platform, and it evolves as the organisation evolves (Parmar, Leiponen & Thomas, 2020). Similarly, Theta realised that it needed to reposition itself to compete in the digital economy by investing in new capabilities and positioning itself as the digital leader (Sebastian, Moloney, et al., 2017). The organisation launched the Managed Evolution programme.

Therefore, based on the patterns that emerged from the data, this thesis concurs with Von Leipzig (2017), that digital is not about technology but strategic and cultural changes in the organisation. The conclusion, therefore, is that upon realisation, there must be consensus in the organisation for digital adoption and the need to leverage the opportunity to change business models.

Stage 2: Transitioning

The transitioning stage lays out the foundation for digital transformation and defines the priorities and delivery approach of the digital programme. The findings showed that as the organisation transitions into the adoption of digital transformation, there is a need to appoint a digital owner.

The thesis found that organisations that failed to appoint a digital owner in 2017 and continued to pay lip service on digital transformation had minimal tangible results by end of 2019. In unison with Tumbas et al. (2018), the thesis presents the emergence of the digital owner, the Chief Digital Officer, as a key step in the transition stage. The Chief Digital Officer is one of the nascent leadership roles that has emerged due to digital transformation. The cases in this research showed that it meant different things to different organisations (Tumbas et al., 2018). Echoing Kunisch, Menz and Langan, (2020)'s observations, a Chief Digital Officer was appointed as the digital owner in four of the cases. The other two had Chief Executive Officer and Chief Information Officer as the custodians of digital transformation. Synonymous with Kunisch et al. (2020)'s findings which observed that the Chief Digital Officers had different roles, this thesis observed different backgrounds for each digital owner, which was not necessarily Information Technology. This thesis, therefore,

differs from past studies in that the role played by the Chief Digital Officer should not simulate mimicry behaviour. However, it must be empowered to lead the organisation through the four phases of digital adoption to leverage the business opportunities presented by digital transformation.

The appointed digital owner then champions the adoption approach, assessing resources from various business units, with the assistance from the relevant executives for capabilities that already exist in the organisation (Dremel et al., 2017; Hess et al., 2016a). A Centre of Excellence is appointed, constituted by digitally skilled resources from each business unit. In his interview in June 2016, Nilles, the Chief Digital Officer of Schindler and Chief Executive Officer of Schindler business, alluded to a need to break the silos and work closely with other business units for digital adoption to be successful (Maedche, 2016). In fact, in Theta, the digital owner demanded that the relevant Business Executive must be a member of the Centre of Excellence or the second in charge; otherwise, digital transformation will not be rolled out in that business unit. This is consistent with literature that posits that when it comes to digital transformation, it is not about adopting technology but about organisational strategy, and therefore business management must find ways to capitalise on the opportunities for new business models and optimise customer needs and experiences (Warner & Wäger, 2019). Consistent with extant literature, the Centre of Excellence is a separate unit that creates a sense of independence from the rest of the organisation and still leverages its knowledge of the business (Maedche, 2016). It is not there to enable digital capabilities only and provides advisory services for the related business units. This ensures that digital transformation is part of the business strategy and, therefore, a key focus area for implementation (Correani, De Massis, Frattino, Petruzzelli & Natalicchio, 2020). The Centre of Excellence identifies elements of the organisation's business model that can be digitised. Extant literature refers to this model as the digital business strategy (Mithas et al., 2013).

This research presents that the digital owner is the link between the mandate to adopt digital transformation from the board and the delivery thereof. The Chief Digital Officer works with the Centre of Excellence to identify digital opportunities in each business unit, extant skills and present priorities. Digital transformation entails redefining the business model and requires employees who possess specific skills and capabilities to fully seize the opportunities created by digital transformation (Correani et al., 2020). This thesis had insights into the challenges that all the cases had with internal digital skills.

An example was observed in Theta, where Managed Evolution was delivered at a very slow and prolonged pace, not as fast as expected, yet there was pressure to meet customer expectations and maintain the market share (Saarikko et al., 2020). The pace was inconsistent with recommendations from extant studies, which argue that digital transformation requires an accelerated pace (Hossnofsky & Junge, 2019). In the same breath, digital transformation is argued to be a business strategy and not a technology strategy (Holotiuk & Beimborn, 2017; Leischnig et al., 2017), yet Theta had positioned its digital programme as a technology programme. The organisation quickly changed their approach, appointed a Chief Digital Officer, and introduced a new digital programme which they called FastDigital, which had shorter and faster delivery cycles of business products and services.

When adopting digital transformation, new roles emerge as seen in the six cases. The most senior role that reports to the board is the Chief Digital Officer. This was a new role in the cases studied, and was responsible for the implementation of digital strategy, reporting to the board sub-committee. The Centre of Excellence, which is the execution team, and its team leaders, mainly from the business units, lead digital initiatives and report to the Chief Digital Officer.

The people in these teams are subsequently re-absorbed into the business units when their work assignments in the digital workstream are completed. This corroborates and presents evidence of Yeow et al. (2018)'s observation that new roles emerged due to digital transformation, and business resources were taking the lead in technology-intensive projects. As a result, as part of the digital adoption framework, organisations should establish a programme to re-skill their staff for digital transformation. Organisations must create methods of retaining such skills to minimise attrition and related loss of skills, as observed in two cases. Though the thesis falls short of inductively interrogating the organisations on the details of the digital skills required, it provided an empirical basis for further research into digital skills and how these can be developed.

In order to shorten launch cycles for the new digital product and service, the findings showed that organisations should identify suitable strategies for both internal and external resourcing models (Ismail et al., 2017; H. Li et al., 2019). Adopting suitable external models allows the organisation to leverage the expertise of the external resources and rapidly deploy the products and services (H. Li et al., 2019). All the organisations under study

identified leveraging internal capabilities as an internal model. However, the cases also used a plethora of strategies, including takeovers, partnerships and outsourcing during the transition stage, thus corroborating Ismail et al. (2017)'s research findings. For example, Theta used both outsourcing and partnering, Zeta, Alpha and Beta primarily focused on partnering while Gamma used takeovers. Delta was still at an early stage of the framework and therefore had not established the strategy for its external model. This thesis, therefore, recommends the use of a combination of internal and external resourcing, which is consistent with extant research, which has shown that well-established business partnerships are effective for the implementation of digital transformation (Ismail et al., 2017).

Based on the risks of partnerships observed during data analysis, this thesis recommends that organisations must devise strategies that minimise risks and unintended consequences emanating from digital partnering, alliances, and mergers. This thesis showed that Gamma had digital products and services developed by the company that it acquired. However, Gamma's internal staff could not sell the digital products and services due to inadequate skills and knowledge of how the digital products and services were developed. Similarly, Theta, which outsourced about 60% of its digital business, could have unintended consequences if a competitor buys the company, its relationship with partners changes or the partner changes. This risk was raised during interviews. Zeta was clear that its partners, FinTechs, presented a business risk if acquired by a competitor.

Lastly, during the transition period, when the board of directors has approved the adoption approach, the priorities are determined, relevant teams are established, and partners are identified, the organisation can establish a budget for digital transformation. This thesis contributes to the literature by presenting all six cases as examples of where digital transformation comes with value optimisation, primarily from process efficiency, new business models and improved customer experience. This value from digital transformation comes with substantial costs and a high risk of failure, supporting current literature (Hossnofsky & Junge, 2019). Although extant research is not clear on the exact costs that are associated with digital transformation, this thesis sheds more light by showing that the costs include, but are not limited to, the high cost of digital skills, the cost of partnerships and digital technology. All the cases consistently showed that there were challenges with obtaining digital skills, and where an organisation manages to get such skills, the cost was exorbitant. This is an area of further study to identify the causes of poor

digital skills and to mitigate this (Laar et al., 2019). In view of the associated costs and risks, this research recommends that the board of directors must approve digital initiatives before teams embark on the work. Results confirm that the board must continuously review the allocated budget for exploration and exploration to align with environmental changes.

Stage 3: Deploying

Having realised the need for digital, and gone through the transition process, organisations transcended into the deployment stage. The appointed teams and partners work with the digital owner, reporting to the Executive Committee, board sub-committee and the main board as they embark on the digital journey. This is when the appointed teams start building digital capabilities in the organisation. Given the high risk of failure that is synonymous with digital initiatives, and the cost, this thesis argues that boards mandate proof-of-concept first before full-scale developments. Results showed that proof-of-concept allows the relevant teams to develop the digital concept on a small scale and validate its feasibility before scaling up to the rest of the organisation. Proof-of-concept not only confirms the feasibility of the concept but ensures that finances are only invested in viable projects, thus mitigating the risk of failure. The initiatives that have been through a successful proof-of-concept can be scaled up to the intended business areas.

Relevant committees, up to the board, review and approve scaling up and release of funds in line with the delegation of authority. Scaling up is argued to be the primary driver of profitability as it drives up production, and lowers the unit of production enhancing profitability (Bharadwaj et al., 2013). Organisations can assess and use different strategies for scaling up digital solutions, which will depend on, among other things, the type of solution, its stakeholders, internal skills, and resources.

This thesis observed that boards of directors make dynamic decisions throughout the digital transformation process. In this case, organisational leaders would review both explorative and exploitative initiatives, compare with the environment and compete for current and future demands of the business, and decide whether there is a need to review resources (Smith & Smith, 2015). Although the dynamic decision-making process is under deployment, it is a process that should occur in the transitioning, deploying, and maturing stages. The process then goes into a maturing stage.

Stage 4: Maturing

This thesis reports that when digital products and services are scaled-up, the next step is to ensure that the digital processes are embedded in the organisation to ensure optimal use. Organisations can use different tools and processes, and boards and management must enforce a culture of using new products and services. Leaders across the organisation must be involved. Embedding digital is critical because it ensures that value is derived from the investment made in digital products and services. Any such programmes for embedding digital should run across all stakeholders to increase adoption. One of the cases, Theta, partnered with Linkedin to roll out the use of digital products and services and ensure that the practice was embedded. Once digital products and services are embedded and have become part of daily business, the Centre of Excellence can be dissolved and reconstituted as and when a need arises. At this stage of maturity, the expectation is that business units can identify digital opportunities on their own and have some skills to develop such products and services. The Centre of Excellence will deal with opportunities where such capabilities do not exist in the business.

Synonymous with the observation that nothing breeds complacency like success (Tushman & O'Reilly, 2016), this research presents that the released products and services are then continuously reviewed and improved, similar to other products. This can be an iterative process that accommodates changes and improvements, based on feedback from stakeholders.

Results showed that some of the cases took their products for competitions and won awards. There was a drive through the three years that the study focused on to maintain those awards. Therefore, the organisations were seen to be posturing for digital to maintain the awards for a prolonged period. Similarly, results showed that the level of reporting on digital transformation in some companies' annual reports did not match the evidence of the products and services released, thus digital posturing. The same was observed in the case that was aborted, where the organisation implemented two robots at one of its sites in 2007, and there was no further work on digital transformation, yet the annual report continued to report on the adoption of digital transformation.

This thesis argues that the board and management should continuously monitor the market and assess digital risks and opportunities, and capabilities that the organisation should

enable. It is through such monitoring processes that areas for re-skilling staff for digital will be identified. Although the monitoring practice was seen in Theta and Zeta only, the products and services that the organisations had released, their market position in digital showed temporal maturity in digital.

The thesis showed that as an organisation matures into digital transformation, different cultures started emerging after the first few cycles of releasing digital products and services. Theta particularly commented on the organisation's traditional compensation methods, which needed to be re-aligned. The difference in culture aligns with Markides' (2013) recommendations to allow different cultures to emerge from the separate units, but the organisation must have a strong shared vision that should unite them.

Ambidexterity is founded on the organisation's ability to maintain its operational backbone and digital transformation, exhibited by the cases under study (Sebastian, Moloney, et al., 2017). Although this framework focused on digital transformation, results have shown that the cases continued to exploit as they delivered the business strategy, maintained existing systems, and ensured regulatory requirements were met. In unison with the literature, the results showed that banks faced increasingly stringent regulatory requirements (Gregory et al., 2018), and therefore, continuous exploitation was at the fore. As organisations try to bring the balance between exploration and exploitation, it must be noted that a balance of exploration and exploitation does not mean equal allocation of resources to each of the two strategies but an optimal point of balance between the two strategies (Harvenmans, Harton, Keegan & Uhi-Bien, 2015).

7.8 Conclusion

In conclusion, in a quest to answer the research question, "How do boards of directors explore and exploit in the context of organisational ambidexterity, this research made significant findings that inform contributions to the body literature and practice. Firstly, the research consolidates the activities that were performed by the board and introduced a process map they can use as they explore and exploit. In the same breath, this research introduces a digital adoption framework that can be used to drive the adoption of digital transformation across organisations. The framework is based on four stages that boards under study went through as they explored and exploited in the context of digital transformation.

Furthermore, the analysis uncovered additions to Simsek et al., (2009)'s typology. Firstly,

contrary to the assertion that each organisation uses one type of ambidexterity, boards used inter-dependent structures when exploring and exploiting which their execution teams used inter-dependent structures, thus two different types of ambidexterity.

Secondly, in the cyclical ambidexterity that was observed, exploration and exploitation are simultaneous, unlike the sequential argument presented by Simsek et al., (2009). This is a novel contribution that extends the anchor research on types of organisational ambidexterity. It was also observed that the board reviewed its processes, triggering changes as and when required, which is synonymous with dynamic decision making (Smith, 2014). The following chapter summarises theoretical and practical contributions based on the findings from this research.

CHAPTER 8: SUMMARY FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

8.1 Introduction

The previous chapter examined the research findings in view of extant. Extant research concluded the following on organisational ambidexterity and boards of directors that are pertinent to this research. First, literature on ambidexterity argues that organisations must balance exploration and exploitation for it to succeed. Although there have been conflicting views on the effects of exploration and exploitation, evidence from extant research suggests that organisations that balance the two competing strategies, exploration and exploitation, are associated with a positive performance (Derbyshire, 2014; Raisch et al., 2009; Wei et al., 2014). Exploration and exploitation are argued to be two conflicting strategies competing for finite organisational resources, and balancing these resources is argued to be a challenge. How then do organisations become ambidextrous?

Second, ambidexterity literature recognises the role of leaders (Jansen et al., 2008, 2009; Mom et al., 2009; Porfirio et al., 2021, Yokoi et al., 2019). Managers are advised to balance exploration and exploitation with caution to stay adaptive, monitoring the environment so that they can adjust and align with environmental conditions (Chai & Zhang, 2017). Research has also illuminated how individuals explore and exploit (Bonesso et al., 2014; Brockner et al., 2006; Papachroni & Heracleous, 2020). There has been a paucity of research on how boards of directors explore and exploit, yet they are at the top of organisational leadership (Oehmichen, Heyden, Georgakakis, & Volberda, 2017; Probst et al., 2011; Rejeb et al., 2019). Research has focused on understanding how individuals and managers explore and exploit in the context of digital transformation. In view of the costs, risk of failure and impact of digital transformation on business models, any transformation project should be approved by the board, and get buy-in at all levels for it to succeed. As far back as 2012, there was already growing evidence that boards that provide sound digital leadership financially outperform their peers and are up to 26% more profitable and enjoy greater market valuation (Westerman et al., 2012).

Third, the role of boards of directors is to help the organisation create a sustainable advantage for the long term (Main et al., 2018). Boards are argued to play a critical role in organisational strategy (Klarner et al., 2020), but there is no clarity on how they achieve this. It is imperative to understand how boards, whose processes are known as the black box of research (Zona &

Zattoni, 2007), achieve ambidexterity. In the past, Corporate Governance research on boards of directors focused on the role of boards (Oehmichen, Heyden, Georgakakis, & Volberda, 2017), board diversity (Triana et al., 2014), and how boards engage in innovation (Klarner et al., 2020; Rejeb et al., 2019), and not extended to organisational ambidexterity. However, minimal attention has been paid to how boards of directors become ambidextrous. Recent studies concluded that ambidextrous innovation is positively associated with the board's service role, yet there is still no clarity on how boards achieve this important role.

Third, in the current environment, pre-digital successful organisations are now facing existential threats (Chanias et al., 2019). Organisations established on digital platforms, known as "born digital", have surfaced and compete with traditional pre-digital organisations. There is pressure to alter the existing business models and portfolios of products and services to offer the demanded personal flexibility (Saarikko et al., 2020) (Li, 2018). In light of these disruptions, organisations must find ways to remain competitive and survive (Sebastian, Ross, et al., 2017). In the same breath, research argues that digital transformation can be used to achieve organisational ambidexterity (Li et al., 2017; Svahn et al., 2017). Studies have shown that 66% to 84% of digital projects fail, which is a sizeable percentage, considering the cost of establishing digital transformation projects (Cennamo et al., 2020). Some reports have shown that 54% of organisations acknowledge that they do not have digital competencies, which impedes their ability to adopt digital transformation. The demand for such skills outweighs the supply (Kerkmann, 2019).

Given such challenges, how do boards of directors, challenged with achieving ambidexterity for long term sustainability, direct organisations to adopt digital transformation?

This thesis contributes to corporate governance literature on ambidexterity and the organisational ambidexterity body of knowledge by shedding light on how boards of directors explore and exploit in the context of digital transformation. The answer to the primary research question was obtained after following a comprehensive research methodology is, "How do boards of directors explore and exploit, in the context of digital transformation?".

In order to answer the research question, this study analysed archival data from 2017 to 2019, data from interviews with board members and executives, and observations to illuminate processes and related nuances as boards of directors explored and exploited in the context of digital transformation. The research objectives of this study therefore were:

- To understand the processes used by boards of directors as they explored and exploited

using temporal ambidexterity in the context of digital transformation.

- To understand the processes used by boards of directors as they explored and exploited using structural ambidexterity in the context of digital transformation.
- To understand the processes used by boards of directors as they explore and exploit in the context of digital transformation.

This thesis answered the primary research question, "*How do boards of directors explore and exploit in a digital environment*"?

A systematic review of organisational ambidexterity and boards of directors literature was conducted to understand the body of knowledge in this regard and shed more light on what was known and what was not known, thus identifying the research gap. In order to answer the research question, this thesis used the research design and methodology that is outlined in the following section.

8.2 Research design and methodology

The results of this thesis are based on the strengths of a multiple case study that interrogated the processes of six organisations listed on the Johannesburg Stock Exchange. The primary source of data was interviews with boards members and executives; both groups were also referred to as 'elites' in literature. Secondary data was from archival data and observations. The research used guidance from elite interviews and performed a content analysis on archival data in preparation for the interviews with the board and executives. The typology informed the research questions of organisational ambidexterity proposed by Simsek et al. (2009) to craft questions used in interviews with board members and executives. During this process, it was evident that the literature's assertion that board members are difficult to access is true (Klarner et al., 2020; Leblanc & Schwartz, 2007; Minichilli et al., 2009). The interviews were conducted both in-person and remotely, owing to the forced lockdown necessitated by the COVID-19 pandemic and the unavailability of some board members. There were insignificant differences that were noticed in the remote and face-to-face interviews, which did not affect the collected data.

Data from interviews was corroborated with the other interview participants from the same organisation, and archival data were collected for the period 2017 to 2019, which was the research focus. As recommended when conducting elite interviews, triangulation and corroboration were done by combining the data from interviews with different participants of

the same organisation with a review of archival data (Natow, 2020). The data from the interviews was captured in the Atlas ti data analysis system. The data went through an abductive analysis which led to codes, categories and themes being generated. These were used to perform within-case and cross-case analyses that then reflected various patterns across the data. These patterns from the data led to research findings discussed in the previous chapter and summarised in the next section. The following section also presents the theoretical and practical contributions. The section ends with recommendations for future research.

8.3 Summary of research findings

In order to answer the main research question, *"How do boards of directors explore and exploit in the context of digital transformation?"* the thesis presented four research questions as structured in the table below. The empirical findings are summarised alongside each of the questions in the table below.

Table 16: Summary of research questions and answers

Question No.	Research question	Summary of the research answer
How do boards of directors pursue organisational ambidexterity in the context of digital ambidexterity?		
1	How do boards of directors explore and exploit using temporal ambidexterity in a digital environment?	Boards of directors use simultaneous ambidexterity from the onset. Boards of directors used simultaneous ambidexterity when especially when they realised that they were behind with digital adoption, thus exploration, and still needed to improve existing products and services, exploitation. It was evident that the two, exploration and exploitation were indeed competing for organisational resources.
2	How do boards of directors explore and exploit using temporal ambidexterity in a digital environment?	Boards of directors use inter-dependent structures at their level and the implementation teams use independent structures, thus partitional ambidexterity. Therefore, organisations do not use one type of ambidexterity as argued by Simsek et al., (2009)
3	How do boards of directors determine the level of resources to allocate for exploration and exploitation when operating in the context of digital environment?	Literature posits that balancing resources does not necessarily mean same number of resources for exploitation and for exploration. Boards of directors for the cases studied employed different methods to balance resources. These included prioritising initiatives, mandating proof-of-concept and scaling up digital initiatives that had had successful proof-of-concept. In addition, boards reviewed the resource allocation regularly to ensure continued alignment with environmental changes.
4	What types of ambidexterity emanate from the board's processes as they pursue ambidexterity in the context of digital transformation?	Boards of the cases under study largely used harmonic ambidexterity while the implementation teams used partitional ambidexterity. However, in one organisation that was mature in its digital adoption, new digital initiatives were identified in monitoring cycles. These were adopted using independent teams. However, exploitation initiatives would continue to run with exploration. Thus this research extended Simsek et al., (2009)'s typology by identifying the new type of ambidexterity.

The research findings are structured such that responses for question 1, temporal ambidexterity, and question two on structural ambidexterity are combined to show the typology that was used, thus leveraging on Simsek et al., (2009)'s typology of ambidexterity.

8.3.1 Theoretical contributions

a. Typology of ambidexterity

This thesis used the typology of ambidexterity to guide with answering the following research questions:

1) How do the boards of directors explore and exploit using temporal ambidexterity in the context of digital transformation?

2) How do the boards of directors explore and exploit using structural ambidexterity?

3) How do boards of directors determine the level of resources to allocate to exploration and exploitation in the context of digital transformation?

4) What types of ambidexterity emanate from the board's processes as they pursue organisational ambidexterity in the context of digital transformation?

Simsek et al. (2009)'s typology presents four types of organisational ambidexterity: partitional, cyclical, reciprocal, and harmonic. This research found that boards of directors used harmonic ambidexterity consistently. Partitional ambidexterity was mostly observed in execution teams, where organisations had just started the journey to adopt digital transformation or were in the process to transition to start the digital adoption. Execution teams predominantly used partitional ambidexterity. Conversely, cyclical ambidexterity was observed in one of the mature cases in its adoption of digital transformation, with digital skills embedded in the organisation.

In addition, this research observed a new case of ambidexterity, different from what was presented in Simsek et al., (2009)'s four quadrants. This was observed in Zeta. The organisation was at a stage where digital products and services were embedded in the organisation and were now being exploited. However, teams across the business units continuously monitored new opportunities in digital transformation. Where these arose, with a need for new skills and capabilities, the organisation established a Centre of Excellence and explored the opportunities. In parallel, the rest of the organisation would be in exploitation, thus intermittent cycles of long cycles of exploitation and bursts of concurrent exploration and exploitation. This observation birthed a new type of ambidexterity, long periods of exploitation with intermittent exploration and exploitation.

This thesis, therefore, extends extant literature by presenting that boards of directors used harmonic ambidexterity as they directed organisations to be ambidextrous in the context of

digital transformation. This research also presents that organisations that started adopting digital transformation used partitional ambidexterity at execution levels to implement board decisions on the adoption of digital transformation. In addition, the thesis makes a novel contribution to the body of knowledge on organisational ambidexterity by introducing a different type of ambidexterity, where sequential and simultaneous ambidexterity was alternated within the same organisation. This thesis then argues that organisations that have matured in digital adoption use a different typology that is not represented in Simsek et al. (2009)'s typology of ambidexterity.

8.4 Contribution to body of knowledge

This thesis is based on a multiple case study of organisations listed on the Johannesburg Stock Exchange in South Africa. The study is used to gain insights into processes used by boards of directors based on data collected from different sources. The research makes the following key contributions to theory and practice.

8.4.1 Theoretical implications

The board's role in enabling ambidexterity and the process that they follow is not fully reflected in the current literature due to the paucity of empirical studies examining how leaders achieve organisational ambidexterity. The research applied the extant theory on organisational ambidexterity to the emerging phenomenon of digital transformation and made the following novel contributions.

The **first** theoretical contribution is to extend the literature on the role of boards of directors by introducing ownership for adopting digital transformation at the board level. Literature has debated the role of the board in organisational strategy. The debate is still inconclusive about whether the board contributed directly, or whether they monitor what management has defined. However, research on digital transformation has shown that if boards do not own and direct the adoption of digital transformation, there will be no organisation to direct. In fact, boards should direct the resources allocated to exploration and exploitation, reviewing these allocations continuously to ensure continued alignment with the environments.

Digital strategy is argued to be the business strategy. Digital transformation is risky and costly, and can take time to bring value. It can transform not only the organisation but industries over time. This research joined other researchers that warned of the demise of the company by ignoring the proliferation of digital technologies. This research gave examples of modern-day

digital natives that have brought down business giants like Borders, Eastman Kodak, compact disc players, music and hotel industries. Others that fail to turn the digital clock will follow suit. While it may have been out of ignorance of the board, the overwhelming evidence in the market makes it inexcusable for the board not to direct the organisations' digital transformation. The adoption of digital transformation cannot be left to the responsibility of executives, whom literature has shown as interested in short term achievements because of their tenure and associated compensation. As such, given that the board is responsible for the direction and leadership of their organisations, this research concurs with arguments that the board of directors is accountable for digital transformation in their organisations.

Now that the board has a clearly defined role to play, research laments the lack of detailed insights into how boards execute their responsibilities. The **second** novel contribution of this study is to board process literature, commonly known as the black box of research. The **resource-based** view advocates for the board's involvement in providing strategic advice, providing information, resources, and counsel (Zona, Gomez-Mejia & Withers, 2016). This research introduced a process model describing how boards of directors, in concert with leadership and relevant teams, explore and exploit in the context of digital transformation. The novelty lies in the introduction of the group level of analysis at the board level into the ambidexterity literature, which until now, had only considered the individual and organisational levels (Simsek et al., 2009; O'Reilly & Tushman, 2013; Brix, 2019).

The model outlined in Chapter 7 of this research illuminates the step-by-step process that the board undertakes when they realise a need to adopt digital transformation, from cradle to grave. In this process, the board is accountable for the adoption of digital transformation. It delegates the responsibility to a board sub-committee, which appoints a digital owner, the Chief Digital Officer, to define and implement the digital strategy, reporting to the sub-committee and the board. The board approves the strategy itself, priorities, and proof-of-concept. The proof-of-concept is critical because most digital initiatives are new and unique, not tried and tested like other technologies. As such, it is known that most digital initiatives fail. The proof-of-concept is a way of preserving scarce resources of the organisation that need to be balanced for ambidexterity to be achieved. The board releases funds for initiatives that have successfully gone through a proof-of-concept. Such initiatives are then scaled up and embedded in the organisation's processes. Therefore while proof of concept is not a new phenomenon, this research's **third contribution** is to posit that boards of directors must mandate proof-of-concept as a precursor to developing fully-fledged disaster recovery.

The defined process shows the interactions that boards have with the top management team while executing their steps. This contribution enhances the understanding of how boards of directors achieve organisational ambidexterity in the context of digital transformation. Although extant studies confirm that board processes influence board effectiveness in performing their tasks, there are very few documented processes because of the board's inaccessibility. It also explains why literature has lamented the quantitative research on boards of directors, advocating qualitative research. The f**ourth contribution** is that the process documented emerged from first-hand information collected from board members and other participants' first-hand experience on how they directed their organisations to adopt digital transformation.

In parallel to the introduction of a defined board process, a **fifth** theoretical contribution from this research is the introduction of a digital adoption framework that boards of directors can use as they direct organisations to explore and exploit in the context of digital transformation. The contribution is a timeline framework that identified timely board practices that an organisation can adopt over a given period as they direct organisations to adopt digital transformation. The framework supports the defined board process and guides, with details, granular activities as an organisation's temporal progression in its digital adoption. The framework articulates that when the board goes into **realising** the need to adopt digital transformation, it goes into a **transitioning** period, where different activities are performed to get the organisation ready. This stage involves the definition of roles and responsibilities. While the board remains accountable, the responsibility to implement is assigned to a digital owner, the Chief Digital Officer, and a board sub-committee is responsible for directing and monitoring the implementation. During the deployment stage, a lot of attention is paid to digital embedding to ensure adoption. The organisation then moves into **maturing** the digital practice.

The **sixth one is a novel** contribution that extends Simsek et al. (2009)'s typology of organisational ambidexterity. Simsek et al. (2009) argued that an organisation could use one of four possible types of ambidexterity, harmonic; partitional; cyclical and repetitive ambidexterity. However, based on empirical evidence, this research concluded that there could be more than one type of ambidexterity that an organisation can adopt at a given time. Boards of directors used harmonic ambidexterity while the rest of the organisation adopted different types of ambidexterity. The research observed consistent use of harmonic ambidexterity at the board level, which consolidated the focus for exploration and exploitation, adjusting resources

where necessary, to create a balance in the organisation. An example of where such an adjustment was made was at the inception of the COVID-19 pandemic, when organisations realised the need to allocate resources to survival and enabling digital business.

In addition to the four typologies of organisational ambidexterity observed by Simsek et al. (2009), this research observed two additional types of ambidexterity. The first one was observed in an organisation where digital transformation was embedded in the organisation's processes and the organisation had matured in its digital practices. In this case, the organisation had long cycles of exploiting the digital capabilities embedded in its processes. However, exploration started when there was a need to introduce digital skills and capabilities which did not exist in the organisation. However, when executing, the cycle of exploration was simultaneous with exploitation, contrary to Simsek et al., who argued that organisations pause exploitation to pursue exploration. According to Simsek et al., there are long periods of exploitation with bursts of simultaneous exploration that are not represented in Simsek et al. (2009)'s temporal ambidexterity. However, this research observed that these processes were simultaneous.

In addition, Simsek et al. (2009) posit that ambidexterity can be achieved through either independent or inter-dependent structures. This research observed that an organisation that was similarly mature, but continued to seek new digital ideas, had created a unique structure to achieve this. The organisation had a Centre of Excellence, which serviced all departments with digital ideas, knowledge, and skills. In parallel, each department had a Centre of Excellence that performed department-specific digital research and fed new ideas to the central Centre of Excellence. This structure created a bi-directional knowledge sharing between departments and the Centre of Excellence, thus an independent and interdependent structure.

Following the extensions to Simsek et al. (2009)'s typology of organisational ambidexterity, which emerged from the context of digital transformation, this research concludes that how an organisation explores and exploits is contextual and is not fully represented in Simsek et al., (2009)'s typology.

Debate on methodology has shown that the research that is based purely on archival data does not reach the deepest patterns of directors (Huse, 2018). Yet research on boards of directors has largely been quantitative, mainly driven by the limited access to directors. Most research on boards of directors is quantitative, relying on published or readily available data.

The few researchers that conducted qualitative research used data observed from one board. This research makes a novel contribution to Corporate Governance and Information Systems literature by conducting one-on-one interviews with sixteen board members and executives, a group that is lamented not to be accessible. Qualitative research allows the researcher to get close to the data. This research, therefore, makes a significant contribution to the literature on Corporate Governance and Information Systems research by increasing the illumination of board processes, the black box of research, based on data collected from sixteen one-on-one interviews.

8.4.2 Practical implications

The **first** practical contribution that this thesis made, was to introduce a digital adoption framework that organisations can use at different levels of digital adoption. The framework is based on the evidence from what was practised in six cases over three years as narrated by sixteen participants. The framework echoes Kotter (1997)'s old research that posits that transformation is a process that advances through stages that build on one another until an organisation reaches maturity and goes into continuous improvement.

There is consensus in the literature that management needs a new mindset to adopt digital transformation. Literature goes on to argue that the incumbents must re-think their leadership education practices. While the focus on extant research was on senior management, it is inevitable that the boards of directors, accountable for directing organisations through digital transformation, also re-think their leadership and educational practices. The proposed digital adoption framework should form part of the foundational education that board members go through when they are appointed to any board.

Secondly, the board processes, which made a novel theoretical contribution, have practical implications. The board, and the rest of the organisation, operate with policies, procedures, and delegation of authority. The proposed processes can be used to inform the board's policies, become part of the core processes and contribute towards the definition of delegation of authority. Thus, proposed processes form part of key inputs to the board's governing documents. The organisation can conduct regular process awareness workshops to ensure continued relevance and consistent adoption among stakeholders.

Both the framework and processes can also be used by Corporate Governance Institutions that govern and/or provide training for boards of directors, including the Institute of Directors in South Africa and similar governance bodies. The use of a defined framework gives structure and should provide structure, reduce failures, and expedite the delivery of digital initiatives.

8.5 Limitations and future research

This thesis argued that boards of directors play an instrumental role in leading organisations to explore and exploit. As such, it was pertinent to understand how boards of directors explore and exploit in the context of digital transformation. The results present processes used by boards of directors, as seen from the evidence presented by sixteen participants representing the six cases from the Johannesburg Stock Exchange in an emerging economy. The research used data collected from a narrative of events that happened between 2017 to 2019. Although there were possibilities of re-call bias, the researcher used triangulation within participants and archival data to corroborate data to ensure data integrity.

Despite the noteworthy of the findings, this study has some limitations. Research has shown that antecedents of organisational ambidexterity in emerging markets include the Top Management Team and organisational context (Oliveira et al., 2022). Future research can investigate these antecedents on the board processes presented in this research.

In addition, emerging markets are not homogenous, there are significant variations across markets (Karolyi & Taboada, 2015). For example, while South Africa is an emerging market, it is the largest economy in Africa. However, its markets and practices would vary from China. Future research can therefore perform comparative practices in different emerging markets.

The cases in this study are organisations of different sizes from diverse industries, with evidence from one-on-one in-depth interviews with sixteen executive and non-executive directors, and other executives, archival reports and observations. The focus was on the companies listed on the Johannesburg Stock Exchange, which are governed by the King Codes of Corporate Governance. The results may be influenced by their empirical context. Future research could determine whether these results apply in a different context, where organisations are operating in a different governance regime.

The thesis showed that the role played by boards of directors in digital transformation differs across organisations. This thesis focused on organisations that had the mandate from the King Codes of Corporate Governance for the board to monitor developments in technology and ensure management of opportunities and effects on the business model (IoDSA, 2016).

However, results showed that in one of the cases where the founder was the largest individual shareholder and the Chief Executive Officer, non-executive board members had minimal involvement in digital transformation. The non-executive director re-iterated during interviews that non-executive board members were reactive to what management, led by the Chief Executive Officer, presented. Future research could also investigate to what extent ownership of the organisation in which the board is operating inhibits or strengthens its efforts to respond to environmental dynamism, particularly digital transformation.

Furthermore, the results of this study showed that the Chief Digital Officer played an instrumental role in the adoption of digital transformation, as evidenced by the appointments of four incumbents to this role in the six cases between 2017 and 2019. However, it was evident that the background and role of each of the Chief Digital Officers varied across organisations. Further research should investigate the background of the Chief Digital Officer and recommend the background that aligns with organisational contexts for increased success in digital adoption.

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APPENDIX A: Consent forms

APPENDIX A: CONSENT FORMS

Gordon Institute of Business Science
University of Pretoria

Informed consent for participation in an academic research study

Gordon Institute of Business Science

BOARDS OF DIRECTORS IN PURSUIT OF ORGANISATIONAL AMBIDEXTERITY: PROCESSES USED IN A DIGITAL TRANSFORMATION ENVIRONMENT

Dear Respondent

I am writing to you as a Board member/Executive Committee member of company ABC. I am a PhD student at GIBS and as part of my academic studies, I am conducting research that seeks to understand processes that are used by boards of directors as they direct organisations on how to balance operational strategies and new initiatives. My study focuses on examples of processes that the board of directors used when the company delivered digital initiatives to the market in the last three years. The results of this research will illuminate the processes used by boards of directors, especially in a digital environment.

I am therefore seeking your consent to perform interviews with yourself as one of the board members who has been involved in these processes. I will perform the interview at a place of your choice and the interview is expected to last an hour.

All information will be anonymised to ensure that both the respondent and the company can not be identified. Do not hesitate to contact me or my supervisor should you have any questions or require further clarification.

Precious Nyamugama

Email: 15393412@gibs.co.za

Tel: 082 816 3234

Professor Louise Whittaker

Email: Whittakerl@gibs.co.za

Tel: 27 11 771 4348

Signature of participant……Date ……

Signature of student ……..…… ……. Date ……

Dear Stakeholder/Gatekeeper

I am writing to you as the Stakeholder/Gatekeeper of the Board of company ABC. I am a PhD student at GIBS and as part of my academic studies, I am conducting research that seeks to understand processes that are used by boards of directors as they direct organisations on how to balance operational strategies and new initiatives. My study focuses on examples of processes that the board of directors used when the company delivered digital initiatives to the market in the last three years. The results of this research will illuminate the processes used by boards of directors, especially in a digital environment.

I am therefore seeking your consent to perform interviews with board members and/or board secretary who have been involved in these processes. The interview is voluntary and participants are free to withdraw at any time. The interview is expected to last an hour. Separate consent letters will be sent to the identified participants.

All information will be anonymised to ensure that both the company and the respondent can not be identified. Do not hesitate to contact me or my supervisor should you have any questions or require further clarification.

Precious Nyamugama

Professor Louise Whittaker

Email: 15393412@gibs.co.za

Tel: 082 816 3234

Email: Whittakerl@gibs.co.za

Tel: 27 11 771 4348

Signature of participant……. Date ……

Signature of student ……..……. Date ……

APPENDIX B: STRUCTURED INTERVIEW QUESTIONS

Section A: Introduction

I would like to begin the interview by confirming some information I gathered about you and your role on the board of this organisation. I already obtained some preliminary information from the organisation's website and the annual report, but I would want to validate the information with you.

1. Although I know your Name and Surname, I want to emphasise again that this discussion will be anonymised for confidentiality.
2. I read your personal profile in the company's annual report. What I could not ascertain is your term as a board member at the organization. How long have you been on the board of this organisation? Do you hold any other board positions in other organisations?
3. What roles have you played on the board of directors for this organisation from the time of your appointment to date?
4. May you explain the role that board of directors play in directing the information and technology and business strategy of the organisation.
5. What are some of the digital initiatives and existing product/service improvements that the organisation worked on in the last three years? I would want us to discuss the processes used in delivering those initiatives. Are there any particular initiatives you want us to focus on?
6. May you take me through some of the organisation's initiatives, events, projects or activities that happened in the last three years, that you would say the organisation was focused on:
    a. Exploitation: Refining existing products or services leveraging on the capabilities that the organization already has?
    b. Exploration: Venturing into experimental processes, which may be designing new products or services, entering new markets, problem-solving to create new solutions or similar activities which require new knowledge or skills that the organization does not have?
7. Which of these initiatives are driven by digital technologies?
8. What was the role of the board of directors in these initiatives?

Section B: Structural Ambidexterity

9. How did the board of directors structure itself to pursue these initiatives? Were independent structures formed to pursue any of the initiatives at the board and board-sub-committee levels, outsourcing, partnerships (independent) or were these pursued by the same structure (interdependent)?
    a. Exploitation initiatives, a maximum of two initiatives
    b. Exploration initiatives, a maximum of two initiatives
10. May you take me through some of the considerations done by the board that led to the decision on the structure.

Section C: Temporal Ambidexterity

11. On the same initiatives, which ones were executed sequentially, one after the other, with cycles of exploration and exploitation and which were delivered simultaneously.
12. What were some of the considerations made by the board in order to decide on the timing of execution, whether these were executed sequentially, with cycles of exploration and exploitation or simultaneously.
13. Were there any differences in the approaches for exploration and exploitation? If so, what informed the differences?
14. Were there any differences in the approaches for digital transformation related initiatives and the rest of the initiatives? If so, what were the key differences?
15. May you take me through considerations that the board of directors made in terms of resourcing both exploitation and exploration. This includes financial and human resources. How did the board decide that the resources for exploration and/or exploitation were adequate?
16. Are there any trade-offs that the organisation had to make during this process?

Section D: Types of Ambidexterity

Mapping initiatives in the Simsek et al. (2009)'s typology of ambidexterity.

17. In the examples that we discussed on (if any), which ones used the following approaches?
    a. Executed sequentially within existing structures (interdependent)
    b. Executed sequentially with independent structures
    c. Executed simultaneously within existing structures (interdependent)
    d. Executed simultaneously with independent structures
18. What were the results of each of these initiatives?

APPENDIX C: DETAILS OF CASES INTERVIEWED

No.	Company Pseudoname	Industry	Participant Pseudoname	Role	Date	Status	Psudonamed
1	Alpha	Insurance	Bravo	CDO	24-Oct-19	Voice recorded & transcribed	Done
2	Alpha	Insurance	Charlie	NED	28-Oct-19	Voice recorded & transcribed	Done
3	Beta	Oil	Echo	CDO	30-Oct-19	Voice recorded & transcribed	Done
4	Beta	Oil	Foxtrot	NED	16-Jan-20	Voice recorded & transcribed	Done
5	Gamma	Information Systems	Golf	CEO	31-Jan-20	Voice recorded & transcribed	Done
6	Gamma	Information Systems	Tango	COO	20-Feb-20	Voice recorded & transcribed	Done
7	Gamma	Information Systems	Victor	CIO	20-Feb-20	Voice recorded & transcribed	Done
8	Delta	Logistics	Kilo	CEO	5-Feb-20	transcribed	Done
9	Delta	Logistics	Juliet	CIO	5-Feb-20	transcribed	Done
10	Delta	Logistics	Lima	CDO	23-Dec-20	transcribed	Done
11	Epsilon	Mining	Mike	CIO	11-Feb-20	Voice recorded & transcribed	Aborted
12	Zeta	Banking	Oscar	NED	25-Feb-20	Voice recorded & transcribed	Done
13	Zeta	Banking	Papa	NED	9-Apr-20	Voice recorded & transcribed	Done
14	Zeta	Banking	Romeo	CDO	14-May-20	Voice recorded & transcribed	Done
15	Theta	Banking	Sierra	COO	29-Apr-20	Voice recorded & transcribed	Done
16	Theta	Banking	Yankel	CIO	30-Apr-20	Voice recorded & transcribed	Done

APPENDIX D: WITHIN CASE ANALYSIS

A detailed analysis of six cases

Processes used by boards of directors in pursuit of organisational ambidexterity in the context of digital transformation

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1. Within case analysis for Theta

1.1 Case Synopsis

Theta was a bank listed on the Johannesburg Stock Exchange that offered Corporate, Investment, Retail, Business Banking and Wealth management services to its clients in South Africa and some African countries. Theta was in the Top Five banks in South Africa. A synopsis of the bank is provided in table 4 in the above section.

Interviews for Theta were conducted under the COVID-19 environment, when South Africa had gone into Level 5 lockdown, the most stringent level in South Africa, which was associated with uncertainty, and the full impact of the lockdown was yet to be determined (Atalan, 2020). In the COVID-19 forced lockdown period, the use of digital technologies was at its optimal worldwide, creating a divide between organisations that would continue operating or those that were at the risk of perishing. The content analysis of annual reports performed before the interviews showed a drastic increase in the company's reports on digital. In 2017, there was only one mention on digital, 40 in 2018 and 175 in 2019! Most of the "mentions" were on digital drivers, which were largely client expectations for Theta, and the digital products produced thereafter.

After interviewing the Chief Operations Officer, an executive board member, he was quick to refer the participant to the Chief Information Officer, who was the owner and played a key role in delivering digital transformation. Both interviews were conducted remotely.

The South African banking sector had been highly competitive in the previous two years. The market had just seen the entrance of a new bank, which operated in a paperless environment, using digital technologies for most of its process, thus making it more efficient (Hartley & Sawaya, 2019) than the traditional banks, a category which Theta falls under. As if that were not enough, the market had witnessed the approval and launch of two digital native banks, with no physical presence. The banks were targeting the same clients that Theta and other Top five traditional banks were servicing. Also, the South African market had seen a nationwide campaign and inquiry popularly known in the country as "Data must fall" which ran from 2017 and had a final ruling in December 2019. Mungadze reported on the matter in ITWeb that data consumption stakeholders, which included citizens, the government and regulatory bodies, forced providers to reduce the cost of data in South Africa, which was deemed to be double the cost of what other countries paid globally (2019, December 02). The ruling was that cost of data must be reduced by between 30% to 50%. Access to data became less prohibitive, and this resulted in South African communities increasing their consumption of global online digital products and services. This sets the scene of the environment in which Theta was operating.

Theta had a typical South African two-tier governance system, constituted by executive directors and non-executive directors (Staikouras et al., 2007). The fifteen-member board had twelve non-executive directors and three executive directors. The within-case results are based on codes, categories and themes that emerged during data collection. The codes and categories were triangulated with archival information available to strengthen the analysis and results thereof. The rest of Section 1 presents processes used by Theta's board of directors in their pursuit of ambidexterity in a digital environment in South Africa, where the bank is operating in.

1.2 Temporal Dimension

This section presents the results of the analyses of the determinants and processes used by Theta to determine when to explore and when to exploit. The temporality of ambidexterity in this research has two meanings. Process research commonly relies on the unfolding of ideas in successive periods (Langley, Smallman, Tsoukas, & Van De Ven, 2013). This research thus analyses the sequence of progression of events around board processes as they explored and exploited in the context of digital transformation in the period 2017 to 2019, thus temporality of the events. Simsek et al., (2009)'s typology of organisational ambidexterity presents the second meaning of temporality, meaning exploration and exploitation can happen sequentially or simultaneously. The results illuminate the temporality being referred to in each instance.

Theta's 2018 annual report presented the main explorative programmes, Digital Project Slow and FastDigital, which executed simultaneously with the exploitative regulatory change programmes as shown in the excerpt in the figure below.

Figure 26: Strategic highlights for 2018

In addition, the main code categories that emerged in this theme were 1) Customer expectations 2) Increase in revenue 3) Reduced cost, all of which are synonymous with drivers of adopting digital transformation, and 4) Maintaining current stakeholder processes, thus exploitation.

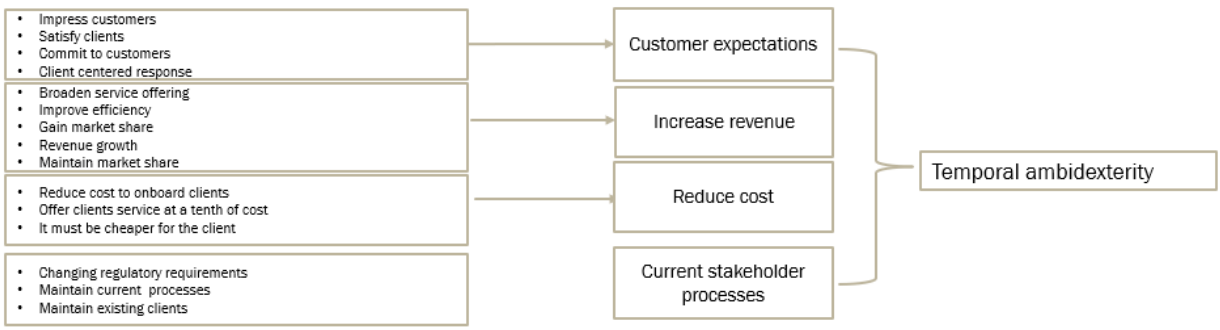


Figure 27: Data structure from temporal ambidexterity

The rest of the section details how the data in this theme was presented in Theta.

Customer Expectations

It was evident from the data that Theta's digital adoption was a result of customer demands, which had the highest number of codes. Theta's customers were exposed to international online platforms where they obtained different services and they demanded similar service experience from the bank. In his reflection of events, the Chief Operating Officer said:

> *"And the reason for that is that Digital transformation is largely exogenous to our economy. It is driven by global innovation. So, the clients that we are serving are procuring from the likes of Apple, Amazon, and domestically from Takealot. And then they are assessing you against their global experience, "I go to Amazon to buy this and Amazon, tells me, other people that bought this, also bought this" so this will raise the interest of other products. You go to Netflix and watch a movie, and it will suggest other movies that may be of interest to you"*.

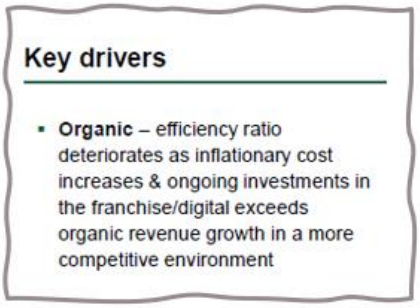
Although Theta's 2017 annual report did not make any reference to digital, in 2018, the organisation boldly reported in the "**Year of achievement**" section the following client-centric report :

The "Apps" were digital products that were launched in 2018 through the FastDigital programme. After the first digital products and services were released, other drivers to expedite digital adoption started creeping in.

Increase in revenue

Subsequently, from 2018 with the rapid release of digital products and services, Theta realised that the products were increasing revenue.

"We if we look at the business model, service level automation through digital is bringing significant savings thus increasing revenue to this business, it's a significant magnitude".



Theta is therefore pursuing both exploitation and exploration simultaneously to increase its revenue using both avenues.

Reduce cost

A typical example is where the bank reduced costs through improved efficiencies is given below:

"For example, there is an existing client, who has a bank account, and then comes to apply for a vehicle loan. The Vehicle Loans business would request for all client information as if the bank does not know him. This is because this client is known to the bank and not Loans business, the bank is acquiring clients by product. This obviously makes the bank very inefficient".

This was triangulated with the annual report of 2019, where Theta highlighted the following steps that they had taken to improve efficiency:

Through our digital innovations we aim to deliver innovative market-leading client experiences. The outcomes of these are described in more detail on page 76. Key developments to support improved client experiences include the following:

- Launching the simplified end-to-end digital onboarding process, which allows our clients to open a FICA-compliant account faster through our staff-assisted service and self-assisted channels – web, app and self-service kiosk. As a key pain point for both banks and consumers, this capability is an obvious game changer. Client and product onboarding for individual clients now follows the full end-to-end process on the platform and has resulted in the following benefits: client-centred onboarding (once for life); single onboarding foundation for most of our core products (transactional accounts, personal loans, card, selected investment products and overdrafts); reduced account opening times and disbursals (enabled by a seamless and consistent onboarding experience across our automated front-, middle- and backoffice processes); digital FICA, biometrics and signing of contracts (no paper); and lower cost of client onboarding.

As such, Theta needed to re-position itself to compete in the digital economy by investing in the new capabilities, bring process efficiencies and position itself as digital leaders (Sebastian, Moloney, et al., 2017). Similarly, as part of their role, the board sub-committee mandated with Digital transformation and Information Technology, given a pseudonym DITCO, monitored the external environment continues to ensure internal strategies address alignment with the external environment and stakeholder expectations.

Current stakeholder processes

The issue of regulatory compliance was evident not just in annual reports as shown in Figure 2 above but was raised five times during interviews. In one discussion, the pain of maintaining the current environment while adopting digital was highlighted as follows:

"You cannot serve your business properly and you can not report on the current business and the regulator will start to issue fines because the regulator requires this information in the traditional form. So that's another complexity when it comes with digitization".

Similarly, the bank needed to serve clients using current processes while developing the digital future.

It can therefore be concluded that Theta pursued ambidexterity simultaneously to meet customer expectations, increase revenue and improve efficiency while meeting regulatory obligations while concurrently maintaining current business.

1.3 Structural dimension

Structural ambidexterity seeks to understand where ambidexterity is pursued (Simsek et al., 2009) in Theta in the period under review, 2017-2019. The theme of structural dimension presented the following as main categories during coding: 1) Governance structures 2) Board involvement 3) Delivery models

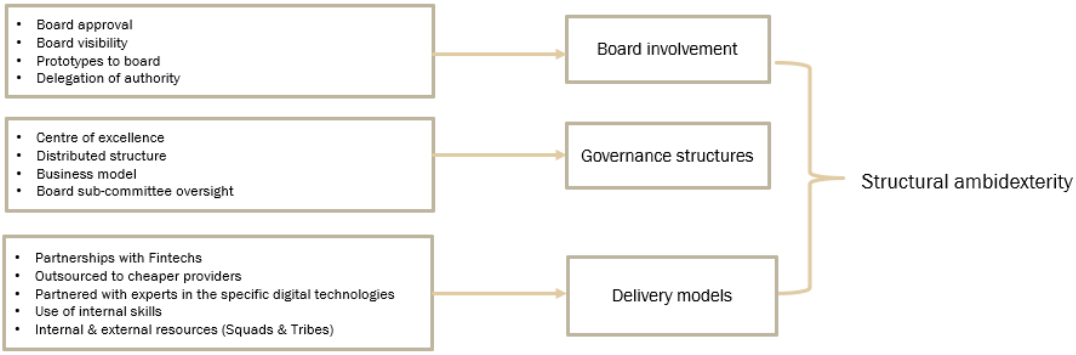


Figure 28: Data structure from structural ambidexterity

Governance structures

Although the focus of this research was on understanding processes used by the board, it was evident through data collection that Theta's processes started at lower levels and were finalised at the board. The structure in the figure below shows a high-level view of the teams and committees that reported to the board sub-committee, DITCO, on the digital transformation programmes, FastDigital and Digital Project Slow.

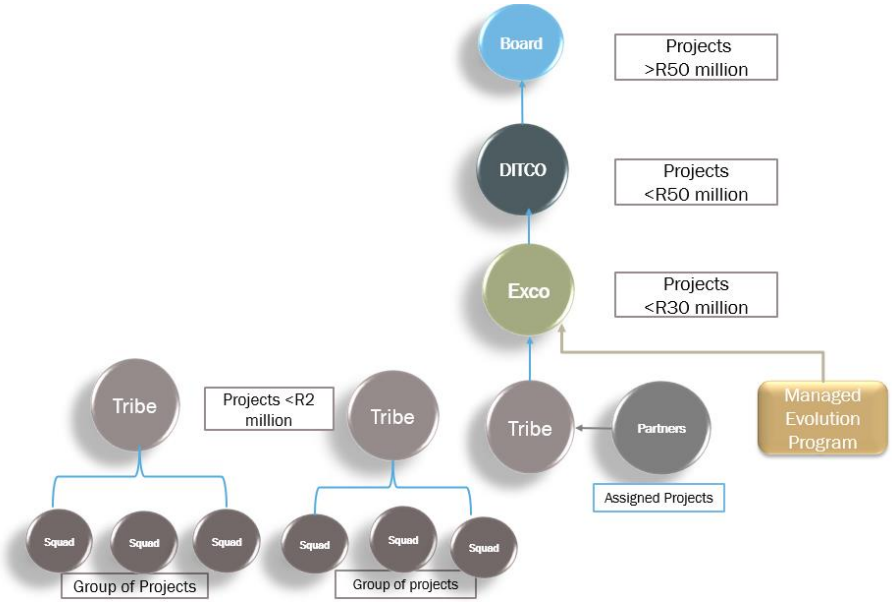


Figure 29: Researcher's conceptualisation of Theta's digital governance structure

Theta established squads and tribes, which were seen as centres of excellence for different digital products, specifically focused on delivering the FastDigital initiatives, thus compartmentalising and synchronising exploration separate from the exploitative structure (Simsek et al., 2009). Similarly, the Digital Project Slow programme had dedicated resources that were solely focused on delivering digital solutions. Digital initiatives went through Proof-of-concept (POC) first, which went for approval to Exco and then board sub-committee, DITCO. Therefore ,Theta explored and exploited using interdependent business units, each embodying different strategies and operating logics, with squads and tribes focused on delivering the digital portfolio in a fast-paced culture. On the other end, exploitative teams maintained and implemented improvements in the traditional environment, which was long and repetitive.

During interviews, Theta participants lamented on the different cultures exhibited by the explorative and exploitative teams. The different cultures presented compensation issues for management. The bank's financial reward models, which included performance bonus, were still structured according to traditional business units and a high delivery model that was on the ground. This quagmire was elaborated by the Chief Operating Officer's statement below:

> *"So here is a dilemma. These teams now are working on these projects, they have shorter development cycles, they roll off, moving away from 3-year development cycles. So, they develop the solution, put it on the market, and refine and fix anything after monitoring the use of the solution. So, who is responsible for rewarding them at the end of the year"?*

Results suggested that the bank appointed a Digital Programme Owner to strengthen the success of digital transformation. In fact, the Chief Information Officer narrated how he motivated for such a setup at Board.

> *"You know, the urgent always takes precedence over the important, and that has been probably one of our most difficult things to navigate now. Where I've been most successful is, when we want to transform the business of a cluster, … I insist that we have either the head of the business unit seconded to digital programmes, while the successor runs the current business, or the successor is seconded to digital programmes to help me transform the business for the future. This was very difficult for the Board to understand at first".*

In this set-up, the board approved the appointment of a business executive to the explorative portfolio as a Digital Programme Owner for relevant initiatives. The owner championed deployment of the initiatives in their department, thus enforcing an interdependent structure. It can be argued that the Chief Operations Officer, mandated with the delivery of the organisational strategy and digital transformation was also a credible integrator for exploration and exploitation.

"My role is to stitch the interdependencies together and make sure we get the alignment right and underscore the delivery of the programmes that we are running".

Contrary to squads and tribes, Digital Programme Owners would report to the Executive Committee (Exco) and subsequently to DITCO, where members were expected to have capabilities to pursue both exploration and exploitation as shown in the reporting structure in figure 4 above. Ambidexterity at these levels was not achieved by structural partitioning but through the same unit.

It is therefore clear that from 2017 to 2019, Theta explored and exploited simultaneously across the organisation. The organisation used interdependent business teams at the lower levels to explore and exploit, synonymous with partitional ambidexterity. On the contrary, management, specifically the Chief Operating Officer, Digital Programme Owner, Exco, the board sub-committee and the board then provided an integrating role, with oversight of both exploration and exploitation, thus harmonic ambidexterity.

Board Involvement

Theta took the position that all explorative initiatives will be reported to the board due to the risks that were associated with such investments. This decision was influenced by an old investment that the organisation made in a technology company in the late nineties, which was lost during the technology bubble and led to a significant decline in the bank's market capitalisation, from R42 Billion to R17 billion as shown in the graph below. Board was not involved and management faced harsh consequences for the investment which affected company sustainability.

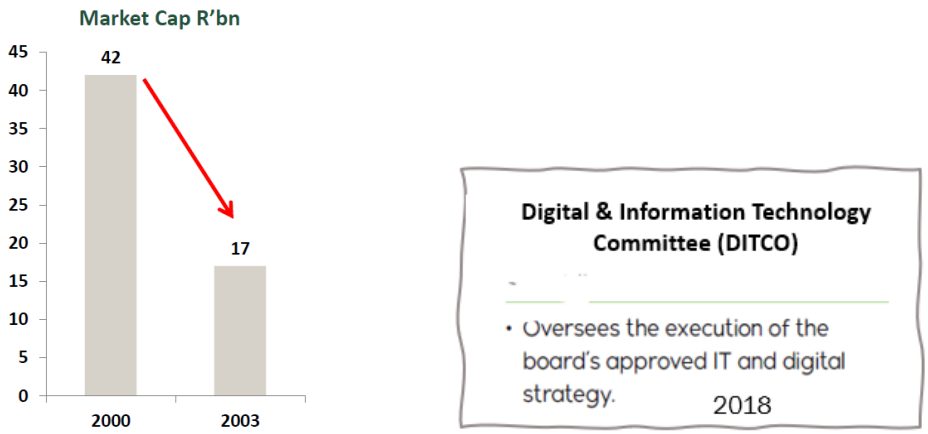


Figure 30: Excerpts from Theta's archival reports

Given the lessons learned from such losses, the board was involved in both explorative and exploitative investments. The comments below were made in the context of the digital programmes that were in execution between 2017 to 2019:

"*Now we have massive oversight. The board is involved and has oversight over any investment we make in technology. It has made us diligent in getting participation from all over the bank*".

"The board is responsible for the current business, and they are also responsible for the future that we are building. For example, if something goes wrong with the regulator, they will go to the board, and the board will lean on management in order to provide adequate responses. So, it's very important that the committee is fully aligned with strategic direction as well as the details of the execution of that strategy".

As such, Theta's structural dimension at the two-tier board system was influenced by learning from a previous event.

DITCO was responsible for technology strategy and digital transformation. This involved approving IT and Digital Transformation Strategies, related budgets, reviewing proof-of-concepts, monitoring the delivery and ensuring a balance of resources in the areas under its jurisdiction. DITCO reported to the board, and below the sub-committee were other structures that executed the work.

"So all of our transformation programmes, they get considered by the Exco first, then taken to the board and the board does the final oversight. The Board does more than approve, they direct on where the organisation should put more focus, where we need to go faster or slower and give us the advice about the extent to which we should tailor the programme".

The board and its sub-committee exhibited harmonic ambidexterity and had the final say in Theta's exploratory and exploitative initiatives.

Mode of delivery

The category, mode of delivery, had the second-highest number of codes in the structural dimension theme. Some of the codes that emerged in this category include insourcing, evidenced by squads and tribes, strategic partnerships, and outsourcing.

Participants lamented on limited digital skills, not only in South Africa but on the continent. The limited digital skills that were available were so expensive, the bank could hardly retain them. As such, the option of using internal resources was limited skills that the organisation could attract and retain. Lack of internal digital skills became a push for use of other delivery models.

"I would say the main driver was that there is such a critical shortage of resources in South Africa. In fact, the shortage is worldwide, but South Africa and the continent of Africa has got a critical shortage".

When the organisation tried to upskill their resources, some of the employees were willing, others would respond:

"I do not have an appetite to learn these things".

The context forced Theta to identify low-cost digital partners across the world. The organisation complimented this model by outsourcing some of its work to local Financial Technology companies, commonly known as FinTechs. To this point, the Chief Information Officer emphasised the significant change in operating the model between IT and digital transformation:

"The competency requirements for the new business model are very high. We are having to scale up very quickly. Scale-up in an environment where there are skills shortages. We all chase a small pool of these skills, and there are raising costs of that skill in the process. Okay. So, we must deal with that".

"So I have been in IT for a long time. The ratio let's say a decade ago, was that you would have about 70%, internal resources, 30%, vendors and third parties. Now in this digital transformation, we are closer to 60% of external and 40% of internal resources".

It is therefore evident that Theta's partnerships and outsourcing resulted in the organisation adopting a digital transformation different from traditional IT due to inadequate and cost of internal skills. One then wonders if there will be unintended consequences in this forced outsourcing model.

1.4 Balancing organisational resources

Simultaneous pursuit of exploration and exploitation is known to demand organisational resources. Looking at the codes and categories that emerged from this theme, the main resources that Theta needed to balance were 1) Financial resources 2) Human resources and 3) Time. To this effect, Theta had a programme that assisted with prioritisation.

"The biggest challenge is to balance the two. Currently we have what is called RSS. That means to Rationalise, Standardise and Simplify our systems and our business models".

The rest of the section summarises the results of how Theta balanced its resources while in pursuit of ambidexterity.

<u>Balance financial resources</u>

During interviews with the first participant at Theta, it was evident that the organisation had created financial reserves from cost efficiencies emanating from digital transformation products and services that were launched in 2017 and 2018. These funds were used for explorative and exploitative programmes.

"*If we look at the business model, service level automation is bringing significant savings to this business, it's a significant magnitude",* said the Chief Operations Officer.

Similarly, the results of the annual report of 2018 showed that the group had adequate reserves from the previous programmes that had led to cost savings.

"F*unding is not an issue because some of the initiatives created savings over time", confirmed the Chief Information Officer.*

The position changed quickly when DITCO reviewed funding for exploration downwards given the organisation's sustainability risks during the COVID-19 pandemic in May 2020 when the last interview was performed. Although May 2020 was out of the study range of 2017 to 2019, it was critical for the researcher to pay attention to the context of the environment in which Theta was now executing its processes.

"But as we scaled up digitisation, we went from 800 million to 2 billion rands. So it was literally, almost 250% increase in the investment" elaborated the Chief Information Officer".

Results confirmed that the board had reduced the budget for digital transformation and exploitative initiatives downwards by 40% for the organisation's survival. The motivation for this review was to ensure that money, time and human resources were directed to business-critical processes for sustainability and the balance was shared between the development of digital products and services that enabled the bank to operate during the lockdown, and maintaining services that enabled the bank to operate and report to authorities. In practice, many other organisations, including Theta, launched digital products and services to service during the COVID-19 era. The organisations that failed to migrate to digital in this period faced existential risk.

<u>Rationalise human resources</u>

Digital skills had the highest number of codes in this category. Most of the codes were a shortage of digital skills, cost of digital skills, and a few codes on re-skilling.

Although South Africa was considered better than most African countries, the nation did not have adequate skills to deliver digital transformation programmes. Inadequate digital skills were such a constrain, participants raised it many times during interviews. Below are a few examples:

"And obviously if you look at the availability of critical digital skills in the local market, these were just not there."

"I would say the main driver was that there is such a critical shortage of digital skills in South Africa. In fact, the shortage is worldwide, but South Africa and Africa, the continent of Africa has got a critical shortage".

"Re-skill them for a more competitive South Africa".

"The rising costs of digital skills"

"So we went to the best people we could find in the world and we needed more digital engineers".

While exploitation was well resourced, Theta leveraged on the few digital skills that were available in-house. There was still a significant amount of work that needed to be delivered by internal resources. The bank adopted the following approach:

"September 2018 Theta collaborated with various digital partners and ran digital learning pilots in key environments. An international learning programme was piloted in Retail and Business Banking and Group Technology".

Through the digital education programme, Theta won the Best Culture of Learning award in 2018.

In addition to the use of internal resources, Theta was forced to use outsourcing and partnership models to supplement its skills and bring a balance to the organisation. In fact, Theta ended up outsourcing to FinTechs whom they considered as competitors. In response to the request to elaborate on how financial technology firms compete with banks, the Chief Operating Officer said:

"… they are agile, less handicapped by bureaucratic processes and tend to be driven by entrepreneurs. If they understand that data faster than your traditional organisation, they will out compete you using agile digital technologies that they use. They have a very rapid early growth, and then they struggle to scale up so they can be easily bought by big organisations and go with your knowledge".

The results show that Theta employed different models in order to balance its human resources to explore and exploit. Approval of these models was obtained from the board.

Balancing Time

An organisation operates within a limited time to achieve its objectives within the given time. It is therefore critical for the board and the rest of the organisation, to allocate available time to key priorities. The process of bringing about such a balance was a challenge. There were very few codes that referred to time. In this case, time mostly referred to the delivery lead time of digital initiatives during the selection and prioritisation process. There was no further reference of time. FastDigital was established to deliver digital solutions at an accelerated pace. By the same token, deliverables mandated by regulatory compliance required speedy execution to avoid penalties.

Theta had this to say about balancing the time available to an organisation:

"It's very difficult to get the organisation to continue to operate at the requisite level and adopt future changes brought by digital at the right pace. Probably a bigger challenge than anything else that I've encountered in my career…" lamented the Chief Information Officer.

It can be inferred from the results that Theta accelerated the delivery of digital transformation through partnerships and outsourcing.

1.5 Outcomes of Theta processes

The data showed that Theta used structural separation in delivering its exploitive and explorative programmes at low levels. Results suggest that following the COVID-19 lockdown, Theta started developing a "digital twin", a simulation of the bank's processes on a digital platform. In the bank's view, this model was successful as it delivered award-winning solutions as evidenced by one of the assertions below:

"It literally is wealth banking in a box. And I think what makes it superior is that, um, this app internationally came second in terms of private wealth apps.

While the bank planned for and expected most of the outcomes from digital transformation and various exploitative initiatives, there was an unintended consequence from the digital transformation programmes. The bank did not foresee what they eventually explained as *"Excess staff in the traditional business due to digital efficiencies"*. The bank had to introduce the following measures to manage excess staff. The context of the environment matters. South Africa is known as a unionised nation, with a high unemployment rate. Therefore, retrenchments are frowned upon and can trigger union action. The bank offered voluntary retrenchment to employees that were not keen to develop in the digital environment. The bank then embarked on an extensive re-skilling programme, this developing redundant staff for other jobs. What is critical to observe is the way Theta's processes to explore and exploit continued to develop as they encountered different results.

In conclusion, results suggest that the figure below shows a high-level transition of digital transformation over the 2017 to 2019 period that was under study.

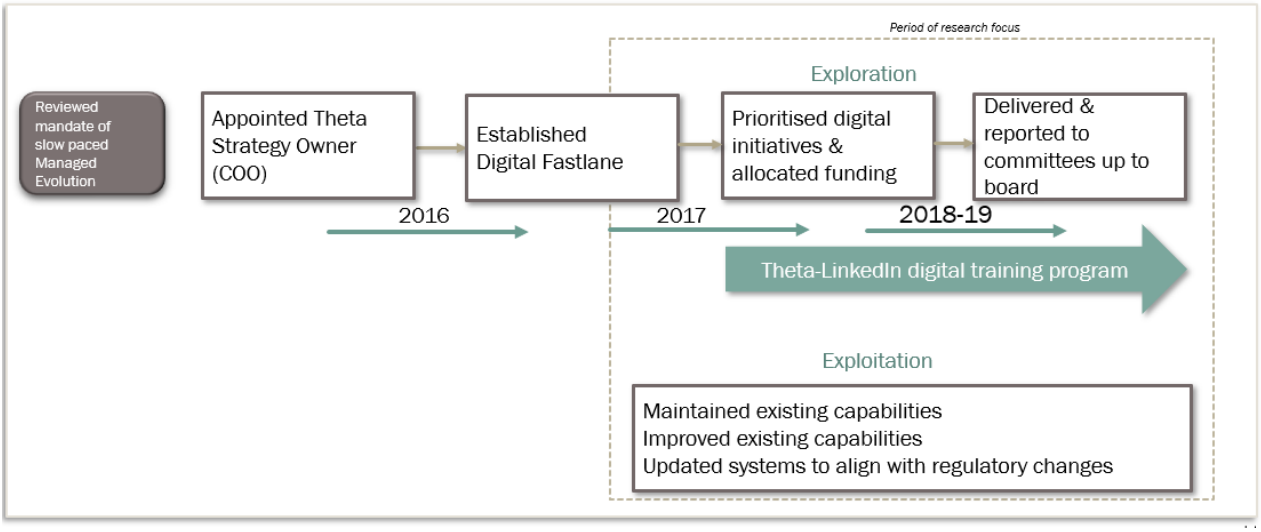


Figure 31: Overview of progression of events that inform the board processes: Researcher's conceptualisation

Theta's results also showed that the bank employed Proof-of-concept, which allowed the organisation to experiment with an initiative and confirm feasibility details before the board gave full approval and committing funds. In their view, this assisted the organisation to invest in what would have been tested as feasible, or discard initiatives that were not suitable.

Theta also observed that migrating to digital platforms increased the bank's exposure to the risk of cybercrime. The bank increased the use of partners, especially FinTechs, to manage this risk.

It can then be concluded that Theta used structural ambidexterity to explore and exploit simultaneously. As the environment changed, the board reviewed the organisation's resources to ensure business continuity and re-balance of its portfolios to changing business context and related priorities. A typical case in point was the COVID-19 and related lockdowns, which triggered a review of the resources allocated to exploration and exploitation. The bank leveraged on the partnerships to obtain the relevant digital skills and manage the risk of cyber-crime on its digital deployments.

2. Within case analysis for Zeta

2.1 Case Synopsis

Zeta Financial Services is a group of companies listed on the Johannesburg Stock Exchange. The group offers Investment, Retail, Business Banking and Vehicle Financing through its three subsidiaries. Zeta was also in the Top Five banks in South Africa, known for its digital leadership in the market. At the time of this research, the group had just integrated its processes, moving away from silo operations, especially for its Information Technology and digital processes. The research was therefore conducted on the holding company. A synopsis of the bank is provided in table 4 in the above section.

Both Zeta and Theta operated in the same banking environment in South Africa and therefore the industry synopsis of Theta applies to Zeta. The group made three resources available for interviews, two non-executive board members and the Chief Digital Officer. The Chairman of IT & Risk started by lamenting the establishment of the new banks driven by digital technology in the market.

"*The new banks in the market, they don't have old systems. They only have new modern systems. They are undercutting the big banks, and obviously, we can't sit and look while other people are eating our lunch because they have digital systems*…"

Having said that, Zeta prided itself on launching the first banking application in the country.

"We were the first bank to launch an App in the country going back then in 2011 and that is the most advanced platform in the country today"

At the time of data collection, Zeta had gone through a process to integrate its businesses into one, migrating from siloed operations to a shared platform, which has "*one view of the customer*". Zeta defined the digital programme with the following focus:

> "*We defined our programmes as **Run the Bank, Change the Bank, Platform the bank**. We have identified 20 odd big initiatives that we are tracking across business units. We identified these as initiatives that will bring material change to the face of the business*".

The rest of the results from the analysis of how the board of directors at Zeta explores and exploits in a digital environment are presented in the rest of this section.

2.2 Temporal Dimension

The researcher used research questions and extant literature to focus on investigating the processes used by boards of directors to explore and exploit in a digital environment. The temporal dimension emerged as one of the themes of focus, naturally so as it was a key area for data collection. The figure below shows some of the codes and categories that emerged from this theme.

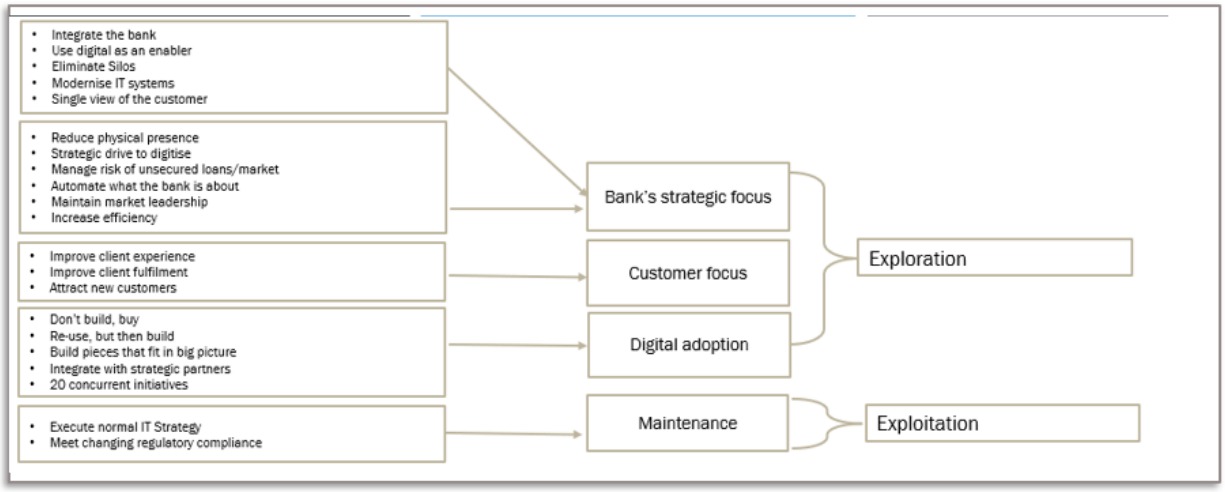


Figure 32: Main codes, and categories from Zeta

The main codes that emerged from the data on exploration and exploitation were drivers for digital adoption, which included 1) digital became the bank's strategic focus 2) focus on the customer 3) considerations made when adopting digital. Data analysis showed that exploitation was largely maintenance driven, thus executing the normal IT strategy and maintaining systems to comply with regulatory reporting.

Exploration

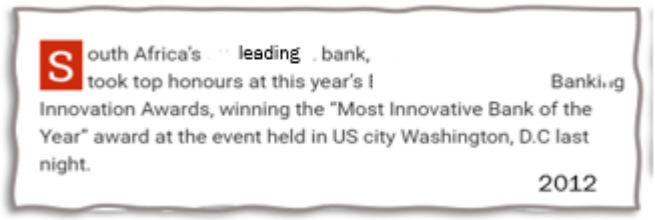
Exploration, in this context of digital transformation, was about developing products and services that met the future needs of the customer, using digital technologies and new skills. Zeta asserted that digital transformation was well integrated into the business that sometimes it was difficult to separate it from normal operations. As such, Zeta continued to release digital products and services continuously, building on the platform that was launched in 2011. This ran simultaneously with the maintenance of the normal environment.

"We have identified 20 odd big digital initiatives that we are tracking across business units".

Although Zeta was the first bank to launch a mobile application in South Africa in 2011, from 2017 to 2019, the period of the research focus, the pressure remained as Zeta wanted to maintain the leadership in the market.

"And Zeta has always been at the forefront of that. I think it's very much known, and if you are in the front, you need to keep running, otherwise, people chasing you will catch you. And that's what they've managed to do today. Obviously, everybody catches up at some stage, but then you need to have something new again".

The comment shows that Zeta was determined to maintain digital leadership. In fact, archival data showed that the application won the most innovative bank of the year award based on the application that was launched in 2011.


South Africa's leading bank, took top honours at this year's I Banking Innovation Awards, winning the "Most Innovative Bank of the Year" award at the event held in US city Washington, D.C last night.

2012

The bank ensured that digital transformation remained a strategic focus for the group, with several objectives including having a single view of the customer as the main strategic focus, removing silo operations, modernising IT systems and enabling the Zeta business using digital technologies. Zeta took a position that the bank would use digital technologies to reduce its physical footprint, thus digitise everything that the bank was about. Both explorative and exploitive programmes were executed simultaneously.

"They run multiple projects at a time. Obviously, you know, because there's a shortage of skills and the resources you've got to later prioritise and some projects might be projectised at some stage and then something new comes and that gets an elevated status. So many many projects are running at the same time and obviously, they have got people to focus on each one"

"What I know is that they do them concurrently. There are a lot of initiatives that are running. It's not one big initiative. You will get some which link to others. Some might be separate, but it's like not like one big initiative".

It could be seen that prioritisation was critical to the balance of the digital portfolio. Despite years of developing digital products and services, participants still lamented on the shortage and cost of highly skilled people. Digital skills keep changing and the fact that Zeta released its first digital product in 2011 did not exempt it from this challenge.

Exploitation

Exploitation in Zeta was largely focused on system maintenance for regulatory compliance. Participants complained about the overbearing regulatory requirements, which seemed to consume a lot of the bank's resources.

"You know that the regulations, the regulator and the Reserve Bank and all the structures that they formed now is very demanding on the banking sector. So your IT spending is totally disproportionate because of our regulatory developments to comply with what the government wants and not what the bank wants".

The bank had no choice as the board of directors were liable for compliance with regulatory requirements. That formed the mainstream of exploitative work.

Zeta also paid a lot of attention to maintaining and enhancing the mobile application that had been launched in 2011. Archival data for the period of research focus, 2017 to 2019, showed significant evidence of the impact that Zeta's maintenance made. The bank maintained its leadership in innovation, as evidenced by the awards below from 2018 to 2019.

The bank consistently won the most innovative bank in Africa award from 2012, after the launch of its digital application to the time of this research, showing consistent maintenance and improvement of the application.

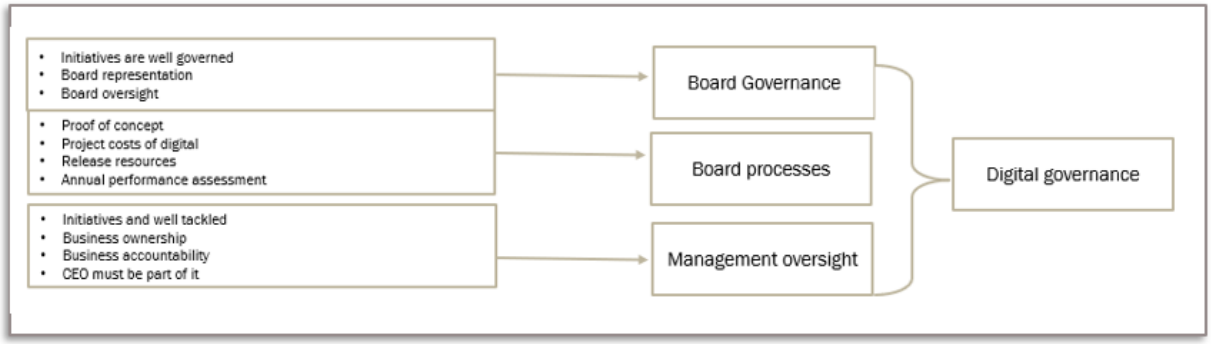
It can therefore be concluded that Zeta explored and exploited simultaneously. The bank identified priorities that were monitored by different committees in a given period and won many awards. The results below outline the structure that was used to explore and exploit.

2.3 Structural dimension

Zeta's structure for exploration and exploitation came through the digital governance theme. The rest of the section discusses the structure and related processes that the board used in its pursuit of exploration and exploitation in the context of digital transformation.

Digital Governance

The figure below shows the main codes and categories that were identified in Zeta's data.



Zeta's board had oversight on explorative and exploitative processes as seen in most codes from the data, particularly the annual reports. The board achieved its objectives on digital transformation through the board sub-committee and the main board itself. The Chairperson of the IT and Risk Committee concurred:

"If you look at digitisation, I think one of the most important things you must have is buy-in from the top, that's at board level. Obviously, you must have the correct CEO that can actually get it out there and be bold to drive the changes".

Owning Digital Transformation Strategy

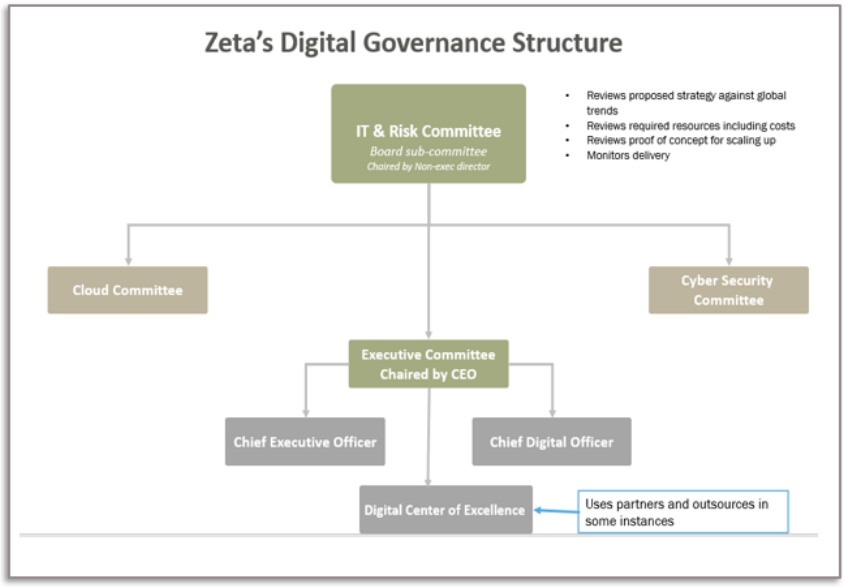
Zeta ticked the last boxes for digital support and ownership in 2019, following the appointment of a new CEO, who had visibly supported digital transformation programmes, and the subsequent appointment of a business owner, the Chief Executive Officer of Retail Banking as Chief Digital Officer. The Chairperson of the IT and Risk Committee elaborated on the roles:

"The logic behind the role being, I mean, we've had an approach in Zeta that tried to put business people in responsibility for driving their overall transformation journey. So while digital is critical to organisations, you know, we don't want it to be seen as Tech led".

In corroboration, the Chief Digital Officer provided more details on his role in the organisation:

"So I'm responsible for all activity from entry-level customers, you know, offering all the way to our private banking offerings. And that's what my primary day job is. In addition to that, I also sit on the Zeta Stratco for the group the Chief Digital Officer at the Zeta Group level. And that is really to drive the strategic influence of how we actually digitize, the Zeta business model across the various franchises"

It is evident that although not a board member, the Chief Digital Officer is instrumental to the execution of board processes in the context of digital transformation hence a key participant in this research. The figure below gives a high-level structure of Zeta's digital transformation programme.



Although Zeta mentioned a Digital Centre of Excellence, the participants asserted that most initiatives were done in the business as part of daily routine. This resembles interdependent ambidexterity. Digital Centers of Excellence was used as and when new capabilities were required by the business units across the organisation. Results from the data also showed that Zeta used partnering to compliment digital skills.

Partnering

Although Chief Digital Officer emphasised the use of internal resources for digital transformation, it was confirmed after corroboration with two other participants that the organisation uses partners.

" Another area highlighted by Risk is partnerships. So they also come to the board with FinTechs. Yes, Fintechs develop a lot of digital. Those guys have the idea but don't have the database, so they come to the bank for the database and roll it out. The bank has an idea but sometimes does not want to carry the risk of development, and sometimes our developments take long, and its easier to partner with a FinTech for the development Zeta is known in the market for funding and using "start-ups", young digital companies that focus on digital transformation-related innovation".

The data showed that partners were used for complementing digital skills, expediting delivery or spreading the risk of some of the digital initiatives. Similarly, the Chief Digital Officer emphasised the use of Commercial Off-the-shelf systems, thus another use of partners who own the systems.

These results, therefore, lead to a conclusion that Zeta primarily uses interdependent structures, with instances of ad-hoc independent structures where centres of excellence are established. It is therefore important to understand how Zeta's board balances the organisation's resources.

Digital embedding

Results from Zeta showed that there was a very minimal distinction between exploration and exploitation where digital transformation was concerned. The Chairperson explained this position:

"So, business as usual and new initiatives are actually very much intertwined because a lot of your changes that you want to make is changing what you're currently doing to what you want to be doing".

The data showed that Zeta would only establish a Center of Excellence when there is a new capability that needs to be developed in the organisation. Once that is done, the Chief Digital Officer explained how this would be embedded in the day-to-day business processes across the organisation:

"So if something is not yet mature or if it's not yet at scale, to my earlier point, lets put "The A-Team", let's put a team together that we believe has our best people to actually make sure we build out something that can be reused across the organization. So we use that centre of excellence to create new things where we believe we need to reinvent something. And then to the extent that it's a mature capability, coming back again to my earlier point, we look to see how do we actually democratize it if you want by allowing every business in the bank business unit in the bank to access that platform to start adding their own features onto it".

It can be concluded based on the results that over time, with the maturity of digital in Zeta, Centres of Excellence were temporary and digital was embedded in daily operations.

Balancing resources

Balancing resources came up as part of digital governance. Exploration and exploitation are known as conflicting strategies that compete for limited resources in the organisation. The data showed a conflict of human and financial resources. Zeta mainly used partnering, prioritisation and proof-of-concept processes. The Chief Digital Officer emphasised:

"And I think that is an ongoing challenge. The reality is that whatever number of people we have, and the priorities it means that there's always a conflict for resources, not just between the running change but also between multiple initiatives on either side".

The results show a conflict of human resources. Zeta would appoint partners to complement their human resources. The Chairperson of the IT and Risk Committee aired the resource challenge:

"So in areas where they need highly skilled resources, they do not do them internally because it's very expensive to bring in and retain such skills. They find it expensive to employ them on a full-time basis. It might've been a few just to make sure that they got it obviously, and able to monitor the consultants that are hired to do the work, but there wasn't ever a full-time team on the other side, just from a cost management perspective".

The skills issue is not just the cost but the availability of digital skills in South Africa. The Chairperson gave an example that illuminated the matter at hand:

It's very difficult for all your initiatives in South Africa to get the necessary skills. I mean, what you need is data scientists that they extremely difficult to come by and a lot of the expertise of emigrated. And people in other countries and know that they're good. So they just, you know, make them offers they can't refuse. At one stage, they took out the whole department of four people and their families do to take them to Australia, you know. So the skills shortage is actually one of the biggest problems in digital digitisation.

The bank had to find ways of addressing this critical issue for them to find a balance and still deliver their priorities.

Zeta introduced a new way of increasing digital adoption so that they would meet their goals. The bank partnered with cellphone companies to give clients access to mobile devices and this increased rate of adoption. Participants narrated this as below:

"So you will see even with the digital platforms, they took some time to take off, maybe it's just me but even with online banking. It took some time for South Africa to get on it. But now you can see that the uptake is actually quite high, but they've also facilitated that. So you can get an iPad and iPhone through Company Y in order to facilitate the use of the platforms through that".

This illuminates the concept of partnering to achieve digital objectives.

Another strategy that was highlighted was the Proof-of-concept. Relevant teams perform a proof-of-concept which requires minimal funding. The board did not have to approve full funding and human resources before validating and confirming whether the explorative idea will work if it is scaled up.

"Some of the initiatives then go into proof-of-concept and then, and then it goes through approval for upscaling".

Another area of contention that was raised was funding regulatory-related initiatives. One of the Non-executive board members complained about these dual demands for funding and said:

So you will find that there are traditional things from a regulatory perspective, so those you must fund anywhere, don't have a choice.

Similarly, the Chairperson of IT and Risk Committee lamented:

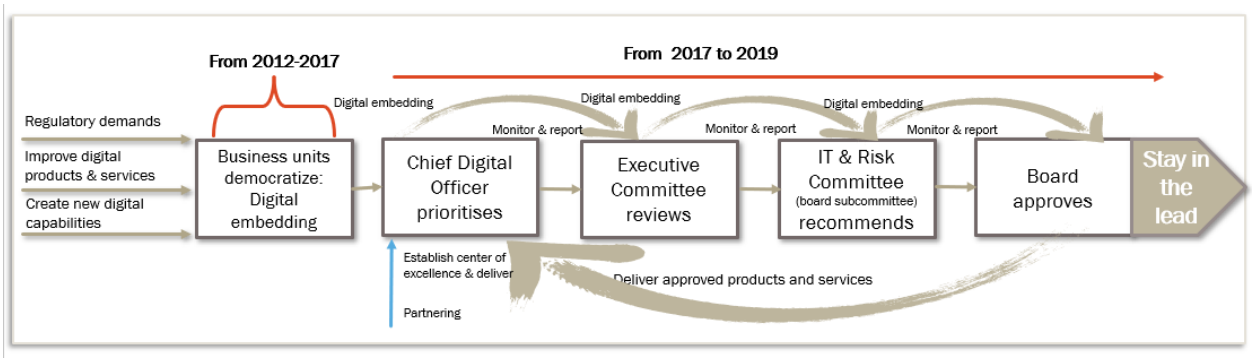
"You know that the regulation of the regulator and the Reserve Bank and all the structures that they formed now is very demanding on the banking sector. So your IT spending is totally disproportionate because of our regulatory developments to comply with what the government wants and not what the bank wants".

The board would review proposed priorities from its sub-committees and approve what would be financially viable in a given period. The Chairperson elaborated:

"So, that's where we drive a lot of the initiatives by allocating business owners to prioritise so that we are not doing IT or digitalisation for the sake of it. Because as you know with, I'm sure from your research you would have seen this".

2.4 The processes used by Zeta's Board

The processes that are followed by Zeta's Board are closely integrated to the rest of the committees that feed into the board. The figure below shows a high-level view of the processes followed by Zeta in different periods as they explored and exploited in a digital environment.



The above process is high level and is iterative. Zeta started by digital embedding when it introduced the first digital application in 2012 and has continued to do so with other products and services that were democratised after that. Now that digital transformation is embedded in the organisation's processes, a Center of Excellence is only established if there is a need to create a new capability. In such cases, the organisation also introduces partnering after assessing the skills required, the risk involved and delivery time.

Conclusion

In conclusion, Zeta introduced digital transformation in 2011 and digital processes have been embedded in the bank's daily operations. Results showed that Zeta largely used interdependent ambidexterity as digital was embedded in their processes. There were a few instances where independent centres of excellence were established. The bank explored and exploited simultaneously. Zeta prioritised its initiatives following the organisation's governance process, and the priority list after that would be monitored by various committees up to IT and Risk Board sub-committee. The board would balance resources through proof-of-concepts, where the organisation funds initiatives that have shown the potential to succeed. Zeta employed partnering as a process of adopting digital transformation. It can be concluded from the results that digital partnering not only brought new skills but also expedited delivery and balanced human resources.

3. Within case analysis for Beta

3.1 Case synopsis

Formed in 1950, Beta is a chemicals and energy company listed under the Oil industry on the Johannesburg Stock Exchange, with operations in the rest of the world. The study was focused on Beta's operations in South Africa and how its board of directors explored and exploited in the context of digital transformation At the time of the research, Beta prided itself with advanced chemical and energy solutions that contributed to a thriving planet, society and enterprise.

The context of the environment during data collection was that Sasol share price had come down from R450 per share to R300 due to a decline in world oil prices. The Non-executive director put this in the context of Beta and said:

"So how is the market being disrupted in terms of being brought about by different things, you know diesel, fuel from environmental pressure, climate change point of view and then move from petrol and diesel to electric cars.".

Notwithstanding this environment, in October 2019, when data collection was performed, Beta had a cloud of a Chief Executive Officer who was fired for an unsuccessful project that was in implementation. Although the dismissal had no bearing on this research per ser, the Chief Digital Officer, who was one of the participants, was appointed by and reported to the Chief Executive Officer, who had just been dismissed two days before the interview. Results from the content analysis that was conducted before the interviews showed evidence of digital successes that Beta had achieved in the period under study, 2017 to 2019. In fact, in 2018 Beta published a report on Information Management modernisation, with the below extract, which had created the foundation for the organisation's road to digital success.

Driving a future digital vision

When the CIO decided to reorganise [redacted] Information Management division in 2013, in order to become nimbler and more cost-effective, a big part of this was creating a roadmap that would enable it to modernise and streamline its IT function.

The beginning of Beta's digital journey was inspired by the World Economic Forum of 2016 which resulted in the Chief Executive Officer appointing the organisation's Head of Strategy to be the Chief Digital Officers. The Information Management modernisation programme of 2013 had given Beta the confidence that technology drives optimal delivery. The Chief Digital Officer immediately established the Digital Centre of Excellence, and the journey began. The Chairperson of Beta showed the organisation's commitment to digital transformation in the 2018 annual report and said:

> We believe that more effective use of digital technology will create value in a broad range of applications. We pursue opportunities to enhance safety and productivity, improve customer experience, improve operational efficiency as well as plant reliability through predictive maintenance.

The rest of this section details how Beta's board directed the organisation to explore and exploit in the context of digital transformation.

3.2 Temporal Ambidexterity

There were numerous codes obtained during data analysis that informed whether exploration and exploitation were done sequentially or simultaneously. However, this thesis was mainly focused on understanding the processes used by the board of directors as they explored and exploited. The figure below shows some of the codes, categories and themes extracted from exploration and exploitation.

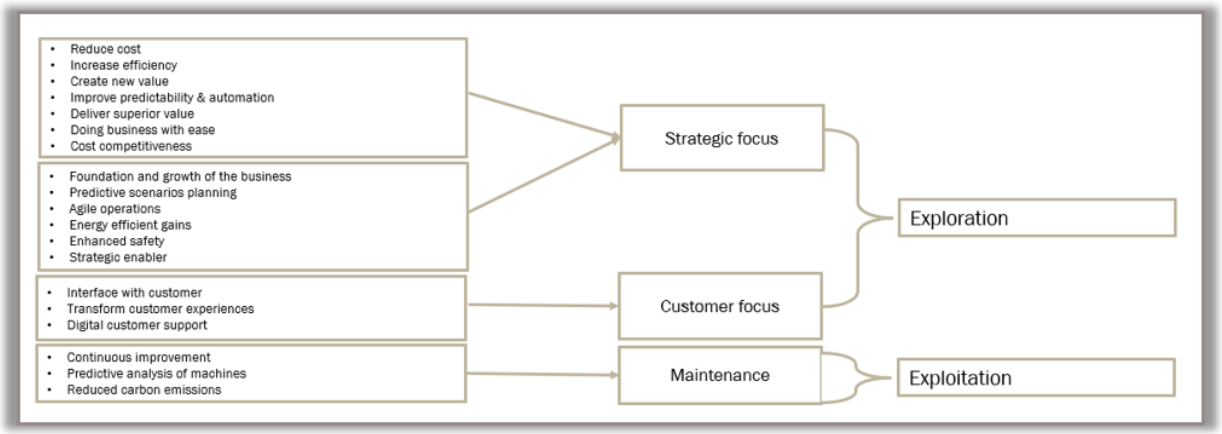


Figure 33: Example of codes, categories & themes from Beta data

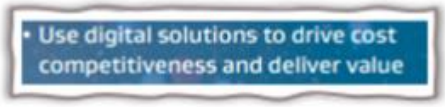
Having been established in 2017, Beta's digital transformation journey was still at its early stages. In fact, in his statement in the 2017 annual report, Beta's Chairperson commented on the establishment of digital transformation:

"…changing market forces and the ability to better leverage technologies to support the overarching corporate strategy, a Digital, Information Management and Hedging Committee was constituted"

In addition to the board sub-committee that is referred to in the statement, there was a Digital Centre of Excellence that was established and led by the Chief Digital Officer. The Chief Digital Officer was a member of the board sub-committee. The inauguration of digital transformation gave the organisation quite an appetite to implement many initiatives simultaneously. This was aimed at reducing organisational costs thus increasing cost competitiveness, increasing efficiency to deliver superior value and improving customer experience.

"I mean certain projects are not related and some can run in series and some in parallel. So it really depends on if there are any dependencies one has on another" clarified the Chief Digital Officer.

Beta also positioned digital transformation as a strategic enabler, with a focus to lay the foundation for the growth of the business.



In addition, results also showed that Beta's maintenance processes, which included improvements through the use of digital technologies in its equipment to improve automation and equipment predictability was also been happening simultaneously.

A Non-executive director, who sits on the Social Governance and Ethics committee elaborated on the role of digital and said:

"Not only does it address climate change issues, but reduce the environmental impact of our product but also getting ready for when the electric cars have come into play".

The 2018 annual report emphasised this stance as follows:

We believe that more effective use of digital technology will create value in a broad range of applications. We pursue opportunities to enhance safety and productivity, improve customer experience, improve operational efficiency as well as plant reliability through predictive maintenance.

Beta started prioritising to be able to streamline its focus to high-value initiatives. The Chief Digital Officer explained as follows:

So I think what we do in order to understand where we focus is, we've created a prioritisation matrix. It looks at obviously value, but it also looks at how quickly you will be able to actually achieve an outcome.

The prioritisation matrix allowed Beta to streamline the organisation's focus on exploration and exploitation. It can therefore be concluded that although Beta's establishment of digital transformation was inspired by the World Economic Forum, the organisation identified internal and external opportunities that necessitated them to explore and exploit simultaneously, with a focus on the prioritised initiatives.

3.3 Structural Ambidexterity

2017 marked the beginning of a digital journey in Beta. The data collected from the organisation showed the following as the most prevalent codes on board structure and related governance.

Figure 34: High-frequency codes for Beta's Board governance

The structure that can be extracted from the above codes is represented by the figure below:

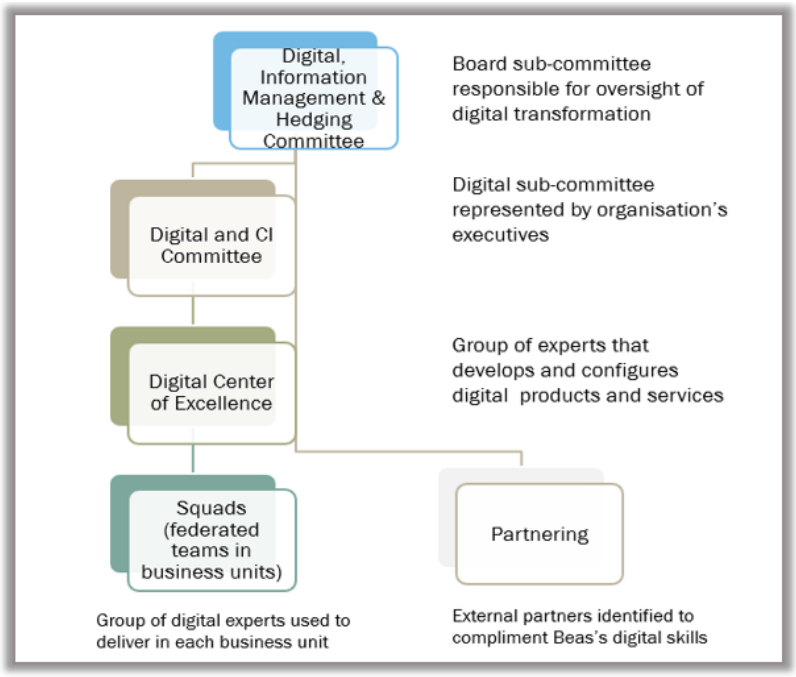


Figure 35: Beta's Digital Governance

The figure above shows Beta's digital governance structure from the teams that develop the digital products and services all the way to the board.

"So we have a centralized structure and then you have structures in every single business unit", explained the Chief Digital Officer.

The Digital Information Management & Hedging Committee reports to the main board. In addition to the above governance process, Beta established a delegation of authority for financial approvals. The highest amounts are approved by the board of directors following recommendations from the Capital Investments Committee, and a delegation of defined amounts is assigned to each of the committees below the board. The Non-executive director explained the process as follows:

"So there is a Capital Investment Committee that looks at any large scale capital investment projects. Okay. It goes through internal approvals within the business until they get to the Exco and then they move to the Capital Investment Committee".

So there is a Capital Investment Committee that looks at any large scale capital investment projects. Okay. It goes through internal approvals within the business until they get to the Exco and then they move to the Capital Investment Committee.

What is evident from the results is that Beta uses a dual approach. The organisation uses an independent team, the Center of Excellence led by the Chief Digital Officer whose sole mandate is to establish digital transformation. When the centre has identified a capability, they get team members from the relevant business units to form part of the Center of Excellence. The capability is then rolled out by business unit squads, who are normally engaged with their day-to-day work, thus an interdependent approach.

The Digital Committee at the Exco level purely focuses on digital transformation, although the members have a dual responsibility to explore and exploit as they lead the business. On the other hand, the Digital Information Management and Hedging Committee at the Board level are charged with both Digital transformation, thus exploration, and exploitation of the business strategy, which includes Information Management.

3.4 Balancing resources

Exploration and exploitation are known as conflicting strategies which compete for the limited organisational resources. During the interview, the Chairperson Non-executive director concurred and said:

"But in all of this, the biggest restriction is money. So every company has limited resources. No company has an unlimited financial resource. And on people, no company has an unlimited number of people".

She also indicated the financial investment that Beta had made in digital:

"25 billion Rands worth of digital technology projects that are ongoing at the moment which should finish within different periods".

Beta mainly used prioritisation, partnering and proof-of-concept to balance its resources as the board directed the organisation to explore and exploit in a digital environment.

Prioritisation

One of the strategies that Beta employed was prioritisation, discussed earlier under temporal ambidexterity.

"So availability of funds is one and delivery pressure is another. So remember there are other things that we do besides digital adoption".

As the organisation prioritised, they identified portfolios that would balance financial and human resources. The Non-executive director gave an example of what informs priority initiatives:

"Cost and the benefits and the time of the return on investment on these projects, as well as the cost and the time to complete the project".

"We need to be quite selective as to where we spend our money. So I think we do pursue specific activities that are going to give us value", echoed the Chief Digital Officer.

Another example that Beta considered when prioritising was :

"But we had to look at what period should we do this in, which plant requires immediate attention, what is the impact in terms of reduction of carbon emissions," said the Non-executive director.

Plant refurbishment was driven by the need to fulfil regulatory requirements for carbon emissions and was highlighted as a priority in the 2019 annual report.

Digital technologies were more effective in addressing carbon emissions, but costly.

The Chief Digital Officer gave shed more light on how the process is done:

> *"So they apply their minds and they come back to us. And we look at whether they have created the right balance on the difficult and limits. Because remember, leadership is about balancing opposing needs, balancing opposing needs. It's about making strategic choices".*

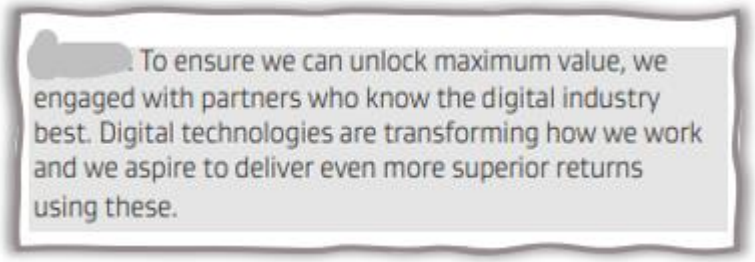
As the organisation reviewed the priorities, they also considered partnering where a need to do so was identified.

Digital partnering

Beta's decision to partner with service providers depended on the organisation's expertise and capacity to deliver the requirement. The example below given by the Non-executive director sums it up:

So in terms of insourcing and outsourcing, it depends on the capability that we're talking about and the level of expertise within the business. Like if you have a wedding, you are not going to do your cake, you will hire someone who will do your cake, even if you bake in your own at home. So you may bake your birthday cake but you will not bake your own wedding cake. So basically what we insource and outsource is based on capability, whether we have the skills internally or not, and also capacity. So you may be able to do your wedding cake but because you are running with so many things, you can decide to outsource it. So it's a function of capability and capacity.

The annual report of 2017 highlighted digital partnering as one of the processes that had been introduced for Beta to leverage on the experience of the selected partners.


To ensure we can unlock maximum value, we engaged with partners who know the digital industry best. Digital technologies are transforming how we work and we aspire to deliver even more superior returns using these.

Beta, therefore, used partnering depending on the context of the delivery and the required skills. The organisation also performed a proof-of-concept on its digital initiatives.

Proof-of-concept

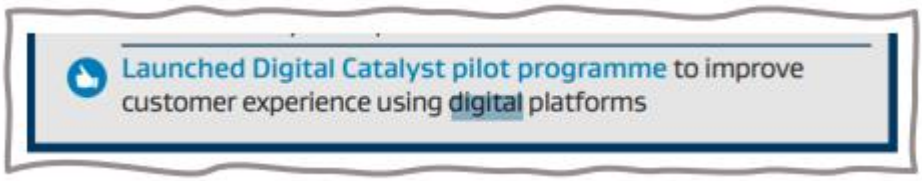
Beta prioritised its initiatives. The prioritised initiatives would go through the proof-of-concept, also known as a pilot, to confirm feasibility before scaling up for the whole business. The Chief Digital Officer explained it as follows:

"You would run what you call a pilot or a POC, to first see that it works. Once you've decided it works, you can then run multiple instances in parallel. So long as you have the capability to actually do it. But I think you always start with making sure that you prove that it works, and once it works then you can scale, we call it scaling".

She elaborated further on the risk associated with digital transformation:

"The first thing is it's important to understand that in digital, a lot of the work that you do is innovative work, where you are trying to implement something new. So you have to have some level of risk tolerance with regards to saying you're going to go ahead with a minimum viable product without having 100% sound business case".

This was corroborated in the annual report of 2018 in the Board Chairperson's report, where he highlighted:



The proof-of-concept was a way of managing the high risk of failure that was associated with digital initiatives.

In conclusion, although Beta used prioritisation, proof-of-concept and digital partnering, results show that the board would still review the balance of resources and readjust when required to. This was confirmed in the board chairperson's highlights of 2019 in the annual report when he said:

Therefore as the business priorities and context of the organisation change, the board reviews and re-balances resources in the organisation.

3.5 The process used over time

The results of how the board directed Beta on how to explore and exploit over the three years under study, 2017 to 2019 are shown the progression of the process from the squads to board in the figure below:

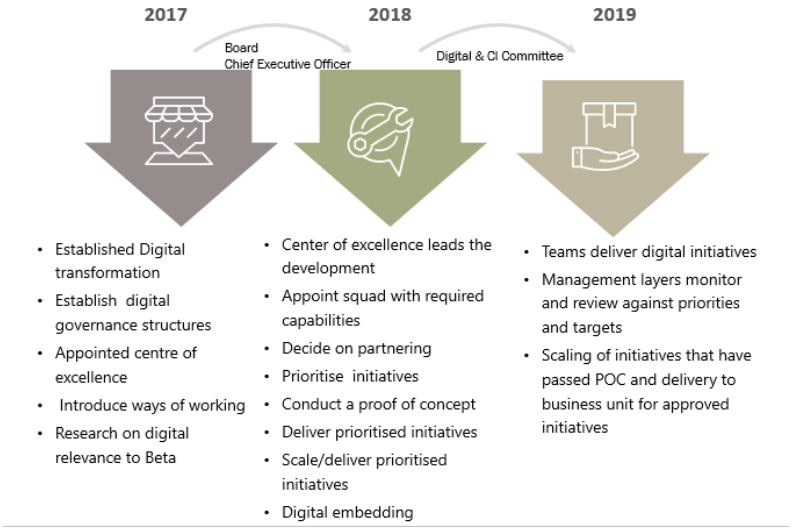


Figure 36: Results of Beta's digital transformation processes

The process of digital embedding which started in 2018 was confirmed in the year's annual report as shown in the figure below.

Figure 37: Digital embedding: Extract from Beta's 2018 annual report

In conclusion, Beta's digital processes started with the mandate to find the relevance of digital transformation in the organisation in 2017, the establishment of governance structures and identifying priorities and executing, scaling up initiatives that will have succeeded in proof-of-concept. The organisation explored and exploited simultaneously, except where initiatives had dependencies and required sequential execution. Beta could be categorised as an infant to digital transformation and is yet to mature in its processes.

4. Within case analysis for Alpha

4.1 Case synopsis

Alpha is an insurance company that prides itself on providing a shared value model that incentivises people to be healthier. Founded in 1992 and subsequently listed on the Johannesburg stock exchange in 1999, Alpha provides health, house and car insurance. The organisation's business model works by giving incentives for its ancillary services. Alpha has grown over the years and had thirteen subsidiaries at the time of conducting this research.

Alpha was the first organisation in South Africa to launch a website in the late nineties. At the time of the research, Alpha had just birthed a digital native business, which operated fully online with a minimal physical presence. The insurance company has a Head Office where digital transformation capabilities are established and then shared with the rest of the group, which are in the federated businesses.

Alpha appointed a Chief Digital Officer in July 2017, who then established a centre of excellence for digital, and created capabilities for the business, and that began the structured journey of digital transformation in Alpha. The rest of the report outlines the processes used by Alpha's board as they explored and exploited in a digital environment from 2017 to 2019. The research was conducted at the group level.

4.2 Temporal Ambidexterity

The figure below shows the main codes and categories that are a result of the analysis of Alpha's data, where the researcher sought to understand whether the organisation explored and exploited simultaneously or sequentially.

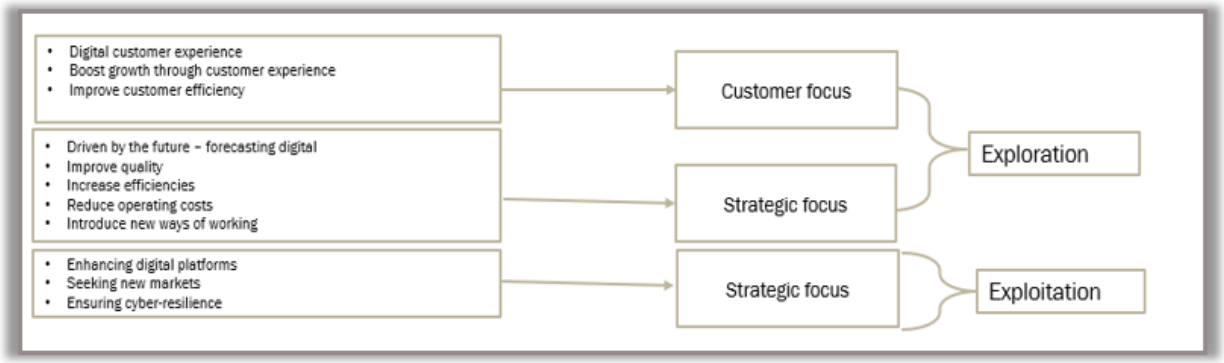


Figure 38: Example of codes, categories & themes from Alpha data

Evidence suggests that Alpha's exploration was largely driven by the need to improve organisational growth through customers' digital experience. This was critical because data for the incentives for Alpha's ancillary services were collected remotely. This message was communicated through the board chairperson's highlights in the annual report of 2017.

The need for improved customer experience continued in 2019, coupled with reducing operating costs, as the board chairperson highlighted:

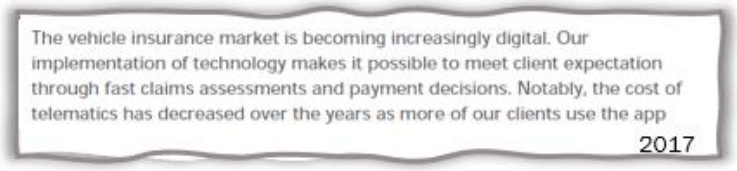
The Chief Digital Officer confirmed the same and said:

"Now most of the work that gets done most of the product innovation, work that happens in our R&D functions, results in some kind of digital customer experience".

It can therefore be concluded that most processes used in Alpha's digital transformation were aimed at improving customer experience.

Digital Forecasting

Data shows that exploration in Alpha was also driven by the organisation's digital forecasting. The organisation was continuously monitoring market trends as shown by the Board Chairperson's comment in the 2017 and the 2019 annual reports, thus showing progressive researching, and therefore the organisation continuously introduced digital products and services.



Synonymously, the Chief Digital Officer underscored the work that the organisation had embarked on for understanding future requirements:

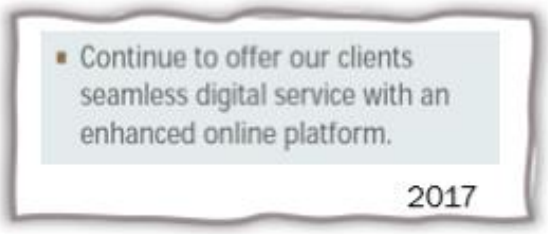
"And so we're now going through a process using modern digital approaches such as design thinking, service design, and so on, to really understand what the requirements are for those customer service agents, understand what the business requirements are and the future kind of road maps are capable of, and technologies and so on".

Enhancing products and services

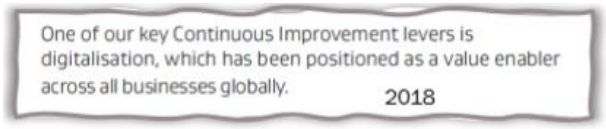
The process of enhancing existing products and inform new products continued as seen in the board chairperson's highlights in the annual report of 2019.

The need to explore was compounded by the Alpha's drive for increasing efficiencies. As part of this, Alpha had an opportunity of introducing new ways of working among its employees.

The pressure to explore left Alpha with minimal choice but to pursue the deployment of digital transformation simultaneously. Therefore the processes that were used were informed by simultaneous delivery. Concurrently, the organisation had pressure to exploit with a focus of enhancing the digital solutions that were released and are in use in their client communities. In the annual report of 2017, the board chairperson confirmed the need to be continuously improving and said:



The same process of continuously improving was communicated by the Chairperson in 2018 and 2019.



In addition, Alpha had to be continuously enhancing its security posturing as exploitation to ensure cyber resilience. The commitment to continuously enhancing security posture was emphasised in the annual report:

In fact, the board chairperson's comment shows that digital transformation is the model that was used for continuously improving business processes.

There is an acknowledgement in the market that Alpha is leading in its industry in digital transformation. This is evidenced by the following statistics from Alpha's 2018 annual report. As such, Alpha reinforced processes of maintaining market leadership.

In fact, during the interview with a non-executive director, she aired her disappointment with how peers in the market were copying Alpha's innovations and had this to say:

"And so the board's decision then was to say, we believe that there is a strong business case for us to launch a digital-only business. And so from the ground that business has been designed to be digital. We said no paperwork and what a view. But we started right and other businesses started to copy. I was so angry".

Evidence suggests that as Alpha explored and exploited simultaneously, the organisation invoked different processes which included improving customer experiences, digital forecasting, enhancing products and services and reinforcing digital leadership in their industry. The next section unpacks the structure that supported the processes for simultaneous ambidexterity.

4.3 Structural Ambidexterity

The structure used by Alpha's board of directors to explore and exploit was evident from the high-frequency codes, some of which are presented in the figure below.

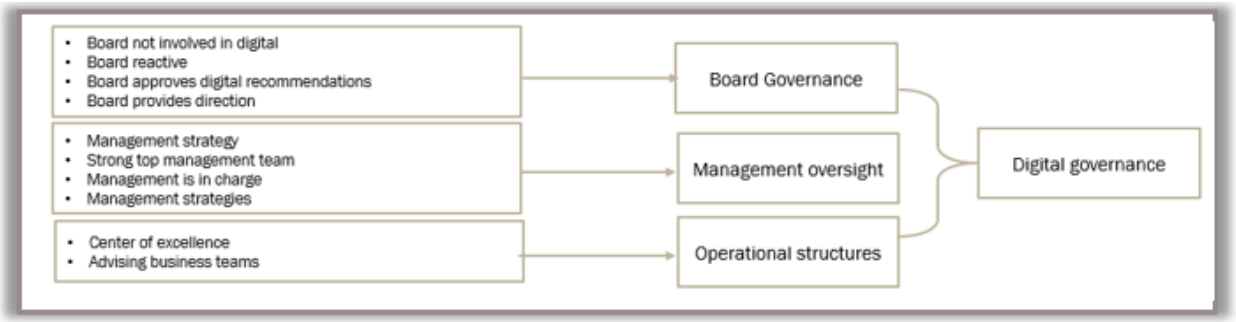


Figure 39: High-frequency codes for Alpha's digital governance

Results show that Alpha's digital transformation processes were executed in a federated structure, with a centre of excellence capacitating the rest of the organisation with digital skills and expertise. The Chief Digital Officer explained it as follows:

"Alpha is a very federated organisation. Each product has entirely its own business. And the group basically provides a complementary function to them. So we don't try to overlap with the work that they're doing. We provide them with tools that will be enabling, that'll help with the crosscutting capabilities and kind of interaction. And also look at new technologies and approaches that we believe are of value across all of the businesses".

The centre of excellence was supported by a strong executive team that led each of their businesses to digitally transform, leveraging on the common digital platform that was availed across the organisation. Alpha, therefore, used independent ambidexterity to create new capabilities from the centre of excellence and pass them on to research and development teams in the federated business. The Chief Digital Officer explained the role of the centre of excellence as follows:

"And so what we're trying to do in certain areas, so for instance, in my team, I've got a small team, but its basically a group function. So we play primarily to provide an advisory role to the business. So I've got seven direct reports in my team. And then we resource from other areas".

The centre of excellence was therefore advising the business research teams. The two teams were reporting to the IT Strategy Committee and then to the Group Executive Committee and then to the main board of Directors as shown in the figure below.

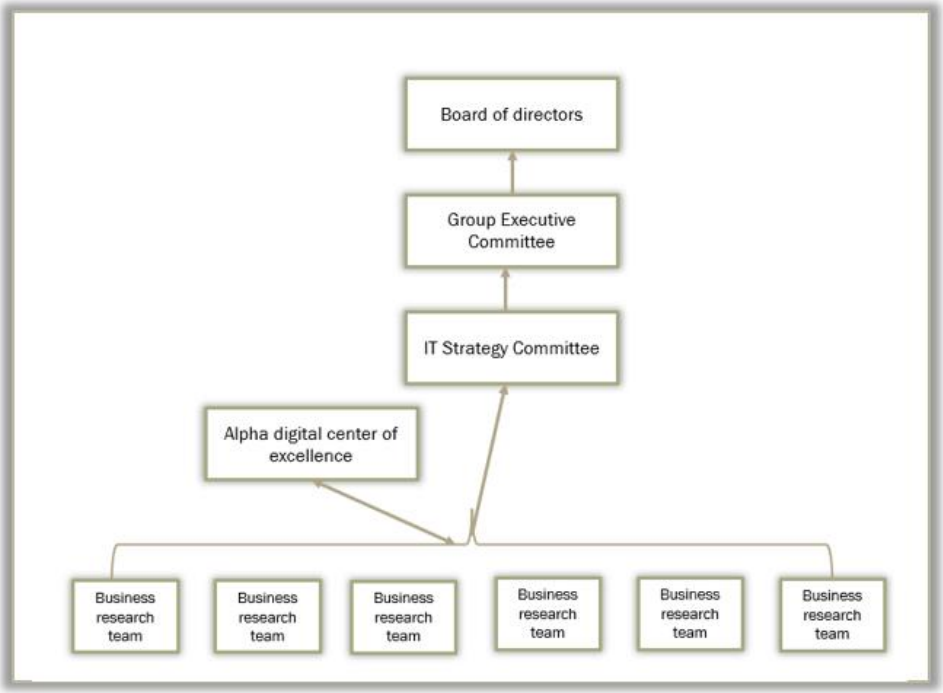


Figure 40: Alpha's digital governance structure: Researcher's conceptualisation

Results show that in Alpha, at the low levels, exploration was happening in the centre of excellence and business research teams, while exploitation continued in business units. Therefore, exploration and exploitation were assigned to different units in the business, thus interdependent ambidexterity. However, the IT Strategy Committee, Group Executive Committee and Board manage both exploration and exploitation within the same committee, thus independent ambidexterity. The rest of the section illuminates the processes used as Alpha's board explored and exploited in a digital environment.

Delegating digital processes

Based on the evidence provided, Alpha's board delegated digital transformation to the management team and the structures that support it. However, the board processes included approving digital strategies submitted by management as attested by the non-executive board member:

"Boards are always reactive to what is on the table. They can enhance, they can do all sorts of things, and occasionally, they can push. Why are we not doing this? That's two out of ten".

"And the reality of the oversight is reactive. You receive packs and they say this is where we want to go with 123, and board applies their mind. In the strategy session, with all the companies, you wouldn't want to run as the board of directors and management. No, you don't do that. Each division comes and says we want to do 123, and then you apply yourself and say "but there, you underestimated 123, I think lets cut that one, lets increase that one", elaborated the non-executive board member.

The Group Executive team was in charge of delivering digital transformation, reporting to Board.

Investing in digital transformation

Alpha's board of directors delegates digital to management. Furthermore, the board processes involve releasing investment funding for digital transformation from the organisation's successful businesses. The Chief Digital Officer explained the process:

"You can see in the way that the board looks at this kind of investment on digital. It's taking the established organisation businesses, and it's reinvesting the profits from those investments into emerging businesses. So, for instance, the new digital business, I mean, that's a wholly digital business".

Therefore, investing in digital transformation is one of the processes that is used by Alpha's board to explore and exploit.

Target setting

Another process used by the board was target setting as explained by the non-executive board member:

So, we, from the ground up, have decided at the Board level and agreed that that's the approach. And they've said that the targets of the new business in terms of how that's going to be rolled out, the efficiency and the scaling of that are based on it being a digital offering.

Although the same board member had indicated that board is not involved in digital transformation processes, target setting is one of the critical processes that the board used.

Maintaining digital leadership

Evidence suggests that Alpha's board delegated digital transformation to management. However, it was observed that there was a drive of maintaining digital leadership in the market, as shown by the statement from the board member below:

"We said no paperwork and what a view. But we started right and other businesses started to copy. I was so angry. For example, Zeta had this thing that you can open and switch your accounts with a selfie. That was three weeks after the board had approved the same for our digital business" said the board member.

Digital leadership was echoed by the Board chairperson in the annual report of 2018.

The board's processes on digital transformation involved maintaining digital leadership.

Advising and collaborating

Digital transformation was supported by the centre of excellence, which was advising business research teams and both reported to the IT Strategy Committee. The business research teams were collaborating with the centre of excellence for visibility and to obtain any skills or capabilities that may be required from the centre.

"And in building out what a vision for that environment could look like and seeing how we could enable those teams, we are looking at various models", elaborated the Chief Digital Officer on processes that Alpha used for advising the business research teams.

He elaborated on the role of the centre of excellence that he leads:

"From our team, we have the initiatives that we lead. And other teams have R&D labs and innovation teams and they've got their own focus. We simply support them where it makes sense". "My team then plays a kind of an advisory function. It's very much dependent on demand from the business, but we try to generate some demand by explaining to them the potential of new ways of working".

In essence, the processes for the centre of excellence are generating demand, advising and supporting while the business research team collaborates continuously with the centre as Alpha explored and exploited in a digital environment.

4.4 Balancing resources

Exploration and exploitation have been known to compete for limited organisational resources, but Alpha did not seem to have limited resources. At the time of this study, the organisation had outperformed the market from the time of its listing, as shown in the figure below, extracted from the Thompson Reuters data stream (Porter et al., 2018).

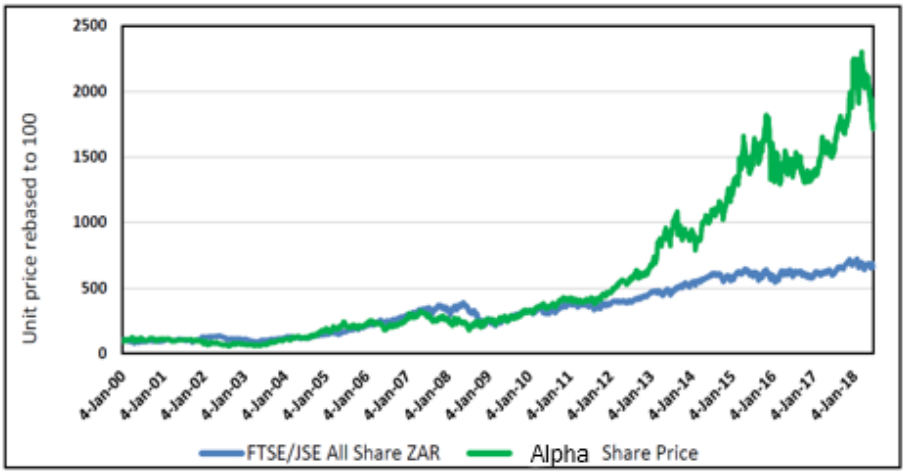


Figure 41: Thompson Reuters Data Stream June 2018 (in Porter et al., 2018)

Granted, Alpha had a strong financial position at the time of the research based on its financial statements in the annual report. However, human resources were not as abundant. The organisation, therefore, used the following processes to balance its human resources as they explored and exploited in a digital environment.

Partnering

Alpha used partnering in its deployment of digital solutions. The organisation uses this process to a minimal extent. For example, the new digital business was established mostly internally as explained by the Chief Digital Officer below:

"So how do we now make this new business offering part of that ecosystem? And so, the board's decision then was to say, we believe that there is a strong business case for us to launch a digital-only business. And so, from the ground that bank has been designed to be digital. So, we've got a fully digital onboarding process".

There are instances though where Alpha uses partnering. The Chief Digital Officer gave an example of such:

"The application is called Alpha-Tap, which provides members with the ability to have chat-based interactions with service providers and video consultations. And so that's the kind of examples where we do work with partners. We probably work less with partners than some other organisations. I think we've got the ability to build a lot of ourselves like we've done, whether that's the right way, in all cases, it has worked, but I think we'll continue to re-evaluate that approach".

While Alpha had a defined structure with processes they could discuss, the Chief Digital Officer shared some of the plans that the organisation had for future processes:

"We should start bringing our customers earlier into the process. We should start iterating and invalidating ideas much earlier in the process with them. We should be testing the technology in small prototypes and building it in an incremental fashion".

The future process defined is prototyping and invalidating products that do not meet customer satisfaction.

4.5 **Conclusion**

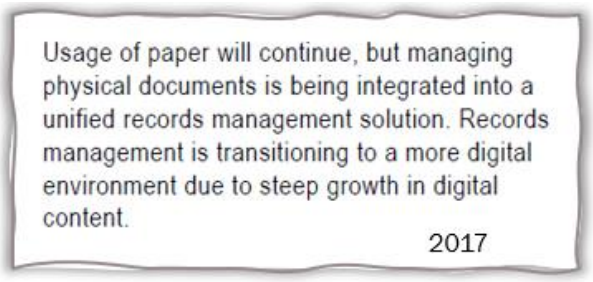
In conclusion, in the period 2017 to 2019, Alpha used a combination of processes as they explored and exploited simultaneously through independent teams and interdependent management and board of directors. The processes that start at ground level, with the appointment of the Chief Digital Officer in July 2017 and the centre of excellence and business research teams, to IT Strategy Committee and Group Exco all feed into Board. Although the board delegated digital transformation, the processes that are done at lower levels allow the board to be setting targets, approve strategies and review performance reports.

5. Within case analysis for Gamma

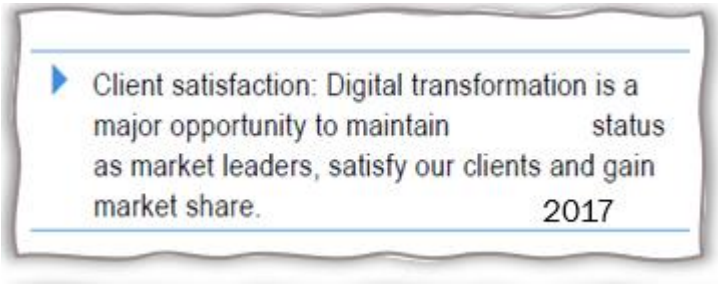
5.1 Case synopsis

This section reports on the processes used by Gamma's board of directors as they explored and exploited in a digital environment. At the time of this research, Gamma was primarily a documents and records management company that provides clients with end-to-end solutions for the information management lifecycle. The services that Gamma provided started from document creation, management, archiving retention, and destruction. The organisation provided other value-adding document and records management services through its subsidiaries.

The South African market, similar to other countries, had intensified data governance through the introduction of different pieces of legislation, the most recent being Protection of Personal Information Act, which legislates that a data owner must give consent for data to be collected for a specific purpose and must be destroyed once that purpose is served. In addition, Gamma had seen the wave of digital disruption in records and document management. The Board Chairperson elaborated on the impact of digital transformation in the 2017 annual report:



Gamma prided itself as the leader in the document management industry in Southern Africa. The organisation saw digital transformation as an opportunity to keep satisfying clients and maintain the market leadership position, according to the board chairperson.



In 2017, Gamma started a journey towards digitisation

"Where clients used to give physical records for retention, the demand is now for digital solutions that would provide similar services at a lower cost " as reported in the annual report.

In fact, results show that a new Chief Executive Officer, Golf, was appointed in 2017 after the board had identified digital disruption as a major risk to the organisation.

"So a few years ago, the emergence of digital as a platform obviously was highlighted as a model that would substitute the model we are currently running. Golf was appointed in 2017, following strategic risk management planning. The board wanted a person who would drive digital transformation so they took him from Company T where he was doing the same" explained Tango.

"So I also form part of our board directors. And on the board, there also some independent board members and that is you know, non-executive. But as part of that, myself as the group CEO and the CFO we sit on that same board", said Golf.

The rest of the section presents the results of the processes that were used by Gamma's board of directors to explore and exploit in the context of digital transformation in the period 2017 to 2019.

5.2 Temporal Ambidexterity

Data analysis for Gamma showed high frequency on some of the codes shown in the figure below.

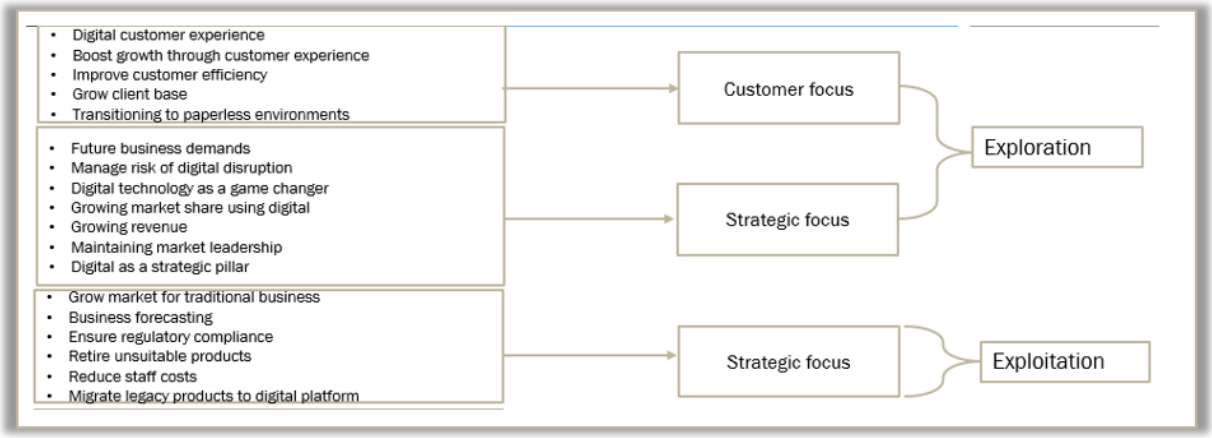


Figure 42: Example of codes, categories & themes from data collected on Gamma

Gamma's exploration was customer and strategy-driven. After acknowledging the risk paused by digital disruption, the organisation used that as an opportunity for increasing its market share, growing revenue while maintaining market leadership in records and document management. In 2017, Gamma made digital transformation one of the four strategic pillars.

While the organisation explored digital technologies, exploitation continued in the traditional business. Gamma used different processes for growing the market in its traditional business, business forecasting for its strategic pillars for growing revenue and reducing staff costs. In all this, Gamma ensured that they maintained regulatory compliance.

As such, the organisation could not explore and exploit sequentially but identified priorities to execute simultaneously. The sections below elaborate on the processes used as the organisation explored and exploited simultaneously.

Growing the business

Gamma decided in 2017, after the appointment of the Chief Executive Officer, to use digital transformation for growing its business. At this time of conducting this research, digital business, which was non-existent before 2017, had grown and the Chief Executive Officer elaborated below.

"Digital business is up to 25% now. Yeah and that quite significant. We are still going to grow beyond that, to 30-40% in the next year or two. And is increasing company growth".

By 2019, the digital business had brought revenue as reported by the board Chairperson in the annual report:

Also, Gamma pursued growth strategies for its traditional business and opened new record management facilities as attested by the Chief Operating Officer.

"As a side note, we have actually opened up new facilities in South Africa. We have opened a new facility in Durban and we have opened a new facility here in Gauteng and potentially we are going to expand that".

Therefore organisational growth was evident in both exploration and exploitation from 2017 to 2019 when the research was conducted. Gamma changed its tactics during that period:

So remember I mentioned that we had to change our tactics when we kind of started doing greenfields, ground-up developmental projects, said the Chief Digital Officer.

Enhancing products and services

Gamma's processes for exploring and exploiting included enhancing its products and services. The Chief Executive Officer explained the two avenues that Gamma could pursue.

"Anything that we are supporting and doesn't require authentification, you keep it in a repository. And that repository is also something that we manage. So then all of a sudden, you've got two avenues, which you can keep the information, and one has as a digital artefact, the other one is as a physical. So that's another area that we are looking at.

The first approach was of migrating Gamma's traditional products and services to a digital platform.

"I think the other thing is that we have quite a number of legacy products that are inside our consumers and that we are working with the customers to see how best to get them onto our new platform", explained the Chief Operating Officer.

Gamma was also enhancing products and services to align with what customers wanted as explained below by the Chief Executive Officer:

"So that's what we have developed over time. And we continuously look at adding features, you know, depending obviously on what customers want".

The second approach was enhancing Gamma's product offering by introducing digital products and services which did not exist before.

"So the customer says I don't want to see paper. So in 2019, we've created a paperless office, from receipt of the paper, approvals, payments, everything. So if you're working there, the only thing that is if you really want to see the only paper you see is a newspaper, but otherwise, they don't have the paper in there. We created a paperless environment " said the Chief Executive Officer referring to new products and services that Gamma was delivering.

Streamlining products and services

Gamma decided that retiring some of its products and services would enhance its focus on the new digital products and services, which was adding to its portfolio.

"Then we have what we call new areas or innovations, the position we have taken is that we have invested in a number of assets, let's enhance and sweat the assets and standardise them so that we have a repeatable experience", said the Chief Operating Officer.

"We have retired a number of old products that were in the business that we felt were not suitable for our business going forward", elaborated the Chief Operating Officer.

Though it started in 2018, the product streamlining process was quite evident in 2019 when the board chairperson highlighted it in the annual report as one of the key strategies.

The streamlining was not only on products and services but the people that delivered them as well.

"So that we don't end up chasing too many things at the same time. We are very clear on the key people that are driving the initiatives and those assets", said the Chief Operating Officer

As the digital transformation champion, the Chief Operating Officer also explained the strategy to improve the marketing of the products:

"We have a contract process for consolidating our digital assets so that we can package them in the manner that is easier to market".

Streamlining products, services and related teams helped Gamma as they pursued simultaneous ambidexterity.

Reviewing customer value proposition

As Gamma embarked on the digital journey in 2017, the Chief Executive officer challenged the organisation to re-think the value that customers were paying for. He challenged employees to review their services because, in some instances, the same services could be offered using digital technologies at a lower cost. He said:

"The issue is, what business issue am I solving for, and can I justify the reason why the customer is paying this much? So I can end up having a box on the shelf, but how it lends there and why it lands there is what the customer pays for ".

Gamma was able to improve customer efficiency and probe into future business demands in their client engagement processes. The Chief Executive Officer gave an example:

"So with my understating of customer's current capabilities, I go to them and say, per square meter here is expensive. You can pay me a tenth and I will keep the information for you".

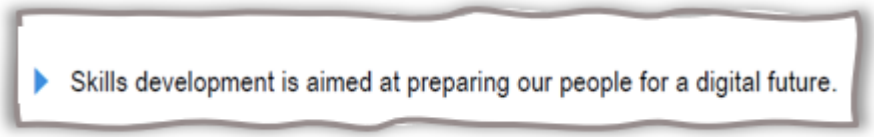
At the time of this research, one of Gamma's businesses used robotics in its operations as narrated by the Chief Executive Officer:

"So we are actually using robotics. So we use robots to manage other robots to be able to provide that process. Because with robots, with all due respect to us, I mean, you want to give that mundane work something that can manage that mundane process".

Subsequently, Gamma was expecting to boost organisational growth through customer experience.

Re-skilling and re-purposing resources

Digital skills are an issue in South Africa and the rest of the continent. In the highlights of the 2017 annual report, the board chairperson's mentioned re-skilling as one of the processes Gamma embarked on.



Results of data analysis showed the following examples of where human resources were to be re-skilled and assigned to different business areas:

"In our bureaus, for instance, there is no need to have too many people doing image processing. There's software with artificial intelligence that can provide that service easily and more effectively", said the Chief Executive Officer.

He went on to elaborate on the context of the South African environment and said:

"But also understand that there's an impact on people, especially in an environment where there is a limitation in terms of jobs, you know. So you look at them and they say will machines replace us? No, but machines have allowed us to do other things, and then we need to convert the skills to something else".

Business Forecasting

The other main process that Gamma's board of directors invoked in the three years under study, 2017 to 2019, was business forecasting. The following examples from both the Chief Executive Officer and Chief Operating officer give a clear perspective of how forecasting was done.

"We are driven by projections and knowing what needs to happen. So if we're growing at 55,000 cartons a year and we have a warehouse which has got 30,000 spaces left, so next year we need to increase our facilities. But what size of facility we need to have?" explained the Chief Executive Officer.

He also challenged the team to think differently:

"So in the digital space, you are saying, what is the understanding of the market opportunity, you know. What are we offering? What is our business model? So if the market opportunity is this size, what market opportunity can we potentially win".

"Well, my own view is that digital innovation is substituting the traditional business. So that understanding of what is going to shift in the future and how it's going to shift, and how does digital fit into that is where most of the thinking would go to", said the Chief Operating Officer.

He continued to give an example,

"And for an investment of this size, this is what we need to have and this is the investment we need to make. There is a demand-pull which is happening in the physical space, so you can tangibly say, that's the demand", elaborated the Chief Operating Officer.

Complying with regulations

The law was an enabler to Gamma's business, and the Chief Executive Officer commented:

"Legislative wise, the laws require that you needed to keep physical paper for a given period".

In addition, Gamma used digital technologies to assist clients to comply with regulatory requirements. In fact, a new business line was started in 2018 and the Chief Executive Officer proudly explained the concept.

"But what this is also doing is allowing municipalities to normalise the way real estate is managed. Because there are people that have built-in areas where they're not supposed to build. Or there are services that were put in place which have to be changed simply because things have changed. So, you know, water reticulation that was supposed to service one million people is now servicing seven million people because things have changed. Our technology helps municipalities normalise this".

In conclusion, there are several explorative and exploitive initiatives that form Gamma's strategic pillars and as such, can not be delayed. Hence the organisation used simultaneous ambidexterity and invokes several processes to ensure successful execution. The next section outlines the structures that are used by Gamma to explore and exploit in a digital environment.

5.3 Structural Ambidexterity

Gamma's data revealed high-frequent codes that showed the structure that Gamma used to explore and exploit. The figure below shows some of the codes and categories that were identified.

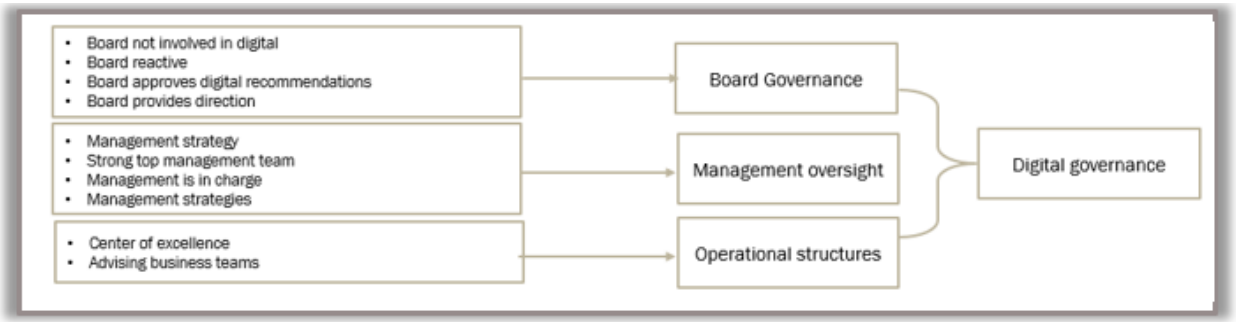


Figure 43: High-frequency codes for Alpha's digital governance

The appointment of the Chief Executive Officer in 2017 marked the inception of Gamma's digital transformation. Upon his appointment, the Chief Executive Officer immediately appointed a Chief Operating Officer to lead digital transformation. The Chief Operating Officer was at the same digital organisation where Chief Executive Officer was from, and therefore he came with the digital skills and experience that was required. The two were executive directors on Gamma's board, and evidence suggests that there were entrusted with leading exploration and exploitation programmes.

A Chief Information Officer was appointed subsequently, in May 2019. However, his responsibility was primarily to manage traditional Information Technology operations and had limited visibility on Digital Transformation, a status which he complained and said:

"So in the past, up until maybe three months ago, IT hasn't played a role in digital transformation. It was an afterthought. So the strategy would be, okay, we were going to deliver this digital service. IT becomes aware when it's launched or implemented into client-facing environments".

The board of Gamma managed Information Technology and Digital Transformation as a risk and therefore assigned both to the organisation's Risk Committee. The Chief Information Officer did not agree with such a structure and said:

"I do however think that if you look at King IV corporate governance, there is a significant responsibility for IT placed on the Board. And I don't think the board members understand that responsibility. Okay. And what they choose to do is abdicate that accountability to a subcommittee, like a risk committee".

As such, the Chief Executive Officer and the Chief Operating Officer were responsible for the digital transformation programme, reporting to the Risk Committee, a board sub-committee. The rest of the structure is presented in the figure below:

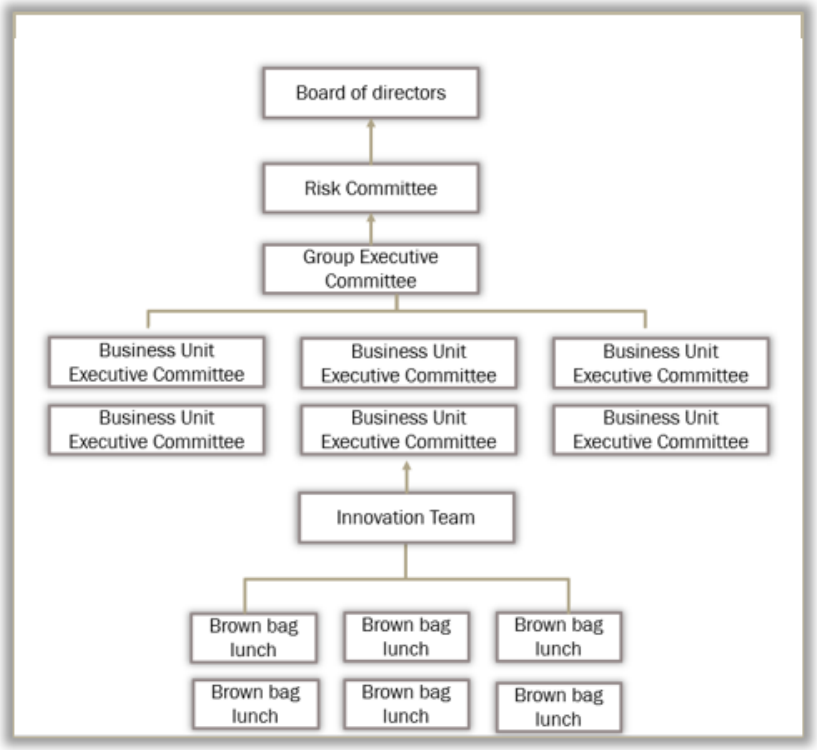


Figure 44: Digital governance structure: Researcher's conceptualisation

Findings from the data show that the Risk Committee had very minimal involvement in digital transformation except performing regular risk assessment reviews on digital disruption and Gamma's Information Technology.

"So if we're talking about governance, we talk about the risk committee having to revisit our risk register as a business on a regular basis, maybe twice a year but I think we do it three to four times a year", said the Chief Operating Officer.

Risk analysis alone is very distant from the actual work and decisions.

Owning Digital Transformation

Evidence showed that digital transformation in Gamma was driven by the Chief Executive Officer and Chief Operating Officer. Both executive directors were members of all the Executive Committees, the Risk Committee and the board.

"Digital has been there. But not planned for. But when I came in, what I did was to bring a lot of discipline and make people conscious of the fact that the environment that we're in is evolving and to assess there's a need for us to remain relevant. And also staying close to the innovation journey that our customers are going through" confirmed the Chief Executive Officer.

However, evidence showed a harp-hazard structure at the lower level, with no clear accountability for origination and development of digital initiatives. the organisation opting for outsourcing. In addition to the structure shown above, Gamma had a Delegation of Authority, and the Chief Executive Officer explained how it functioned:

"There are obviously thresholds in terms of approvals. So there are approvals that end at the Managing Director level, then at my level, then there's approval at the board level. So we have set investment limits. But that doesn't necessarily mean you just spend the funds without bringing the discussion into the respective forums. You can bring it to say, I want to invest in this thing, but it's within my budget it's for your information".

Strategising for digital

After appointing the Chief Executive Officer, he went on to establish a digital strategy. Digital transformation became one of the four strategic pillars of the organisation.

"In that multi-year strategy, we then identified the core pillars of our business. And then those core pillars of our business, one of them is obviously our traditional business. But the other one we identified going forward is the digital services or digital business perspective" said the Chief Executive Officer.

Digital continued to be a strategic pillar and in the 2019 annual report, the board chairperson concurred and highlighted the pillars as:

Once the strategy was defined, it had to be operationalised and then monitor and report. The two executive board members, Chief Executive Officer and Chief Operating Officer decided to outsource execution as the organisation explored and exploited.

Planning for digital

Results showed that after that, Gamma went into the planning. The Chief Executive Officer explained the process for planning for digital:

> *"So at the beginning of the financial year, you say that I would like to look at a couple of opportunities in this area. As such this is the required investment that I believe would cater for my requirements for the next year. Then on a regular basis, in fact, on monthly and quarterly reviews, we also look at that right. Because then, from a governance point of view, regardless of the fact that it's built into the budget, it also requires approval. Just make sure that the expenditure is right and we're sort of channelling the money in the right direction".*

In addition, Gamma also ensured that there was an adequate budget for exploration and exploitation.

> *"So we will always say that it's important to make sure that the investment you are going for, one it is budgeted, two it is within the price range budgeted for, at least plus or minus 10% of the set budget. Because then all of a sudden, you can not just come to me and say I want to spend 10 million and you did not foresee this. That becomes indicative of bad management practices",* said the Chief Executive Officer".

Therefore, planning is integrated with Gamma's processes to explore and exploit in the digital environment.

Outsourcing digital transformation

Gamma needed other structures below the executive board members to execute the strategy. The Chief Executive Officer corrected an earlier statement about insourcing:

"So yeah, maybe that was a very generic statement on in-house developments. Where we don't need to have the skills internally, we leverage on our partners. Right. So we keep the skills that we want to keep, but the ones we don't, we always bring specialists and we partner with specialists because I mean, we can then be a solution to everything".

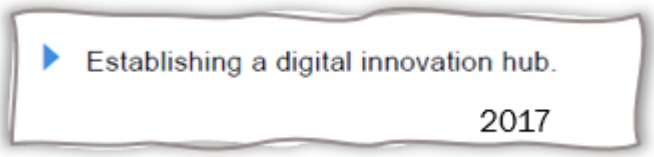
The Chief Operating Officer commented on the challenges of resourcing digital transformation and said:

"Right now we do have a very small internal team that leads the product development if you want to put it this way. The hardcore technical stuff we outsource to people that have development teams, you know. So we do that so that we do not carry that resource on our books".

The internal and external teams had partnerships to harness the skills from internal and external resources.

"So our internal team understands the customer's requirements and understands the core business of the banking sector, but the actual coding now is what we use and give the external party but the IP belongs to us. So in other words, our external team are the developers we own the IP", explained the Chief Executive Officer.

Despite the assertions for partnerships, the structures below the Chief Executive Officer and Chief Operating Officer seemed to be haphazard. In 2017, the executive board members committed the organisation to:



However, at the time of conducting this research, it was evident that the innovation hub was not working and Gamma was reviewing the decision to outsource its digital transformation.

Reporting

Gamma's Group Executive Committee reports to the Risk Committee on digital transformation strategies and progress thereof. The reporting is more for the board sub-committee to perform a risk analysis and treat any residual risk on digital disruption than to give guidance to management on adopting digital transformation. The Chief Operating Officer confirmed the reporting and said:

"But all of these matters that I am talking about, there is a Board report that goes to Board quarterly, that addresses how we are seeing growth according to our operational metrics and if there is anything that we are foreseeing the future which might affect our traditional reasons, then that gets to address those engagements".

Evolving digital adoption approach

This research was conducted three years after the digital strategy was established in Gamma. The organisation was reviewing some of the approaches that it had taken in that period:

"So not only does it affect product development, but the also affects our sales. Very few people can sell digital products. Thus, that is a journey that is still in the process of evolving for us to get to the point that we want to go", said the Chief Operating Officer.

Balancing resources

Results show that after establishing the digital strategy, Gamma set priorities for the year and opted for digital initiatives that had a shorter return on investment, as the Chief Executive Officer pointed out.

"We obviously would have a three-year plan. But a three-year plan on split into the respective financial years. So there are certain things that we will want to achieve in a year. Furthermore, anything that we do must fit within the costs and budget allocation and have either impact in that financial year or an impact in the next financial year. So anything that we do is return based".

The financial resources that Gamma allocated to digital transformation were informed by international benchmarking.

"Let me put it this way; we use a set of benchmarks in terms of what percentage of revenue should be invested for growth capital or maintenance CAPEX. So there are international benchmarks, global benchmarks that we follow around that," explained the Chief Operating Officer.

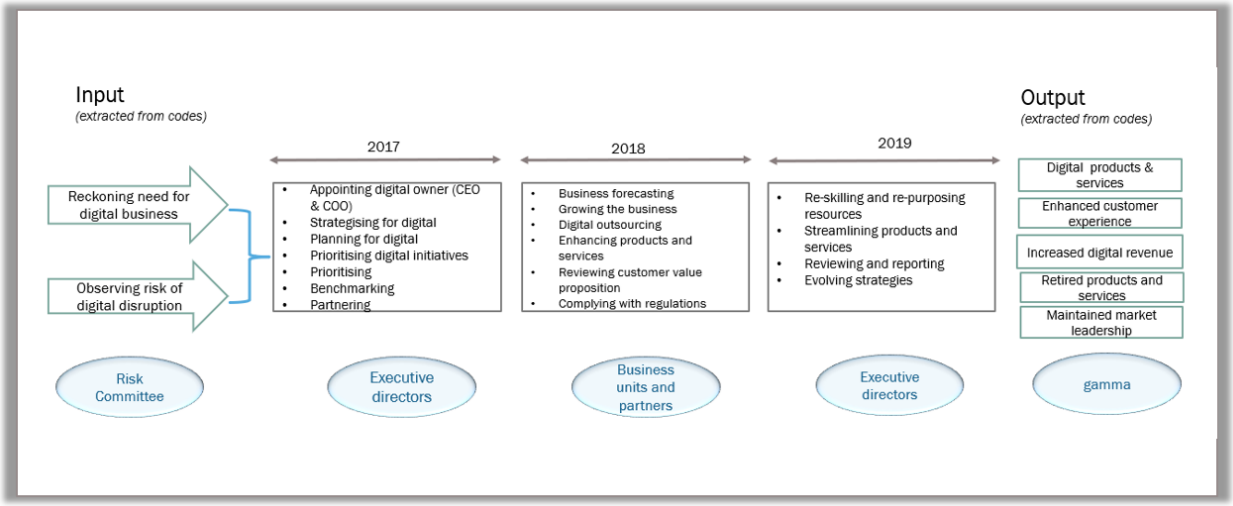
In addition, the Chief Executive Officer explained internal controls on how the digital priorities were identified:

"So we will always say that it is important to make sure that the investment you are going for, one it is budgeted, two it is within the price range budgeted for, at least plus or minus 10% of the set budget".

In summary, results show no independent structures were established for digital transformation and therefore the organisation explored and exploited using interdependent ambidexterity. Each business unit identified digital opportunities as part of its daily routine. Similarly, the "brown-bag" innovation lunches that were held in the organisation

5.4 Conclusion

In conclusion, Gamma exploited and exploited simultaneously, using interdependent structures, thus harmonic ambidexterity. The organisation established its digital transformation programme in 2017 and set annual priorities over three years. The figure below summarises the temporal progression of Gamma's processes in the period of this study, 2017 to 2019.



6. Within case analysis for Delta

6.1 Case synopsis

Delta is an Automotive and Logistics company that provides short term vehicle solutions and motor trading to complement the dealer footprint across the market.

"On the supply chain side is moving like warehousing. So we run warehouses on behalf of our customers. Some of our customers are big global sports and food brands. So the IT side plays a vital role because we provide the IT solutions that fit our final customer, the end customer at the end of the day".

Delta was listed on the Johannesburg Stock exchange in 1941 and was equally bound by the King Code of Corporate Governance for the board of directors to monitor digital disruption. As such, digital disruption was one of the risks that were closely monitored on the organisation's risk register and highlighted in the three annual reports, 2017, 2018 and 2019.

However, similar to most organisations in South Africa which had been slow in response, Delta was at the inception of introducing digital transformation in 2017, which was the beginning of this research. In the annual report of 2017, the board chairperson applauded the company's decision to invest in digital technology, citing customer value proposition as the expected outcome.

Although the Automotive and Logistics industry in South Africa had been slow to respond to digital transformation, the global market had reined havoc in Delta's short term vehicle business. The coming of Uber, a digital native where a rider requests a ride over a mobile application and pays rates lower than car hire, reined havoc for Delta's short term vehicle solutions. Other worldwide digital technologies continued to disrupt the South African market, including technologies like shipment visibility, augmented reality, robotic process automation and 3D printing. Delta had to review its position on digital, lose its competitive advantage or risk extinction. The board chairperson lamented on the impact of digital transformation and said:

In 2018, digital transformation in Delta ceased to be just a plan but the organisation invested funds and identified digital priorities for implementation. Concomitantly, Delta appointed a Chief Digital Officer to drive digital transformation for the Automotive and Logistics group.

Therefore, to investigate how Delta's board of directors explored and exploited in a digital environment from 2017 to 2019, this research was carried out in this context. The rest of the report presents the results of how the organisation pursued ambidexterity.

6.2 Temporal Ambidexterity

This section details the results of how Delta explored and exploited as the organisation adopted digital transformation. Delta had taken significant steps towards integrating its Automotive and Logistics businesses when this research was performed. Figure 20 below is an example of the most prominent codes relevant for this research, grouped into relevant categories and themes.

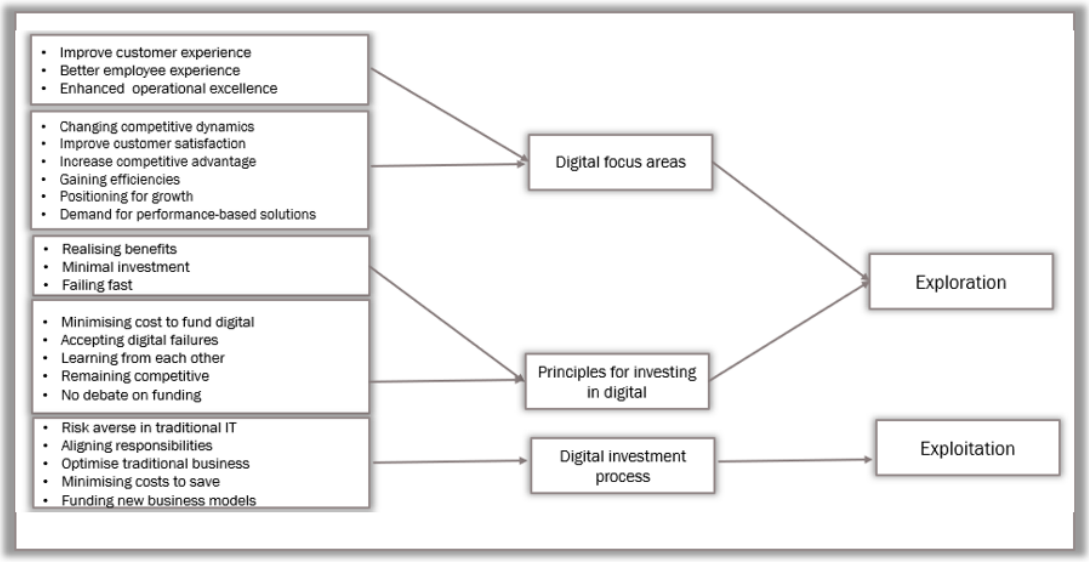


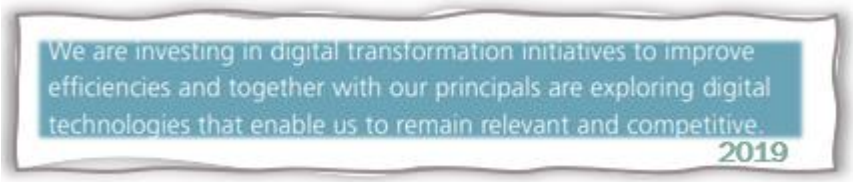
Figure 45: Example of frequent codes, categories and themes from Delta's data

Delta's exploration, thus digital transformation, was driven mainly by three areas as explained by the Chief Digital Officer:

So when we are looking at digital transformation, our digital transformation is for these three legs. We've got customer experience, operational excellence we've got employee experience.

On the identified three areas, improving customer experience and customer satisfaction was one of the frequent high codes from Delta's data. The board chairperson emphasised the same in the 2019 annual report:

Delta is also committed to improving operational efficiencies using digital transformation, similarly emphasised in the same annual report of 2019.



The Chief Digital Officer explained how the efficiencies were to be achieved:

"So I am charged with the responsibilities of integrating existing IT solutions and trying to find areas where we can align and bring economies of scale and put a muscle on how we negotiate, create some savings. Moreover, as a result, those kinds of cost containment or savings will fund our initiatives".

As the organisation started looking for synergies, employee experiences were improved in the process. In order to address all three areas of focus for digital transformation, Delta introduced key principles which would inform the organisation's processes. While the Chief Digital Officer lamented ensuring that digital was funded from savings from the existing business, Delta's Chief Information Officer and Chief Executive Officer agreed that the business does not debate on funding for digital and Information Technology initiatives.

"We do not really compete for this, especially funding. IT is a business enabler. So there is, there is not a debate on funding. For example, the need for customers navigation capability on our website. So there is not a, there's not an argument about the cost because it is a business benefit," elaborated the Chief Executive Officer.

The organisation realised that they needed to learn from each other and make quick decisions on discovering and experimenting before fully investing in the scaled-up initiative. This way, the organisation learned to fail fast. Having taken this approach, Delta's discovery and experimentation processes were simultaneous because limited funding was required. The committees would then interrogate initiatives after experimentation and identify a few for scaling up. Once the organisation identified suitable candidates for scaling up Delta used simultaneous ambidexterity, depending on available resources. The structures that Delta used as they explored and exploited are detailed in the next section.

6.3 Structural Ambidexterity

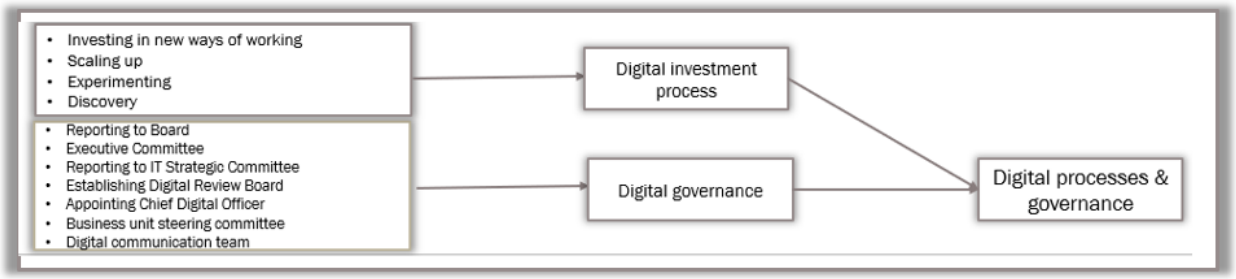


Figure 46: High-frequency codes for Delta's governance and processes

In explaining the roles for digital transformation, the Chief Information Officer said:

"So business solutions and technology within automotive and logistics is where the normal traditional IT resources would be, including your business intelligence, developers, support people, et cetera. Nevertheless, also within this department, we have got a petite department for digital communication".

Despite this assertion, results suggest that there was no focused delivery on digital transformation from the time Delta committed to the programme in 2017 until the Chief Digital Officer was appointed in 2019. The digital communication team seemed to be orphaned. The Chief Digital Officer established digital governance structures shown in the figure above upon her appointment in 2019. This gave focus and traction to digital initiatives. She explained the processes for each level:

"So how we function is that as long as the initiative is running in discovery or experiment, it goes to the digital review board. Moreover, the way it works is that someone can move back from even scale up and go back to discovery if we realise we did not define the value proposition correctly. So this process allows us to almost like going on a refining kind of a concept and hence the need for the digital review board because someone must ensure that we did not just spend much money and much time on something that we never see the light of day. But on the other hand, you must also be space for innovation. Furthermore, as such, the digital review board is all the Chief Executives (CEs) in automotive logistics will sit on that board. So for automotive and logistics, it is going to be a new way of working for them. Now they all the CEs will sit at that detail and all the divisional Exco members.

Chief Digital Officer, the Chief Executive Officer and all the Chief Executives for different businesses in the group sat on the IT Strategic Committee, which subsequently reported to the Executive Committee then to Board. She continued to expand on the roles:

"We had one this morning. So that is where you review what needs to go out of experimentation into scaling up. Review what is in discovery what is on scale-up".

"CIO has been part of our board structure for 10-15 years", said the Chief Executive Officer.

Digital Communication Team and the Digital Review Board were established to solely deliver on digital initiatives. Therefore Delta was using an interdependent approach at this level. However, all other governing bodies from the business unit steering committees up to the board were using independent processes. Each level handled both exploration and exploitation within the same structure. Figure 47 below summarises the process.

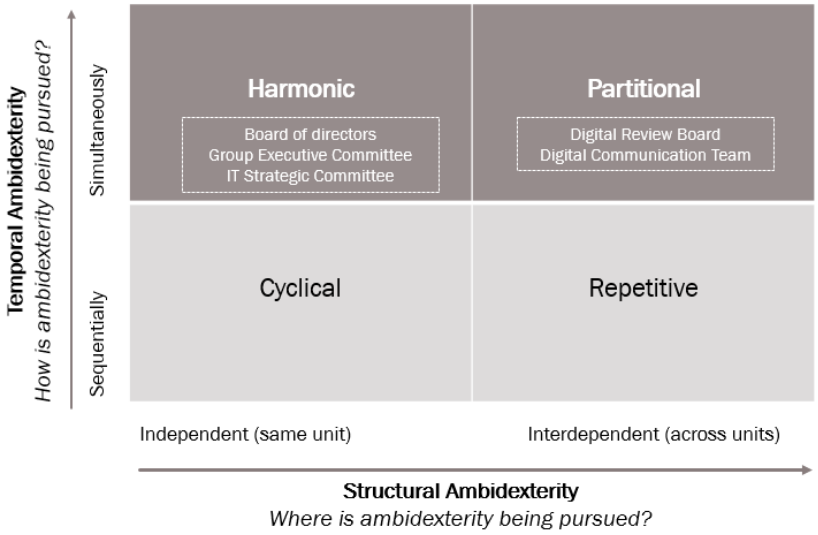


Figure 47: Representation of Delta's exploration and exploitation (adapted from Simsek et al., 2009)

Therefore, it can be concluded that Delta used harmonic ambidexterity with independent structures exploring and exploiting simultaneously within the same level, from management levels up to the board, and partitional ambidexterity at the lower levels, thus exploring and exploiting in different structures. The rest of the section presents the processes that Delta used from 2017 to 2019 as they explored and exploited in a digital environment.

6.4 Balancing resources

There is no organisation with infinite resources and Delta was no exception. As such, relevant processes were used to balance resources between exploration and exploitation. According to the data collected, cost, human resources and the related digital skills were the main stretched resources. In her explanation on the role of the Digital Communications Centre, the Chief Digital Officer emphasised the need to share resources and said:

"It is key that you at least get the maturity and the discipline first from one business and it becomes the centre of excellence and other businesses benefit from that area. In that way, school fees cannot be paid twice. So the Digital Review Board is gonna give us that edge as well. So if you are from the business unit, you can pick up that oooh you guys are running this, I am also interested. This is very different from previously where everybody is this running and trying to make sure that they respond to digital".

The Chief Digital Officer expanded on how she was going to achieve this:

"So I am charged with the responsibilities of integrating existing IT solutions and trying to find areas where we can align and bring economies of scale and put a muscle on how we negotiate, create some savings. Furthermore, as a result, those kinds of cost containment or savings will fund our initiatives".

The Chief Executive Officer also emphasised the need to use cost-saving processes in the existing business to fund the digital business and said:

"So we are finding ways to ensure that if we say we are going to carry additional costs, where is this funding going to come from? Because you fund it from existing business, therefore you need to minimise the costs to serve existing customers so that when you bring innovation, it makes sense. however, if costs to serve the customer are high, it makes you not competitive".

The Chief Information Officer echoed the same view:

"The traditional business must be optimised so that you can innovate without burdening the end customer at the end of the day. Okay. So that we remain competitive. We do not compete for this especially funding. IT is a business enabler. So ithere is not a debate on funding".

The issue of cost was related to Delta's ability to fund the digital transformation and the organisation's customers, who were reported to seek cost and production efficiencies in the board chairperson s report in 2018.

The success of Delta to explore and exploit hinged on its ability to achieve cost efficiencies in the exploitative processes, seeking customer and production efficiencies, thus positioning the organisation for growth.

Delegating authority

Although Delta established digital governance structures that are represented by the codes in the above section, there was an additional process known as the Delegation of Authority. The Delegation of Authority works as follows:

"So before you move from discovery to experiment, you need to present to the Digital Review Board, and the digital review board needs to give a nod of the concept. Furthermore, you need to tell us how much money does it take to do this experiment. So we have not given the business a cap to say on R150 000 you do not need approval for discovery. Nevertheless, if you will spend more than R150 000 you need to tell us why and motivate and tell us the value of what you are bringing in the business", explained the Chief Digital Officer.

There did not seem to be different processes that the organisation used as it explored and exploited in digital transformation.

6.5 Conclusion

Therefore, it can be concluded that in the period under review, from 2017 to 2019, Delta's processes for adopting digital transformation were not structured until the appointment of a Chief Digital Officer. On her appointment, she structured the processes, including assigning digital ownership, defining relevant structures, delegating resources and balancing resources. At the time of the research, Delta had minimal digital products and services that they could showcase. The Chief Information Officer confirmed:

"We have got one, it was called Energy Management Solution. It did not see the scale-up process because it did not give us the results that we expected".

This could be attributed to immaturity in the digital transformation process, evidenced by only seven codes on digital in 2017's annual report, 18 in the 2018 report and 37 in the 2019 report compared to a minimum of 60 codes in other organisations' reports of 2017.

APPENDIX E: APPROVAL FROM ETHICS COMMITTEE

UNIVERSITY OF PRETORIA
Gordon Institute of Business Science (GIBS)
APPLICATION FOR ETHICAL CLEARANCE

DBA/PhD RESEARCH PROJECT INFORMATION	
NAME	**PRECIOUS NYAMUGAMA**
STUDENT NUMBER	15393412
TELEPHONE / CELL PHONE	0828163234
E-MAIL OF RESEARCHER	Precious.nyamugama@pic.gov.za
PROPOSED TITLE OF STUDY	Processes used by Boards of directors in pursuit of organisational ambidexterity in the context of digital transformation.
RESEARCH SUPERVISOR	Professor Louise Whittaker
E-MAIL OF SUPERVISOR	**Whittakerl@gibs.co.za**

GIBS distinguishes between FOUR types of data. Please complete the table for ALL the data types that you plan to use.

Type of data	Relevant section of form	Attachments (please mark that they are included)	Initial all those sections that apply to your research
HUMAN: **A.** Pre-existing personal records, e.g. performance reviews	A	☐ Methodology section of proposal ☐ Permission letter from organisation to use the data	None
B. New data solicited, e.g. interviews or surveys	B	☐ Methodology section of proposal ☐ Separate informed consent statement (unless included in the document marked below) ☐ Interview schedule / questionnaire / proprietary test instrument / description of intervention ☐ IF proprietary test instrument, letter of permission	The questions that will be used during the interviews has been attached
NON-HUMAN: **C.** Public data, e.g. World Bank or other databases	C	☐ Methodology section of proposal	4.7
D. Private/ Organisation-specific non-human data, e.g. financial statements of private companies	D	☐ Methodology section of proposal ☐ Permission letter from organisation to use the data	4.9.3

Complete all sections relevant to your research.
ALL researchers must complete Sections E and F.

A. PRE-EXISTING RECORDS OF HUMAN SUBJECTS

1. Specify the nature of records and how they will be used.

2. Confirm that permission has been obtained to study and report on these records.
   ☒ I confirm.
   Remember to attach permission letter(s).

3. Provide the name and job title of the person in the organisation who has authorised the use of the records.

4. How will confidentiality and/or anonymity be assured? (Mark all that apply).

   ☒ No names will be recorded
   ☐ No names will be requested
   ☐ Data will be stored without identifiers
   ☐ Only aggregated information will be provided
   ☐ Other. Please specify

B. NEW DATA OBTAINED FROM HUMAN SUBJECTS

5. Please confirm that no inducement is to be offered.
   ☒ I confirm

6. Mark the applicable box(es) to identify the proposed procedure(s) to be carried out to obtain data.
   ☒ Interview schedule (Attach if applicable)
   ☐ Questionnaire (Attach if applicable)
   ☐ Pre-existing proprietary test instrument, e.g. MBTI (Attach)
   IF a pre-existing proprietary test instrument is used, confirm that permission has been obtained to use it.
   ☐ I confirm
   Remember to attach permission letter(s).
   ☐ Intervention, e.g. training (Describe)

7. Confirm that the data gathering is accompanied by a consent statement.
   ☒ I confirm

8. Where is the consent statement found?
   ☐ As part of the data gathering document, e.g. in the introduction of the questionnaire.
   ☒ As a separate document. Remember to attach (

9. Is there is risk that the researcher is not competent in (one of) the language(s) subjects use to communicate?
   ☐ Yes, there is a risk
   ☒ No, there is not a risk
   IF yes, how will the subjects' full comprehension of the content of the research, including giving consent, be ensured? Please specify.

10. Do subjects risk possible harm or disadvantage (e.g. financial, legal, social) by participating in the research?
    ☒ No
    ☐ Yes.
    IF yes, explain what types of risk and what is done to minimise and mitigate those risks.

11. Are there any aspects of the research about which subjects are not to be informed?
    ☒ No
    ☐ Yes.
    IF yes, explain why, and how subjects will be debriefed.

12. How will confidentiality and/or anonymity be assured?
    ☒ No names will be recorded
    ☐ No names will be requested
    ☐ Data will be stored without identifiers
    ☐ Direct data or quotes, where used, will be reported anonymously
    ☐ Only aggregated information will be provided
    ☐ Other. Please specify

C. PUBLIC NON-HUMAN DATA

13. Specify the nature of records to be used: How they will be selected, sourced and used.

This research will use the following details:

- Published annual reports for the past three years which may be downloaded from the company website or obtained from the board secretary. These will help researcher identify board members and the digital initiatives that the company released in the period under review.
- Use of press statements and press releases to identify digital initiatives that the company released in the period under review.
- Popular press to identify market related comments, awards, sentiments relating to board processes or digital initiatives in the organisation.

D. PUBLIC DOMAIN / COMPANY-SPECIFIC NON-HUMAN DATA

14. Specify the nature of records (e.g. marketing reports or safety records) and how they will be used.
    - Annual reports
    - Press releases
    - News from popular press

15. Confirm that permission has been obtained to study and report on these records.
    ☐ I confirm.
    Remember to attach permission letter(s).

16. Provide the name and job title of the person in the organisation who has authorised the use of the records.

17. Do companies risk possible harm or disadvantage (e.g. financial, legal, social) by participating in the research?
    ☒ No
    ☐ Yes. Explain what types of risk and what is done to minimise and mitigate those risks.

18. How will confidentiality and/or anonymity be assured?

    ☒ All company-specific details will be removed
    ☒ Data will be stored without identifiers
    ☐ Only aggregated information will be provided
    ☐ Other. Please specify

E. TO BE COMPLETED BY ALL RESEARCHERS

19. In what format will the data be stored? Mark all that apply.
    - ☐ Physically
    - ☐ Electronically
    - ☐ Other. Please explain.

20. Confirm that the data will be stored for a minimum period of 10 years.
    - ☐ I confirm.

21. It is a goal of GIBS to make research available as broadly as possible. Mark the boxes below for the medium/media in which you do **NOT** wish results to be made available.

Academic dissemination	**Popular dissemination**
☐ Research report	☐ TV
☐ Scientific article	☐ Radio
☐ Conference paper	☐ Lay article
☐ Book	☐ Podcast
	☐ Book

22. Confirm that the consent obtained is aligned with the extent of dissemination. E.g. consent if you are planning to use the research to launch a consulting career will be more comprehensive than in the case of research that is intended only for a scientific audience.
    - ☐ I confirm

23. IF you wish to describe any other information which may be of value to the committee in reviewing your application, please attach a separate sheet.

F. RESEARCH REPORT CONFIDENTIALITY

Please note that the thesis/report will be available immediately in the public domain unless there are sound reasons for delaying/denying public access.

Please select the relevant option

☐ The thesis/report will be available immediately in the public domain

☐ No access for a period of two years
Specify reasons for consideration

☐ No access under any circumstance for an undetermined period.
A letter of permission from the Vice- principal: Research and Postgraduate Studies is attached.

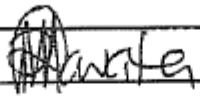
G. **APPROVALS**

The applicant must please ensure that the supervisor has signed the form before submission.

RESEARCHER/APPLICANT:

24. I affirm that all relevant information has been provided and that all statements made are correct.

Name in capital letters: PRECIOUS NYAMUGAMA

Signature: 

Date: 13 MAY 2019

STUDY SUPERVISOR:

25. I am of the opinion that the proposed research project is ethically acceptable.

Name in capital letters: _PROFESSOR LOUISE WHITTAKER

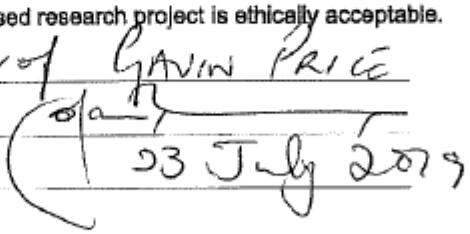
Signature: 

Date: 4 July 2019

GIBS RESEARCH ETHICS COMMITTEE:

26. I am of the opinion that the proposed research project is ethically acceptable.

Name in capital letters: Prof GAVIN PRICE

Signature: 

Date: 03 July 2019