Exploring the impact of emerging technology innovations on corporate strategy

Sne Mnguni
Student Number 17399565

A research paper submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of Master of Business Administration

07 November 2018

Abstract

Information technology has been, and remains, a critical element to business success across various sectors. As the world has become more connected, with a sharp increase in globalisation experienced over the last few decades, advances in technology have provided increasingly sophisticated tools for businesses to achieve greater levels of operational efficiency. Much of the early research on the role technology within corporate strategy focused functional efficiency.

Since the turn of the century however, there has been significant technology advances, leading to technology being at the forefront of how corporate strategy. Emerging technology has the potential to impact the direction and structure of an entire industry; determine strategic choices and define the business opportunities that companies are able to explore.

Against this backdrop, the study explored how emerging technology is impacting adoption of innovative business applications and corporate strategy, particularly beyond the functional level strategic focus. The study explored how corporate strategy is evolving in the context of a sharp rise in disruptive technology across various industries in South African and global business environment. Furthermore, the study explored the degree to which the faster pace of change in emerging technology and innovation has fundamentally shifted the role that IT has on business strategy as a whole, including corporate level strategy.

The study found strong evidence of an increasing strategic emphasis on operational efficiency, as well as a cost-reduction focus with respect to the adoption of technology innovation. There was limited evidence for a revenue expansion strategic focus. Furthermore, the study confirms the significance of leadership and organisational culture, as well as the impact of technology innovations in driving a more client centric business philosophy across various industries. The study also confirms the increasing strategic drive for organisations to build capabilities that enhance organisational agility and adaptability, a critical element in how corporate strategy is evolving in the dynamic context of the emerging technology environment.

Keywords

Emerging Technology, Innovation, Corporate Strategy, Technology Adoption

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University.

I further declare that I have obtained the necessary authorisation and consent to carry out this research.

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Sne Mnguni
7 November 2018

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1 Introduction to Research Problem

1.1 Introduction

This chapter provides the introduction and background to the research problem by considering the evolution of information technology (IT) in a business context, the innovations in business applications that have resulted from modern innovations in technology (emerging technology) and how such technology innovations impact corporate strategy. In particular, the role that emerging technology plays within the development of corporate strategy for large businesses, as the world moves into the so-called 4th industrial revolution.

Globally, technology innovation continues to drive changes in business models; speed of delivery of products and services to markets and customers; the structure the labour market, as well how firms compete. Some of the technology innovations that are driving these fundamental changes in productivity are listed below:

- The move towards a greater degree of automation for many business functions;
- The Internet of Things (IoT), including an increasing level of digital connectivity of networks beyond the traditional technology domain – e.g. digitally connected networks in the Energy, Transportation and Logistics sectors;
- Autonomous (or semi-autonomous) driving technology. This could fundamentally change the industry structure across various sectors (e.g. Transportation, Logistics, Manufacturing etc.), as well as displace millions of jobs over the next few decades;
- Digital platforms (e.g. Amazon, Alibaba, Uber & Airbnb) that offer goods and services that were previously only provided by bricks-and-mortar businesses
- Blockchain (or distributed ledger) technology;
- Cloud computing services

Given such technology innovations and the fundamental changes they are likely to bring about, both business and academia have a need to continuously enhance its understanding of what the implications for the future of business will be, particularly as more of these technology innovations become mainstream.

Chapter 1 explores the research problem within the context of business strategy, considering emerging technology trends and the interaction with the development of firm level strategy in a competitive and dynamic business environment. The chapter also presents the research objectives for the study, the scope of the study and then ends by considering the relevance of the study business perspective, as well as for theoretical development.

1.2 Background to the Research Topic

1.2.1 Information Technology Evolution

Information technology has been, and remains, a critical element for organisational success across all sectors in the business domain. As the world has continued to be more connected, with the increase in the role of digitally driven technology in the last few decades, technology innovation has had an increasingly fundamental impact on business models and processes; products and services, as well as industry structure (Koutroumpis, Leiponen, & Thomas, 2017). Technology innovations in business applications has provided increasingly sophisticated tools for businesses to achieve greater levels of operational efficiency (Koutroumpis, Leiponen, & Thomas, 2017).

However, despite the importance of technology innovation for business success, much of the early academic research on the interaction of IT and business strategy has primarily focused on the technology's contribution to functional level strategy, with less of a focus on corporate level strategy that shapes the structure of the firm and industry (Drnevich & Croson, 2013; Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013). The emphasis in early academic literature was on how companies first formulate a corporate level strategy, which is developed independently from technology considerations in the prevailing market environment, after which an IT strategy is considered (typically focused on optimising operational efficiencies) in alignment with a predefined corporate level strategy (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013). In essence, according to the traditional view in literature, corporate strategy led IT strategy (Drnevich & Croson, 2013).

Since the turn of the twenty first century, there has been significant advances in how technology innovations are driving capabilities that more fundamentally shape business models and industry structures, leading to a serious threat to many traditional business models and increasing the frequency of disruption to organisations that fail to adapt to change.

Moreover, advances in technology innovation and business applications have amplified the role of IT in business, making this a key element of strategy. In a recent study on the increasing importance of Information Communications Technology (ICT) in business, Koutroumpis, Leiponen, & Thomas (2017) use patend data to empirically test the influence of ICT innovations on cumulative technological change (i.e. both IT and non IT technological change), relative to the impact of other fields throughout the 20th century.

They find strong evidence that ICT is becoming more influential than other types of non-ICT patents, observing a significant difference in the number of citations of ICT vs non-ICT technologies in much of the new patents data submitted for new innovations (Koutroumpis, Leiponen, & Thomas, 2017).

Such studies support the view that IT will continue to become a more generalised technological tool that extends beyond just the IT domain, and thus a key consideration for corporations as they innovate and pursue differentiated business strategies to create and capture value in a competitive market environment.

These technological advances have led to IT strategy gradually shifting from having a predominately functional focus, to being at the forefront of how modern businesses develop strategy to establish and sustain their strategic position and competitive advantage (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013).

Moreover, as the cost of technology has continued to fall, a wide range of sophisticated digital tools and capabilities have become more widely accessible – with both early stage or start-up companies, as well as mid-stage and more established companies more or less able to take advantage of emerging technology, making this an important market dynamic in business strategy.

The democratisation of digital information, communication, and connectivity technologies has thus created a key competitive feature that enables new business opportunities, as well as new business threats, that extend beyond the narrowly-defined functional scope, as presented in the tradition view of IT strategy (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013).

Studies indicate that technology has the potential to impact the direction and structure of an entire industry; determine strategic choices and define the business opportunities that companies are able to explore (Drnevich & Croson, 2013). Additionally, the increase in the rate of change for traditional business models has increased the risk of disruption for established, and formerly stable sectors in the business environment.

The study seeks to explore the degree to which the faster pace of change in emerging technology and innovation has fundamentally shifted the role that IT has on business strategy as a whole, including corporate level strategy.

Consequently, the study considers the expanded view of the role of technology, considering impact on functional efficiency, as well as impact across the broader business.

1.2.2 The Fourth Industrial Revolution

Literature distinguishes four broad stages in the ongoing progression of advances in industrial productivity, i.e. a process widely referred to as an industrial revolution.

The first industrial revolution occurred toward the end of the 18th century, with accelerated productivity growth due to efficiencies in mechanical production after the introduction of the steam engine (Bloem, et al., 2014).

The second industrial revolution dates back to around the early 20th century, after technological advances in manufacturing and mass production drove sharp gains in productivity. The third industrial revolution relates to the introduction of digital automation that accelerated productivity, driven largely by advances in electronics and information technology (Bloem, et al., 2014).

The fourth industrial revolution is characterised by productivity gains that derive from advances in the integration of physical and digital networks – impacting efficiencies across production, sustainability and customer experience (Bloem, et al., 2014).

Against this backdrop, the study seeks to explore how businesses are adopting and integrating emerging technology and digital capabilities beyond the functional level. Additionally, the study explores how corporate strategy is evolving in response to this market dynamic, particularly within the context of a sharp increase in disruptive technologies, platforms and technology start-up businesses across many, traditionally stable, industries in the global economy.

1.3 Research Problem

Technological advances have predominantly been viewed as a tool that presents opportunities for organisations to add value to their bottom line, by optimising internal operational processes (Lin & Lin, 2008; Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013), as well as leveraging the opportunities available in the external business environment (Lin & Lin, 2008), by optimising operational efficiencies, the supply chain and speed to market.

However, research has continued to show that the integration of technology innovation into the broader corporate strategy, can lead to organisation-wide benefits and an enduring competitive advantage (Barney, 1991; Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013; Mithas & Rust, 2016). These benefits are particularly significant where firms compete in a

business context with complex market structures and dynamic environments (Tanriverdi, Rai, & Venkatraman, 2010).

Given the central role and increasingly strategic position that technology innovation continues to play in the broader economy (Koutroumpis, Leiponen, & Thomas, 2017), the integration of technology innovation in the formulation of business models; products and services, as well as with the broader corporate strategy discussion in an increasing number of corporate boardrooms, has the potential to significantly change the market structure and value proposition across various industries. Therefore, how businesses continuously align strategic business goals with the evolving technology environment, can meaningfully impact firm performance, enabling companies that most optimally harness this market dynamic to enhance their competitive position in the market.

Wu & Chiu (2015) define technology innovation as advances in the organisational applications of IT, considering both internally developed capabilities, as well as external technology related threats and opportunities. From a corporate strategy point of view, the focus of academic research, on the nature of benefits that could be realised from technology innovation, has been with respect to optimising functional efficiencies that provide a cost advantage, or enhance the value proposition of a product or service that a company offers (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013). This view of IT strategy is consisted with the strategy framework which is supported in academic literature, as presented by Porter's (1980) generic competitive strategy model.

The key question that the research study seeks to explore, therefore, is how businesses are continuously adapting their strategies, beyond the functional scope, and integrating emerging technology and innovation tools to meet the demands of a more dynamic competitive environment (i.e. both firm and industry level market changes), as well as how the corporate strategy function is evolving in response to this market dynamic. The study explores this question within the context of increasingly disruptive technology innovation across business, both within internal functional areas, as well as across firm and industry level business models.

1.4 Research Objectives

The field of study covered in the research is Information Technology and Corporate Strategy. While this is generally a well-covered area within Management Information Systems (MIS) research, the dynamic nature of the information technology field, and the relevance to business, provides a diverse set areas of practical and academic interest that require

continuous exploration from a management and strategy research point of view. In this particular study, the guiding principle was to focus the research on the corporate strategy function (i.e. the analysis; formulation and execution of strategy at the executive or board level).

Accordingly, the primary objective of the study is to explore the question of how modern organisations, across a diverse set of industries, are incorporating emerging technology and innovation trends as they develop firm capabilities that enhance long term performance and competitive position, as well as how technology related opportunities and threats presented by the fourth industrial revolution are being integrated into the broader corporate strategy.

Specifically, the study will explore the extent to which large corporations operating in both emerging and developed markets have adopted technology, and the degree of integration of emerging technology and innovation as a strategic tool to (1.) manage risk and costs for the firm (i.e. operational efficiency), (2.) gain or maintain a competitive advantage and (3.) ultimately create and capture value for shareholders by optimising firm performance.

From an academic point of view, the purpose of the study will be to build on the current literature that explores the interaction of technology innovation and strategy, with a focus on the corporate level strategy perspective.

The research study thus has three primary objectives:

1. Exploring factors that affect the adoption of technology innovation at the corporate level.
2. Exploring the role of IT innovation in organisational strategy.
3. Exploring the dominant strategy focus when integrating technology and business strategy to drive organisational performance

A secondary objective of the study was to determine the risks and opportunities that technology innovation presents for businesses as the industry structure evolves.

Finally, the study seeks to add to existing knowledge on the subject by focusing on strategic considerations for firms operating in dynamic industries within a fast changing internal and external technology and business environment.

1.5 Scope of the Research

The scope of the research was limited to exploring the processes that determine corporate level adoption and diffusion of emerging technology innovation, the role of such technology

innovation plays within corporate strategy and the perceived impact on effectiveness for companies in competitive and dynamic markets.

Due to the central role of the corporate strategy function at the executive and board level, the high degree of interaction with external stakeholders (i.e. clients; shareholders; suppliers, regulators; competitors), as well as the growing role of technology innovation across all business sectors, the strategic development context will provide an effective frame from which to obtain deeper insights on the role that technology innovation plays in shaping firm strategy and potentially, industry structure.

The study considers companies with responsibility for developing and shaping its own strategy and operate as independent business units. The study may have broad applicability to different emerging and developing market contexts.

1.6 Importance of the Research

The ability to build organisational capabilities through technology innovation is considered a source of superior competitive performance (Wu & Chiu, 2015). As technology innovation continues to drive changes in the market structure of traditionally stable business sectors and industries, the integration of innovative technology-enabled business processes, products and services will continue to provide a strategic differentiator to firms operating in a competitive context. Therefore, with the emerging technology innovations, there remains a growing need to develop a deeper understanding of how technology innovation can influence firm performance (Sambamurthy, Bharadwaj, & Grover, 2003; Basole, Seuss , & Rouse, 2013).

Given increasing complexity in the modern business environment and the need for firms to learn to adapt quickly (Arnold, Benford, & Canada, 2015), firms that are able to continually enhance and redefine their value creation and competitive position through superior innovations in products, services, channels, and market segmentation, will be better positioned to succeed (Sambamurthy, Bharadwaj, & Grover, 2003).

1.6.1 Relevance of the study for Business

The move to digital platforms has progressed at a fast pace across many sectors over the past decade. Using the South African retail banking sector as an example, customers now have access to a myriad of technology-based platforms through which they can access new and traditional banking products and services. The technology platforms include traditional internet

banking, mobile banking apps and cell phone banking. In addition, a number of financial services technology (fintech) start-ups have been introduced in the market, particularly within the payments segment (Alkema, 2016). These changes have driven significant changes to the market structure in the South African retail banking industry, lowering traditional barriers to entry and the power dynamics between rivals, suppliers and customers.

On the other hand, within the corporate banking space, much of the delivery of banking products and services is conducted through traditional platforms, including proprietary banking systems and channels which generally require a dedicated relationship manager to fully service a portfolio of large corporate customers.

While some technology firms have been successful in bringing online much of the financial services required by corporate customers (most notably, the increasingly wide-spread use of Bloomberg and Reuters terminals by financial services firms), there has been more limited adoption of integrated technology systems that fundamentally change the way corporations interact with banks and other financial services firms.

As innovations in technology tools and platforms become more wide-spread across both individual consumers markets (e.g. the South African retail banking industry), as well as corporations, adoption of technology innovation will continue to increase across business and industry. Consequently, organisations that are able to identify optimal ways of integrating technology innovation into their overall corporate strategy can develop a superior competitive position (Barney, 1991; Sambamurthy, Bharadwaj, & Grover, 2003). Technology innovation has the potential to enhance the operational efficiency of companies, as well as impact the broader organisational strategy. The study will be relevant to organisations that seek to understand how these emerging trends in technology innovation can be exploited to enhance corporate strategy and firm performance.

Changes in technology presents both a threat and an opportunity for firms across all sectors. The increasing significance information technology, speed of delivery of products and services and access to digital tools to small and large businesses alike, makes the conventional competitive market forces of industry structure more fluid, in particular by lowering traditional barriers to entry for new entrants and increasing the bargaining power of consumers and suppliers.

Considering the typically large investment in technology based business applications, the increasing connectivity to clients, suppliers and other business sectors of the economy that emerging technology enables and the need for organisations to be responsive to fast changing

customer needs, business has the most to benefit from having deeper insights on the impact of IT innovation on corporate strategy and firm value.

1.6.2 Relevance of the study for Theory

This research study aims to contribute to existing theory MIS research related to technology innovation, as well as investigate factors impacting adoption at the corporate level, focusing on the context the modern business environment. In addition, the study will seek to explore an integrated framework that considers the adoption, strategy and technology strategy focus elements of technology innovation, presenting an area of consideration for future research.

1.7 Conclusion

The study investigates technology innovation at the corporate level, the role technology innovation plays within corporate level strategy and the perceived effectiveness of strategic focus (with respect to technology) on firm performance. The aim of the study is to understand key factors that influence corporate level adoption of IT innovations; impact on strategy formulation and effectiveness of strategic focus.

The following chapters consider the existing literature (Chapter 2), a summary of the research questions (Chapter 3), an outline the research methodology (Chapter 4), the results are then presented in (Chapter 5), an analysis and discussion of the results is then presented (Chapter 6); with Chapter closing by discussing the key business and academic insights derived from the study as well as providing suggestions for further research.

2 Literature Review

2.1 Introduction

The review of the existing literature considers the research problem against three broad theoretical perspectives.

First, a review of the existing theory that considers the processes driving adoption and diffusion of technology and innovation from an organisational point of view. While much of the early adoption and diffusion literature focused mostly on individual level factors, this study (and the review of the related literature) considered the literature from the lens of corporate level factors that impact adoption and diffusion of technology and innovation.

The early academic research that developed much of the adoption and diffusion frameworks that underpin the academic literature in the field is the Diffusion of Innovations framework (DOI), developed by Everett Rogers, and the Technology, Organisation and Environment framework (TOE), developed by Tornatzky and Fleischer in 1990. Building on these influential works, the study further reviews more recent theoretical models that have developed and extended these early frameworks further, including the Technology Acceptance Model (TAM), the Extended Technology Acceptance Model (or TAM 2), as well as the Unified Theory of Acceptance and Use of Technology (UTAUT) theories.

Second, the study reviewed the existing literature on academic theories that speak to the role of technology innovation in the process formulating business strategy, where the objective is value creation and value capture for organisations – i.e. establishing a sustainable competitive advantage that delivers value that is ultimately captured by the business. The literature review thus covers theories that explore the interaction of technology, innovation and corporate level strategy. The literature review includes covering prevailing academic theory on the influence of technology innovation on firm agility, the development of firm resources and capabilities, and how this ultimately shapes the competitive strategy and organisational effectiveness (i.e. the creation and capture of value). The increasingly crucial role of technology innovation at both the corporate and industry level is considered against this backdrop, and the impact thereof on how firms are integrating emerging technology innovation trends into the broader business strategy, as businesses, industry structure and customer needs continue to evolve.

Specifically, the literature review considered theoretical frameworks that explore organisational agility, digital options and firm specific capabilities that firms develop. In the context of emerging technology innovation trends, the study considered these frameworks as it explores

the question of how firms adapt their strategies in a constant drive to establish or sustain their unique market positions and competitive advantage as technology continues to increases the level of complexity and market dynamism.

Finally, the literature review considered how the evolving strategic emphasis on investment in technology can affect the firm's performance.

In evaluating firm performance and the effectiveness of firm-level strategic choices, the literature review considers three theoretical perspective that are more of less aligned to the generic strategies for competitive advantage identified by Porter (1980):

1. A cost reduction strategic focus (aligned to the cost leadership strategy);
2. A revenue expansion strategy focus (aligned to the differentiation strategic); and
3. A dual (cost reduction and revenue expansion) strategic focus

A summary of the three theoretical perspectives adopted for the literature review is illustrated in Table 1 below.

Literature Review	**Theoretical Frameworks**	**Focus**
Technology Adoption & Diffusion	Diffusion of Innovations; Technology, Organisation and Environment; Technology Acceptance Model, Extended Technology Acceptance Model & Unified Theory of Acceptance and Use of Technology	Technology Adoption & Diffusion
Technology & Competitive Advantage	Organisational Agility; Digital Options & The Resource-Based View	Technology & Corporate Strategy
Technology Focus & Performance	Cost Focus; Revenue Focus vs Dual Focus	Strategic Focus vs Firm Performance

Table 1. Summary of Literature Review & Theoretical Frameworks

Each of these theoretical perspectives are discussed below, followed by a review of the relevant foundational theories within each theoretical perspective. Against this backdrop, the study sought to advance the researcher's understanding of how technology innovations are being integrated into the broader firm-level strategy and shaping the future business environment.

2.2 Technology Adoption

The integration of technology innovation with core business operations and increasingly with broader strategy at the firm level (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013), has the potential to materially transform organisations, as well as entire industries (Wu & Chiu, 2015; Drnevich & Croson, 2013).

As technology innovations become more widely spread in the business environment, technology will continue to shape industry structure through not only enhancing functional efficiencies within firms, which has been the focus of much of the early literature in this field of research (Drnevich & Croson, 2013), but by also contributing to shaping corporate level strategy and driving the dynamic nature of developing and sustaining a competitive advantage for organisations (Drnevich & Croson, 2013; Wu & Chiu, 2015).

The nature of the key processes that drive adoption and diffusion of technology innovation, particularly at the level of the firm, is therefore considered a significant element of competitive strategy in the context of contemporary organisations (Lin & Lin, 2008).

As technology innovation becomes an increasingly important competitive feature across many aspects of the modern business landscape, with increasing levels of digital integration of the business infrastructure, as well as better interconnections between platforms; products; processes and services (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013), a deeper understanding of how individuals; organisations and industries adopt and apply the tools and business applications made accessible by this emerging technology innovation trend has become an increasingly important consideration for both academic research and business executives alike.

In this context, the processes and key factors impacting adoption decisions for technology innovation is considered against the backdrop of either a firm initiated process, aimed at driving performance, or against the backdrop of a shifting external environment, which necessitates the need for businesses to respond to external forces, so as to remain competitive (Hameed, Counsell, & Swift, 2012).

With this perspective in mind, the literature review begins by considering foundational adoption frameworks that can be useful in the analysis of this aspect of the technology; innovation and business level strategy dynamic.

2.2.1 Technology Adoption and Diffusion Frameworks

While numerous conceptual models that consider technology adoption, more generally, are well developed in literature (Hameed, Counsell, & Swift, 2012), the Diffusion of Innovations (DOI) framework (Rogers, 1962) and the Technology, Organization, and Environment (TOE) framework (Tornatzky and Fleischer 1990), formed the early theoretical basis for technology and innovation adoption research in academic theory focusing more specifically at the organisational level.

While there has been an increasing number of more recent academic studies on technology adoption that build on these two early frameworks, and include more of a focus at firm-specific variables that impact adoption (Oliveira & Fraga Martins, 2011), the technology adoption literature at the organisational level remains less developed (Hameed, Counsell, & Swift, 2012).

At their core, these two frameworks emphasise the importance of both the external business environment, as well as internal or firm-specific variables related to organisational culture; structure; size and communication networks, as key factors driving technology adoption for organisations (Oliveira & Fraga Martins, 2011).

2.2.2 Extended Technology Adoption and Diffusion Frameworks

Given the large-scale nature of investments in technology based business applications, tools and innovation typically undertaken by organisations, both from a management time and financial point of view, well-developed theoretical models that contribute in predicting the key processes that lead to effective adoption and diffusion continue to provide valuable insights for business and academia (Legrisa, Inghamb, & Collerettec, 2003).

Foundational theories in literature that are related to technology adoption include the Technology Acceptance Model (TAM), developed by Fred Davis in his doctoral thesis in 1986 (later extended to the TAM2 framework) (Legrisa, Inghamb, & Collerettec, 2003), and the Unified Theory of Acceptance and Use of Technology (UTAUT) theoretical model, developed by Viswanath Venkatesh; Michael Morris; Gordon B. Davis and Fred D. Davis in 2003, as an extension to the original TAM model.

Most of the early academic studies consider mediating effects of perceived characteristics of a technological innovation, specifically the Perceived Usefulness; Perceived Ease of Use, and Perceived Ease of Compatibility, in influencing user decisions regarding acceptance and adoption for a new technology or innovation and use by individuals and technology users with an organisation (Lin & Lin, 2008).

While research findings in previous academic works related to the factors that drive adoption processes remain mixed, empirical evidence suggests that the TAM framework is successful in predicting about 40% of the processes that drive a system's use (Legrisa, Inghamb, & Collerettec, 2003).

2.3 Technology and Competitive Advantage

There is strong support in literature for the value of technology and innovation as a key element in enhancing operational efficiencies to support business unit functions, both internally within the firm and externally with trading partners in the external environment (Wu & Chiu, 2015). Investment in emerging technology and innovation, as well as in related capabilities (such as business processes; communication infrastructure and human capital), can also positively influence firm performance through enhancing three important organisational competencies – strategic agility, digital options, and entrepreneurial alertness (Sambamurthy, Bharadwaj, & Grover, 2003).

2.3.1 Organisational Agility

In this context, agility is defined as "the ability to detect seize market opportunities with speed and surprise" (Sambamurthy, Bharadwaj, & Grover, 2003, p. 238). Agile organisations are able to rapidly, and effectively respond to changing customer requirements, market dynamics, as well as emerging technology options (Mathiassen & Pries-Heje, 2006; Drnevich & Croson, 2013). Technology is thus seen as a key element in driving organisational agility (Drnevich & Croson, 2013; Lu & Ramamurthy, 2011), particularly when investment in technology is directed towards developing capabilities across a firm's technology infrastructure; the development of a well-defined technology strategic vision that is effectively integrated with the broader business strategy; as well as developing a firm-wide orientation toward leveraging technology innovations to exploit emerging business opportunities (Lu & Ramamurthy, 2011).

There is strong support in literature for the concept of enhancing organisational agility through leveraging technology innovations (Mathiassen & Pries-Heje, 2006; Lu & Ramamurthy, 2011; Drnevich & Croson, 2013). However, although there is wide support found in academic literature for the benefits of leveraging organisational capabilities to enhance agility (Barney, 1991; Benitez-Amado & Walczuch, 2012; Sambamurthy, Bharadwaj, & Grover, 2003; Santhanam & Hartono, 2003; Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013; Drnevich & Croson, 2013), much of the prior research, while largely conceptual or case oriented, suggests that there is mixed empirical support with respect to harnessing IT to enhance organisational agility.

As technology becomes an increasingly important element in influencing competitiveness, business strategy and shaping industry structure (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013), a key area of interest for academic research and in business will relate to how technology capabilities can harnessed to enhance organisational agility, as well as how businesses most optimally integrate their technology strategy with the broader business level strategic direction as the external environment continues to evolve.

Lu & Ramamurthy (2011) argue that organisational agility, in a business context, is a construct that should incorporate more than just a business's degree of flexibility (which is described as the ability to effectively respond to largely predictable changes) and identify two types agility constructs that are key for organisational effectiveness:

1. Market capitalising agility; and
2. Operational adjustment agility

The market capitalising agility construct has more of a focus on the external environment, primarily considering the dynamic competitive process of adapting products and services to position the organisation to best compete and exploit continuously changing market opportunities (Lu & Ramamurthy, 2011).

The operational adjustment agility construct speaks to an organisation's ability to dynamically and effectively adapt internal business processes and operational efficiencies to respond to changes in the general market environment (Lu & Ramamurthy, 2011). Building on the operational adjustment agility construct, Lu and Ramamurthy (2011) argue that organisational agility can be effectively enhanced through the development superior firm-wide technology capabilities which are supported along three primary technology elements, IT infrastructure capability; IT business spanning capabilities and an IT proactive stance (Lu & Ramamurthy, 2011).

IT infrastructure capability speaks to appropriate investment in shareable IT platforms; integrated communication systems and networks that enable the efficient distribution of information across an organisation; IT business spanning capabilities reflects management's ability to leverage IT capabilities through developing an effective IT strategy that is well integrated with broader strategic goals; and IT proactive stance speaks to an organisation's orientation to business opportunities (Lu & Ramamurthy, 2011).

With a movement towards a more integrated technology and business strategic approach (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013), research and business must incorporate an IT capabilities element in designing a business level strategy and in developing organisational agility.

As illustrated in Table 1, many previous studies looking into the IT-Agility theatrical perspective suggest there is strong support for the view of the enabling role of technology with respect to enhancing organisational agility, although a few of the previous studies listed in the table below show mixed results from studies that explore the effect of technology on organisational agility.

References	Method	IT Capability	Enable	Disable	Mixed	Findings about IT & Organisational Agility
Allen & Boynton (1991)	Conceptual & Case Example	Information Systems Architecture		X		Information systems are inflexible and are disablers of flexibility. The study proposes two IS architectural solutions to address the dual challenge of "speed and flexibility" and "low cost of efficiency": the low road and high road approach.
Lucas and Olson (1994)	Conceptual & Case Example	Information technology	X			Information technology can have a significant impact on organizational flexibility by speeding up the processing of information and enabling quick response to changing market conditions. The study also acknowledges that IT may disable flexibility because of technological inflexibility or second- order effects.
Clark et al. (1997)	Case study	Change-readiness IT capabilities	X			IT groups' business expertise, in combination with IT skills, directly deter- mines the firm's ability to rapidly develop and deploy critical information systems within short development cycle times for long-term competitive advantage.
Zaheer and Zaheer (1997)	Empirical	Use of information networks	X			Proactive use of information networks enables alertness and responsiveness to rapidly-changing market information in the global currency trading industry.
Weill et al. (2002)	Conceptual	IT infrastructure	X			IT infrastructure capability enables strategic agility. The study identifies types of IT infrastructure services to support three types of business initiatives: supply-side, internally focused, and demand-side.
Sambamurthy et al. (2003)	Theoretical	IT competence	X			The study proposes IT as a digital options generator in contemporary firms. IT competence positively impact agility through digital options including process and knowledge options.
Gosain et al. (2005)	Survey	Inter organizational systems			X	The study found that modular design of interconnected processes and structured data connectivity relates positively to supply chain flexibility whereas sharing a broad range of information is detrimental to supply chain flexibility.
Overby et al. (2006)	Conceptual	Information technology	X			The study proposes that IT enables enterprise agility by extending the reach and richness of firm knowledge and processes but also acknowledges that IT might hinder agility due to inappropriate deployment or management.
van Oosterhout et al. (2006)	Case study	Information technology			X	IT can be both an enabler and disabler for business agility. The study found that inflexible legacy IT systems result in rigid IT architectures and disable agility in the face of unpredictable rapid changes whereas an agile process and information system architecture serves as an enabler for agility.
Fink and Neumann (2007)	Field survey	IT personnel capabilities, IT infrastructure capabilities	X			The study found that technical and behavioural capabilities of IT personnel have a positive effect on infrastructure capabilities, which, in turn, exhibit a direct effect and indirect effect (mediated by IT-dependent system and information agility) on IT-dependent strategic agility.
Mathiassen and Vainio (2007)	Case study	Dynamic capabilities	X			The study employs the sense-and-respond framework to explore and analyse activity level sense-and-respond behaviour and firm-level mechanisms that shape a firm's responsiveness in software development.

Rettig (2007)	Conceptual	Enterprise software		X		The study posits that enterprise systems that emphasize data integration and process automation may produce rigidity and unexpected barriers to change because changes involving technology are both profoundly complex and uncertain.
Zhang and Sharifi (2007)	Survey and case	Information systems	X			Information system is considered one of the agility providers to implement manufacturing choices and to achieve agility. Cluster analysis was used to identify agility strategy types in a subset of the sample but did not directly examine the relation between information systems and agility.
Goodhue et al. (2009)	Case study	Enterprise systems				Enterprise systems enable business agility through four options – built-in unused capabilities, globally consistent integrated data, "add-on" systems available on the market, and vendor provided "patches." The study also acknowledges the challenge to change the tightly integrated backbone in an enterprise system.

Table 2. Prior Research on IT and Organisational Agility (Lu & Ramamurthy, 2011, p. 934)

2.3.2 Digital Options

Developed centuries earlier and formalised into a mathematical model in finance literature by Black and Scholes in 1973, the concept of financial options describes a transaction which provides the holder of an option contract a preferential advantage in decision making at a predetermined point in the future (Sandberg, Mathiassen, & Napier, 2014). By making a small initial investment, a financial option gives the holder a choice of making an investment, typically at a predetermined cost, as well as an option to not investment if doing so would not be beneficial relative to the prevailing market conditions (Sandberg, Mathiassen, & Napier, 2014).

Similarly, the concept of real options, as it relates to the business context in strategy and management research, provides a framework for the evaluation of optionality with respect to investment choices for organisations and the beneficial commercial position this presents for business strategy.

In this construction however, a real option is acquired through an organisation's past actions that shape its resources and core capabilities and allows it to establish a preferential right to future business choices, without having to incur the full cost of the future investment until the investment decision has to be made (Sambamurthy, Bharadwaj, & Grover, 2003; Sandberg, Mathiassen, & Napier, 2014). Sambamurthy, Bharadwaj, & Grover (2003) build on the concept of real options in developing their theory of digital options, which they describe as "a set of IT-enabled capabilities in the form of digitized enterprise work processes and knowledge systems" (p. 247).

According to this view, digital options emerge out of enhanced operational or functional business processes and systems, as well as IT-enabled efficiencies, at the broader firm level, that provide a unique set of firm-specific capabilities that create a diversity of strategic choices as the firm invests time and financial resources to build core competencies and networks (Sambamurthy, Bharadwaj, & Grover, 2003; Drnevich & Croson, 2013; Sandberg, Mathiassen, & Napier, 2014).

Consequently, these IT-enabled capabilities serve as a sort of organisational digital capital, which provides strategic choices that can be leveraged to exploit future business opportunities that establish and sustain a strategic advantage that can be difficult to replicate (Sambamurthy, Bharadwaj, & Grover, 2003).

By leveraging technology innovation and optimising processes that emphasise capability-building, entrepreneurial action and adaptation, modern companies are able to enhance agility and remain competitive in the face of a dynamic external environment (Sambamurthy, Bharadwaj, & Grover, 2003; Drnevich & Croson, 2013). Building on this view, Drnevich & Croson (2013) argue that as organisations invest in technology and complementary capabilities within the organisation (including infrastructure; human capital; accumulated expertise and experience), they can "fundamentally alter the set of business level strategic alternatives and value-creation opportunities" as well as improve the attractiveness of business opportunities on both a risk and reward basis (Drnevich & Croson, 2013, p. 484).

2.3.3 The Resource Based View

According to the Resource-Based View (RBV) framework (Barney, 1991), a competitive advantage can also be established and sustained by the distinctive opportunities and capabilities obtainable by different companies due to the inherent differences in tangible and intangible resources that an organisation may control, as well as internal firm-specific strategies related to the application of these resources across different firms, even those competing in the same industry (Barney, 1991; Wu & Chiu, 2015; Sambamurthy, Bharadwaj, & Grover, 2003).

There is strong support in literature for the concept of an internal, resource-driven ability to gain a sustainable competitive advantage (Wu & Chiu, 2015). Technology innovation, in particular, can be an important strategic resource that can be used to develop a competitive advantage at both the firm level, as well as from an industry wide perspective (Wu & Chiu, 2015). Furthermore, where a firm is able to effectively execute a technology integrated

strategy that both enhances revenue opportunities as well as optimise operational efficiencies (i.e. a dual focus technology strategy), the competitive advantage that is developed through unique company specific capabilities can be even harder to imitate (Mithas & Rust, 2016).

This is particularly relevant where an industry can exploit underlying structural differences in resources or internal, firm-specific strategies among competing firms within an industry (Santhanam & Hartono, 2003; Benitez-Amado & Walczuch, 2012; Sambamurthy, Bharadwaj, & Grover, 2003; Mithas & Rust, 2016).

Using the RBV framework, Mithas and Rust (2016) identify four factors that drive performance, where firms emphasise a dual-focus IT strategy (i.e. revenue focus, as well as cost or efficiency focus), (1) greater social complexity, (2) greater causal ambiguity, (2) greater path dependence, and (4) organisational learning (Mithas & Rust, 2016).

In the context of this research study, the RBV framework provided a useful theoretical perspective to evaluate how firms leverage advances in technology innovation as they establish and develop differentiated strategic resources and capabilities that enhances or sustains competitive advantage.

Importantly, as the rate of technology innovation has accelerated in the last few decades, the variability of strategic choices across different geographies, industries and organisations has increased exponentially, further increasing the strategic complexity for organisations as they seek to establish or sustain a competitive position in evolving industries.

2.4 Technology Strategic Focus and Firm Performance

While the two perspectives discussed above consider adoption frameworks, as well as how technology innovation can be a source of competitive advantage, they do not specifically consider how technology innovation interacts with business level strategy to impact organisational performance. Prahalad and Hamel (1990) argue that the root of sustainable performance for organisations is the ability to effectively leverage core competencies – i.e. the collective expertise within a firm; the coordination of diverse skills and integration of technologies – that an organisation has developed over time (Hamel & Prahalad, 1990). Corporate strategy is primarily concerned with how firms optimally coordinate organisational resources to create value through core competencies, as well as establish a compelling and sustainable competitive advantage (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013). Firm level strategy is thus an important element in shaping competitiveness in a business context with emerging technology trends.

Drnevich & Croson (2013) define strategy within the context of MIS literature as “a set of management decisions regarding how – through choice of industry; firm configuration; resource investments; pricing tactics; and scope decisions – to balance the firm’s trade-offs between being efficient (reducing cost) and being effective” (p. 485). In their 2013 study looking at an integrated technology and business strategy perspective, they argue that the key strategic function for management is striking the most optimal trade-off in technology strategic emphasis, within the context of the industry the firm operates in and the degree of variability in the external business environment.

According to this view, the higher the degree of variability in the business environment, the higher the bias towards a business strategy that focuses more on effectiveness (i.e. a revenue expansion focus), even if this is at the expense of efficiency. On the other hand, the lower the degree of external business variability, the higher the bias towards a business strategy that focuses more on efficiency (Drnevich & Croson, 2013). Within this theoretical perspective, the role of technology innovation, with respect to business level strategy, is primarily centred on impacting two strategic drivers, investment in firm resources and enhancing capabilities (Drnevich & Croson, 2013)

Moreover, as technology innovation has increased the pace of variability in the external business environment, shifting competitive dynamics across various industries have favoured some set of core competencies and has made others less competitive or even obsolete (Drnevich & Croson, 2013). Bharadwaj, El Sawy, Pavlou, & Venkatraman (2013) argue that as firms and industries become more digitally enabled and therefore rely more and more on information; communication and connectivity technology to compete in their traditional markets, there may be little distinction between technology strategy (or digital strategy) and business level strategy in future.

Consequently, as business functions; processes and infrastructure becomes more connected with the external environment, including with customers; suppliers and other stakeholders along the value chain, the evolving digital and technology landscape will continue to play an increasingly important role in shaping business strategy and industry structure (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013).

In a more recent study, Mithas and Rust (2016), consider the influence of both technology investments and corporate level strategic emphasis on organisational performance – as measured by firm market value (reflecting the stock market’s assessment of strategic effectiveness) and profitability (reflecting a more fundamental assessment of strategic effectiveness) (Mithas & Rust, 2016).

In line with the work by Drnevich & Croson (2013), Mithas and Rust identify cost-reduction IT strategic focus and revenue-expansion IT strategic focus as two of the dominant strategic directions that firms can pursue with respect of firm strategy (Mithas & Rust, 2016; Drnevich & Croson, 2013). This perspective can be viewed alongside the conceptual model described by Porter (1980), in the generic strategy framework highlighting the cost leadership vs differentiation strategic trade off (Porter, 1989). In addition, Mithas and Rust also recognises a third key element in strategic direction, dual-focus IT strategy, which seeks to combine the need to optimise efficiencies and achieve effectiveness into a single firm-level strategy (Mithas & Rust, 2016).

The study finds that for similar levels of investments, firms that pursue a dual-focus strategy (i.e. emphasising both cost-reduction and revenue expansion as part of the strategy) have superior firm valuations, despite no significant differences in profitability – when compared to firms pursuing a single-focus IT strategy, i.e. either efficiency or effectiveness only emphasis (Mithas & Rust, 2016).

2.5 Review of Relevant Theories

2.5.1 Diffusion of innovations (DOI)

Developed by Everett Rogers in 1962, the DOI theory provides a theoretical framework for how, why and at what rate an innovation spreads through a system, where innovation is defined as an idea, process or object that is perceived as new by an individual or organisation (Rogers, 1995). The theory considers the spread of technology at both the individual, as well as at the firm level (Oliveira & Fraga Martins, 2011).

The framework argues that, in principle, a new innovation spreads due to four primary factors – time; the social systems in which it is introduced; the relevant communication channels; as well as the nature of the innovation itself.

The framework further identifies five distinct categories of adopters through the lifecycle of an innovation – Innovators, Early Adopters, Early Majority, Late Majority and Laggards (Rogers, 1995). The model suggests that each category of adopters “possesses different degrees of willingness to adopt innovations, and thus it is generally observed that the portion of the population adopting an innovation is approximately normally distributed over time” (Rogers, 1995, p.111). At the firm level, the framework further emphasises three factors that impact the degree of organisational innovation adoption – individual or leader characteristics; internal

characteristics of organisational structure and external characteristics of the organisation (i.e. degree of openness to external influence) (Rogers, 1995).

In the context of the study, the DOI theory presents a useful theoretical framework for evaluating organisational readiness for adoption of IT innovations. The three organisational factors highlighted by the model as impacting the degree of innovation adoption (i.e. leadership; internal and external characteristics), are assessed as part of the study to determine how these factors interact with the firm strategy as organisations compete, as well as with how this shapes industry structure across various sectors.

2.5.2 Technology, organisation and environment (TOE)

The TOE framework (Tornatzky and Fleischer 1990) suggests three factors that impact the process by which an organisation adopts and implements technological innovation – Technological Context; Organizational Context and Environmental Context (Oliveira & Fraga Martins, 2011). The technological context element refers to the general use of both internal and external technology across the firm. The organisational context element refers to characteristics of the firm, such as size, complexity of corporate structure and depth of human capital. The third element, environment context, refers to the nature of the industry in which the firm operates, including the complexity of the industry structure and value chain, the level of sophistication of industry rivals, customers, trading partners and government (Lin & Lin, 2008).

The TOE model thus provides a useful analytical framework to consider the impact of both internal and external factors in the adoption of IT innovation. Considering the element focusing on the environmental context, this framework will provide a good theoretical basis for the study in conducting a comparative analysis of the degree of IT adoption for corporate treasuries in South Africa versus corporate treasury departments in other developing economies, as well as versus more developed markets which have different external factors.

2.5.3 Technology acceptance model (TAM)

Adapted from an earlier framework which looks into factors influencing user satisfaction in a more general sense (i.e. Theory of Reasoned Action, or TRA) which was developed in the psychology domain, Fred Davis proposed the TAM model (Davis 1986) for application in the information systems field (Legrisa, Inghamb, & Collerettec, 2003).

The theoretical model proposes two primary processes as mediating factors driving behavioural intentions to use a new technology, (1.) Perceived Usefulness and (2.) Perceived Ease of Use (Legrisa, Inghamb, & Collerettec, 2003). Empirical research has established consistent and strong empirical evidence for Perceived Usefulness as a key determinant of usage intentions (Venkatesh & Davis, 2000). Overall however, the empirical evidence indicates that the TAM model explains approximately 40% of the processes driving adoption of technologies (Legrisa, Inghamb, & Collerettec, 2003).

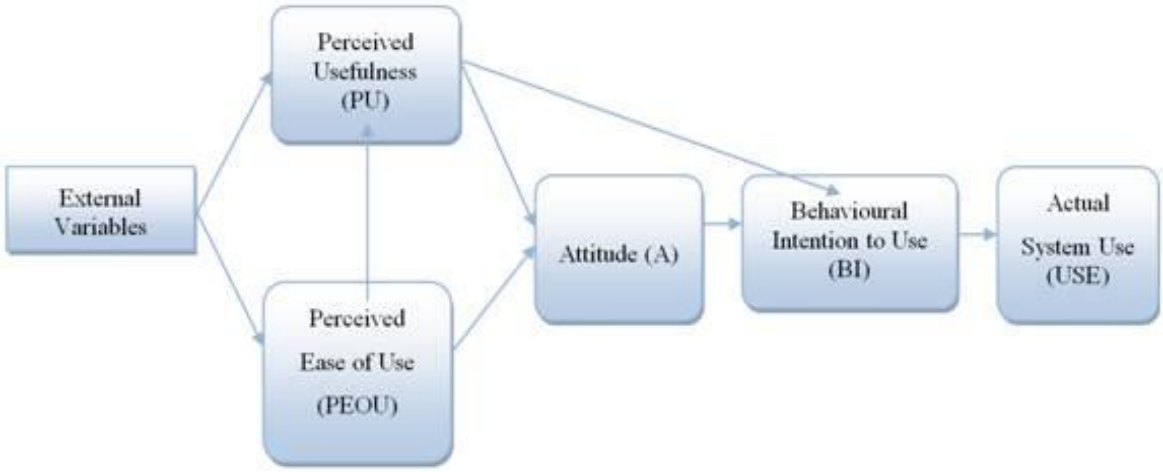

Figure 1. Original TAM (Legrisa, Inghamb, & Collerettec, 2003, p. 193)

Building on the TAM framework, Venkatesh and Davis extended the TAM model in 2000 to include factors that influence the Perceived Usefulness dimension. The extended TAM, or TAM2, incorporates additional constructs to the original TAM model. These additional constructs fall under two broad dimensions; Social Influence processes and Cognitive Instrumental processes. The social influence component considers social factors that affect use intentions and perceived usefulness of a new innovation, while the cognitive elements considers the factors that impact perceptions of the innovation's capabilities versus the required output (Venkatesh & Davis, 2000).

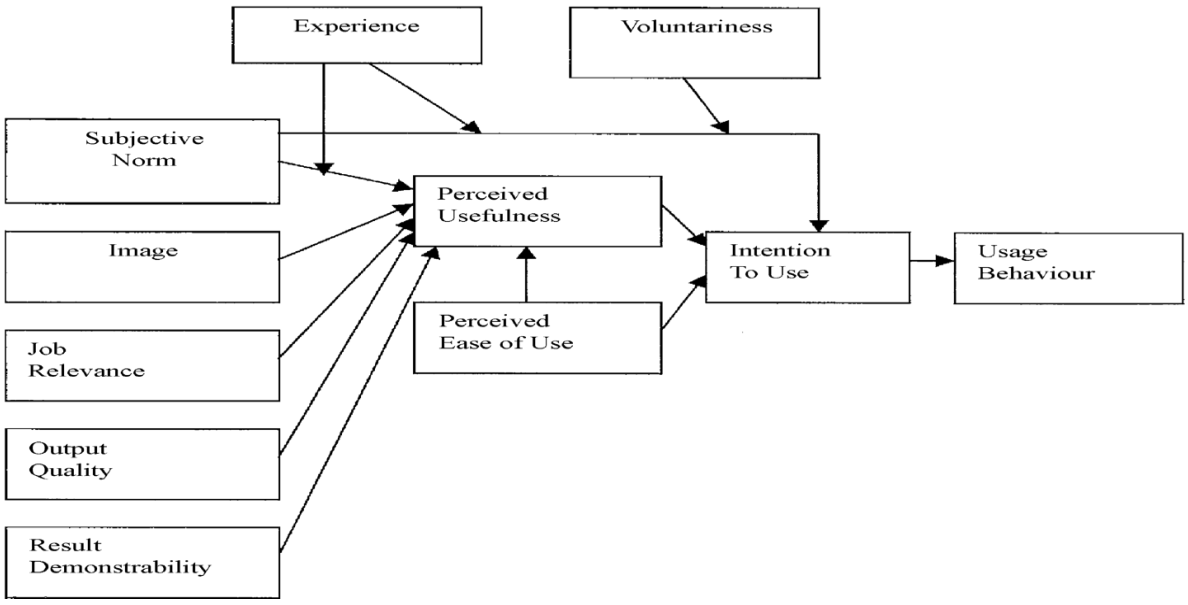

Figure 2. Extended TAM or TAM 2 (Legrisa, Inghamb, & Collerettec, 2003, p. 200)

Both the TAM and TAM2 offer a useful analytical framework in the context of the study. Considering the typically large investment in IT innovation, as well as integration thereof into the broader corporate strategy, IT projects can be a material undertaking in terms of investment in both time and financial resources. Therefore, an understanding of the factors influencing the use of new technology across the organisation can contribute to the decision for corporate managers considering incorporating new IT systems in their business. Additionally, the processes suggested by the TAM and TAM2 can further influence the direction strategy, particularly as emergent IT innovations become an important strategic factor driving competition and industry structure.

2.5.4 Resource-based view (RBV)

The Resource-Based View theory (Barney, 1991), is a management framework that is useful for evaluating how a firm's strategic resources can be leveraged to achieve a sustained competitive advantage (Barney, 1991). The theoretical model defines strategic firm resources as physical, human and organisational capital, including know-how; processes and other non-tangibles; that "enables a firm to conceive of and implement strategies that improve its efficiency and effectiveness" (Barney, 1991, p. 102) and a "sustained competitive advantage as "a value creating strategy not simultaneously being implemented by any current or potential competitors, and when these firms are unable to duplicate the benefits of this strategy" (Barney, 1991, p. 101). Barney (1991) stated than in order for a resource to provide a firm with a sustained competitive advantage it must be valuable; rare; difficult to copy; and not easily substitutable.

2.6 Conclusion

A number of technology adoption theories have been developed and adapted over the last few decades. While most focus on adoption of innovation at an individual level, the DOI and TOE are examples of the early academic works that have sought to understand factors that impact adoption at the corporate level (Oliveira & Fraga Martins, 2011).

The analytical frameworks proposed by both of these models present a good theoretical foundation from which to view the antecedent factors that influence company readiness for adoption of IT innovation. In particular, a deeper understanding of the external environment factors proposed by the TOE model present a basis for first analysing the context in which the study will take place and the mediating influence this has for adoption of IT innovation and, ultimately, strategy at the corporate level.

The TAM model, as well as the extended TAM model, provides a theoretical frame with which to consider the level of adoption of innovations for individual members within a firm. Within the context of the study, this will provide insight on any possible factors that restrict the widespread adoption of IT innovations by individuals within an organisation.

Linking the technology adoption literature to the corporate strategy element of the study, the RBV frameworks sets a theoretical foundation for how firms can gain a sustained strategic advantage as a result of having access to different resources (e.g. IT innovation – including, systems, processes and human capital) (Barney, 1991; Wu & Chiu, 2015).

In their 2016 study, Mithas & Rust consider the impact of IT strategy and investment on overall firm performance – as measured along two performance dimensions;

1. Profitability; and
2. Market value.

The literature underscores the importance of understanding the integration of technology adoption, corporate strategy and firm value – grounded in theory along the three perspectives discussed above, the study will draw on these works as it explores the research problem from the perspective of the corporate treasury function.

3 Research Questions

3.1 Introduction

Chapter 2 reviewed literature from existing academic research and theoretical frameworks that discuss the integration of technology and corporate level strategy from an academic perspective. The review of the existing academic literature considered the research problem against three broad theoretical perspectives.

1. Technology adoption and diffusion from a corporate perspective
2. Technology innovation, organisational strategy and competitive advantage
3. Technology strategic focus and performance

The research study aimed to answer three specific research questions. Each of these research questions were guided by the research objectives discussed in Chapter 1 and are derived through the reviewed literature, based on the three theoretical frames listed above.

3.2 Research Questions

3.2.1 Research Question 1

Establish factors affecting the adoption of technology innovation at the corporate level

Research Question 1 sought to identify the primary factors that drive the adoption and diffusion of technology innovations for large organisations in the current business environment. The question explored various adoption and diffusion factors outlined in the discussed theoretical frameworks as well as sought to establish any new insights within the specific context of the research objectives outlined in the study.

3.2.2 Research Question 2

What is the role of technology innovation on the development of organisational strategy?

Research Question 2 explored the degree to which technology innovation plays a role in the formulation and application of corporate strategy. A key part of the research objective was developing deeper insights as to technology innovation interacts with corporate level strategy across an organisation; industry or economy. Specifically, the research questions sought to determine how organisations harness technology to organise strategic resources so as to improve their competitive position.

3.2.3 Research Question 3

What is the dominant focus in integrating technology and business strategy to drive organisational performance?

Research Question 3 considered the interaction between technology innovation, organisational strategy and perceived organisational performance. Essentially, the question aimed to establish the business outcome of investing in IT innovation and shaping corporate strategy to align with the opportunities and threats presented by the digital world.

4 Research Methodology

4.1 Introduction

This chapter presents an overview of the research methodology that was followed throughout the research study. Specifically, the chapter discusses the choice of the research design, provides a brief description of the population frame, the unit of analysis, the sampling method and sample size, as well as the data collection process undertaken in the study. The chapter ends with a discussion of the potential limitations of the research design.

The literature review presented in Chapter 2 formed the basis for the choice of the research design selected for the study, as well as guided the formulation and design of the interview questions (taking into account ethical considerations) when developing the one-on-one in-depth interviews that were used for the data collection process.

The approach adopted for the research study was a qualitative and exploratory approach. The research method, research design, data sampling and data analysis all supported the selected research approach.

4.2 Research Methodology and Design

The study adopted a pragmatic research philosophy. Saunders and Lewis (2012) define a pragmatic research philosophy as one which is guided by the reseach questions and research objectives. The research questions and objectives in the proposed study consider three broad elements:

1. Technology and innovation trends in a business context
2. How these trends shape the evolution of corporate level strategy
3. How technology strategic focus impacts organisational performance

Each of these research elements will make use of the qualitative research method and will be investigated through in-depth discussions with research participants, and will require a large element of collecting and interpreting of unstructured data on the part of the research participants and interviewer.

The research study thus requires a fusion of more than one philosophy in the research approach, aligning with the view that the most relevant determinant in the philosophy is the nature of the research question (Saunders, Lewis, & Thornhill, 2009).

Saunders & Lewis (2012) state that exploratory research is most suited to research where the study seeks to investigate a particular area within a field of study that may currently not be well understood by the researcher. Furthemore, literature indicates that exploratory research is most valuable where the study is “conducted to clarify ambigous situations or discover potential business opportunities” (Zikmund, Babin, Carr, & Griffin, 2013, p. 52), or where an investigation is conducted as an initial exercise to develop new information in a poorly understood topic, followed by a more comprehensive research process intended to further refine the initial research effort (Saunders & Lewis, 2012; Zikmund et al., 2013).

The purpose of the study is to develop new insight into an evolving area within the business environment, with a specific focus on technology innovation and its role shaping strategy at the corporate level. A key research objective was to gain a broad understanding on the evolving area, based on the three research perspectives listed above, as well as to develop a conceptual understanding on the chosen research area. Therefore, the research study was most suited to a qualitative and explorative research method.

The potential application of the research insights for expanding business opportunities, also aligned with the basis of exploratory research as argued by Zikmund et al. (2013). The chosen research method enabled the researcher to conduct a comprehensive investigation of the topic to develop deeper insights (Saunders, Lewis, & Thornhill, 2009; Saunders & Lewis, 2012; Zikmund, Babin, Carr, & Griffin, 2013), as well as potentially discover concepts within the chosen topic that may offer valuable business insights an opportunities (Zikmund, Babin, Carr, & Griffin, 2013)

The data was collected over a period of a few weeks, at a specific period in time, through in-depth interviews conducted with a diverse sample that was representative of the population group. Consequently, the design of the research study was of a cross-sectional nature (Saunders & Lewis, 2012; Zikmund et al., 2013).

The study used research data collected from one-on-one discussions or in-depth interviews, which enabled to the research to probe responses provided by the research participants, enabling the discussion to build on topics covered during the interview (Saunders, Lewis, & Thornhill, 2009). Unstructured interviews were selected because they enable the collection of “a rich and detailed set of data” (Saunders, Lewis, & Thornhill, 2009, p. 324). Furthermore, this data collection method enabled the researcher to develop deep insight on the topic, identify central themes constructs and research findings based of the key patterns that emerged from the research process.

Considering the exploratory nature of the study, no hypotheses or assumptions were set out by the researcher at the beginning of the investigation. The theoretical perspective of the study was deductive, as the researcher allowed the patterns that emerged from the analysis of the data to guide the formulation of themes, constructs and concepts that led to a framework, if any, that helps to explain the impact of technology innovation on corporate strategy. Saunders and Lewis (2012) define such an approach as "the development of a theory as a result of analysing data already collected" (Saunders & Lewis, 2012, p. 109)

A key element of the research was to conduct an assessment of the emerging trends technology innovation as well as the nature of integration, if any, into the broader corporate strategy. The success (or lack thereof) of strategic choices undertaken organisations, as well as the impact of the dominant strategic emphasis was explored through in-depth discussions with the sample group. An analysis of the research results was conducting and the findings used to develop the themes presented in the discussion and conclusion chapters.

4.3 Population

The population is defined as all the possible members of a group (Saunders & Lewis, 2012). In the study, the area of interest was technology innovation and corporate strategy. Furthermore, guided by the theory and research questions, the study sought to have broadly generalisable insights in the area of corporate strategy, and how technology innovation impacts the formulation of corporate strategy.

Therefore, the relevant population for the study was considered to be all Senior Executives (including c-suite executives), Managers and Management Consultants that work in, or have specialist knowledge of companies that have an integrated corporate strategy.

Extending the scope of the population frame in such a way ensured that the study had broad applicability and relevance across the business landscape, regardless of industry; sector or geographical context.

4.4 Sampling Method and Size

The primary sampling technique that was used for the study was non-probability, purposive sampling. Saunders and Lewis (2012) define purposive sampling as a non-probability sampling method in which the researcher applies their judgement to select a sample based on a range of factors. Furthermore, this method is commonly applied when the research design calls for the selection of a relatively small sample size for the collection of largely qualitative data (Saunders & Lewis, 2012). In addition the use of a purposive sampling technique, the snowball sampling technique was applied to increase the sample size using individuals identified by potential research participants identied earlier in the sampling process (Saunders & Lewis, 2012). The use of both of these samplic techniques was appropriate given that the research design was to collect a rich set of data through in depth interviews, from a small sample research participants represening the populatio group described above (Saunders, Lewis, & Thornhill, 2009; Saunders & Lewis, 2012).

Given that the research approach and design emphasises quality and richness of data for a qualitative and exploratory study, the selected sample was relatvely small in size, consisting of 8 individuals who were subject matter experts in the area of study. The selected sample included Chief Operation Officers (COOs), Senior Executives and Consultants in a technology or management descipline. All of the selected sample members were working in a large private organisation and had at least an undergraduate tertiary qualifications and a minimum of ten years experience in the field of study.

Although the scope of the study is intended to be as broad as possible, given for convenience and practical considerations, sectors that were selected for the sample group were limited to those with an operational presence in South Africa. Additionally, as judgmental sampling was applied in the selection process, the sample group was selected to be varied with respect to industry or sector, in order to provide a sufficiently diverse set of factors and characteristic from which central themes and key patterns across various industries can be identified (Saunders & Lewis, 2012). A more comprehensive description of the respondents is provided in section 5.2

The primary data collection technique for the study will be unstructured interviews with participants chosen from companies in the sample group. The unstructured interviews will be designed to assemble data that is rich in detail. The relatively small sample size therefore reflected the need to tailor the sampling technique to this research design, which required

more time to conduct the data collection, as well as the necessary detailed analysis after the data has been collected.

4.5 Unit of Analysis

A unit of analysis is the most basic element that forms the core focus of the research study. In the context of this study, the unit of analysis was the distinctive insights provided by each of the respondents in the selected sample group.

4.6 Data Collection Tool

The data was collected through researcher-directed, unstructured or in-depth interviews. In depth interviews are often useful in exploratory qualitative research (Saunders, Lewis, & Thornhill, 2009; Patton, 2015). This method was chosen as if allows the researcher to probe responses and dig deeper into insights provided by the research participants throughout the research process.

In depth interviews also enable the participants to discuss concepts and topics that the research may not have considered as part of the initial research process, but may nonetheless be import for the research objectives (Saunders, Lewis, & Thornhill, 2009; Saunders & Lewis, 2012).

The research design initially set out to conduct 10 face-to-face, in-depth interviews with interview participants selected in accordance with the sample method described in section 4.4. However, due to the richness of data collected from each interview, data saturation was soon reached during the interview process.

While the initial interview provided a large degree of insights, additional data collected provided limited new concepts and insights, indicating saturation (Patton, 2015). Despite this, the researcher ultimately conducted 8 in-depth interviews from which the study results were analysed and findings presented comprehensively in chapters 5 and 6. The data collection was guided by the structure of the research questions and research objectives.

The length of time for each in-depth interview varied for each individual, with the longest recorded interview having taken 61 minutes and the shortest recorded interview taking 28 minutes to complete.

The suitability of the data collection tool for the research objectives – including the interpretation of the guiding questions by the research participants, the ability of the researcher to organise and code the participant responses – was tested in a pilot interview, which was conducted prior to the in-depth interviews with sample group began. The aim of the pilot interview was to test the interview process and structure of the envisaged in-depth discussion. The outcome of this exercise helped to further refine the interview technique and guide the direction of the interview discussions. A sample of the outline of the interview guide is in provided in Appendix 1.

Improvement to the design or coding structure were applied subsequent to the pilot interview process. The data collection was limited to one unstructured interview per day, providing sufficient time for appropriately managing the time constraints and changes in scheduling. The suitability of the measurement instrument will be influenced primarily by two components, validity and reliability. Each of these are discussed briefly below.

Within the context of qualitative research, validity refers to the degree to which the data collection actually measures the intended research elements in accordance with the research objectives, or in a manner that gathers data that provides sufficient insights to address the research questions (Saunders & Lewis, 2012).

In this context, validity can be considered on two levels;

1. External validity; and
2. Content validity.

External Validity

External validity refers to the extent to which the results of the research study can be generalised from the selected sample, to the total population as defined in the population frame. Considering the sampling method outlined above – purposive non-random sampling – representatively of the sample will be an important element in determining broad generalisability.

In using the selected sampling approach, the researcher applied judgement to in the selection of a suitably diverse sample, ensuring broad sector representation within the samples – e.g. across the major sector classifications such as manufacturing; financial services; resources or telecommunications. The selection of a heterogeneous sample aided the researcher to

enhance the variation in the collected data, enabling the provided insights to the collected in greater depth (Saunders & Lewis, 2012).

In addition to a selection bias towards a heterogeneous sample, the research design and the chosen data collection method was designed to investigate broad trends in technology's impact on the corporate level strategy in a general business sense – avoiding elements which were specific to any one industry or company specific.

Content Validity

Content validity refers to the degree to which the measurement instrument accurately measures the topic being investigated in an approach that fully addresses the research objectives and research questions.

In the context of this study, content validity can be determined by two specific questions:

1. Did the use of in depth interviews provide an accurate assessment of impact of emerging technology innovation trends within the research participants' organisation or sector?
2. Did the measurement instrument accurately assess the role of technology and innovation on corporate strategy?

The unstructured nature of the interviews enabled the researcher to direct the discussion, probing much of the responses provided by the research participants to provide a large amount of data and insight on the chosen area of study. This included investigating topics introduced by the research participants that were relevant to the research objectives; specifying topics of discussion that address the research questions as well as structuring the interview questions to directly address aspects of the research questions.

This research study submitted an application to GIBS for ethical clearance, which was granted 30 July 2018 (refer to Appendix 2), after which the data collection was conducted in August, September and October 2018.

4.7 Data Collection

In depth interviews are well supported in literature as an effective data collection tool for qualitative research (Saunders & Lewis, 2012; Patton, 2015). In the context of this study, this method of data collection was chosen as the most suitable due to the need to draw on the detailed insights from the research participants (Saunders, Lewis, & Thornhill, 2009). Therefore, in-depth unstructured interviews allowed for the flexibility needed for the type of exploratory data collection methodology envisaged in the study in order to follow the patterns that emerge through the data collection process, as guided by the interview responses and emerging insights (Zikmund, Babin, Carr, & Griffin, 2013).

To support the research objectives and best draw on participant insights, and being guided by the literature review, the researcher conducted 8 in-depth interviews as part of the data collection process. As discussed in section 4.4, the in-depth interviews were conducted with senior-level executives such as Chief Technology Officers; Chief Information Officers and other executives that contribute to shaping strategy technology across a range of industries, as well as subject matter experts that have intimate knowledge of the technology or strategy discipline, in accordance with the process outlined section 4.4.

Data collection was primarily conducted by the researcher as part of the unstructured interview process. The data collection for the in-depth interviews with the sample participants was recorded through a number of tools, which were all administered by the researcher. These tools included note taking by the researcher; as well as recording responses on an audio device, as well as transcribing the interview subsequent to the discussion.

To enhance the effectiveness of the in-depth interviews, each respondent and their organisation and industry or sector were thoroughly profiled to ensure the researcher had adequate information and background prior to the in-depth interview process. In addition, each respondent was asked to complete and sign an informed consent form, which will be kept as part of the record of the research data collection process.

Finally, safeguarding the accuracy and integrity of the data during the collection process is essential to ensuring that research findings are not distorted and that the research questions can be answered accurately.

4.8 Data Analysis

The analysis approach for the research study was be based on two central methods:

1. Researcher coding of the narrative data (responses) from the in-depth interviews
2. Researcher interpretation of the key themes emerging from the in-depth interviews

Given the data collection tool chosen for the research study, the audio recordings from the in-depth interviews were first transcribed by the researcher to convert the content from an audio format, to a text format. In addition to enabling the researcher to have more intimate familiarity with the research data, the transcribing process aided the analysis process by converting the data into a format more suitable for coding.

The coding process was guided by the theory, with the research codes developed around key ideas emerging from the data, as well as categorising the codes along central themes addressing the three research questions outlined in Chapter 3.

The analysis of the research results and inclusion in the research project, and then the findings presented through a systematic process applied to identify common emerging themes.

4.9 Research Limitations

An inherent limitation to qualitative research is the subjective element that may lead to biases for both the researcher and research participants (Saunders & Lewis, 2012). This will be an inherent limitation in the proposed study. Furthermore, the researcher will not be a trained expert in the designing and conducting an interview – a factor which could impact the data collection process.

The expected timing of the research, c. August 2018, will coincides with the tail end of a long period of low business confidence in the South African economy, with low GDP growth, political uncertainty and ratings downgrades. Given the large capital investment that technology and innovation may require, the overall strategy may differ significantly in an environment of strong economic growth. This could potentially impact the responses in the in-depth interviews, due to an element of recency bias, and thus impact the relevance of the data for long-term implications or through the business cycle.

5 Analysis of Results

5.1 Introduction

A comprehensive description of the methodology employed to select the sample, collect data and test the three research questions outlined for this study was provided in Chapter 4.

This chapter presents the key findings from the interviews from the research participants interviewed for the research study. The key findings are presented as they relate to the research questions presented in Chapter 3, namely:

1. Results addressing the factors of technology adoption at the corporate level
2. Results addressing the role of technology on the development of organisational strategy
3. Results addressing the impact of technology focus on organisational performance

While the data collection was conducted through unstructured interviews, the research questions discussed in Chapter 3 were used as a basis to frame the broad themes of the interviews, as well as provide the structure for the presentation and analysis of the research results.

Although designed and largely conducted as an unstructured, in-depth discussion, the guiding interview questions were also formulated on the basis the research questions outlined in Chapter 3, building on the theoretical perspectives discussed in the literature review. The research problem outlined in Chapter 1 was then explored based on the findings of the research interviews, framed around the three research questions.

The research results are presented below based on key themes that were identified from the qualitative analysis of the interviews. The research themes were clustered into key constructs that were relevant for addressing the research questions and the research results coded accordingly, in order to enable the study to further explore the below elements:

1. Insights on the most commonly identified process and factors driving adoption of emerging technology innovations for corporations
2. Insights on the most commonly identified process and factors driving the integration of emerging technology innovations, with the development of firm-level strategy; and
3. Insights on the perceived impact on organisational performance of the dominant strategic focus of technology investments.

The most frequently mentioned themes identified through the coding process are presented in the word cloud diagram shown in Figure 3 below. The word cloud shows a visual depiction of key emerging content from the in-depth interviews, based on codes tags used to culture the themes that emerged during the data analysis exercise.

More frequently identified codes (indicating key research themes) are depicted in larger font, with the display order being laid out in alphabetical order from the top to the bottom of the plane, illustrating the key themes that emerged from the interviews.

Each of the main themes relevant, for the research objectives and for addressing research questions, are presented more systematically in the sections that follow. The themes are organised according to the relevant construct related to the three research questions listed above.

Figure 3. In-depth Interviews Word Cloud

This chapter begins by presenting a brief summary and description of each of the research participants that were interviewed in the data collection process for the study, followed by a

more granular presentation of the results and themes from the qualitative data, organised in accordance with each of the research questions.

5.2 Description of Participants and Research Context

As outlined in the research methodology, the research participants in the study were selected from a diverse set of organisations and industries. This was due to the purposive sampling technique, which was chosen due to the need to gain a rich and diverse set of data during the data collection process, such that the research data does not overly bias a dominant view from any particular discipline or industry. Guided by this principle, the research participants chosen for the research sample varied in industry, level of experience, area of specialisation and formal education, as outlined in the Table 3 below.

Three of the participants had a consulting industry background (i.e. management consulting and technology consulting), two were from the banking industry (i.e. retail banking and investment banking), one was from a software development firm and two from a transportation services company. The age of the participants ranged from about the mid-thirties to late forties. The minimum amount of work experience of the participants was 10 years, with 7 out of 8 of the respondents having worked exclusively in the South African business environment.

All of the research participants had tertiary qualifications, mainly in a computer science and/or business discipline, 7 of the participants have post graduate level academic qualifications and one had a PhD. All of the research participants hold senior strategic roles within their firms. The below table provides a broad overview of the research participants.

Participant	Industry	Position	Experience	Qualification
Participant 1	Retail Banking	Head of Digital	15 years	MBA
Participant 2	Investment Banking	Chief Operating Officer	13 years	BSc Computer Science, BA (Hons), PhD
Participant 3	Software Development	Chief Operating Officer	14 years	BCom Informatics (Hons), PG Dip
Participant 4	Transportation	Head: Business Intelligence	11 years	BCom
Participant 5	Technology Consulting	Senior Manager	16 years	BSc Computer Science
Participant 7	Technology Consulting	Senior Manager	16 years	BSc Information Systems
Participant 6	Management Consulting	Associate Director	14 years	BSc Computer Science, MDP, MBA
Participant 8	Transportation	Head: Telematics	10 years	BSc Electronics, SMP

Table 3. Description of Research Participants

5.3 Results: Research Question 1

RQ 1: Establish factors affecting the adoption of technology innovation at the corporate level.

5.3.1 Introduction

Research Question 1 sought to identify the key factors and processes most frequently identified by the research participants as important in driving the adoption of emerging technology and innovation in a business context. Accordingly, the in-depth discussions conducted during the data collection phase focused on getting participant insights which address this question in the context of the current dynamic technology innovation environment, which includes a number of emerging technologies that are impacting businesses and industry models. Some examples of these emerging technologies include the increasing use of Cloud Services (Cloud), which provides access to large amounts of storage and processing capacity for both large and small businesses.

A key theme that emerged from the in-depth interviews related to how the increasing importance of Cloud is enabling business to leverage big data and analytics capability, the harnessing deep customer insights, as well as the rise of digitally enabled business tools and applications that drive operational efficiencies and continuously enhance the customer experience.

The first part of each interview focused the discussion on the research question relating to the adoption of emerging technology at a business and industry level. The interview guide, provided as Appendix I, was used to guide the direction of the discussion around collecting sufficiently rich data that would enable the researcher to address the research question.

A key theme that emerged from the in-depth interviews was the role played by the various emerging technologies in increasing the level of access to previously cost prohibitive tools that have now been more broadly adopted across the business landscape. The ability to cost-effectively access large amounts of storage and processing capabilities through the Cloud, scale-up or scale-down capacity as business needs dictate, as well as the growing use of third-party digital platforms (or eco-systems) that allow organisations to access or provide goods and services, have all reduced traditional barriers to entry in many industries across the business spectrum – impacting both the technology adoption and business strategy across the board.

The sections below will elaborate further on the key factors identified during the in-depth discussions and demonstrate some of the key themes through selected quotes from the research participants. The below statement an interview participant demonstrates the view of the increasing role of a number of different technologies that have become mature at the same time.

> *"Now, what we're finding today is what we call the "combinatorial effects of technology", where you've got all of these dependent technologies maturing at more or less the same time." Participant 5*

Several key processes and market factors were frequently cited by the research participants as being important factors driving the adoption of emerging technology by organisations. The top ten themes related to adoption that were identified by the research participants are listed in Figure 1 below:

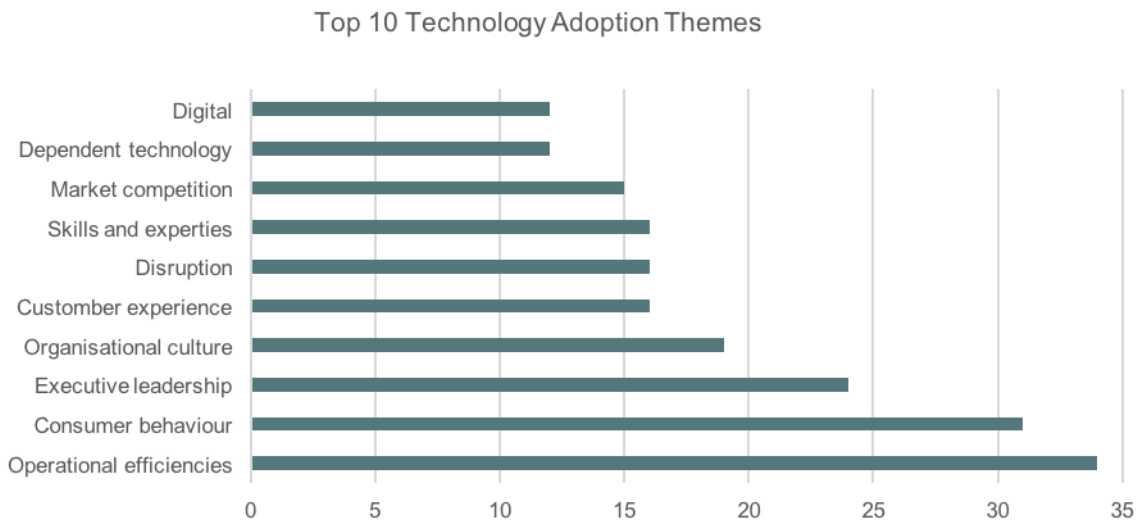

Figure 4. Top Ten Emerging Technology Adoption Themes

To organise the results relating to Research Question 1, the coded responses from each interview were aggregated and then grouped according to the two broad categories: Internal factors & External factors. The interview responses related to the adoption question were then arranged in accordance with the frequently emerging themes that were identified. The results obtained across both categories (i.e. Internal and External factors) are summarised and presented individually in the sections below.

5.3.2 Internal Factors

5.3.2.1 Overview

The internally driven factors identified by the research participants were clustered around three key constructs. These were highlighted by the research participants as important elements of the technology adoption conversation in the current business context:

1. Operational Efficiency
2. Organisational Culture
3. Executive Leadership

During the data analysis exercise, these three themes were clustered together as they relate primarily to how an organisation is internally organised. The top two factors identified by the research participants in driving the adoption processes for organisations were (a.) the constant need to improve operational efficiencies, as well as (b.) the role that the executive leadership team plays in the adoption of technology, both items having been mentioned over 20 times throughout the in-depth interviews. The importance of organisational culture emerged as the third most frequently highlighted element that influences the adoption of emerging technology and innovation.

Each of these three factors illustrate the continued relevance of the internal emphasis in the strategic application that is largely adopted by organisations with respect to technology and innovation, despite the fast changing external technology environment. While emerging technologies continue to advance at an increasingly faster pace, the three dominant elements that were identified most frequently as driving the adoption debate were internally focused, with two of these constructs being fundamentally non-technical and non-financial (i.e. the influence of the executive leadership team and organisational culture).

A key takeaway was the dominance of the operational efficiency construct, which is more in line with the traditional view outlined in earlier academic literature, where functional effectiveness dominated the strategic view of the role of technology, rather than the broader firm-wide strategic view of technology, which could be harnessed to impact the direction of business level strategy for the organisation as a whole.

5.3.2.2 Operational Efficiency

The most frequently highlighted theme from the research participants related to Operational Efficiency, with the theme having been mentioned a total of 34 times across all but one of the in-depth interviews.

The chart below lays out the breakdown from the interview participants that highlighted “Operational Efficiency” as a key factor considered in the adoption of emerging technology within the business and organisational strategy context.

While Participant 1 did not highlight this theme, participants two through eight each provided multiple quotations attributable to Operational Efficiency, with Participant 4 mentioning this six times and Participants 7 and 8 each highlighting this theme a total of nine times during their respective interviews.

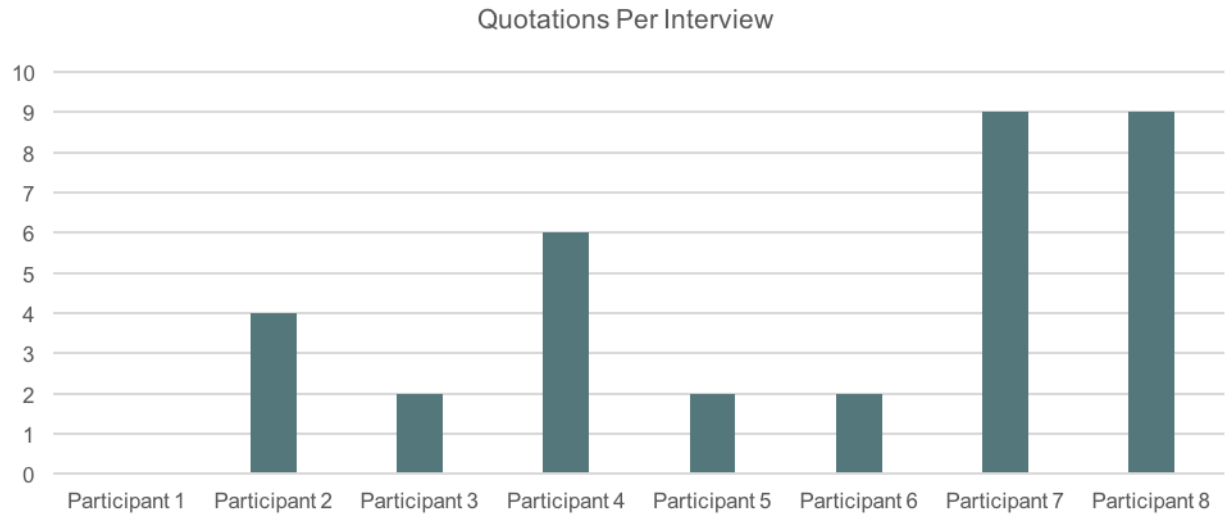

Figure 5. Operational Efficiency Quotations per Interview

This included a heavy focus on speed to market, cost reduction and increasing convenience for internal stakeholders. Many of the research participants identified the increasingly digital nature of the business environment as the key enabler driving organisations to compete on efficiencies.

The below statements from some of the interview participants demonstrates the frequency of this theme from a number of the research participants.

Interview extracts from Participant 2 and 3 illustrates the focus on adopting emerging technology in order to optimise input costs. This view of the processes of adoption and diffusion of emerging technology within the organisation emphases the perceived benefits that can derived from the cost-effective access to technology platforms, new business tools and applications (e.g. the Cloud) that businesses are adopting in order to gain a competitive advantage through driving technology enabled efficiencies.

> *"I think you then get your industrial players, who understand that there is value in optimization and efficiencies that they can get from technology" Participant 2*

> *"There's a drive to get them onto a common platform, as terrible as it sounds, to reduce headcount, realise operation efficiencies" Participant 3*

On the other hand, the below extracts from Participant 7 and 8 demonstrates an emphasis on the operational efficiencies derived from the increase in agility and flexibility that emerging technology innovations allow, for both large and small organisations, in the current business environment.

> *"Actually, digital is about operating efficiently in the garages, it's about operating at a coffee shop and still be able to transact and still be able to engage with customers" Participant 7*

> *"But as technology grows, I think companies are evolving and growing. But I think from what I've seen in corporates, is that one of the biggest ways to get quick returns is to change where your expenditure is, by optimizing existing business processes." Participant 8*

While the above extracts emphasise different elements of the perceived benefits operational efficient derived through adoption of emerging technology, much of the focus with respect to the operational efficiency theme, in general, related to the input side of functional efficiency dynamic (i.e. optimising on costs, time, people and other input resources), with very limited mention of the output side of the efficiency paradigm (i.e. producing more output with the same level of resources).

5.3.2.3 Executive Leadership

The impact and influence of the executive leadership team within the organisation emerged as the second most recurring theme across many of the in-depth interviews, reflecting the perceived importance of the “leadership” factor in the technology adoption decision for many organisations.

The chart below reflects breakdown from the interview participants that highlighted “Executive Leadership” as a key factor for the adoption of emerging technology within the business and organisational strategy context.

While Participant 6 did not highlight this theme, all of the other participants from the interviews provided at least one quotation attributable to the Executive Leadership theme, with Participant 2 mentioning the theme four times, Participant 3, five times and Participant 8 highlighting the theme six times over the course of the interview.

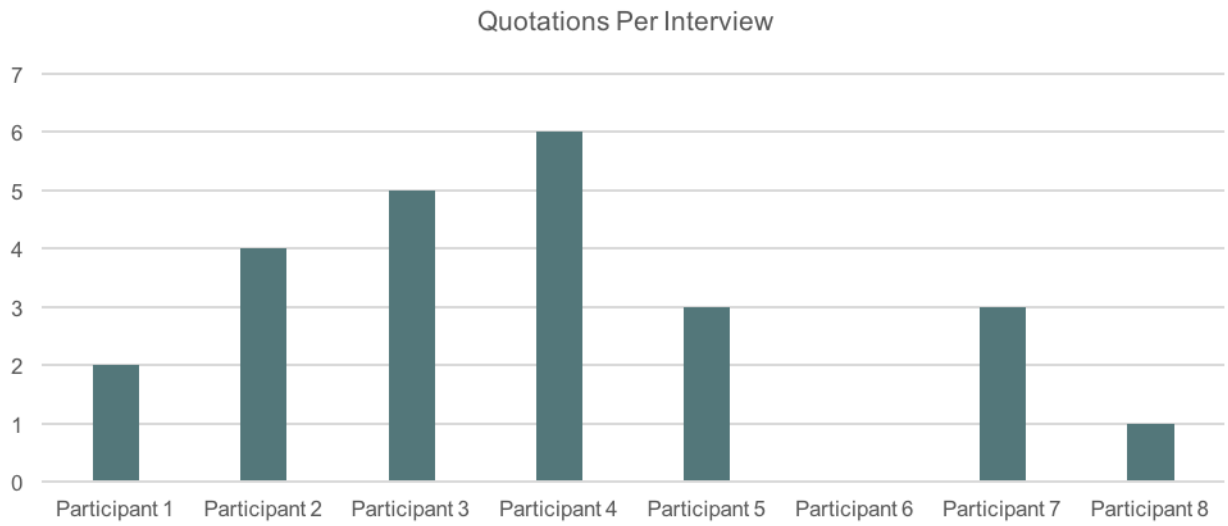

Figure 6. Executive Leadership Quotations per Interview

“Leadership” emerged as a key theme across all but one of the discussions, with most participants mentioning this as a key theme driving the adoption of emerging technologies within organisations.

A recurring point from the research participants was the changing skillset of the typical leadership team across the business environment, which is becoming increasingly technology-savvy, as emerging technology becomes a key business tool. This was contrasted against the traditional executive leadership style which in general, was not as exposed to technology.

Participant 1 captured the evolution skillset required for the modern executive leadership teams (providing examples from within the banking sector) over time as technology has become more and more important for business strategy. This has involved the need to give a voice to technology people and technology leaders as part of the strategic engagement in the boardroom.

> *"I think initially, the C-Suite has been a bit slow to respond. I think the reality is, in a lot of traditional banks, your C-Suite doesn't consist of technology people. So, I think the first step needed is to include the voice of tech leaders in the conversation at an executive and board level." Participant 1*

> *"I think we've seen that happen and I think most companies have done that already. Where you now have technical IT heads a Head of Digital; that sort of stuff…sitting down and being represented at a board level, around the business strategic discussions." Participant 1*

Participant 2 also emphasised the changing technology landscape within the boardroom, from very few executive teams that embraced or understood technology innovations in the past, to more technology savvy leadership teams in the modern business environment.

> *"Simultaneously, you are getting a change in the leadership of organizations. I think there's been a huge amount of change linked to organizations that tend to be led by older generations who, just by default, tend to lag in terms of technological savvy." Participant 2*

> *"I would characterize the first decade of the 21th century as a lot of people struggling to get to grips with what the information revolution meant and having PCs on every worker's desk…what that actually meant… and what the power of this was, to moving into a world in the last decade where now suddenly every CEO has had a lot of exposure at a very high level to all of these technologies." Participant 2*

Other participants indicated a continuing need for improvement in skillset at the executive level in order to drive the adoption of appropriate technology innovations.

In the extracts below, quotations from Participant 3 demonstrate a contrast in the different approaches taken by more effective companies when adopting technology innovations.

"We've seen higher success rates were the executives have made themselves vulnerable. They've acknowledged that they need to expand their horizons, that they need to investigate the adoption of technology, but they actually acknowledge and accept that they are uncomfortable and are out of their depth." Participant 3

"And that's where we sometimes play a pivotal role…walking this journey with them almost as advisors. Um, so there is a lack of understanding, generally speaking, there are shortcomings" Participant 3

5.3.2.4 Organisational Culture

Many of the research participants emphasised "Organisational Culture" as a key theme in how companies approach technology adoption and the integration thereof with the broader organisational strategy. In this context, "Organisational Culture" reflects openness to experimentation with the innovative business tools and applications that emerging technology has made more widely accessible.

The chart below lays out the breakdown from the interview participants that highlighted "Organisational Culture" as a key factor in the adoption of emerging technology within the business and organisational strategy context. Five of the eight participants highlighted this theme, with Participant 3, 5 and 7 each mentioning it seven, five and three times respectively.

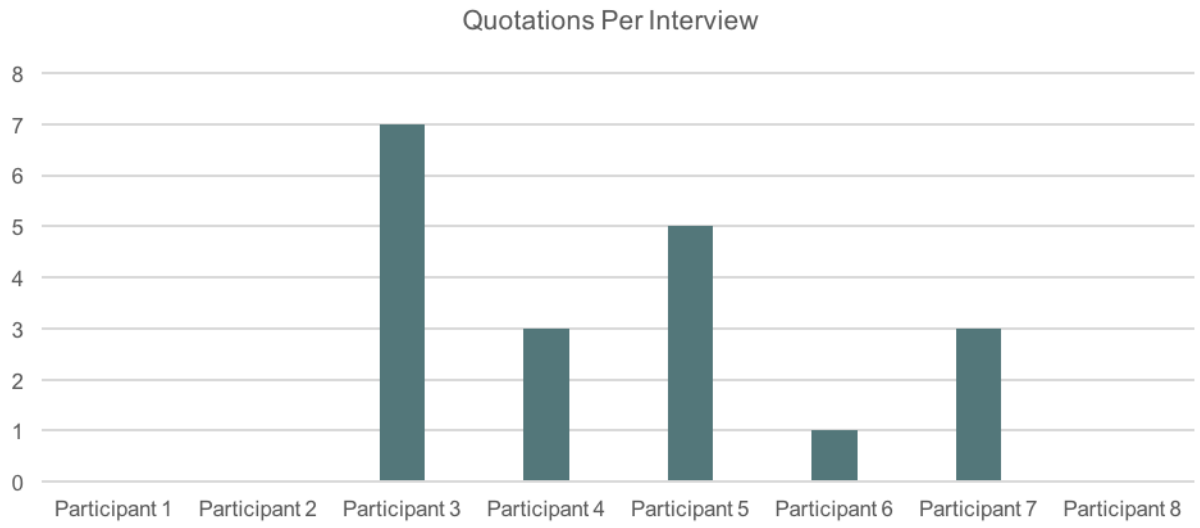

Figure 7. Organisational Culture Quotations per Interview

Organisational culture was mentioned multiple times as an organisation wide factor that drives firms to act, whether in adopting new innovations and technologies, formulating and driving a business level strategy or being more responsive to changing business needs.

Organisational culture is therefore seen as a central nontangible component in the adoption process that spurs business into action and sets otherwise similar organisations apart.

Participant 7 captures this theme in the quotation below, demonstrating the perceived link in the importance of organisational culture (or "organisational DNA") to the convergence of technology and business strategy.

> *"What you see is the convergence of technology business strategy. Converge of the two into a single strategy is not only about technology, it is also about the organisation changing its DNA. It is also about the organisation positioning itself to be able to drive efficiencies. It is also about the organisation looking at how we go to the market utilising the existing platforms...it's all about building that ecosystem." Participant 7*

Notably, the "Organisational Culture" and "Leadership" themes were mentioned alongside each other across a number of interviews. This is demonstrated in the extracts from Participant 3 in the quotations below, there the participant emphasised the connection between both "Organisational Culture" and "Executive Leadership", signifying the interaction between both of these elements as an important factor driving technology and innovation adoption at in business context.

> *"I mean, you asked what are some of the underlying trends or themes that drive the adoption or lack thereof, I think it's definitely culture, organizational culture and maybe the age of the leadership as well" Participant 3*

> *"I think culture is driving the decision-making process in terms of deciding whether it's important to go cloud or not go cloud" Participant 3*

5.3.3 External Factors

5.3.3.1 Overview

The themes related to Research Question 1, i.e. factors driving business level technology adoption, that were identified by the research participants that were driven by factors largely external to the organisation fell broadly across two categories:

i. Customer Centricity
ii. Competitive Environment

During the data analysis exercise, coded responses that fell into one of these two categories were clustered according to themes related to how organisations respond to external drivers that impact technology adoption, considering two key stakeholders – Customers and Competitors.

During the in-depth discussions, two sub-themes emerged within the “Customer Centricity” category:

1. The opportunity presented by emerging technology in leveraging data to gain deeper insights into the broad market changes in "consumer behaviour;
2. As well as the need for organisations to adopt innovative technology tools to address the need to constantly enhance the customer experience;

The two subthemes listed above emerged as the 2th and 5th in the most frequently mentioned adoption themes across all categories, see Figure 3 above, each of these items having been mentioned at least 15 times throughout the interviews.

Taken together, the collective “Customer Centricity” theme emerged as the most frequently mentioned theme across the in-depth interviews (i.e. a total of 47 times, well ahead of the Operational Efficiency theme, which was mentioned 34 times). The importance of the role of external competitive environment also emerged as a strong thematic element from the interviews, suggesting a material impact on corporate level adoption of emerging technologies.

Each of these themes illustrate the importance of the two key stakeholders shaping the business level strategy and adoption of emerging technology – customers and competitors. As technology advances the competitive landscape and drives changes in customer expectations, the dynamic industry structure is shifting the power from business to customers as well as to rivals (both established and new competition). This shifting market dynamic requires businesses to think more strategically about how to respond to the technology environment

and adjust their technology focus for both functional level effectiveness, as well as for broader business level strategy.

5.3.3.2 Customer Centricity

The significance of placing the customer at the centre of decisions regarding the adoption of technology innovation came through very strongly across all of the interviews. This theme is evidenced by the frequency with which “Customer” related items were referenced during the interviews. Reference to this theme by the research participants came through primarily in two broad thematic contexts:

1. Technology enabling better insights into changing customer behaviours and demands
2. Technology driving innovations to continuously enhance the customer experience

Figure 8 below illustrates the share of the “Customer Centricity” theme (i.e. Customer Insights and Customer Experience) from the top five adoption themes identified during the data analysis process. The customer theme accounts for approximately 38% of the top five frequently mentioned themes across all the interviews. Together with the “Operational Efficiency”, these two themes accounted for over 50% of the key factors addressing Research Question 1 that were identified by the research participants.

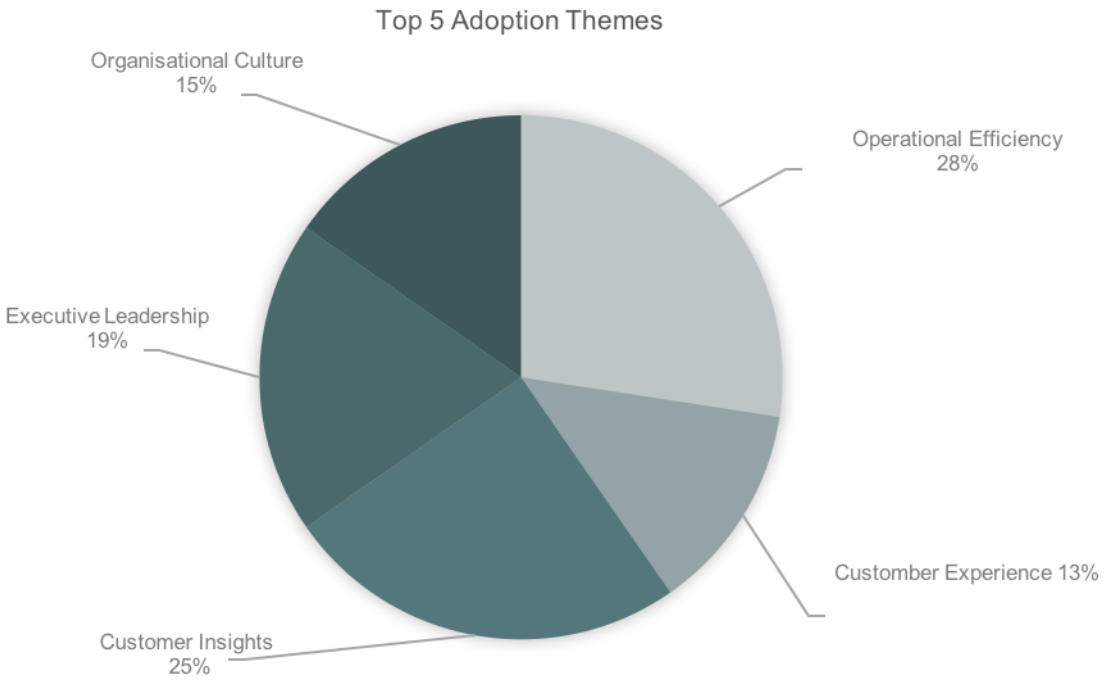

Figure 8. Top 5 Adoption Themes

5.3.3.2.1 Customer Insights

The chart below lays out the breakdown from the interview participants that highlighted “Customer Insights” as a key factor in the adoption of emerging technology within the business and organisational strategy context.

The chart demonstrates that this theme was mentioned by each of the research participants, with each having highlighted this theme at least one. Participants 8, 5 and 7 each mentioning the theme nine, seven and five times respectively.

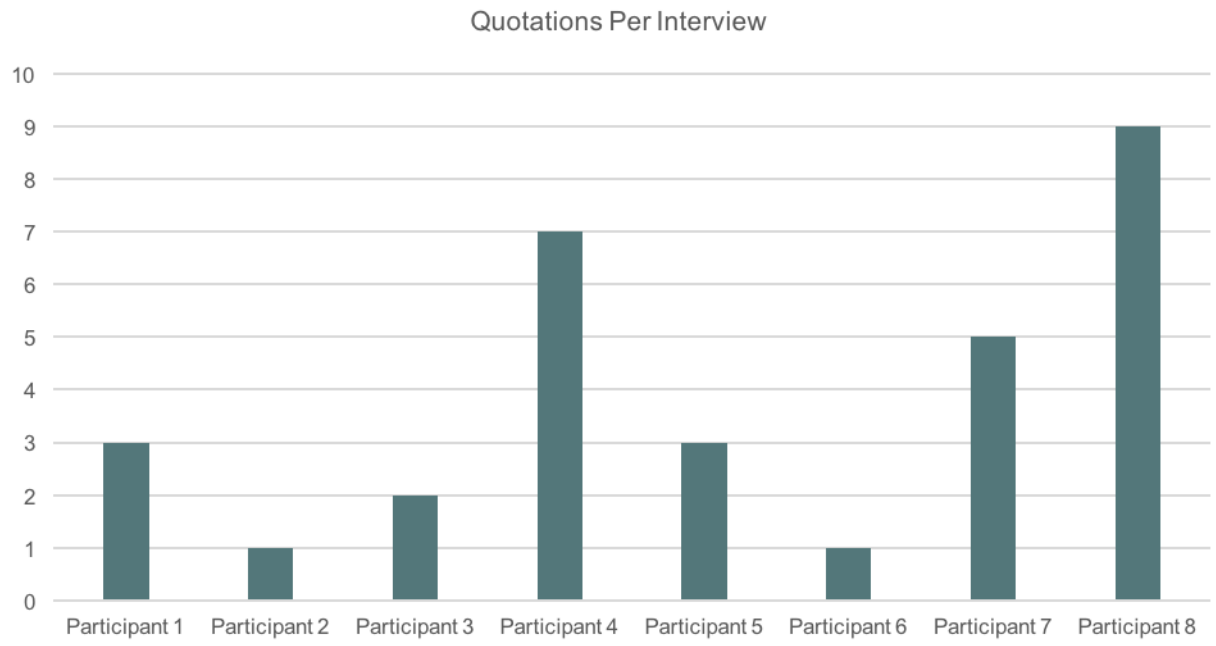

Figure 9. Customer Insights Quotations per Interview

A dominant theme that emerged from all of the interviews is the application of adopted technology in order to better engage customers, which have become increasing engaged with the products and services they consume. While innovations in big data, analytics and cloud provide modern tools and business applications, the view emerging from the research participants is that it is ultimately the ability to enhance the customer experience (through better insights) that drives much of the strategic development at the business level.

Participant 3 captured this frequently mentioned view most succinctly in the extract shown below.

> *"I've heard of the cheesy phrase 'Data is the new oil'. But data isn't valuable – it is the information that you can extract, and the insights that you can extract from data that is the real value." Participant 3*

The use of technology to extract deep customer insights, which can then be used to inform strategic decisions across the business, including to optimise cost efficiencies or to drive revenue, also came out as a strong theme from the interviews. The quotes below from a cross section of the research participants demonstrates the participants' view of the importance of the connection between use of technology enabled innovations to enhance customer insights and the interaction with business level strategy.

> *"So, it might be how you can understand the customer better, to improve Credit and Risk…and those are two major focuses in the business department." Participant 4*

> *"So that when you design, be it you are designing your customer platform for you to rotate the business to respond to customer needs that will likely be driven by analytics. It is that insight that can be utilised at different levels of the business." Participant 7*

> *"The core underlying part of telematics is one of the core features within business because the data and the insights you get from it can feed into different business areas. When you start taking the data and seeing how it is related to Credit, Credit Correlations and Insurance Correlations." Participant 8*

> *"Because now you can provide all this contextualised information about your clients, which adds to their business models. Those are the guys that are really understanding the value of data and how they can actually use data to up and evolve the product offerings." Participant 8*

Emerging technology innovations, such as cloud; data analytics and artificial intelligence, are a critical component of the collection, storage and processing of the information necessary to develop better insight into customers. In the interview extract below, Participant 5 points out the convergence of emerging technology innovations that are maturing at the same time, thus enabling businesses to more effectively leverage tech-based business applications.

"Now, what we're finding today is what we call 'the combinatorial effects of technology', where you've got all of these dependent technologies maturing at more or less the same time." Participant 5

"This combinatorial effect, what it's effectively doing, is allowing a lot of these interesting innovations, some of which may have been there, but maybe now they can be accelerated." Participant 5

5.3.3.2.2 Customer Experience

Figure 10 illustrates the spread across the interview participants that highlighted the theme "Customer Experience" in the adoption of emerging technology within the business and organisational strategy context.

Six of the eight participants highlighted this theme, with Participant 3, 5 and 7 each mentioning it seven, five and three times respectively.

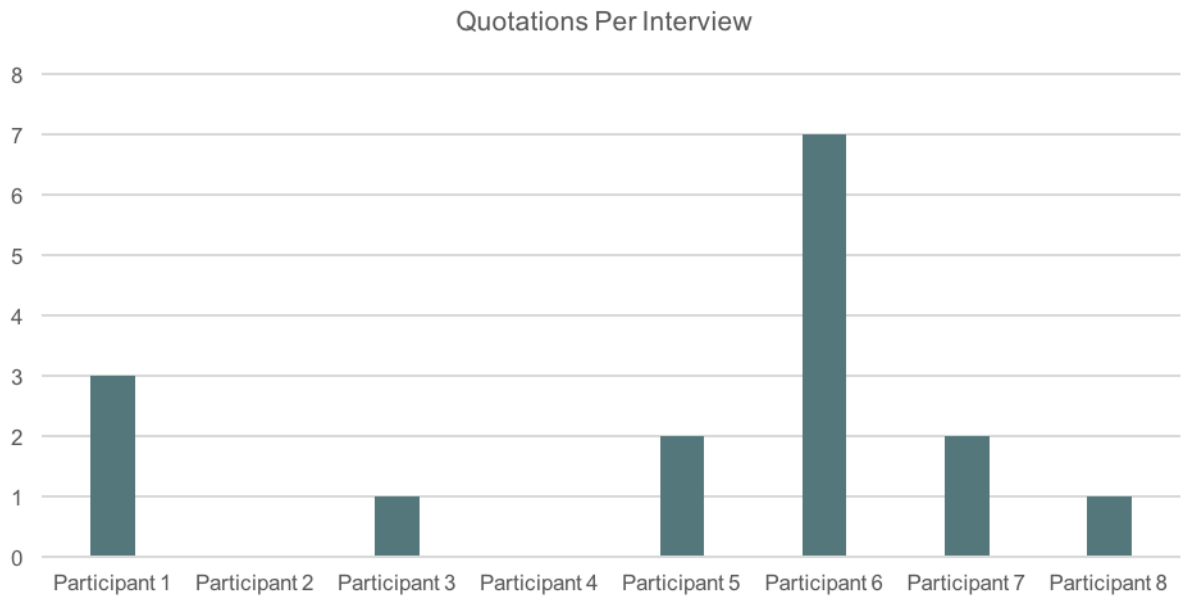

Figure 10. Customer Experience Quotations per Interview

Due to the evolving technology landscape, even traditionally non-tech businesses must consider strategies to respond to the increasing importance of customer experience. With technology having placed access to products and services much closer to the consumer as indicated by participant one in the extract below.

> *"So, I think industry-wide, whether you're in Retail or you're in Banking or Financial Services, or Insure-tech…I think the role of technology in terms of Data; AI; the Internet of Things; Connectivity and the democratization of products and services, technology has made services and products available to many people who never had them available before," Participant 1*

> *"You now have a technology store's worth of gadgets on your phone, all in your pocket" Participant 1*

The increase in access and proximity to the customer enables by emerging technology innovations has increased the level of engagement with customers, making the need to enhance the customer experience an increasingly critical element of business strategy. The data from the interviews demonstrates the view from participants that this is a key area that business is thinking about.

> *"Two big themes that we see time and time again is how do we improve the customer experience? How do we transform the customer experience?" Participant 3*

> *"It means that businesses need to look at their operating model. Because the adoption of emerging technology changes how a business functions due to the integration of the devices, the platforms that are sitting on those devices, the convenience that they bring to the customer." Participant 7*

5.3.3.3 Competitive Environment

In addition to the increasing significance of “Customer Centricity” in business strategy, the importance of a largely technology-led increase in the level of intensity of the external competitive environment came out as a key theme across many of the interviews.

As illustrated in Figure 11 below, all but one of the research participants identified this is a key element driving the technology adoption and business strategy, with more than half of the participants mentioning the Competitive Environment theme at least twice during the course of the interviews and in-depth discussions.

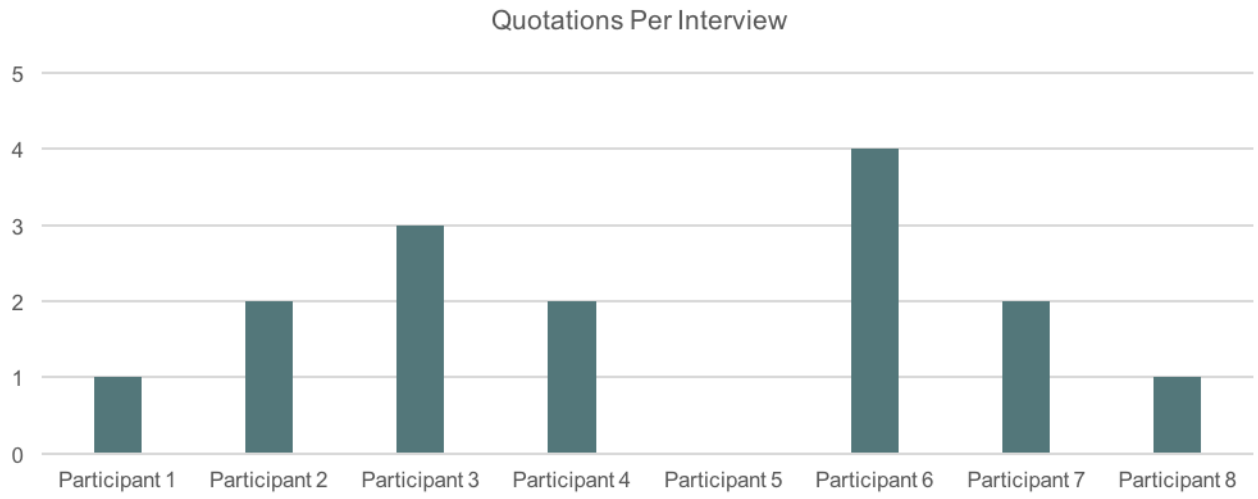

Figure 11. Competitive Environment Quotations per Interview

5.4 Results: Research Question 2

RQ 2: What is the role of IT innovation on the development of organisational strategy?

5.4.1 Introduction

Research Question 2 sought to explore the degree to which emerging technology is shaping the business level strategy and the competitive position for organisations. The interview guide focused the discussion on the strategy discussion at the executive and board level within organisations, exploring the role of emerging technology and innovation trends in driving corporate strategy in an increasingly digitally enabled world, as well as exploring the key strategic drivers perceived to be important in the context of the prevailing technology environment.

A number of key themes emerged from the in-depth interviews, the top three themes identified from the coding process are listed below:

1. First, research participants highlighted the importance of having a well-articulated business strategy that the organisation is solving for, and then framing the appropriate technology solution – with technology is viewed as a strategic enabler, rather than the central strategic business objective.
2. Second, research participants highlighted the need to put customer needs at the centre of the business strategy, and then leveraging technology to solve business problems
3. Third, research participants highlighted the need for strategic transformation of businesses to be more responsive to the needs of the changing competitive environment that is being driven by emerging technology and innovation.

The key arguments that emerged from the research participants relating to Research Question 2 was clustered according to these three themes. Further insights that were gained through follow-up questions was also grouped according to common patterns that were identified. The results from each of these themes are presented in the sections below.

A key takeaway from the set of interviews was the view from many of the research participants that business applications driven by emerging technology innovation play an essential role in strategy development and execution. However, this is primarily as a key enabler for strategic business objectives and not as a key strategic objective in and of itself. Therefore, the dominant view from the participants was that business level strategy remains separate from

the emerging technology innovation, although there is mixed evidence on this point throughout the data set.

For example, the interview extracts below demonstrate the contrasting views from a few of the research participants, indicating the wide diverging views on the convergence of technology and business strategy from many of the participants.

> *"There is no such thing as a digital strategy, there is only a business strategy in a digitally-enabled world." Participant 1*

> *"They (executives) are not clear on the technology solution they want, they are clear on the business problem and they are clear around the business strategic goals." Participant 3*

> *"If we have the conversation with the CIO or the CTO, it is very often a technology conversation, it goes very much to the technology straight away. Whereas the technology should only be an enabler to achieve the strategic objective." Participant 3*

> *"I think strategy has not really changed. However, the way you actually drive out your strategy has changed. So, in essence, instead of having those long delivery cycles you've got agility." Participant 6*

The results obtained from the research process were clustered and coded along the key themes addressing Research Question 2, Figure 12 below illustrates the top 10 highest factors ranked factors.

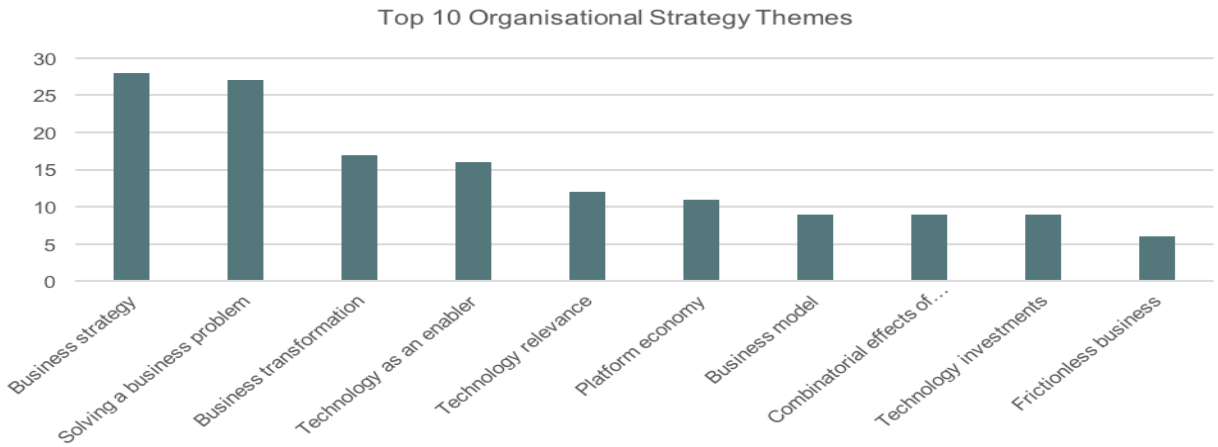

Figure 12. Top 10 Business Strategy Themes

5.4.2 Business Strategy

The importance of developing a business strategy to remain competitive in the dynamic emerging technology environment featured as a prominent theme in the discussion.

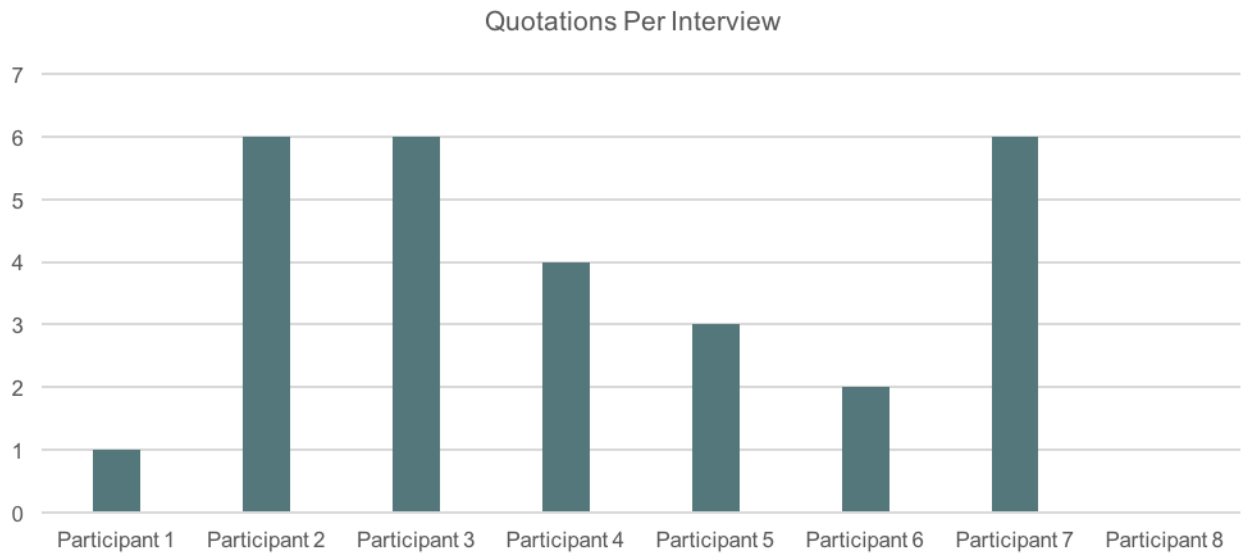

Figure 13. Business Strategy Quotations per Interview

The central theme emerging from many of the research participants was how businesses are developing corporate level strategy that emphasises agility, adaptability and responsiveness, in the face a changing fast changing environment, including to customer needs and increased competition, that is being drive by emerging technology in the business environment.

As per the research results presented above laying out the emerging themes related to adoption of emerging technology innovation (Research Question 1), business innovations driven by emerging technology have both increased the competitive rivalry between existing firms, as well as lowered barriers to entry for new entrants. Additionally, the degree of customer engagement has been elevated, with increasing pressure on organisations to enhance their customer insights, as well as deliver to increasingly higher expectations. Many of the research participants emphasised the need for business strategy to incorporate a higher degree of flexibility to meet this changing market dynamic. The research results suggest that many of the participants view emerging technology as playing a significant role in enabling businesses to incorporate this flexibly as part of formulating the business strategy.

The quotes below provide interview extracts from a selection of the research participants, and demonstrate the emphasis on “agility” and “flexibility” that emerged from the interviews, suggesting strong support of the benefits of emerging technology in formulating business level strategy.

> *“Those questions are ongoing and evolving as these emerging technologies also changed the landscape. So, the landscape is ever-evolving. I think you now have a C-Suite that is becoming more sophisticated and technology that is becoming more sophisticated. So obviously that is now filtering into everybody's strategy and everybody's thinking.” Participant 2*

> *“So, the business strategy we are seeing, and we make it our business to try and better understand our clients’ business strategies so that we can offer a better digital information offering.” Participant 3*

> *“They're thinking how can we use and leverage technology to realise our strategic goals and strategic objectives? And the CEO in the strategy formulation is thinking technology but they often don't know where technology plays a part.” Participant 3*

> *“I still believe that the strategy has become around the customer. What do I need to do to actually retain my customer and how do I retain that customer?” Participant 6*

> *“It’s at the core of making sure that business attracts the right customer, retains the right customer, in real time. That's a dependency you have on technology, right? So, businesses, when they think strategy, they must think about how do we go through digital transformation as a strategic value proposition for the organization? How do we make sure we enter the market, we defend the core, and we win? And those are not traditional methods.” Participant 7*

5.4.3 Solving Business Problems

The theme of viewing the business innovations and applications enabled by emerging technology as an additional tool to solve increasingly complex business problems came out strongly across the interviews. The emphasis across the interviews was for technology to be viewed as an additional component in the business toolkit available to executive, and should be considered within the range of other business applications available in addressing business problems or on executing on strategic business objectives.

The chart below shows the breakdown from the interview participants that highlighted “Solving for a Business Problem” as a key factor in thinking about how emerging technology interacts with corporate strategy.

Although two of the participants did not identify this theme, five of the eight participants highlighted the theme at least once, with Participant 8, 7 and 2 each mentioning it eight, seven and four times respectively.

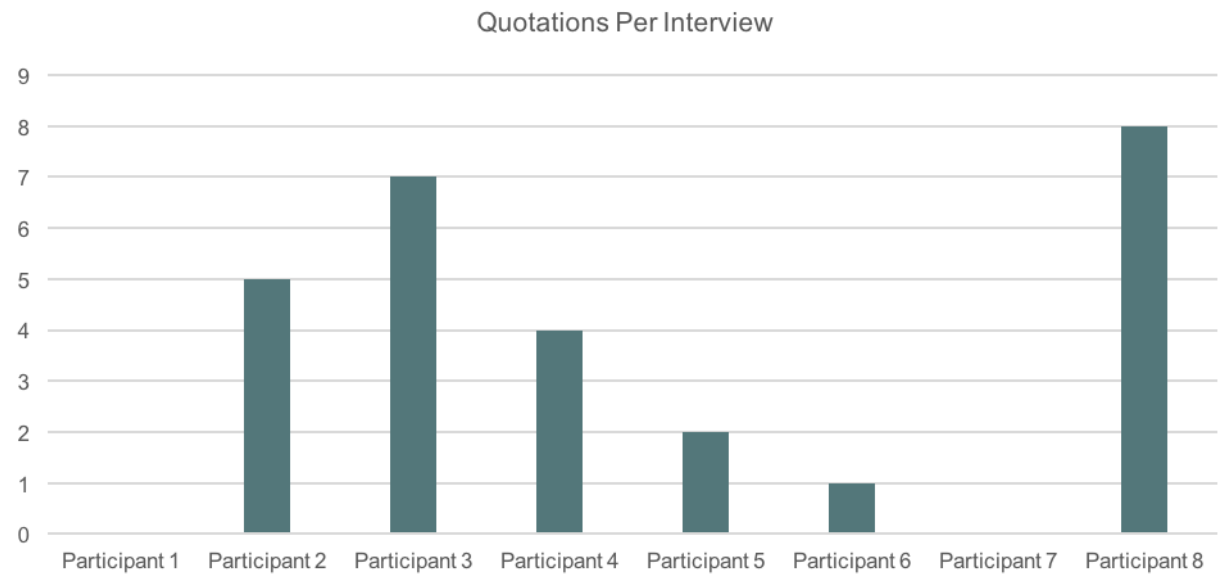

Figure 14. Business Solution Quotations per Interview

The quotes below from a selection of the research participants demonstrates the emphasis on the need for corporate strategy to first identify and be clear about the core problem that the business is solving for, with technology being an enabler in the execution of the solution, as well as increasing the available tools for management to draw from.

> *"What we often do is add complexity into our systems by spending a whole bunch of money on data solutions. Have you really solved the problem, or are you just adding more complexity and detail to the overall landscape… and the answer is, typically, the latter."* Participant 2

> *"So, just because cloud technology exist, doesn't necessarily mean that it's the right thing for us to adopt. Just because big data is something that can be done, doesn't mean that it's something that we should get involved in. All of these are additional tools that you add to the technology landscape and you always, with everything, you start with the business problem. What are we trying to solve?"* Participant 2

> *"So no, they (executives) are not clear on the solution they want, they are clear on the business problem and they are clear around the strategic goals. We have conversations with them to co-create and assist in the formulation of the solution towards the achievement of those goals. So, they often don't know what they want or what they need. They know what the problem is, they know where they want to go and we assist on this journey of solving the problem with them."* Participant 3

> *I'm hugely dismissive of anything which is just cool. You've got to have something which can either make money or save money effectively."* Participant 4

> *"I think there's loads of technology out there. There's loads of blue sky thinking which I think is completely unrelated to business and I think is too immature to use in business, so all the technology which we use in the businesses is around a business problem."* Participant 4

5.4.4 Business Transformation

Technology's ability to transform organisations into a digitally enabled, agile business that can compete in a digitally connected business environment was highlighted several times throughout the interview process.

Figure 15 below shows the breakdown from the interview participants that highlighted "Business Transformation" as a key factor in thinking about how emerging technology is interacting with organisational strategy. In the context of the study, "Business Transformation" refers to aligning corporate strategy, capabilities and resources to the increasingly digital external environment – including changes driven by the changing customer landscape, as well as the changing competitive environment.

Although two of the participants did not identify this theme, six of the eight participants highlighted the need for business transformation as a key strategic objective at least once, with Participant 5, 7 each mentioning it five times and Participant 3 identifying the theme a total of three times.

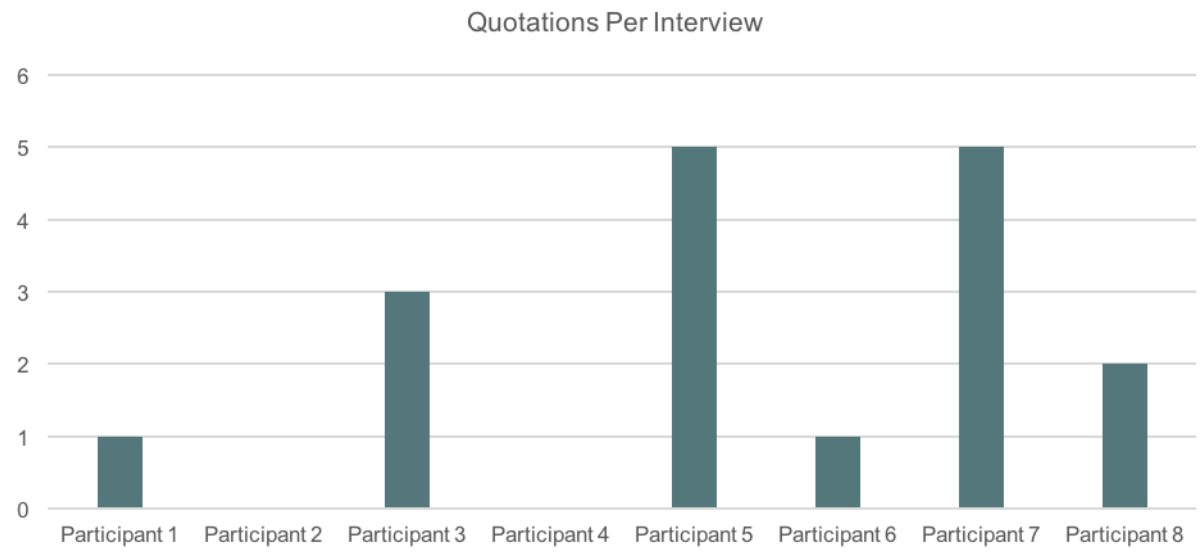

Figure 15. Business Transformation Quotations per Interview

The below interview extracts from selected research participants demonstrate the perceived impact that emerging technologies are having on how organisations are thinking about business strategy as it relates to transformation.

The emphasis on the ability to adapt and respond to a dynamic external environment is also worth noting, linking back to the themes identified and discussed in the preceding sections.

> *"So, to the first question...if we look at the 4th Industrial Revolution in terms of disruption, it's about how businesses are taking on a new shape in order to respond to the challenges that are posed by the 4th Industrial Revolution." Participant 7*

> *"I strongly believe that organizations that are traditional in nature will most probably be wiped off the market. I don't think they'll be able to navigate and repurpose themselves so that they are useful going forward. Organizations that are in the business of addressing customer needs are probably the ones that are better off, in the sense that if you've been truly addressing a customer need, you would have acknowledged and accepted that the customer is dynamic. It's always changing. So even the way you run your engine must be dynamic and be accepting of new change" Participant 7*

> *"But you need to realise at some point that I have had my claim to fame and I'm useless. So, the question in terms of the reaction to emerging technologies, do we even have the right leaders in the existing organizations that can transform those organizations for the future? Participant 5*

An interesting point was made by Participant 3, who suggested that the business transformation discussion differs, even at the executive management level, depending on who is in the room. Non-technology executives (i.e. CEO/CFO/COOs) tend to focus on broader strategic goals more so than technology focused executives, who tend to see technology as being the central strategic goal.

> *"I think the word you might have been looking for there is 'transformation'. And I know digital transformation is a buzzword. We don't like that word, but using technology to transform business has become relevant to advance your business. We are seeing that, and it depends who in the c-suite you're having a conversation with. We're finding the better conversations are with the CFO, the CEO, and the COO as opposed to the CIO." Participant 3*

> *"With all due respect to CIO's, they are more around the 'technology', as opposed to the transformative power that technology can bring to business." Participant 3*

5.5 Results: Research Question 3

RQ 3: What is the dominant focus in integrating technology and business strategy to drive organisational performance?

5.5.1 Introduction

To address Research Question 3, the study sought to establish perceived bias in strategic focus in organisational performance. To answer this research question, the study considered findings from the in-depth interviews that focused on two key elements that address Research Question 3 – strategic technology focus and perceived organisational performance:

1. Perceived impact of a “cost reduction” strategic focus of technology innovation, and
2. Perceived impact of a “revenue expansion” strategic focus of technology innovation

It is worth noting that the objective of the research question was not to conduct a quantitative or empirical evaluation of the impact of emerging technology and innovation on the two performance measures, but rather to determine whether the research participants viewed emerging technology innovations as having a direct impact on both strategy and performance, and which of the two strategic focus viewpoints they considered most relevant in the current business environment.

The structure of the research process thus focused on firstly, comprehensively addressing research questions 1 and 2; secondly, exploring and discussing the central themes identified which relate to adoption and strategy and thirdly, highlighting direct linkages to performance (based on the two constructs mentioned above) that are identified by the research participants.

The dominance of the cost-efficiency view came out strongly throughout the research findings. Amongst the top raking adoption factors presented in the discussion on Research Question 1, the “Operational Efficiency” theme, a closely related construct, was referenced a total of 34 times by the research participants.

Conversely, the potential for emerging technology innovations to expand the universe of revenue generating business opportunities was only mentioned a few times by the research participants. Indirectly, the increasing focus on “client centricity” implies some bias towards leveraging technology innovations to enhance products and services, which indirectly speaks to revenue expansion opportunities. However, this theme was explicitly mentioned by the participants only a few times throughout the discussions, indicating that this may not be a

dominant focus on corporate strategy in the current context of emerging technology and innovation.

5.5.2 Cost Efficiency Focus

The role of technology as a key element of the modern business applications and innovations that enhance businesses' ability optimise costs, through improving efficiencies in operations, was one of the highest-ranking themes coming out of the research process.

Figure 16 below shows the breakdown from the interview participants that specifically discussed the interaction of corporate strategy focus and emerging technology.

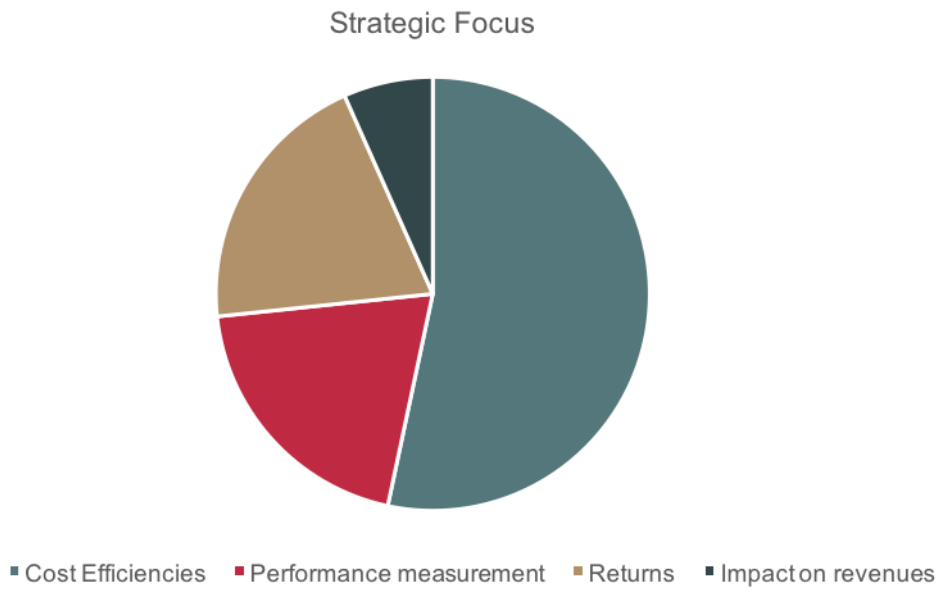

Figure 16. Strategic Technology Focus

The focus on cost-reduction accounted for more than half of the themes mentioned by the research participants that related to the strategic technology focus and relevance thereof for organisational performance.

The below interview extracts from selected research participants demonstrate the perceived impact on cost efficiencies that emerging technologies have, as well as how organisations are focusing heavily on this component of the technology trend in large parts of business strategy.

The emphasis on the ability to adapt and respond to a dynamic external environment is also worth noting, linking back to the themes identified and discussed in the preceding sections.

> *"I think it would be unrealistic, to be quite honest, to be any business in this world today and not be thinking about costs any way, shape or form. Because at the end of the day, business functions on debits and credits and the reality is that the cost conversation needs to happen."* Participant 1

> *"I think there is always going to be a cost discussion. Businesses don't exist in a vacuum, and for as long as we will have economic pressures, geopolitical pressures, you're going to have businesses that are going to be constrained with margins, turnover and profit and as long as you have that, you always going to have a cost discussion."* Participant 1

> *So, the real discussion, I think, is how do you balance costs, with the ability to scale your business, the ability to pursue new revenue streams and do so such that your cost to income ratio doesn't skyrocket under control."* Participant 1

> *"So, people will come back and say, well you save cost, but actually a recent study showed that companies don't end up saving cost on Cloud in the long run. They pretty much pay the same amount of money and what they do is simplify their operations because they're getting rid of having to look after pieces of hardware."* Participant 2

> *"We are finding more success in smaller interactive deployments because time to market is reduced significantly. Costs are also reduced and you can be more agile in terms of how you adapt to changes. Business has to have a seat at the table, the executives need to sponsor technology projects from day one. Failure to do so will result in higher costs and lower ROI."* Participant 3

5.5.3 Revenue Expansion Focus

There was little evidence from the research results of the perceived importance of incorporating emerging technology into corporate strategy, with a dominant focus on enhancing revenue expansion opportunities.

The emphasis on the role of technology to drive revenue expansion was mentioned only once bay Participant 1. The interview extract below provides the additional context.

> *"I think that every business is now at the point where they are looking at the role of technology in helping them to drive and scale their businesses moving forward; looking at the role of technology in helping them find new revenue streams and huge client segments. So, I think there definitely is a conversation happening at a business level." Participant 1*

5.6 Conclusion

This chapter presented the results of the in-depth interviews conducted in the study, organised according to the three research questions discussed in Chapter 3. Analysis of the data from in depth interviews lays out the views and perceptions of senior level executives (in strategic technology or consulting roles). The major findings that emerged from data collected in the study are listed below.

The adoption of emerging technology for organisations is driven primarily by internal factors, including organisational culture, executive leadership and the drive to optimise operational efficiencies. Each of these themes emerged strongly across the interviews and

6 Discussion of Results

6.1 Introduction

This chapter discusses the research results within the context of the literature review, as well as the research questions presented in Chapter 3. The analysis of the research findings contributes to the research objectives of exploring the impact of technology innovation on corporate level strategy.

The chapter begins by considering the research findings within the relevant theoretical framework, considering the literature review conducted in Chapter 2 as well as each of the research questions discussed in Chapters 3 and 5. The chapter then considers the research results against the research objectives outlined in Chapter 1 of the study.

The chapter concludes with a summary of the research findings and provides a framework for the integration of the key themes that emerged during the research process.

6.2 Discussion: Research Question 1

Research Question 1: Establish the factors that affect the adoption of emerging technology and innovation at the corporate level

6.2.1 Overview

Research Question 1 sought to identify the key factors and processes that impact adoption of emerging technology and innovation at the corporate level. The literature review conducted in Chapter 2 showed strong support in academic literature for the significance of the adoption of technology within the context of organisational strategy and performance (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013; Drnevich & Croson, 2013; Wu & Chiu, 2015).

Furthermore, academic literature emphasised a strong connection between the processes that impact technology adoption for organisations, and competitive strategy in the modern business environment (Lin & Lin, 2008). Further insight into the factors that impact adoption decisions at the firm level in the context of the current dynamic technology environment thus formed an important foundation for the study and is a key part of meeting the research objectives.

Consequently, Research Question 1 looked to establish the connection between the research results and the technology adoption frameworks discussed in the review of the literature. The conceptual frameworks related to technology adoption that were reviewed in literature emphasise key factors related to the external business environment, as well as internal or firm-specific variables that drive corporate-level technology adoption (Oliveira & Fraga Martins, 2011).

The research findings appear to be well supported by literature, with the results indicating a strong connection to the conceptual frameworks of the factors that impact technology adoption and diffusion found in literature. The key themes identified from the research results demonstrate a significant link between the research findings and the factors outlined in the literature review. These include the both of the adoption themes across both the categories identified in the findings, impact of the external and internal environment, where the internal themes were identified as “Operational Efficiency”, “Leadership” and “Culture”, and the external dimension themes identified as “Customer Centricity” and “Competitive Environment”.

In particular, the Leadership and Culture themes, which emerged strongly from the research results, are both well supported by the DOI framework, which identifies similar elements as critical elements of technology or innovation adoption for organisations (Rogers, 1995).

In addition to the three internal factors presented from the research finding (i.e. Operational Efficiency Leadership & Culture), the study suggests that many of the research participants perceived the increasing bias of organisational strategy towards Customer Centricity and the more intense nature of the current Competitive Environment, to be two important external environment factors in the technology adoption process for organisations, the former theme coming out as the highest ranking collective category (i.e. Customer Experience and Customer Insights) as shown on Figure 8.

The research findings thus indicate the continuing significance of the external business environment in the adoption process for organisations, a finding also well supported in literature. This view is confirmed by the TOE framework, discussed in the literature review, which explicitly lists the “environmental context” as one of the three key factors that impact the process by which an organisation adopts and implements technological innovation (Lin & Lin, 2008; Oliveira & Fraga Martins, 2011).

The top ten themes from the research findings addressing Research Question 1 are listed in Figure 4, with the research results for five of the most frequently identified themes presented more comprehensively throughout the first section of Chapter 5, which illustrates the frequency distribution for each theme across the research participants, as well as provides pertinent excerpts from a sample of interview transcripts.

The research results for each of these top adoption themes are discussed more comprehensively below, considered against the context of the relevant literature as well as the research objectives.

6.2.2 Operational Efficiency

Operational Efficiency emerged as one of the highest-ranking themes from the research results, and the top theme within the “internal environment” category in the presentation of the results. A key feature of much of the emerging technology (including cloud services; digital; data analytics and internet of things) discussed throughout the study is the benefit of cost efficiency, which has led to increased access to sophisticated technology tools for business across the board, particularly for information processing tools and storage capacity. The research results demonstrate the implications of this “cost efficiency” benefit in technology adoption within a business context, with the operational efficiency theme coming out as a strong theme in the research findings.

As illustrated in Figure 5, this theme was identified by all but one of the research participants, which highlighted the perceived benefits of applying technology tools in driving internal efficiencies as a key factor with respect to the adoption discussion. The research findings underscore the internal focus that most businesses continue to have when it comes to considering business strategy and incorporating technology solutions.

The findings thus point to a stronger focus on the functional-level strategic approach, where technology innovations continue to be viewed within the narrow context for cost optimisation within specific parts of the business, rather than as a key strategic driver for overall corporate-level strategy and performance. This is in line with the dominant view in much of the early MIS literature, which primarily considered the integration of technology and strategy within this narrower “functional efficiency” context, as noted by Drnevich & Croson (2013), as well as Bharadwaj, El Sawy, Pavlou, & Venkatraman, (2013).

Furthermore, the high prevalence of the operational efficiency theme in the research findings highlights the strong link to at least one of the two key elements proposed in the original TAM model (Davis 1986) – Perceived Usefulness. The significance of the perceived benefits that emerging technology and innovation can have on operational efficiency as demonstrated in the research findings is supported by Venkatesh and Davis developed (2000), who argue in the extended TAM (or TAM2) that perceptions of an innovation's capabilities and required output are key elements of the decision to adopt new innovations and technologies for organisations.

Given these research findings with respect to the perceptions of efficiency benefits for the adoption of technology and development of corporate strategy, the implications of technology innovations are significant for business strategy going forward. This is supported in literature, as noted by Wu and Chiu (2015) who argue that technology continues to be key element in enhancing operational efficiencies to support business unit functions, both internally within the firm and externally with its trading partners. As emerging technology and innovation continues to become more accessible to a broader set of businesses, and the commercial benefits of scalability, cost optimisation, speed and agility continue to increase, the incorporation of new technologies will form an increasingly important part of organisational strategy. The key for business will be the ability to expand the strategic view of emerging technology across functional areas.

6.2.3 Leadership

The influence of leadership within the organisation emerged as a key theme throughout the research findings. While the leadership element from the research results is presented and discussed within the context of the adoption research question, it is worth noting that this factor comes across as a key variable in considering the integration of adoption of emerging technology with corporate level strategy across most of the research results.

The significance of the leadership factor is well supported in adoption literature, as indicated in the DOI model, which explicitly lists "leadership characteristics" as one of the three factors that impact the degree of organisational innovation adoption (Rogers, 1995). Additionally, in the TOE model, Tornatzky and Fleischer (1990) note "organisational context" as one of the three core factors driving technology adoption the firm level, where the organisational context also refers to characteristics of the firm, such as size, complexity of the corporate structure and depth of human capital. Organisational leadership, be it executive management or board-level leadership, drives much of the direction of each of these variables as well, indicative of the significance of the leadership factor on much of the adoption process.

6.2.4 Culture

The culture theme, which emerged as one of the key themes in the research results as illustrated in Figure 8, extends organisational context across all levels of the firm (as opposed to just the leadership context).

6.2.5 Customer Centricity

Another overarching theme that came out of the research findings was the significance of technology innovation as an enabler for enhancing the user experience for the customer – or a technology enabled "customer centric" approach. The increasing focus on the customer within business strategy was a top theme that came out of the research results. The results presented in Chapter 5 break up this theme into primary components that classify the most commonly mentioned factors along two categories, "customer insights" and "customer experience".

The findings demonstrate the importance of the perceived power of technology innovation in enhancing a client centric approach to business. This reflected a core element of the external environment that impacts adoption, a finding well supported in literature. As technology innovations have enhanced the engagement between organisations and their customers, the user experience has become a much more central feature in the formulation of corporate strategy. The findings also indicated that a key to this trend is the transformative impact on business across a number of industries that advances in digital technology has made possible. While this is clearly more dominant in specific industries, primarily consumer retail industries such as retail banking and telecommunications, the findings suggest that the trend towards a more customer centric business philosophy is a key factor for technology adopting across different industries in the business environment.

The data shows that significant advancements in innovations across data analytics, processing and storage, presents business opportunities that impact competitive strategy on a number of levels, including adding significant value to customers through the leveraging of insights that were previously not possible to achieve. An example provided by one of the research participants (Participant 7) that illustrates this point is the leveraging of telematics data collected by car tracking companies for use in determining insurance risk profiles, through analysing driving habits and frequently visited locations. This transforms conventional car tracking business from merely providing asset tracking services for security reasons, to providing smart devices which have potential applications in other areas such as insurance.

Such strategic opportunities that advances in technology present is an increasingly important factor in how business considers adoption of technology, well as how to advance their corporate strategy in order fully exploit these opportunities.

6.2.6 Competitive Environment

Another key factor that emerged from the research results, within the context of external business environment, is the impact of an increasingly dynamic competitive environment. This was the second most cited external factor in the technology adoption, and considered the pressure to compete in an increasingly dynamic environment as a critical factor in adoption and strategy for organisations.

The research results suggest that perceptions of the disruptive forces unleashed by the wider access to technology has led to businesses expanding what they consider as the competitive field across various industries, impacting both adoption decision and the formulation of corporate level strategy. The findings also emphasised the increasing importance of organisations to be to more adaptable to innovations that impact consumer expectations, industry models

6.2.7 Conclusive Findings for Research Question 1

The research results reveal five key factors, discussed above, which provide valuable insights into the integration of the process of technology adoption at the firm level and the development of corporate strategy. The identified factors help to explore the primary constructs outlined in the research objectives, how the evolving technology dynamics influences the formulation of strategy for organisations. The findings demonstrate the significant connection between external and internal drivers of the adoption of technology and innovations for organisations, a finding reflected in many of the theoretical frameworks considered in the literate review.

The findings further suggest that the increasing significance of the factors related to the external business context, customer centricity and the competitive environment, will continue to escalate the role of technology in the formulation of corporate level strategy, as the benefits or a well-integrated technology framework becomes a firm wide strategic objective, despite the dominant view of technology seen as mostly impacting functional level efficiency.

6.3 Discussion: Research Question 2

Research Question 2: What is the role of IT innovation on the development of organisational strategy?

6.3.1 Overview

Research Question 2 sought to establish the common themes identified by the research participants that provide insight into the interaction of emerging technology innovation and the formulation of competitive strategy. Specifically, the study considered key factors that address Research Question 2 by exploring how organisations are formulating their strategic choices, in the context of the current technology and innovation tools, in order to harness technology capabilities and resources to enhance their competitive market position in the increasingly dynamic business environment.

The research results indicate that most of the research participants consider technology to have a significant impact on the competitive environment, with organisations increasingly having to emphasise agility and adaptability in the formulation of organisational strategy in order to remain competitive. Another central theme from the findings was the importance of formulating organisational strategy with the customer at the centre, connecting to the client centric theme discussed in Research Question 1 above.

The research results presented in Chapter 5 lay out the key findings relating to the connection between emerging technology and corporate strategy according to the three dominant themes which emerged from the research process.

1. Business strategy being the primary focus, and technology being an enabler
2. Solving a core business problem, with the client at the centre
3. The need for continuous innovation to transform businesses to meet changing demands

Overall, the research findings demonstrate the research participants' view of the importance of organisations to formulate technology-enabled business strategy that is oriented around solving business problems as well as prioritise a greater degree of agility and adaptability to the dynamic external environment.

This view is supported in literature, which highlights adaptability and the capacity of business to leverage technology to harness organisational resources as a key consideration in the development of organisational strategy. Sambamurthy, Bharadwaj, & Grover (2003) note the

importance of this approach for organisations incorporating emerging technology into corporate level strategy, arguing that a well-integrated technology strategy can positively influence firm performance through enhancing three important organisational competencies – strategic agility, digital options, and entrepreneurial alertness (Sambamurthy, Bharadwaj, & Grover, 2003).

The importance of incorporating agility and adaptability in the formulation of business strategy is also supported by Mathiassen & Pries-Heje (2006) and Drnevich & Croson (2013), who note that agile organisations are able to more effectively respond to changing customer requirements, market dynamics, as well as emerging technology options. Each of these three elements emerged as key themes driving strategic consideration within the emerging technology environment. The role played by technology in enhanching adaptability and agility is also noted by Lu & Ramamurthy (2011), Benitez-Amado & Walczuch, (2012) and Drnevich & Croson (2013), who emphasises the role of technology in developing organisational capabilities to enhance agility.

Additionally, Lu & Ramamurthy (2011) note two factors impacting organisational agility. The first is “market capitalizing agility”, which considers the external business environment and the organisation’s ability to respond to dynamic external factors. They identify the second factor as “operational adjustment agility”, which considers more internal organisational factors that relate to cost optimisation and other operations efficiencies. This further demonstrates support in literature for the research findings’ strong emphasis on organisations having to prioritise agility and adaptability in formulating strategy in the current technology environment.

Other findings related to organisational strategy that were highlighted by the interview participants are listed in Table 12, which illustrates the top ten most frequently occurring items. A key takeaway from the research findings is the view from most of the research participants that emerging technology will continue to play an increasingly essential role in strategy development and execution. This is being driven by innovations that enhance the relevance of technology in the strategy decision making process, as technology is increasingly seen as a key enabler in the strategy execution process. The theme of “technology as an enabler” approach to strategy formulation was mentioned 16 times throughout the interview process, while the theme of increasing importance of “technology relevance” in organisational strategy was mentioned 12 times.

6.3.2 Technology as an enabler in business strategy

The findings strongly suggested an increasing focus on formulation of a core business strategy, which organisations continue to view as a separate organisational objective from IT strategy. Instead, the research results suggested that technology innovations are considered as a key enabler to execution of business strategy. This view came out as the top-ranking theme within the Organisational Strategy category, as illustrated in Figure 12, with all but one of the research participants identifying this at least once as illustrated in Figure 13.

In this context, research participants emphasised the need for strategy formulation to be framed first at a business level, where the primary objective was to best position the organisation compete in the context of broad dynamic factors in the sector or economy, not just focusing on the incorporation of technology innovations. According to this view, the incorporation of technology becomes more of a factor in the execution process, where technology innovations are then considered against an array of business tools, resources and capabilities that are applied to drive the business strategy.

The research results further indicate that while participants continue to view technology as an important element of the overall strategy discussion, corporate level business strategy continues to lead and guide technology strategy. This is consistent with the view supported in literature, as noted by Drnevich & Croson (2013). Furthermore, the findings suggest that developing business strategy that emphasises adaptability to the changing technology environment, rather than a narrow strategic focus on adoption of emerging technology, is viewed as a more important factor in success of organisational strategy.

The implications for business is that both technology and non-technology solutions should be viewed as appropriate strategic tools that can be harnessed to drive performance by enhancing an organisation's ability to adapt to the increasingly dynamic external business environment. The finding therefore, it that corporate strategy continues to be guided by the fundamental market circumstances and business needs, with business innovations in technology expanding the toolkit available to management.

6.3.3 Technology as an enabler in problem solving

The theme of harnessing emerging technology to build competencies that enhance business problem-solving capabilities came out strongly in the research findings. This came out as the second-highest ranking theme within the Organisational Strategy category, as illustrated in Figure 12, with the majority of the research participants identifying this at least once.

While this theme was somewhat related to the Business Strategy concept, emphasising agility and responsiveness to changing business needs, within the context of the study, the “business problem solving” theme referred to the effect of technology on building business applications to identify and creating specific business solutions that were previously difficult or expensive to solve. The ability to identify business problems being enhanced largely by digital tools and data analytics capabilities, which provide organisations better access to internal and external information, as well as quicker processing capability, enabling better insights that were previously unavailable.

The research findings indicate that this technology-driven market development is viewed as an important component in organisational strategy. Moreover, the increasing affordability of much of the technology innovation means that the competition in various industries has become more intense, as there is a wider group of potential competitors – both established rivals and potential market entrants pose a much more serious threat.

The findings highlight the importance of technology as an enabler for businesses in formulating organisational strategy to enhance problem-solving capabilities. This adds to the list of research findings supporting the view of technology as an enabler, as noted by Lu & Ramamurthy (2011) and listed in Table 2 in the literature review. The distinction between technology as an enabler in strategy execution and in identifying and formulating business solutions is also evident in the research findings.

6.3.4 Business Transformation

The third theme related to Research Question 2 was the role of emerging technology in driving business transformation as a key factor in organisational strategy. In this context, business transformation relates to fundamental adjustments to the structure, culture or processes in order to better orient organisations to compete in the digitally enabled businesses environment, as well as be more responsive to the external business environment. This came out as third-highest ranking theme within the Organisational Strategy category, as illustrated in Figure 15, with six of the eight participants having highlighted the theme at least once.

The findings highlight the need for organisational to make fundamental adjustments, in response to the increasingly digital external business environment. The emphasis of this theme in the research findings demonstrates a view that is not immediately evident in the literature, which stresses continuous adaptation and agility as a core feature of organisational strategy.

6.3.5 Conclusive Findings for Research Question 2

The research results underscore three key finds with respect to how technology innovation impacts organisational strategy, technology's enabling role in the execution business strategy; technology's enabling role in building organisational capabilities in problem solving and how organisations are transforming key elements of their processes, culture and other capabilities in order to be better positioned for a digitally enabled business environment.

Each of these strategic themes demonstrate a core thread emerging throughout the research findings, emerging technology continues to drive the need for organisations to be more adaptable to the dynamic external environment, and consider innovations in technology as an important tool to enhance capabilities in agility and adaptability.

6.4 Discussion: Research Question 3

RQ 3: What is the dominant focus when integrating technology and business strategy to drive organisational performance?

6.4.1 Overview

Research Question 3 sought to establish the common themes identified by the research participants that consider how strategic technology focus impacts organisational performance. Organisational performance is a relevant element to consider within the overall exploration of the technology's interactions with firm level strategy.

Specifically, the study sought to identify what participants considered to the dominant focus pursued by organisations with respect to strategic investments in technology innovations. The two elements considered in the study are rooted in the theoretical framework developed by Drnevich & Croson (2013), as well as Mithas and Rust (2016), namely:

1. A cost reduction IT strategic focus; or
2. A revenue-expansion IT strategic focus

In addressing the research objectives, the two elements of strategic focus on technology investments were useful in focusing the study to a broadly measurable metric that research participants could identify in considering the perceived impact of technology on organisational performance.

Moreover, further insight into the dominant IT strategic focus for businesses provided a useful dimension to the research study, in addition to that provided by the two research questions that explore technology innovations within the context of adoption and organisational strategy.

Overall, the research findings indicate a strong bias towards a cost reduction strategic focus, with participants overwhelmingly highlighting the emphasis of technology innovation in exploiting operational efficiencies. The evidence of the dominance of the cost efficiency focus in corporate strategy presents an interesting area of investigation for future literature. The importance of both a cost efficiency and revenue expansion focus in organisational strategy has been well established in literature. In a 2013 study on technology and business strategy, Drnevich & Croson argued that one of the key factors in organisational performance is the firm's ability to integrate technology and business strategy to balance the strategic trade-offs between operational efficiency (i.e. cost reduction focus) and business effectiveness (i.e. revenue expansion focus). Bharadwaj, El Sawy, Pavlou, & Venkatraman (2013) further note benefits for firms that are able to most optimally coordinate organisational resources to create value and a sustainable competitive advantage, suggesting a need to expand the strategic use of technology innovation beyond just cost reduction focus. In their empirical study on technology strategy and firm performance conducted in 2016, Mithas & Rust found that organisations that emphasise both a cost efficiency, as well as revenue expansion focus as part of their technology strategy (i.e. dual focus technology strategy) exhibit superior valuations, despite the data showing no significant differences in profitability relative to firms that followed a single focus strategic focus (either on cost reduction or revenue expansion). In addition to the cost reduction focus and revenue expansion focus, the only other themes in the research findings highlighted by the participants was the increasing use in technology innovations for better performance measurement, as well as technology's role in driving an ROI (Return on Investment) strategic focus, which implies there exists some for consideration for both the revenue and expense line items, albeit not a dominant factor.

On balance, the findings imply a relatively low strategic focus on technology's direct impact on performance. While there is strong strategic emphasis on efficiency and strategy, there is a limited view of the connection between the technology and the direct impact of firm performance beyond the cost reduction benefits derived from operational efficiency. This

narrow view of the role of technology may limit firms from exploiting revenue expansion opportunities that may otherwise have been pursue.

6.4.2 Cost reduction strategic focus

The findings indicate that a cost reduction focus is the dominant strategic emphasis for organisations in integrating technology into strategy. It is worth noting that the research results are aligned to the finding discussed in Research Question 1, which also list operational efficiency as a key adoption factor identified by research participants. More specifically, the research results indicate that the cost efficiency theme was explicitly identified 8 times by the research participants, while the revenue focus these was mentioned only once.

6.4.3 Revenue expansion strategic focus

The findings indicate a limited view of technology's role in revenue expansion. While a number of the themes discussed in the findings indirectly impact revenue – e.g. impact of technology on an increasingly client centric philosophy – there is little evidence of a direct focus on how emerging technology impacts revenue expansion opportunities.

6.4.4 Conclusive Findings for Research Question 3

The findings emphasise the perceived dominance of a cost reduction strategic focus in the integration of technology and organisational strategy, will minimal evidence in the research results supporting a revenue expansion or dual focus (i.e. cost reduction and revenue expansion) strategic focus.

The findings reaffirm the perception of emerging technology being seen primarily as an innovation tool to drive operational efficiency, a key finding that emerged throughout the research results. The potential for expanded revenue generation opportunities, or a dual focus on both costs and revenue did not feature strongly in any of the discussions. This finding provides an interesting area for further exploration as deeper insight into the trade-off between the cost and revenue strategic focus would likely be valuation for both business and academia.

6.5 Conclusion

The discussion of the findings conducted in Chapter 6 considered the research results presented in Chapter 5 against the theoretical frameworks, with an analysis provided in the

context of each of the three research questions listed in Chapter 3, as well as research objectives outlined in Chapter 1 of the study.

For each research question, an outline of how the research results and key findings from the study that address the research question was provided as an overview at the beginning of the discussion for each of the three research questions. Additionally, the overview considered any link the research results had to the relevant literature, indicating any support or deviation from theory as well as considered the implications of the research findings for business or the development of future literature.

The data from the research findings that addressed key themes within each research question was clustered along the relevant category, with each of the key constructs per research questions identified and discussed comprehensively in the sections following the overview.

7 Conclusion and Recommendations

7.1 Introduction

This chapter discusses the key findings of the study and evaluates them against the research objectives outlined in Chapter 1. The primary objective of the study was to explore the impact of emerging technology innovation on corporate level strategy, where emerging technology innovation considered advances in business tools and applications that are increasingly impacting the modern business environment.

The chapter begins by considering the principal findings from research study, considering each within the relevant theoretical framework. The chapter then considers the main implications of the research findings for business. The limitations of the research study are considered and noted, before concluding by making recommendations for future study.

7.2 Research Findings

The research findings underscore the increasing importance of technology innovation in the business envelopment. Advances in processing power, as well as the simultaneous maturity of technology innovations in storage, data analytics and digital platforms, have led to broad based access to a variety of sophisticated business applications and technology tools. This shift has driven fundamental changes in how business engage their customers, as well as the competitive landscape.

The study found that technology innovation has significantly impacted the way organisations engage their customers, with digital technology enabling businesses to not only receive rich feedback on products and services, but also on the overall customer experience. While technology innovation has allowed more access to rich information about clients, products, services and the overall user experience, organisations have had to be ready to adopt a more client centric philosophy in order to better serve customer needs. The study found that the need to responsive to external customer-led factors was a key factor in how technology innovations are shaping corporate strategy.

In addition to the increasing shift towards client centricity, advances in technology have also led to wide spread access to sophisticated business applications and tools. Innovations such as cloud services, access to digital platforms and the low cost of connectivity, has significantly lowered traditional barriers to entry, made the world more connected and led to the

democratisation of information. These changes have all led to a fundamentally different competitive environment relative to just a few decades ago. The spectre of digital disruption has means organisations have to constantly consider how the changing landscape in technology innovations impact the business model or industry structure.

The study found that the internal view of the benefits of technology innovations continues to be prominent in the formulation of corporate strategy. In addition to the changing dynamics in the competitive environment, as well as shifting customer expectations, the study found a strong internal bias towards organisational strategy. The research findings highlighted a strong focus on the adopting of technology with a view to optimise operational efficiency, as well as evidence of organisational strategy with an emphasis on cost reduction. This suggests a continuation of the narrow, functional effectiveness, view of the role of technology innovation on organisational strategy.

The research findings further emphasise the point of corporate strategy formulation continuing to happen independently from the technology strategy in most organisations. Research findings indicate that the dominant view is that of business strategy leading corporate strategy. In this view, the role of technology innovation is predominantly with respect to execution of corporate strategy and not as a core strategic objective within the firm.

Key to this view, is the concept of technology's impact on the need to organisations to enhance agility and adaptability. The research findings show that the increase in uncertainty and dynamism in the external business environment has prioritised the need to build organisational capabilities that enable a greater degree of dexterity and speed. The findings highlight the role of emerging technology in building these competencies, with organisational strategy increasingly being formulated around this central theme.

The study found limited evidence of the role of technology in driving a revenue expansion focus into organisational strategy. While the study found strong evidence of the increasing importance of customer centricity as well as competitive environment, suggesting an external focus, the study found that revenue expansion opportunities did not play a central role in how organisational strategy is leveraging innovations in technology. Conversely, the study found that there is a high degree of strategic technology focus on cost reduction, further emphasising the functional effective view of technology as a key element of how emerging technology innovations are impacting strategy.

7.3 Limitations

Some of the specific limitations of the study identified by the researcher are outlined in Chapter 4 as well as listed below.

While the study achieved significant insights from the in-depth interviews and managed to collect comprehensive data which contributes to the research objectives, the limited number of research participants due the time constraints potentially limits the preliminary results and research findings. Additionally, the sample selected for the participants was limited to executives that work predominantly in the South African business context. The research results may thus be limited by the geographical context and idiosyncrasies unique to the South African business environment.

Although the unstructured nature of the interview enabled the researcher to extract a much richer set of data from each interview, the relatively small sample size of N = 8 was identified as a key limitation of this study. Given more time to conduct the research study, a larger sample size could potentially provide more accuracy to the research process as well as add an additional dimension to the research results and research findings.

The use of the purposive sampling method may have also resulted in a limitation of this study due to the sampling technique not facilitating an adequately diverse sample. All but one of the research participants' work for large organisations in and around Johannesburg.

Additionally, the majority of research participants have a large amount of work experience in a technology related discipline. The study may have benefited from a gaining insights across a more diverse set of disciplines with not only make technology related strategic business decisions, but are also users of various technology related business applications in front line business functions.

7.1 Implications for Business

The findings from the research study has several key impactions for business. The findings in the study will assist business by providing insight as to which aspects of the business environment innovations in technology most impacts, and will provide executives some guide on how strategic focus impacts organisational performance.

Firstly, the study findings confirm the increasingly important role that innovations in technology has on business strategy. The implications for business is the need to develop capabilities and competencies that enable organisations to leverage this increasingly important resource. This includes bringing in, or developing the requisite technology skills across the organisation, from the executive level as well as across lower levels of the organisation. In some firms and industries, this may mean a more fundamental transformation of the business culture, and in others it may mean only a marginal change from the existing processes. Overall however, the changing technology landscape in the external environment means a more digitally connected world, which will increasingly drive the need for digitally-enabled organisations, which are able to best respond to market more dynamic circumstancing going forward.

Second, as emerging technology innovations continue to drive substantial changes to the customer experience, bringing products and services closer to end-users (primarily through digitally-enabled platforms), as well as increasing access and engagement between service providers and customers, the study findings show that developing an increasingly client centring strategy is becoming increasingly important in business. This is a key implication for how business practitioners must be guided in mapping a strategy that is fit for purpose, where the needs of the customer are at the centre and the technology environment facilitates a much closer client engagement than used to be the case.

Third, the study findings indicate a strong emphasis on leveraging technology innovations for the optimisation of functional level objective. This includes a strong bias for operational efficiency, as well as a cost-reduction focus. The implications for business is the need for business executives to expand the strategic technology focus beyond just the efficiency component. The increasing integration of technology enabled innovations across industries, changes in customer expectations and increasing competition suggests businesses will need to increasingly incorporate a revenue expansion focus into their strategic technology focus. While an efficiency or cost reduction focus has been shown to enhance performance, research indicates that a dual focus on both cost reductions, as well as revenue expansion leads to superior valuations (Mithas & Rust, 2016).

7.2 Suggestions for Future Research

This study identified several factors impacting technology adoption for organisations, with the main factors shown in the results largely confirming and supporting the adoption frameworks found in literature. The study also found a growing need for organisational strategy to emphasise agility and adaptability. The study found limited evidence of a revenue expansion focus in corporate strategy, with the research results suggesting a more internal approach to incorporating technology innovation into corporate strategy. This calls for future research that aims to replicate and enhance this component of the study findings.

The research design of this study was cross sectional in nature, exploring only the thinking on technology innovations based on views from the participants as assessed at a discrete point in time. Considering the both dynamic nature of the prevailing business environment, as well as the speed of change in technology, further evaluation of the relationship between the constructs identified in this study may be offer more insight in a future study based on a longitudinal research design approach.

Finally, future research that focuses more specifically on each of the three constructs considered by the research questions (i.e. emerging technology and innovation adoption; emerging technology innovation and competitive strategy & emerging technology innovation and strategic focus) may offer deeper insights and expand the knowledge more comprehensively for each of the specific areas considered in the study.

7.3 Conclusion

As innovations in technology continue to impact business and the competitive environment, organisations will need to continually consider how emerging technology impacts customers, competition and the broader industry structure. The increasing speed of change in market dynamics has increased the significance of agility, speed and adaptability in organisational strategy. As emerging technology innovations continue to increase market access, organisation strategy will need to be more fluid and position firms to respond to the changing external environment. Some of these changes may be fundamental market changes in the industry structure, or more incremental changes driven by changing customer or competitor dynamics.

The aim of this research was to explore the relationships identified frameworks discussed in the literature review, and illustrated in Figures 1 and 2, in order to gain further insights as to how organisations are leveraging emerging technology. Additionally, the research aimed to determine the key components of organisational strategy in the context of the current trends in technology innovations.

The study has been successful in exploring the key factors that impact adoption of technology innovations, drawing a distinction between the role of external factors as well as internal factors. The study has also considered some of the key factors being prioritised by organisations in developing corporate strategy in the context of the emerging technology environment, with the key findings being an increasing emphasis on building agility, speed and adaptability.

The study also highlighted possible limitations in how technology innovations are being incorporated into organisational strategy, with the study finding limited evidence of a revenue expansion emphasis with respect to strategic technology focus.

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Appendix 1 – Interview Guide

Interview Guide

Part a. Recording of interview details: Before the interview begins

Interview Identifier/Number …….

Interview Date …….

Interview Start Time …….

Interview Venue …….

Part b. Confirmation of anonymity: Minutes 1 to 2 of the interview

Confirm that all information that is provided during the interview will be used only for the purposes of the research study, as outlined in the invitation and informed consent forms. Confirm that information provided, including quotations, will be anonymised.

Part c. Introduction and opening: Minutes 2 to 5 of the interview

- Introduction of myself as the interview and role in the research study.
- Review background and purpose of the study.
- Review background and purpose of the interview.
- Review and explain the method of data collection (i.e. unstructured interview) and analysis.
- Confirm consent for participation, recording of information through written notes and audio.
- Confirm duration of the interview.
- Thank and acknowledge the research participant for taking part in the study.

Part d. Confirmation of participant background: Minutes 5 to 10 of the interview

This section will be used to confirm background information regarding the participant, including the following key information:

- Qualifications and experience
- Specific area of expertise or specialisation within the research area of interest
- Any experience in related subjects or topics

Part e. Discussion and in-depth interview: Minutes 10 to 40 of the interview

The purpose of the section will be examining the key issues related to the research questions in depth, as guided by the questions outlined below, as well as additional insights provided by the research participant during the course of the discussion.

The discussion will be framed in line with the insight into the current business environment, in the context of evolving technology and innovation trends and role this plays in shaping strategy at the corporate level. Although intended to be an in-depth, unstructured interview. The discussion will be guided by the following central questions, which will be posed to the research participant:

1. What would you describe as the current emerging information technology and innovation trends that will impact business in the medium to long term?
2. How are businesses in different industries and senior executives developing corporate level strategy in the context of these emerging information technology and innovation trends?
3. How are emerging information technology and innovation trends impacting traditional business models across business sectors?
4. What are the key strategic issues in business that are most impacted by these trends?
5. How are businesses aligning their business models and competitive strategies to remain relevant?
6. Do you have any further inputs which you feel would benefit the study?

Part e. Conclude & end the interview: Minutes 40 to 45 of the interview

- Thank and acknowledge the research participant for taking part in the study.
- Ask the research participant if there is anything further they would like to add or clarify regarding the interview or research process
- Conclude and end the interview

Appendix 2 – Consent Form

Consent to take part in research study

Exploring the impact of emerging technology innovations on corporate strategy.

I.....voluntarily agree to participate in this research study. I understand that I can withdraw from participating in the study at any time or refuse to answer any question without any consequences of any kind. Furthermore, I understand that I can withdraw permission to use data from my interview at any time prior to publishing of the research study. I have had the purpose and nature of the study thoroughly explained to me and have had the opportunity to ask questions about the study. I understand that participation involves unstructured, in depth interviews covering technology innovation and strategy.

I agree to my interview being audio-recorded. I understand that all information I provide for this study will be treated confidentially. I understand that in any report on the results of this research, my identity will remain anonymous. I understand that disguised extracts from my interview may be quoted in the research report. I understand that signed consent forms and original audio recordings, as well as a transcript of my interview in which all identifying information will be removed, will be retained electronically for a minimum period of 10 years.

I understand that I am free to contact any of the people involved in the research to seek further clarification and information.

Researcher: Sne Mnguni – 17399565@mygibs.co.za
Research Supervisor: Rob Beney – Robert@ironsky.co.za

Signature of Research Participant: _____

Date of Signature: _____

Signature of Researcher: _____

Date of Signature: _____

Appendix 3 – Research Participation

Gordon Institute of Business Science
University of Pretoria

Research Participation Invitation

Dear xxxx

You are invited to participate in a study about the role of emerging information technology and innovation trends in shaping modern corporate strategy. The title of the research is ***Exploring the impact of emerging technology innovations on corporate strategy.*** The purpose of the study is to gain insight into the current business environment, in the context of evolving technology and innovation trends and role this plays in shaping strategy at the corporate level. The study will address the following central research questions:

1. What are the main technology and innovation trends that are impacting businesses
2. What are the key strategic issues in business that are most impacted by these trends
3. How businesses are aligning their competitive strategy to these trends

In order to help answer these questions, the researcher will conduct in-depth interviews with subject matter experts; industry practitioners; as well as senior executives from a sample of organisations representing various sectors in South Africa. The questions will not be company specific. The interview will take approximately 60 minutes, will be audio taped, transcribed and the results presented as part of the research findings in a research report submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of Master of Business Administration. No participant will be identified by name in any findings that come out of the study.

The interview will be conducted in person, and take place at a time and place convenient for each participant. Participation is voluntary and you may withdraw your participation and data from the study up to a month following your interview.

I look forward to your cooperation and hope you might find it an interesting experience.

Yours sincerely,
Sne Mnguni
+27 82 447 0954
17399565@mygibs.co.za

Gordon Institute of Business Science
University of Pretoria

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

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Student details			
Surname:	Mnguni	Initials:	STD
Student number:	17399565		
Email:	17399565@mygibs.co.za		
Phone:	082 447 0954		
Qualification details			
Degree:	MBA`	Year completed:	2018
Title of research	Exploring the impact of emerging technology innovations on corporate strategy		
Supervisor:	Rob Beney		
Supervisor email:	robert@ironsky.co.za		

Access

Please select

A.

	My research is not confidential and may be made available in the GIBS Information Centre and on UPSpace.

I give permission to display my email address on the UPSpace website

Yes	✓	No	

B.

	My research is confidential and may **NOT** be made available in the GIBS Information Centre nor on UPSpace.

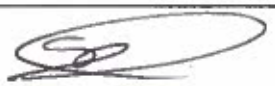
Please indicate embargo period requested

Two years		Please attach a letter of motivation to substantiate your request. Without a letter embargo will not be granted.
Permanent		Permission from the Vice-Principal: Research and Postgraduate Studies at UP is required for permanent embargo. Please attach a copy permission letter. Without a letter permanent embargo will not be granted.

Copyright declaration

I hereby declare that I have not used unethical research practices nor gained material dishonesty in this electronic version of my research submitted. Where appropriate, written permission statement(s) were obtained from the owner(s) of third-party copyrighted matter included in my research, allowing distribution as specified below.

I hereby assign, transfer and make over to the University of Pretoria my rights of copyright in the submitted work to the extent that it has not already been affected in terms of the contract I entered into at registration. I understand that all rights with regard to the intellectual property of my research, vest in the University who has the right to reproduce, distribute and/or publish the work in any manner it may deem fit.

Signature: 	**Date: 06 November 2018**
Supervisor signature: 	**Date: 06 November 2018**

Gordon Institute of Business Science
University of Pretoria

31 July 2018

Mnguni Sinethemba

Dear Sinethemba

Please be advised that your application for Ethical Clearance has been approved.

You are therefore allowed to continue collecting your data.

Please note that approval is granted based on the methodology and research instruments provided in the application. If there is any deviation change or addition to the research method or tools, a supplementary application for approval must be obtained

We wish you everything of the best for the rest of the project.

Kind Regards

GIBS MBA Research Ethical Clearance Committee

SNE MNGUNI
07 NOVEMBER 2018

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University.

I further declare that I have obtained the necessary authorisation and consent to carry out this research.

She Mnguni
7 November 2018

CERTIFICATION OF ADDITIONAL SUPPORT

(Additional support retained or not - to be **completed by all students)**

Please note that failure to comply and report on this honestly will result in disciplinary action

I hereby certify that (please indicate which statement applies):

☐ ***I DID NOT RECEIVE*** *any additional/outside assistance (i.e. statistical, transcriptional, thematic, coding, and/or editorial services) on my research report:*

☐ ***I RECEIVED*** *additional/outside assistance (i.e. statistical, transcriptional, thematic, coding, and/or editorial services) on my research report*

If any additional services were retained– ***please indicate below which:***

☐ ***Statistician***

☐ ***Coding (quantitative and qualitative)***

☑ ***Transcriber***

☐ ***Editor***

Please provide the name(s) and contact details of all retained:

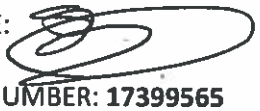
NAME: **Charmaine Mphahlele**

EMAIL ADDRESS: charmaine.mphahlele@gmail.com

TYPE OF SERVICE: **Transcribing**

I hereby declare that all *interpretations (statistical and/or thematic) arising from the analysis; and write-up of the results for* **my study was completed by myself without outside assistance**

NAME OF STUDENT: Sne Mnguni

SIGNATURE: 

STUDENT NUMBER: **17399565**
STUDENT EMAIL ADDRESS: **17399565@mygibs.co.za**
DATE: **06 November 2018**