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Corporate Entrepreneurship in the South African Financial Services Sector: Entrepreneurial Firm Culture as a Moderator Between Digital Capability and Digital Orientation in Fostering Innovations

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Corporate Entrepreneurship in the South African Financial Services Sector: Entrepreneurial Firm Culture as a Moderator Between Digital Capability and Digital Orientation in Fostering Innovations

A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Management in Entrepreneurship and New Venture Creation

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Date 26/05/2023

ABSTRACT

Corporate entrepreneurship relies heavily on technological innovation. Companies throughout Africa and South Africa have sought innovative approaches and advanced strategies to ensure their continued existence in the marketplace. This study analyzes the factors that impact the uptake of digital innovations for financial service organisations in South Africa. Through the lens of the resource-based view and dynamic capability theory, this research aimed to investigate not only the factors influencing digital innovation (digital capability and digital orientation) but also the moderating role of organisational entrepreneurship culture (CU) in considering the relationship between digital capability (DC), digital orientation (DO), and digital innovation (DI).

The report employed a positivist research philosophy using a quantitative research approach. The study had a descriptive and cross-sectional design. The research instrument was a questionnaire with five sections to measure the research constructs on seven-point scales. The convenience non-probability sampling strategy was used to gather 228 fully complete responses, which were used for data analysis. The tools utilised were Statistical Package for the Social Sciences (SPSS) and AMOS (correlation analysis, regression analysis and SEM).

The key finding of this study was that DO influenced DI, DC influenced DI, CU did not moderate the relationship between DI and DO, and CU did not moderate the relationship between DC and DO. These results imply that digital orientation can enhance corporate and academic efficiency as well as effectiveness and that digital orientation can enhance corporate and academic efficiency and effectiveness. Digital tools can streamline processes, reduce costs, and improve collaboration across departments and geographies for corporate organisations. Furthermore, digital capability can considerably impact an organisation's capacity for innovation and market competitiveness. Corporate organisations with robust digital capabilities can leverage emergent technologies to develop innovative products, services, and business models, thereby increasing market share and profitability.

Keywords: Digital Innovation, Entrepreneurial Culture, Digital Capability, Digital Orientation, Corporate Entrepreneurship.

DECLARATION

I, Kennedy Mateyo, declare that the research report has been my own work except as indicated in the references and acknowledgements. The report submitted is for the partial fulfilment of the requirements for the master's degree in the Field of Entrepreneurship at University of the Witwatersrand, Johannesburg. The report has not been submitted for any degree or examination or any other university.

Kennedy Mateyo

Signed at Johannesburg. On the 26th of May 2023.

DEDICATION

The report and work done are dedicated to my two mothers, My mother Ruth Sule Sichizya, and the late mother In-law Rosita Andrews for the wisdom and life lessons they have shared with me. The life lessons they have taught me not only have made me a better loving husband and father to our two boys but a good leader at work in my work. I believe that the wisdom shared has guided me to be a better listener and an effective communicator.

To Genevieve my wife, I dedicate this report to the support, tolerance, and encouragement you gave this day. You generated inspiration to hope and dream that this work was possible and achievable. The sacrifice you took to step in and cover most of my responsibility is commendable, and I admired you for that.

To my children, Katenta and Noah Mateyo thank you for providing space to work on this Research Report. I miss spending time with you and catching up with you on most of your activities; hence, my sincere apologies and appreciation for your tolerance. Continue to do well at your school and grow your loving nature that makes me so proud of both of you.

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I firstly want to thank and express sincere appreciation, to my Supervisor Professor Boris Urban and Wits Lecturers that lectured me for their invaluable support and guidance during the duration of my master's programme in Entrepreneurship and New Venture creation. It would not have been possible to complete this report without taping their knowledge, expertise, encouragement, and insights.

I also would love to acknowledge my Leadership Warren Wilson and Llyod Buthelezi for the support I received and allowing me to invest my time in participating in Master's program. To my colleagues in the Financial Services industry and Standard Bank, I am grateful for providing me with the opportunity to conduct my research and for all the resources and support provided.

I also extend my sincere gratitude to all the participants who contributed towards the research by willingly sharing their insights and experience to make this Research Report possible and make it a success.

I would also like to thank Stats Ninja for their support and guidance in producing an analysis of the collected data.

Special thanks to my wife Genevieve Mateyo for the patience and tolerance in allowing me to focus on my studies and, above all, giving me the confidence to complete this program. Your encouragement ensured that I stayed on course and became persistent, believing that I could achieve this goal.

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1. CHAPTER 1: INTRODUCTION

1.1. Context of the study

According to projections from the World Economic Forum in 2017, more than half of the global economy is expected to become digital by 2030. However, South Africa's entrepreneurial ambitions are lagging, with the 2020 GEM report ranking the country in 37th place out of 50 countries, indicating poor performance and intentions. Innovation is a crucial driver of entrepreneurship and contributes to the success of an organisational strategic advantage (Kuratko et al., 2014; Tarhini & Kassar, 2017). As a result, many organisations previously considered non-entrepreneurial recognise corporate entrepreneurship's importance as a strategic imperative to navigate rapidly changing environmental factors and survive, according to Phan et al. (2009).

Corporate entrepreneurship relies heavily on technological innovation. To ensure their continued existence in the marketplace, companies throughout Africa and South Africa seek innovative approaches and advanced strategies (Carayannis et al. 2014). For businesses to succeed, Fitzgerald et al. (2014) suggest that they must undergo digital transformation through the utilisation of digital technology, which can lead to significant improvements in business operations. Implementing developing technologies such as artificial intelligence, the Internet of Things (IoT), cloud computing, and big data analytics is introducing a new phenomenon: the digitalisation of companies across all industries.

According to the McKinsey Global Research Institute, in 2013, addressing economic growth and social challenges requires opportunities for digital development. The successful implementation of digital tools can optimise organisational systems and processes.

The African Union has recognised the importance of Digital Transformation for innovation, inclusiveness, and sustainable growth and is driving this from 2020 to 2030. This presents an opportunity for Africa to catch up with the Global North by digitising faster owing to fewer legacy challenges. Digital transformation is also an important success element in South Africa's National Development Plan, which aims

to eradicate poverty and decrease inequality by 2030. The National e-strategy (2017-2030) seeks to position the country as a significant player in developing information and communication technologies across all ecosystems and value chains. Munyoka (2022) suggests that South African organisations listed on the Johannesburg Stock Exchange can experiment with cutting-edge technology's early adoption because digitalisation is a game-changing innovation that can impact organisations in various sectors.

This study analyzes the factors that impact the uptake of digital innovations for financial service organisations in South Africa. This study considers the drivers of innovation and entrepreneurship cultures. While there have been various investigations into the antecedents of digitalisation for corporate bodies, most have focused on developed nations with little attention given to developing markets such as South Africa. According to prior studies, entrepreneurial activities are essential for innovation to thrive, and companies must allocate resources and establish flexible structures that support entrepreneurship initiatives to make this possible. Failure to do so may result in innovation being viewed as a lofty goal rather than a practical reality (Thornberry, 2001; Hornsby et al., 2008).

1.2. Theoretical review

1.2.1. The resource-based view

The resource-based theory, abbreviated as RBT, serves as this investigation's view and its hypotheses' primary source of theoretical guidance (Galbreath, 2005). Within the entrepreneurship and strategic management subfields, RBT has established itself as a preeminent paradigm (Hitt et al., 2016). In addition, it has been extensively used throughout the body of research on innovation to explain how businesses might achieve superior performance and a competitive edge. According to RBT, companies should differentiate themselves from their competitors to achieve exceptional performance and a durable advantage in the market (Hitt et al., 2016; Galbreath, 2005). The core principle of the idea is that substantial business performance must be related to resources and abilities that are unique to the organisation in question, extremely rare, and challenging for competing enterprises to copy (Barney, 1996).

Furthermore, RBT shows that a corporation can be more competitive and outperform its present or future rivals who do not use such techniques (Barney, 1996). Consequently, a business that employs a value-creating strategy such as corporate entrepreneurship is more likely to produce value for its consumers. RBV is use Researcher to conceptualise technological orientation towards emerging digital technology developments as a crucial asset for businesses. According to the study, organisations will be at a competitive disadvantage if they do not invest in new digital technologies.

1.2.2. The Dynamic capability theory

Dynamic capabilities are a company's capacity to integrate, grow, and rearrange internal and external skills to adapt to rapidly changing events with a high degree of unpredictability (Teece et al., 2016). According to dynamic capability theory, the ability to recombine and reconfigure assets and organisational structures in response to changes in markets and technologies is a fundamental factor in achieving continuous profitable growth and competitive advantage for a business. According to Teece (2013), dynamic capability theory gives organisations a unified structure that enables them to cultivate and oversee their capabilities to create a competitive advantage (Teece et al., 2016). Digital competence is required in the context of innovation for the digital knowledge of professionals working with digital technologies. Digital capability is perceived as an example of dynamic capability when dynamic theory is used as a foundation. Dynamic capability is the ability of an organisation to develop new goods and processes and adapt to shifting market conditions (Teece and Pisano, 1994).

1.3. Motivation of the study and problem statement

Entrepreneurial endeavours have fascinated academics for many years (Audretsch, 2012; Busenitz et al., 2003). This is partially because entrepreneurial activity favourably relates to innovation, new ventures, employment growth, and social and economic value creation. Every country's economic growth and prosperity can be traced to the introduction of entrepreneurial practices. Contrary to popular belief, entrepreneurial activity is not limited to new small independent ventures (Wiklund et al., 2011; Shane and Venkataraman, 2000), but may also take place in established

organisations depending on the degree to which they take risks, innovate, and act proactively. As technology advances and the global market becomes very competitive, established businesses have been forced to become more entrepreneurial to attain success (Morris, Kuratko, & Covin, 2008). Multiple scholars (Shane and Venkataraman, 2000; Wiklund et al., 2011) have concluded over the last few decades that encouraging and maintaining business competitiveness can be achieved through corporate entrepreneurship. Corporate entrepreneurship or intrapreneurship can help employees think and act like entrepreneurs within an organisation to gain a competitive edge (Kennedy, 2018). Because of the global financial crisis and impending economic shock caused by the worldwide COVID-19 epidemic, it is more important than ever for businesses to cultivate entrepreneurial attitudes.

Significant adjustments are taking place across industries as a direct result of today's highly competitive markets and the widespread effects of globalisation (Remane et al., 2016; Remane et al., 2017). Consequently, companies have started looking for innovative ways and cutting-edge strategies to ensure their continued existence in the marketplace (Carayannis et al., 2014). Fitzgerald et al. (2014) contend that for firms to succeed, they must embrace change via digital technology to allow significant business improvements. Customer experience and engagement can be improved, processes can be streamlined, and new business models can be developed as part of these enhancements. Organisations that have embraced change will crash competitors that do not (Fitzgerald et al., 2014).

While there is an understanding that digital orientation and capabilities are vital for contemporary businesses, there is a lack of comprehensive studies examining how these factors influence digital innovation in the South African financial services sector. This knowledge gap creates the following research problem.

"How do digital orientation and digital capabilities influence digital innovation in organisations operating within the South African financial services sector?"

Hence, there has been little empirical research on the aspects associated with digital innovation, resulting in a knowledge gap. Despite the increasing relevance of digital

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innovation, which may be defined as new digital solutions that allow digital transformation of enterprises across sectors, there is a scarcity of studies on these topics. This study examines the elements that influence digital innovation (digital capability and digital orientation) and the moderating role that organisational entrepreneurship culture plays in considering the relationship between digital innovation, digital orientation, and digital capability. The research undertaken aims to address gaps in the existing literature.

1.4. Research question and objectives

Drawing from two schools of thought, Gatignon and Xuereb (1997) emphasise that a company must have a solid technological orientation to generate an innovation superior to its rivals. "Technology orientation", according to the authors, is a company's dedication to absorbing new technology and its response to changes in technological trends (Gatignon and Xuereb, 1997). Considering the increasing number of digital technologies, organisations have been geared towards the adoption of digital technology innovations to produce new digital solutions (Fitzgerald et al., 2014). A company's use of digital technologies in the innovation process must be managed and maximised (Khin and Ho, 2018). This is evidenced by capability acceleration through innovation that integrates and mobilises human capital, technological advances, resources, and skills. A company must have this competence, in addition to being open to digital technologies (Fitzgerald et al., 2014). According to Liu et al. (2011), although effectively managing digital transformation might be difficult, being prepared in terms of resources and expertise is critical.

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1.4.1. Research questions

According to the prior explanation of the research, the primary question that is serving as the impetus for this investigation is, "What are the variables that drive digital innovation?" sub-questions are:

1. To what extent does digital orientation influence organisations' digital innovation in the financial services sector?

2. To what degree does digital capability influence the digital innovation of organisations in the financial services sector?
3. To what extent does entrepreneurial culture moderate the relationship between digital orientation and digital innovation of organisations in the financial services sector?
4. To what extent does entrepreneurial culture moderate the relationship between digital capabilities and innovation in the financial services sector?

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1.4.2. Research objectives

1.4.2.1. Primary Objectives

Based on the problem described earlier, the following are some of the primary objectives of this study.

- To examine the influence of digital orientation on the digital innovation of organisations in the financial services sector.
- To understand the impact of digital capability on the digital innovation of organisations in the financial services sector.

1.4.2.2. Secondary objectives

- To investigate how organizational culture affects the relationship between digital innovation and orientation in the financial services sector.
- To analyse the role of organisational culture relationships between digital capability and digital innovation in financial service organisations.

1.5. Conceptual definitions of terms

- Digital orientation (DO) has been defined as, an organisation's "dedication towards the application of digital technology to produce new products, services and solutions" by Gatignon and Xuereb (1997). In the context of digital technology, digital orientation is viewed as a technological orientation.
- Organisational Culture (OC): OC refers to assumptions, beliefs, and standards held by all community members (Schein, 1985). According to Barney (1991), OC is a source of sustained competitive advantage, and several studies have

demonstrated that it is a critical component of an organisation's overall effectiveness.

- According to Khin and Ho (2018), digital innovation (DI) refers to creative information technology solutions that develop and integrate digital technologies that enable digitalisation in non-technological sectors such as finance, healthcare, manufacturing, and retail. This is considered to be a viewpoint of technological innovation.
- Corporate entrepreneurship (CE): The concept of corporate entrepreneurship, as defined by Morris et al. (2011), is the practice of entrepreneurial behaviour in well-established organisations that are either large or mid-sized (Morris et al., 2011). It alludes to the existing process inside an organisation that results in innovative activities such as the growth of new and current services, technologies, administrative approaches, and new enhanced strategies (Guth and Ginsberg, 1990).

1.6. Contribution of the study

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The objective of this study is to explore the influence of digital orientation and digital capabilities on digital innovation in the financial services sector. Recognising the accelerated progression of digital innovation and the lack of comprehensive studies on digital orientation and capabilities impacting this innovation in the South African financial services sector, this research contributes significantly to the body of entrepreneurial knowledge.

Understanding the correlation between digital orientation, capability, and innovation is crucial, especially in the financial sector. This sector, marred by traditional structures, processes, and practices, has witnessed a significant digital revolution. An understanding of digital orientation and capabilities can offer insights into how such organisations can seamlessly transition into digital-first entities. The theoretical and practical contributions of this study are discussed in the following sections.

1.6.1. Theoretical contribution

Studies such as Nambisan et al. (2017) have emphasised the role of digitisation in transforming entrepreneurial processes, concluding that a strong digital orientation can lead to better business model innovation. However, while the importance of an entrepreneurial approach towards digitisation is understood, the specific dynamic between digital orientation and innovation in the financial services sector has been less examined, leaving room for targeted research.

The literature has identified essential relationships between digital capabilities and innovation. Bharadwaj et al. (2013) and Mithas et al. (2013) found that digital business strategy is enhanced by the depth of an organisation's digital capabilities, impacting its digital innovation ability. However, the investigation of the specific digital capabilities that drive innovation in the financial services sector in South Africa is still nascent.

Investigations on how entrepreneurship can harness digital innovation for business growth are prevalent. For instance, Hanelt et al. (2021) proposed a digital innovation management framework to guide organisations into a digital age. However, the influence of digital orientation and capability on such innovation, especially in financial services, has not been widely covered.

In terms of sector-specific research, the financial services sector has received attention in digitisation studies. For example, Louw and Nieuwenhuizen (2020) discuss how digitisation influences service delivery and customer experience in the South African banking sector. Nonetheless, a broader exploration of the role of digital orientation and capability-driven innovation is needed.

In summary, considerable research has been conducted to understand the roles of digital orientation, digital capabilities, and their impact on innovation. However, the specific combination of these factors in the financial services sector remains underexplored. This emphasises the importance of the proposed study, which bridges this gap and provides fresh insight into this multifaceted relationship.

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1.What has been done so far
2.What are the gaps or if no gaps what are you contributing to the conversation
3.Are you fiIling a gap by taking a different angle on what is there already or you coming up with something new
4.How are you filling the gap (Is it theoretical, empirical. Methodological, conceptual or practice or all)
5.Who is going to benefit from what you bringing on the table
6.And how are they going to benefit

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Using data from prior research, this study fills gaps in the current body of literature regarding the drivers of digital innovation and the moderating role of organisational culture based on the relationship between digital capability and digital innovation (Khin and Ho, 2018). By studying the influence of digital orientation on digital innovation, this research can provide insights into how organisations can foster an entrepreneurial spirit in terms of using digital technology for innovation. This contributes to the understanding of how strong digital orientation permeates entrepreneurial innovation.

This research will also help elucidate the impact of digital capabilities on innovation, which is crucial for both startups and established businesses to understand the resources and competencies required to successfully drive digital innovation. The findings from this study can help financial service companies strategically apply digital innovation to improve their services, thereby contributing to entrepreneurial practices that are beneficial for budding and existing entrepreneurs.

In addition, studies conducted in developing nations such as South Africa are frequently overshadowed by research carried out primarily in Asia, Eastern Europe, and other developed countries (Urban, 2013). As a result, this study aims to contribute to the growing body of knowledge on digital innovation by examining the factors that influence digital innovation from the perspective of South Africa.

1.6.2. Practical contribution

Owing to the growing demand for innovative digital solutions, digital innovation has emerged as a significant research focus in recent years, going hand in hand with the expansion of digitalisation (Khin and Ho, 2018). Innovative digital solutions are critical enablers of digitising organisations across sectors in a variety of activities (Nambisan et al., 2017), such as logistics, human resource management, manufacturing, marketing, and customer service. Consequently, businesses are not prepared for digital transformation without adopting new digital solutions (Khin and Ho, 2018). The results of this study reveal how South African organisations can gain a competitive advantage by adopting digital innovation (Khin and Ho, 2018; Nambisan et al., 2017). To succeed, new digital technologies must be embraced and developed through digital capabilities. By doing so, organisations can become innovation leaders that boost

their performance by utilizing the opportunities new digital technologies and trends presents towards digitalization

1.7. Delimitations

The scope of this study is outlined as follows.

- The study is delimited to investigating the impact of digital orientation and digital capabilities on the digital innovation of organisations in the financial services industry, with no respect for other sectors.
- The study focuses entirely on the influence of digital orientation and digital aptitude on digital innovation, with no regard for other relevant variables such as financing or market environment.
- To maintain consistency and manageability, the study focuses on organisations operating in one specific country or region, namely the South African financial services sector, while acknowledging that its findings may not be directly applicable to financial sectors in other countries with different regulations, infrastructure, or cultural nuances.

1.8. Outline of the report

Chapter 1 provides a comprehensive introduction to this study, beginning with an overview. It then delves into the history of the topic, presents a concise summary of the problem statement, outlines the research aims and questions, and highlights the relevance of the study.

Chapter 2 of this study centres on the identification and examination of the variables, hypotheses formulated for the study, and comprehensive evaluation of relevant literature.

Chapter 3 presents a comprehensive perspective and outlines the methodological approaches used in the research process. This document provides a comprehensive overview of the research equipment used, the sampling techniques used, the size of the sample, and the processes employed for data collection.

Chapter 4 presents the analysis and data obtained from the tested hypotheses, examining the relationship between the independent and dependent variables.

Chapter 5 elucidates the research results in relation to the existing body of literature and the assertions stated within the study.

Chapter 6 provides a comprehensive overview of the study, including a review of key findings and conclusions. Furthermore, it offers valuable recommendations based on the outcomes of this study. In addition, this chapter presents proposals for potential avenues for future research that might build upon the findings of the current study.

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2. CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

Most published entrepreneurship research focuses on entrepreneurship at the individual level. Most studies have investigated how entrepreneurs recognise opportunities, establish new business ventures, influence an entrepreneur's capacity to identify opportunities, and the psychological characteristics most associated with successful entrepreneurs (McClelland, 1962). Although most research has focused on entrepreneurship from an individual perspective (McClelland, 1962), organisations have not received as much attention, as they have encouraged entrepreneurial initiatives to deliver greater economic success and competitive advantage (Weinstock, 2002). Within the context of an organisation, this study investigates entrepreneurship as it manifests itself. This is supported by the findings of Steyaert and Katz (2004), who assert that entrepreneurial endeavours could occur in various locations and settings.

Additionally, Steyaert and Katz (2004) asserted that entrepreneurial endeavours should not be viewed solely from the financial benefits they may bring, and that entrepreneurial endeavours are a matter of everyday activities rather than the actions of exclusive groups of entrepreneurs. Considering this, researching how businesses or organisations are maintained through entrepreneurial endeavours and the myriad aspects that impact digital innovation is equally important to organisations. This chapter summarises the research on digital innovation and reviews important ideas and concepts. Although this literature review could not cover all aspects of digital innovation, as it is a dynamically and consistently changing subject, it still considered and reviewed the most pertinent material the researcher has access to, and this is something that should be mentioned. This section comprises the following subsections.

- 1st section provides an introduction.
- 2nd section concentrates on both individual and corporate forms of entrepreneurship.

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- 3rd section focuses on digital innovation.
- 4th section concentrates on the factors influencing digital innovation.
- 5th section concentrates on the formulation of the hypothesis.

2.2. Entrepreneurship and Corporate entrepreneurship

As Baumol (1993) describes, entrepreneurship is "the basis of the dynamics of capitalism", It is a topic that policymakers, administrators, and researchers alike are of tremendous interest. This is because the advantages of entrepreneurs have been widely reported. These advantages are linked to business creation (Gartner, 1985), national identity (Reynolds et al., 2004), competitive advantage (Zahra, 1991), financial gains (Ireland et al., 2002), and economic growth (Ireland et al., 2002). In addition, several distinctions studies have been developed and are generally acknowledged on the many facets and levels of entrepreneurship, which can be found throughout the literature (Shane and Venkataraman, 2000). At the individual level, the study will generally focus on the characteristics of entrepreneurs, emphasising their ability to recognise and differentiate opportunities (Shane and Venkataraman, 2000), as well as the demand for achievement (McClelland, 1962). In general, research at the organisational level emphasises renewal, new strategic direction, and change (Guth & Ginsberg, 1990) and endeavours to foster entrepreneurship within the organisation. Corporate entrepreneurship is seen as an organisational strategy to promote innovation in uncertain environmental factors, fostering a process of added value and novelty within the organisational ecosystem by developing new procedures that include solutions, products, and services, as well as new methods of commercialisation. This would also involve dissolving bureaucracy, enabling the assessment of new opportunities, and fostering alignment and exploitation of resources (Yunis et al., 2017), which is a process that leads creative activities to develop new/current services, technologies, procedures, and innovative strategies (Guth and Ginsberg, 1990). This leads to efficiencies, economies of scale, and organisational growth (Antoncic and Hisrich, 2004). For the organisation to enable innovation, entrepreneurial behaviours must be adopted (Kuratko, 2017:2).

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In addition, the constraints in the global business climate necessitate that established businesses embrace entrepreneurial techniques to obtain a competitive advantage, remain relevant in this competitive global market, and achieve success (Morris et al., 2008; McGrath & MacMillan, 2000). Furthermore, Fitzgerald et al. (2014) suggest that corporate entrepreneurs can gain a competitive advantage by embracing digital technology to create new business models, streamline operations, and improve engagement with customers. Hence, corporate entrepreneurship may provide companies with a competitive edge. In addition, Fitzgerald et al. (2014) note that companies that do not accept transformation through digital technology would risk devastation are in the hands of their competitors who have welcomed such transformation. This is because these competitors embraced this transformation.

2.2.1. Entrepreneurial culture

Currently, persistent strains of competitiveness arising from globalisation and technological developments are progressively buffeting enterprises. One-way organisations can withstand these storms to awaken the latent spirit of entrepreneurship among their staff (Fitzgerald et al., 2014). This enables employees to carve out new pathways, begin new ventures, challenge the status quo in their organisations, and break new ground (Fitzgerald et al., 2014). Companies can use this strategy to weather these storms. A growing body of information is linked to the concept of "corporate entrepreneurship", also known as "intrapreneurship", which refers to releasing latent entrepreneurial energy in large organisations. Intrapreneurship is a significant driver of organisational renewal or 'reinvention' (Morris et al., 2008).

Before addressing entrepreneurial culture, given that corporate entrepreneurship or intrapreneurship refers to entrepreneurial acts undertaken within the organisation, it is vital to first look at organisational culture. According to Barney (1986), academics have characterised organisational culture in various ways; nonetheless, there is no widespread agreement regarding the construct's definition in the literature. However, several scholars have described organisational culture as a system of values, norms, beliefs, attitudes, and ways of thinking shared by all organisation members (O'Reilly

and Chatman, 1996; McKinnon et al., 2003). This study adopted Llopis Taverner's (1992) definition of organisational culture. According to Llopis Taverner (1992), an organisation's culture is characterised as a sequence of values, symbols, and rituals shared by its members, which describe the current situation within an organisation when fixing inherent managerial problems, as well as those related to customers, suppliers, and the environment. (Llopis Taverner 1992). Concerning this concept, a firm's ability to compete based on innovative development is severely limited without a strong, shared entrepreneurial and innovation-oriented culture, as noted by Deshpandé, Farley, and Webster (1993).

After introducing the concepts of corporate entrepreneurship and organisational culture, this section shifts its focus to the central idea of entrepreneurial culture. Entrepreneurial culture has been widely discussed in both academic and professional circles for many years. When defining an entrepreneurial culture, academics do not seem to agree. The definitions and descriptions of entrepreneurial culture vary across academics, but they all have one thing in common: an emphasis on seeking out and seizing opportunities (Chandler et al., 2000). There is consensus among outstanding works that an entrepreneurial culture is highly desired because of its benefits to development, efficiency, and achievement. In an intrapreneurship culture, employees are encouraged to think beyond the box (Chandler et al. 2000). An organisation may have an innovation-supportive culture if it provides its people with explicit norms and standards for engaging in innovative practices.

A similar view is that of Canalejo (1995), who states that a culture of innovation requires the following qualities: challenge and initiative, client-orientedness compromised with objectives, continuous progress, exemplary behaviour, and teamwork. Therefore, when viewed through the lens of the RBV theory, Hall (1993) states that organisational culture is the capability of an organisation that is both one-of-a-kind in nature and impossible to replicate by other organisations. This suggests that any renowned leader has the potential to alter a firm's culture and, as a result, gain a competitive edge for such organisations (Kuratko and Welsch, 2004). Research that has been done on strategic management has generally concluded that

organisational culture is a crucial component to consider when attempting to explain how organisations function and strive for greater efficiency (Prajogo and Sohal, 2001).

2.3. Digital innovation

Nambisan et al., (2017), define digital innovation as the production of market products, business processes, or business models that are the direct outcome of the utilisation of digital technology. As long as these outcomes are made possible through the use of digital technologies and digitised processes, the authors (Nambisan et al., 2017) concluded that a different variety that consists of innovative outcomes are possible, for example, new services, products, and platforms, in addition to improved or new customer experiences and other value strategies. Digital innovation has radically altered the nature and structure of new products and services (Porter and Heppelmann 2014). Novel value creation and appropriation pathways have been created as a result of digital innovation (Nambisan et al., 2017). Digital innovation has enabled innovation collectiveness, which involves dynamic sets of actors with diverse goals and capabilities (Iansiti and Lakhani, 2014), and has produced a new breed of innovation processes (Khin and Ho, 2018).

Organizational technological innovation is viewed as a strategic driver that enables effective business processes to sustain their competitive advantage (Nguyen et al., 2015). However, it is challenging for organisations to maintain a consistent and coherent strategy using technological innovation.

This study interprets the idea of digital innovation as a fresh digital solution that has a positive influence on the products, services, and operations of other businesses. As a result, Khin and Ho's (2018) definition is used to describe digital innovation in this study. Khin and Ho (2018) It's defined as, "the development of new products, services, or solutions by employing digital technology." Big Data, Cloud Computing, Cyber-Physical Systems, Augmented and Virtual Reality, Artificial Intelligence, and the Internet of Things (IoT) were identified as innovative Digital Technologies (Urbinati et al., 2018).

2.4. Factors influencing Digital Innovation

According to UNCTAD (2019), there continues to be an increased effort to access ICT and affordability, although a digital divide still exists in developing countries, such as South Africa. According to the report, these barriers to entry include high-quality and affordable infrastructure (reliable electricity), skill shortage, and monopoly, resulting in high data costs and government policies.

Digital Innovation in organisations is a continuous process that will always affect the external and internal environment, leading these organisations to redesign their existing internal and external processes or methods. The main driving factors in financial services include consumer demand, differentiation from competitors, efficiency to satisfy customer experience, and reduction in operating costs.

To meet these demands, organisations must continue investing in transformative tools and processes that enhance customer experience and profitability and remain competitive. Developing a creative entrepreneurial culture increases operational efficiency and provides better solutions and products.

Achieving and ensuring the successful adoption of digital innovation depends on how organisations can identify the demands of adopting technology tools (Jahanmira and Cavadas 2018). Top Management must create a tolerable environment that encourages the conversion and experimentation of existing work practices and organizational operations (Ghobakhloo and Tang 2013).

2.4.1. Digital orientation

In a lot of research that is even remotely pertinent to the concept of “digital orientation”, it is merely an expanded term for “technology orientation”, As a result, the literature on technology orientation has been contextualised and alluded to in this investigation because both phrases refer to the same thing. Based on Gatignon and Xuereb’s (1997) definition of a technology-oriented organisation, they state that it is an organisation that has the ability which includes desire to obtain a significant technological advancement used to introduce innovative products. In addition, organisations ensure that they remain current with emerging technology as a result of

creating unique goods (Gatignon and Xuereb, 1997). According to the findings of their research, "digital orientation," is conceived same as "technology orientation," described as an organisation's "dedication toward's the application of digital technology to produce new products, services, and solutions." Thus, these businesses are not mostly receptive and are likely to adopt digital projects swiftly and wholeheartedly (Khin and Ho, 2018).

2.4.2. Digital capability

The innovation process requires significant resources, not least technological know-how and expertise (Freel, 2005; Renko et al., 2009). Regardless of organisations successfully implementing new technology, its utilisation and the services it provides must still be maintained explicitly and ensure efficiency (Lu and Ramamurthy, 2011). Moorman and Slotegraaf (1999) define technological capability as a company's ability to formulate and develop new goods and related processes using its technical resources. The term "digital capability" can be understood in terms of digital products as, "a company's skill, talent and competence, to manage digital technology for new product creation." According to Carcary et al. (2016), an organisation must develop several capabilities in various fields to successfully undergo digital transformation. These capabilities may vary depending on the industry in which the organisation operates as well as the organisation's requirements. As the competitive landscape changes, the primary source of sustained competitive advantage shifts dynamic capabilities according to a firm's stance (Teece and Pisano, 1994; Teece et al.,1997). This is achieved through competence or capabilities subsets that allow an organisation to generate new services or goods, which can be adjusted when faced with situations that change market conditions defined as dynamic capabilities (Teece et al., 1997).

2.5. Formulation of the conceptual diagram and research hypothesis

2.5.1. Formulation of hypothesis

2.5.1.1. Digital orientation as it relates to digital innovation

The resource-based perspective, often known as the RBV, has been utilised extensively within this innovation research community to explain how organisations

can achieve superior performance and competitive advantage (Hitt et al., 2016). The core principle of the idea is that tremendous business success is due to resources and abilities unique to the organisation in question, which are extremely rare and challenging for competing enterprises to copy (Barney, 1986). Technology orientation towards new advancements in digital technology is a key asset achieved using the RBV. The research suggests that companies that possess superior technology orientation manage to gain higher innovation levels as a result of a clearer mission and vision of how new technologies are used to develop innovative solutions and products based on great commitment to making the vision a reality (Westermann et al., 2012). Based on the rationalisation and support offered by earlier research in the relevant literature, their study argues that digitally focused organisations mostly stand a great chance to produce digital innovations. The initial hypotheses of this study are as follows:

- H_1: Digital orientation has a positive influence on the digital innovation of organisations in the financial services sector.

2.5.1.2. Digital capabilities as it relates to digital innovation

Digital competence is required in the context of digital innovation to integrate professionals' abilities with digital technologies. Digital capability may be considered as representing the idea of dynamic capability when viewed through the lens of dynamic capability theory (Teece et al., 2016). A substantial body of research based on resource-based and dynamic capability theories concludes that these capabilities support the link between technological capability and innovation. However, digital capability has been confirmed to have less influence on digital innovation studies (Teece et al. 2016). For instance, Westermann et al. (2012) discovered that digital capabilities play an important role as building blocks in organisations to enhance customer experience, operational processes, and business models. The success generated through digital products or solutions depends on the company's capacity to handle digital technologies, which is a critical success factor for attaining digital innovation (Teece et al. 2016). This is because the success of digital product creation relies heavily on a company's ability to handle digital technologies. Every step in the

digital innovation process starts with the organisation acquiring digital technology to develop new digital solutions that require appropriate levels of capabilities held by competent personnel (Teece et al. 2016). Thus, the second hypothesis is as follows.

- H_2: Digital capability has a positive influence on the digital innovation of organisations in the financial services sector.

2.5.1.3. The moderating role of entrepreneurial culture

As mentioned earlier, when RBV theory is applied, entrepreneurial culture is the capability of an organisation that is both one-of-a-kind in character and impossible for other organisations to replicate. This is because entrepreneurial culture encourages employees to take risks and experiment with new ideas (Hall 1993). Research on strategic management has, in general, concluded that entrepreneurial culture is a vital component to consider when attempting to explain how organisations function and when formulating strategies for making those organisations more efficient and innovative (Prajogo and Sohal, 2001). Even though many factors affect both incremental and radical innovation, such as national systems, knowledge flows, and labour markets, it is generally accepted that entrepreneurial culture is a significant factor in determining how likely an organisation is to innovate. However, many factors affect incremental and radical innovations (Tidd et al. 2001). Existing theories in the vast field of innovation management show that organisational culture impacts the likelihood of organisations being inventive in their new product development offerings. This finding is supported by the finding that firm size is positively correlated with innovation (Claver et al. 1998). This is based on the concept that organisational culture impacts the degree to which organisations spend on research and development. This idea provides support for the first point.

According to Klein (2011), having an appropriate fit between an organisation's culture and innovation is preferable to attain high innovation capability. Organisation theorists have hypothesised (Barney, 1986; Kuratko and Welsch, 2004; Hall, 1993) that the culture of the organisation and innovation approach are inextricably linked. The innovation strategy a business decides to pursue reflects the behaviours that its managers and employees wish to see (Lau et al. 2004). Organisations must cultivate

an environment conducive to innovation when implementing the proposed innovation plan. This may be accomplished by focusing on developing the capabilities of the workforce, offering incentives, and removing roadblocks (Verdu-Jover et al., 2005). For example, it is not enough for CEOs to design the behaviour and actions which must be abided by; instead, they should also produce the right entrepreneurial culture so that all employees inside the firm recognise and develop the desired organisational project. This is performed to design new technologies for use in products and processes. On the other hand, it is indeed unmistakable that the activities of the upper management, whether symbolic or technical, determine the directions in which the organisation will move. This study makes the following propositions based on the reasoning of the stated and resource-based theory views:

- H_3: Organizational culture positively moderates the relationship between digital orientation and the digital innovation of organisations in the financial services sector.
- H_4: Organizational culture positively moderates the relationship between digital capability and the digital innovation of organisations in the financial services sector.

2.5.2. *Formulation of the Conceptual Diagram*

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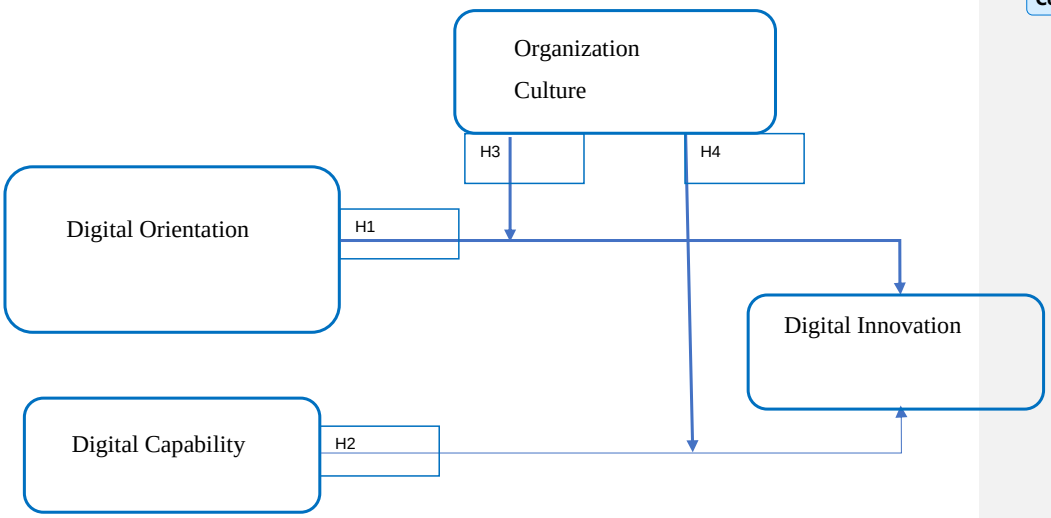


Figure 1: Conceptual Framework

Source: Zhou et al. (2005), Zhou and Wu (2010), Moorman (1995), Paladino (2007)

2.5.3. Summary of the Formulated hypothesis

With:

- H_1: Digital orientation has a positive influence on the digital innovation of organisations in the financial services sector.
- H_2: Digital capability has a positive influence on the digital innovation of organisations in the financial services sector.
- H_3: Organisational culture positively moderates the relationship between Digital orientation and Digital innovation of organisations in the Financial services sector.
- H_4: Organisational culture positively moderates the relationship between Digital capability and Digital innovation of organisations in the financial services sector.

2.6. Conclusion

This chapter examines entrepreneurship at both the individual and organizational levels, focusing primarily on digital innovation and its influential factors. Entrepreneurship, described as "the basis of the dynamics of capitalism," plays an essential role in business creation, national identity, competitive advantage, financial gain, and economic growth. Corporate entrepreneurship is an organizational strategy that encourages innovation and adds value in addressing uncertain environmental factors. Entrepreneurial culture in organisations is essential for dealing with competitiveness and maintaining innovation. Intrapreneurship or exhibiting entrepreneurial behaviour within a company promotes organizational renewal and reinvention.

Digital innovation refers to the creation of market products, business processes, or business models resulting from the use of digital technology. It helps organisations remain competitive and adapt to the rapidly changing digital landscape. Embracing

digital technology can lead to new business models, streamlined operations, and improved customer engagement.

This chapter concludes that understanding and implementing digital innovation and entrepreneurship are crucial for organisations as they enable them to maintain competitiveness, foster innovative mindsets, and adapt to the challenges posed by an ever-changing digital environment. The next chapter outlines the research methodology used to collect and analyse the data.

3. CHAPTER 3: RESEARCH METHODOLOGY

3.1. Introduction

In this section, the researcher describes the research design, instrument, paradigm, and all essential analytical techniques used in this study to arrive at the findings. It explains how data were collected, and the sampling processes were followed to ensure that it was accurate and representative of the studied population. It was essential to determine how one obtained and analysed the data to obtain meaningful and applicable results to the study. The methodology of this study is an important factor in this determination. It was essential to have a solid understanding of the researchers' points of view in the study, as this influenced both the research agenda and design. Understanding the processes applied to the data to obtain the desired outcomes is necessary to generate knowledge that is reliable and free from prejudice.

3.2. Research paradigm

According to academics (Kuhn, 1970; Olasky, 1989), a research paradigm is a collection of beliefs and understandings held in common by researchers and academics regarding how issues should be comprehended and treated. This calls for a process of reflection in which researchers attempt to reconcile their subjective convictions with the three basic frameworks for management research: interpretivism, pragmatism, and positivism (Saunders et al., 2015). Positivism is considered the primary worldview of organisational studies. This study adopts positivism as its theoretical framework. This worldview claims that anyone can comprehend organisational behaviour through hypothesis testing and presupposes that human activity is reasonable (Saunders et al., 2015).

Moreover, this research also adopted a positivist epistemology, which means that the researcher relied on observable data and drew conclusions based on scientific results to determine whether knowledge claims are legitimate (Saunders et al., 2015). This study considers entrepreneurial culture as a moderator in assessing South African Financial Services Organisations' digital orientation, digital capacity, and digital innovation by collecting observable and quantifiable data. This type of research also

presumed that the researcher was autonomous from the results of the study and did not influence them in any way.

3.3. Research Approach

A quantitative approach was used as the methodology of choice. According to Curwin and Slater (2008), the quantitative method involves using statistics to define, describe, and find solutions to various issues. In addition, according to Johnson and Onwuegbuzie (2004), the quantitative approach concentrates on the deduction, prediction, and testing of the hypotheses. The quantitative research approach uses a standardised collection of data, procedures, and statistical analysis. The Researcher used a cross-sectional survey with scales drawn from earlier research to collect data for this report, and the questionnaires were administered to the participants as a group. A rating method was utilised, which asked participants to assess a pre-determined collection of questions on a Likert scale with a 7-point Likert scale. The rating allowed the respondents to evaluate each item independently, easing the mental load they had to carry.

3.4. Research design

Various definitions can be found in the literature on research design; however, Cooper and Schindler (2014) summarise it as a framework used to examine a study, beginning with the development of the hypothesis and ending with the final data analysis. Therefore, it can be seen as a manual for identifying types of data and a framework for determining the relationships among variables (Cooper and Schindler, 2014). A selection of study designs was available, and a descriptive cross-sectional design was adopted. In contrast to longitudinal designs, cross-sectional designs include collecting data from a group of individuals (either the entire population or a subset thereof) at a specific location and time for a limited amount of time (Wahyuni 2012). The exploratory nature of this study has already been established. The Survey population was based on the South African Financial Services sector as described under the Charter on Black Economic Empowerment, as gazetted on 2 March 2012 (Republic of South Africa, 2012), which categorises Banks, Insurance companies, JSE listed companies

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in financial services, and brokerages regulated by The Financial Advisory and Intermediary Services Act (37 of 2002).

According to Greenwood and Levin (2006), an exploratory approach describes the characteristics of an event, situation, or community concerning an outcome, and a set of influential factors from well-known theories. In this research, theories such as the resource-based view and dynamic capability were applied, and the study aimed to discover variables affecting the adoption of digital innovation technologies by South African enterprises using these theories.

3.5. Population and Sampling

According to Cooper and Schindler (2014), a research population is defined as a well-defined group of people who are understood to relate to or have comparable features of a particular phenomenon relevant to the research topic. The individual senior manager, subject expert (IT professional), decision maker, executive, manager, and general workers (non-managerial staff) served as the unit for participants in this study, based on companies listed on the Johannesburg Stock Exchange (JSE). Data provided in reference to the Johannesburg stock exchange were that, as of 2021, 325 firms were recorded with 100,000 employees (Nkhi et al., 2021), which served as the target population of the research.

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3.5.1. Sample

Bless et al. (2006) defined a sample as a portion of a given population that has characteristics indicative of the studied population. According to Nkhi et al. (2021), approximately 100,000 people were discovered working in various companies listed on the JSE before the inclusion of Section 3.5.1. Moreover, as mentioned, the total number of employees at the JSE served as the study population because detailed statistical data on the percentage of top executives or IT experts working in listed businesses were unavailable. Accordingly, the following is an estimate of the sample size based on Yamene's formula:

$e_2 = 0.05^2$

$$n = N / \{1 + N (e^2)\}$$

N= 100 000

Therefore:

$$n = 100\,000 / \{1 + 100\,000(0.05^2)\}$$

$$n = 398$$

Table 1: Estimation of Sample Size

Age	**Over the age of eighteen**
Description of respondent type	Work as a Manager, an executive, an IT expert, or a general worker (non-managerial staff) for any firm listed on the JSE.
Gender	Any gender
Highest academic qualification	At a minimum, a high school diploma
Language	English
Number to be sampled	398 individuals

Source: Yamane (1967)

According to the calculations made using Yamane's (1967) formula, to generate meaningful findings, it was anticipated that 398 employees of JSE-listed enterprises would be given questionnaires to complete.

3.5.2. Sampling method

This study employed a non-random sampling technique known as the convenient sampling technique. In this approach, participants were chosen based on accessibility and closeness to the researcher, in a manner that was most convenient for the researcher. The participants were engaged through the researcher's social media and

email networks. Most respondents came from banks and long-term insurance organisations, and the researcher used business heads to get approval to distribute the survey or send it to their subordinates, emphasising that the survey was voluntary.

This strategy offers numerous advantages, including reduction in both time and cost. The downsides of this strategy include a greater risk of sampling errors during data collection and a greater possibility of bias. In addition, because of the sampling method used, generalisations could not be drawn from this study. To mitigate several of the shortcomings of the method, Sweetman (2010) first proposed increasing the sample size. Owing to the increasing sample size, the sample became more representative of the population over time.

Consequently, there are more opportunities for acquiring accurate data. According to Sweetman (2010), the second stage was to verify that the sample represented the population appropriately (in terms of age, gender, and race). In other words, the sample needed to reflect the proportional representation of age, sex, and race in the population.

3.6. Unit of Analysis

The Researcher's analysis aimed to show and provide data on what or who at an individual level (Zikmund et al., 2010) consists of employees in financial services from the general to the executive level to assess entrepreneurial culture as a moderator for digital orientation, digital capacity, and digital innovation. The unity of analysis was determined by the objective of this study, Sekaran and Bougie (2010) highlighted in Chapter 1, to understand the individual members' perceptions of companies that exist in financial services. The respondents were determined by their job positions and qualifications to ensure research and perception accuracy. The questionnaire was used to collect data with closed questions, and the researcher was aware that if only one individual was examined, it could have presented a single respondent bias. The Researcher used more than one respondent to decrease the common method variance bias and enhance the convergent or discriminant validity evaluation. (2003). The Researcher ensured that the consistency of the units was maintained in all

analysis processes, from coding and developing categories and themes to interpreting the data to gaining insights and ensuring the reliability of the results.

3.7. The research instrument

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The instrument that was used to conduct this research consisted of a questionnaire that comprised 17 items which were assessed based on a 7-point Likert scale (varying from 1- being strongly disagree, 4- being the midpoint of Neutral, and 7- being strongly agree) which was developed from existing literature. This also involved ethical considerations that guarantee anonymity and privacy. Previous studies have resulted in the development of many scales that can measure the levels of digital innovation, capability, and orientation, as highlighted in Table 2. In light of this, the researcher examined various scales and chose quick and accurate ones.

Table 2: Reliability of Constructs used in Research Instrument

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Number	Construct	Data Type	Cronbach's Alpha	Literature
1	Digital orientation	Scale	0.76	Zhou et al. (2005)
2	Digital capability	Scale	0.81	Zhou and Wu (2010)
3	Organisation culture	Scale	0.77	Moorman (1995)
4	Digital innovation	Scale	0.87	Paladino (2007)

Table 2 illustrates how this study's research instrument section was developed using constructs with the appropriate Cronbach's alpha (reliability) ratings. In addition, respondents were asked to answer questions in the three main areas of the questionnaire. There are three main sections, each with a distinct format and based on a construct that had been established in prior studies.

Section A: Digital orientation

This study employed a modified version of the measures used by Zhou et al. (2005) to determine digital orientation. Zhou et al. (2005) initially changed Gatignon and

Xuereb's (1997) measures. The questions evaluated a company's propensity to use digital opportunities, as well as its dedication to the use of digital technologies in the creation of new products. Four items for digital orientation were measured on a 7-point scale like the Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Section B: Digital capability

Five components of digital competence were used to conduct an internal evaluation of the organisation's capabilities in response to the survey concerning the application of digital technology. A seven-point scale was used to rate the items, with one representing "extremely low" and seven representing "very high."

Section C: Digital innovation

There were six questions, each of which utilised a scale analogous to the Likert scale and contained 7 points scale, with one point representing "strongly disagree" and seven indicating "strongly agree." Revisions were made to the questions to make them suitable for research that is now being conducted on digital innovation.

Section D: Organisation culture

The organisational culture measures developed by Quinn and Spreitzer (1991) and used by Moorman (1995) were included in this study's evaluation of the organisation's culture. These items were updated to fit this study. The participants were provided with questions that addressed their values, beliefs, and principles. This information served as the foundation for the creative culture of their different organisations, and they were asked to provide their responses. The evaluations were performed using a seven-point Likert scale, with one indicating that the individual strongly disagreed and 7 indicating that the individual strongly agreed.

Section E: Sample demographics

Closed-ended demographic questions were included in the survey's last section and participants were asked to answer them. This was done primarily to identify the individuals who provided data for the study. These data were used to determine

whether the sample included a more significant proportion of males than females, and to estimate the average age of the sample. This demographic information was also utilised to determine whether there was a link between biographical information and the dependent variables. As a result, the descriptive statistics of the statistical analysis were interpreted using the data.

3.8. Procedure for data collection

Following Hox and Boeije (2005), the Researcher gathered the primary data from a direct source. Hox and Boeije (2005) state that various methods can be used to obtain data, including interviews, surveys, and observations. A standardised survey technique was used to collect survey data, which served as a significant data source for this study. As expected, the researcher distributed the survey to a sample identified from several publicly traded organisations. In addition to survey distribution, secondary data were obtained from various sources. Secondary data for this study were drawn from previously published studies, such as journal articles.

More specifically, the primary data for this study were gathered via close networks, email, and various social media platforms. The research instrument, a comprehensive yet straightforward survey, was shared with the potential respondents within these networks. This method was utilised following the recommendation of Chaganti and Greene (2002), who reported difficulties in data collection solely using an online platform.

The integrity of the study and the privacy of the respondents were of utmost importance. No confidential or proprietary information about the companies was collected, and there was no need to access any company database.

A convenient and non-probabilistic sampling method was employed for this study because there was no defined sampling frame available. Despite this limitation of not having explicit information due to a lack of access to specific statistics on the number or proportion of decision-makers, managers, senior managers, executives, and subject experts (IT professionals), this method was convenient and efficient given the research context.

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Furthermore, the survey instrument clarified the purpose of the study. Respondents were assured of the confidentiality of their responses, and they were explicitly stated that they could withdraw from the study at any point if they felt uncomfortable. After the respondents completed their participation, their responses were recorded and compiled into a dataset for subsequent analyses. The dataset was thoroughly cleaned and prepared to ensure accuracy and compatibility during the analysis.

3.9. Validity and Reliability

The reliability and validity of the study were evaluated using Cronbach's Alpha and the Factor Analysis. The steps taken to ensure reliability and validity are explained in detail in the following sections.

3.9.1. Reliability

Using scales as predictor components in objective models raises issues of reliability and validity. Consistency and reliability in summated scales are crucial, because they are interconnected items designed to measure fundamental notions. Thus, it was essential to know whether they would yield similar results if the same set of items were updated and re-tested on a new group of respondents (Santos, 1999). The reliability of a scale does not guarantee accuracy; hence, it is important to recognise this. Internal consistency was measured using Cronbach's alpha, which is a numerical coefficient of reliability expressed as a value ranging from zero to one, according to Tavakol and Dennick (2011). If a test's components are internally consistent, it tests for the same notion (Tavakol & Dennick, 2011). It was necessary to have a Cronbach's alpha of ≥ 0.7, to declare the credibility or validity of the research instrument (Santos, 1999). According to Tavakol and Dennick (2011), the scales used in this study were found to be reliable because, based on a Cronbach's alpha value of more than 0.7 for each construct or variable.

3.9.2. Validity

Validity can be divided into two categories: external and internal. Internal validity was the ability of the research instrument to successfully assess each of the topics that were the focus of the study, as well as how well a notion was evaluated in the study

(Heale and Twycross, 2015; Bhattacherjee, 2012). Additionally, to demonstrate external validity, it must be possible to generalise it throughout the population and beyond the current location and sample (Bhattacherjee, 2012). Exploratory factor analysis was used because it is the most appropriate method for validating the study instrument.

Analysis of the factors: This investigated the connections between the variables in the data, determining which ones are most closely connected to one another (Sutrisna, 2009). Principal component analysis and varimax rotation tests were used to determine the factors and associated loadings.

3.10. Data analysis

The data collected for the study were captured and analysed after they had been obtained. The Researcher began by conducting a test to assess the normality of the data to establish whether the data were accurately modelled and displayed a normal distribution. Subsequently, the researcher conducted a reliability test, demonstrating that all the items utilised were dependable, as shown by their Cronbach's alpha values greater than (> 0.7). Before moving on to any inferential analysis, the researcher conducted a factor analysis to group the variables following the correlation between the variables. The Researcher also conducted a demographic distribution, which included a breakdown of the employees according to category, gender, age, and degree of education. The Researcher used inferential statistical methods for structural equation modelling during data analysis.

3.10.1. Confirmatory Factor Analysis

In this section, the Researcher's objective is to test for convergence and discriminant validity, as well as to test whether there is a relationship between latent constructs and their observed variables. This process establishes how well the sample data are fitted within the existing latent variable structure of the manifest variables. The latent variables were modelled and abstract concepts were operationalised (Hair et al., 2020). In structural equation models (SEM), latent variables and their relationships must be specified using abstract concepts (Wilson et al. 2014).

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The factor loadings of the observed variables (indicators) that assembled the latent construct were computed and analysed. In the available literature, there is no agreement regarding cut-off/threshold or rules of thumb for assessing the practical significance of standardised factor loading (SFL). Field (2005) and Guadagnoli and Velicer (1988) regarded a latent factor as reliable if it had four or more loadings ≥ 0.60, without considering the sample size. Hair et al. (1998) related the pre-requisite sample size to the practical significance of factor loadings, as shown in the table below. Based on the Researcher's sample size of *N*=228, the value established for the factor loading threshold was ≥ 0.40, following the guidelines suggested by Hair et al. (2013). Chapter 5 presents the results of the CFA factor loading analysis.

Table 3: Factor Loadings for Practical Significance

Factor Loading	Sample Size needed for Significance
0.30	**350**
0.35	**250**
0.40	**200**
0.45	**150**
0.50	**120**
0.55	**100**
0.60	**85**
0.65	**70**
0.70	**60**
0.75	**50**

Source: Hair et al. (2013)

3.10.1.1. Structural equation modelling (SEM)

This multivariate statistical framework is a causal inference method composed of two sets of models used to model the complex relationships between directly and indirectly observed (latent) variables. It simultaneously solves linear equation systems and encompasses other techniques, such as regression analysis, factor analysis, path analysis, and latent growth curve modelling. The model presents a path analysis that

tests the study's hypothesis dependencies, and the measurement model measures composite variables.

For this study, the researcher chose structural equation modelling because it enabled the researcher to test reliability and validity based on the hypothetical relationships among the theoretical constructs and their observed indicators. This can test extensive hypothesised relationships among any blending observed or manifest and latent variables across different territories of scientific enquiry (McQuitty 2004).

3.10.2. Steps in Structural Equation Modelling

The main steps in structural equation modelling followed by the researcher are as follows.

Model specification: This was accomplished by defining the model by finding every link between the variables important to the study via the formulation of assertions about a set of variables. The Researcher hypothesised and established the model upfront and found a model that fits the observed data and yielded an interpretable solution.

Identification: The goal was to establish if the model worked, which included investigating the circumstances to generate a single, unique answer from the observed data for all the model's given parameters. If the Researcher could obtain a unique value for each parameter from the observed data, stated issues. The Researcher determined several features, including specification, fixation, free parameters, and SEM restrictions. (Shaheen et al., 2017).

Parameter estimation: At this stage, the objective of the researcher is to obtain numerical values for the unknown (free) parameters to specify the model and estimate the population parameters. This was achieved using the Maximum Likelihood (ML) estimation method, which uses software to present the model concerning the respective variables (Shaheen et al., 2017). It is primarily used and is seen as a default for many model-fitting programs, where all estimates are calculated simultaneously. The estimates are assumed to be population values; they maximise

the likelihood (probability) that the data (the observed covariances) were drawn from the population (the expected covariances).

3.10.2.1. Evaluation of the model fit

This involved checking and examining the fitness of the models. The Researcher achieved this using various model comparative indices, from zero to one, to determine a good fit. The table below shows the acceptance ranges of all model fit indices (Malkanthie 2015).

Table 4: Criteria range of the model fit indices

Model Fit Indices	Acceptable Level
CMIN/DF	**Between 2 and 5**
RMSEA	**Value Less than 0.10**
GFI	**A value greater than 0.90**
AGFI	**A value greater than 0.90**
SRMR	**Less than 0.05**
TLI	**A value greater than 0.90**
NFI	**A value greater than 0.90**
IFI	**A value greater than 0.90**
PNFI	**Greater than 0.05**
PCFI	**Greater than 0.05**
PGFI	**Greater than 0.05**

Source: (Kocakaya & Kocakaya, 2014; Weston & Gore, 2006)

To assess model fit, chi-square was used, which is a technique that examines differences between observed and expected frequencies by comparing the theoretical model with the reality model aimed at determining how well the data fit the model.

Factor loadings were tested to determine whether they met the criterion expectation of $\lambda \geq 0.7$. Then, a chi-square test was performed to confirm if there was no major difference between the theoretical and actual models expected for the model to work for results indicating a chi-square close to zero and a p-value greater than 0.05.

Model modification was the final process that involved changing the path or items by adjusting different parameters to improve the fit between the data and theoretical model if the model did not fit well. The Researcher examined the errors and standardised the regression weights wherever necessary. This was performed to either free the fixed or fixed free parameters. The Researcher established a factor structure and used multiple regressions to test the hypotheses.

3.10.3. Determining Reliability

Reliability is concerned with the consistency yielded from the methods chosen by the researcher for data collection and analysis; in other words, for research to be considered reliable, an earlier research design employed by the researcher should come to the same findings (Saunders, Lewis, & Thornhill, 2016).

Cronbach's alpha was assessed for each construct. This measurement was used to test the reliability of the multiple-question Likert-scale survey questionnaire. Internal consistency was measured in terms of how closely related the set of items was as a group, and the extent to which it remained a consistent measure of a particular construct. The> 0.60 alpha value threshold indicated that the data had reliable exhaled internal consistency.

To assess the internal consistency of each scale, the researcher also examined composite reliability, also called construct reliability, a measure of internal consistency in scale items, such as Cronbach's alpha (Netemeyer, 2003). Composite reliability was calculated as the ratio of the true score to the scale score variance.

Table 5: Steps for Determining Reliability and Validity

Step 1				
Step		Method and Measure		Threshold
Factor Analysis		CFA	Standardised Factor Loadings	Acceptable - > 0.50
			Correlation Estimates	> 0.50
Step 2				
Step		Method and Measure		Threshold
Validity		Covergent Validity	AVE	> 0.50
			MSV	AVE > MSV
		Correlation & Square roo of AVE		Square root of AVE > Correlation
Step 3				
Step		Method and Measure		Threshold
Reliaboloty		Cronbach's Alpha		0.6
		CR Coefficient		Acceptable : 0.60 - 0.70.
				Good: > 0.70
Step 4				
Step		Method and Measure		Threshold
Model Fit Analysis	Absolute fit indices	Chi-square (X^2) / degree of freedom (CMIN/df)		< 3 good; 5 sometimes acceptable
		Root Mean Square Error of Approximation (RMSEA)		<.05 good : .05 to .1 moderate; >.1 bad
		Comparative Fit index (CFI)		>.80 sometimes acceptable; >.90 good
		Standardized Root Mean Square Residual		< 0.08

3.10.4. Statistical tool Used in this study

For both the collection and processing of data, SPSS and AMOS was utilised (correlation analysis, regression analysis and SEM etc.) (Nassaji, 2015). In addition, the researcher used process analysis (version 3.2), established by Hayes, to evaluate the impacts of the moderator factors on the link between the independent and dependent variables of the study subjects.

3.10.5. Inferential Statistics Used

Most research attempts to determine not only whether there is a connection between the variables in their sample, but also whether there is such a connection in the actual world. The population results were derived using inferential analysis based on sample data (Durrheim and Wassenaar, 1999). This is because researchers are only aware of the sample used to generate the population, not the entire population itself.

Consequently, reliable conclusions must be derived from the data provided by the sample (Blanche & Durrheim, 1999). Inferential statistics include the estimation, prediction, and testing of hypotheses (Leedy, 1982). Both SPSS and structural equation modelling (SEM) software, which is called Amos, were utilised by the researcher to investigate the link and arrive at appropriate results.

3.11. Ethical consideration

In academic research, compliance with ethical norms is necessary because upholding integrity serves as the compass by which the research is carried out. It is essential for the success of this research that the study participants are not subjected to any dangers or put at risk in any way and that the highest ethical standards are always adhered to. The ethics committee granted ethical clearance after submitting all the necessary papers and documentation utilised in this study for at least two months before the data collection process. This clearance was used in this study to ensure the safety of the decision makers. Data collection began after obtaining the clearance certificate necessary to proceed with this research. As a result, ethical principles were adhered to to protect respondents' privacy, identity, and confidentiality.

3.12. Conclusion

This chapter outlined the comprehensive research strategies and techniques for assessing South African Financial Services Organizations' entrepreneurial culture, digital orientation, digital capacity, and digital innovation. This study used the positivist research paradigm. This worldview posits that organisational behaviour can be understood through hypothesis testing and presumes that human activity is rational. This research used a quantitative approach to their method, using statistics to define and find solutions. The research adopted a descriptive cross-sectional design, facilitating data collection from a target group at a particular location and time. The research population comprised senior managers, executives, subject experts (IT professionals), managers, and general workers from companies listed on the Johannesburg Stock Exchange (JSE), totalling approximately 100,000 employees. The sample size, estimated using Yamane's formula, was 398 participants. A convenience sampling technique was used, where participants were selected based

on their accessibility and proximity to the researcher, primarily through social media and email network interactions.

A questionnaire with 17 items, evaluated based on a 7-point Likert scale, was used to ensure privacy and anonymity. This instrument was developed on the basis of an extensive review of the literature. The researchers intended to provide data at the individual level, involving employees in the financial services sector, spanning from general to executive roles. In conclusion, this methodology offers a robust approach for understanding the adoption of digital innovation technologies in South Africa. The next section presents the data analysis and findings of this study.

4. CHAPTER 4: DATA ANALYSIS FINDINGS AND RESULTS

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SME or Multiple Regression and why ? Choose one

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4.1. Introduction

The Researcher presents and outlines the results from the Descriptive and Inferential data generated from the survey in this chapter, using the presentation and interpretation, tables, and graphs based on the methodology detailed in Chapter 3. The results are summarised as follows.

- The demographic profile and characteristics analysis of the participants
- Data analysis was based on descriptive statistics of the constructs in terms of the characteristics and distributions of the variables.
- Construct evaluation based on internal consistency, reliability, and validity.
- A Presentation of regression analysis and SEM in line with the hypotheses that have been put developed for testing.
    - The first two hypotheses were tested using linear regression analysis.
    - The third and fourth hypotheses were evaluated using hierarchical multiple regression analysis to establish the moderator interaction effects.

4.2. Data Collection

Using Qualtrics, voluntary questionnaires were sent to the respondents via email and social platforms. Looking at emails, a total of 1545 emails were sent, with participants' open rate sitting at 79% and average time reading requests at 30 seconds. Participant engagement indicated that 63% were highly engaged, 9% were moderately engaged, 15% were slightly engaged, and 6% were disengaged.

Of the 1545 questionaries sent, 297 responded, representing a 19% response rate, and the final subset responses used were 228 for the analysis.

The responses were downloaded from Qualtrics and exported to statistical software (SPPS 26 and AMOS) for analysis.

4.3. Data preparation and leaning

In preparing the data, the researcher ensured that the data were fit for analysis using the following steps.

- Identifiers such as IP address, geo-location, names, and email were removed.
- Data were coded in numerical form to allow analysis.
- Respondents with more than 10% missing values were removed after undertaking a missing-value analysis, as depicted in the pie charts below.

4.4. Overall Summary of missing values

Figure 2 highlights the extent of the missing data that were part of the data collected. Therefore, there were no concerns regarding the missing data that impacted the study results.

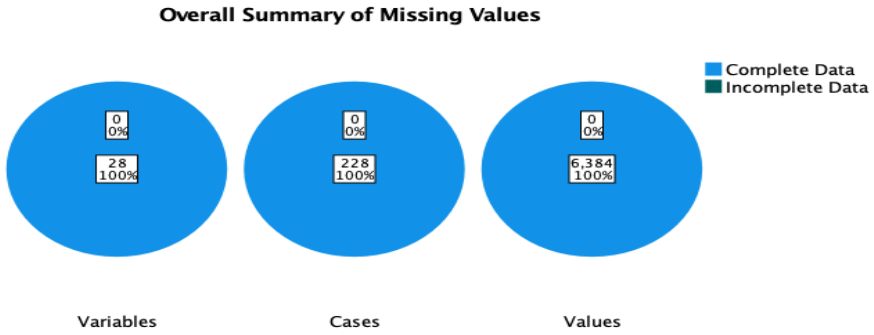


Figure 2: Overall Summary of Missing Values

4.5. Sample Characteristics

4.5.1. Gender

The Researcher in this section provides analyses of the demographic characteristics of the respondents, which consists of four demographic questions positioned and asked: gender, age, employment, and job position.

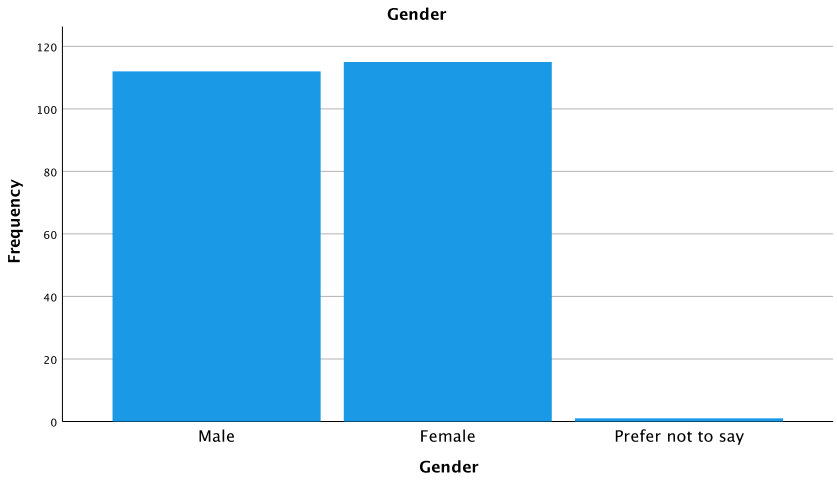


Figure 3: Gender

The distribution of females (50.4%) and males (49.1%) was even. Only 0.1% of the respondents indicated that they did not prefer to say. Questionnaires were sent to the general population of financial service employees. The researcher could not deduce the number of males and females to relate to the even distribution of gender based on the results. This was done to check the consistency advocated in past research, which concluded that women were more likely to participate in research than men (Curtin et al., 2000). From a diverse perspective, the researcher was satisfied with the respondents.

4.5.2. Age and participation

In this section, the researcher measures accounted for the highest number of responses to the survey, based on which age group participated the most. The age group between the ages of 35-44 was the most common and accounted for 44.3% of the respondents, followed by the age group of 45 – 54, which accounted for 24%, the age group between 55-64 accounting for 16%, the age group between 25-34 that accounted for 14%, and finally, 65 and above, which accounted for 0.9%. By visual inspection of the bar chart below, age was approximately normally distributed, based

on the shape of the distribution. The following is a diagram representing the age groups.

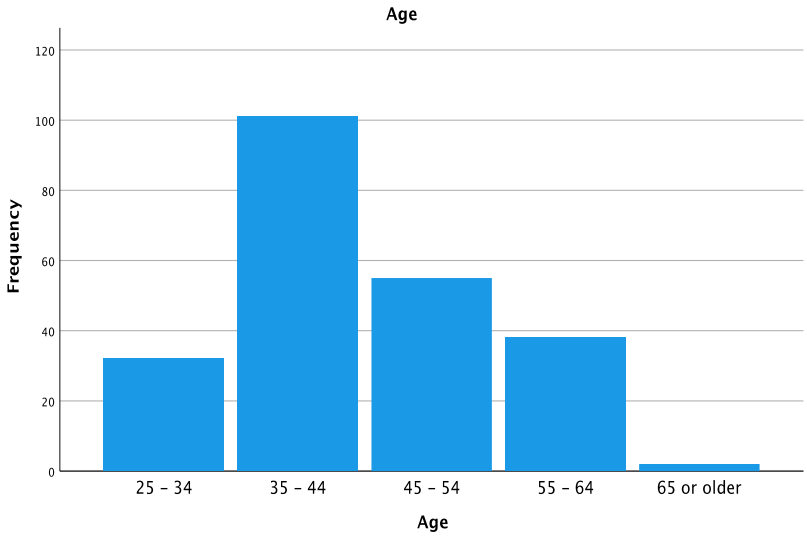


Figure 4: Age

4.5.3. Education Levels of Respondents

In this section, we examine participants' educational backgrounds to determine their comprehension of the questions. Overall, all respondents attained a matriculation certificate following industry requirements. However, only 11% exclusively have matriculation certificates, while 89% hold post-matriculation qualifications. The highest level of qualification was diploma, containing 35% of the scores, with 80 respondents. Honours' degrees followed closely, accounting for 24% of the 46 respondents. Bachelor's degrees comprised 20%, while 10% had earned a Master's degree. Based on these statistics, the researcher concluded that the participants possessed a generally good level of education and comprehended the questions presented in the study.

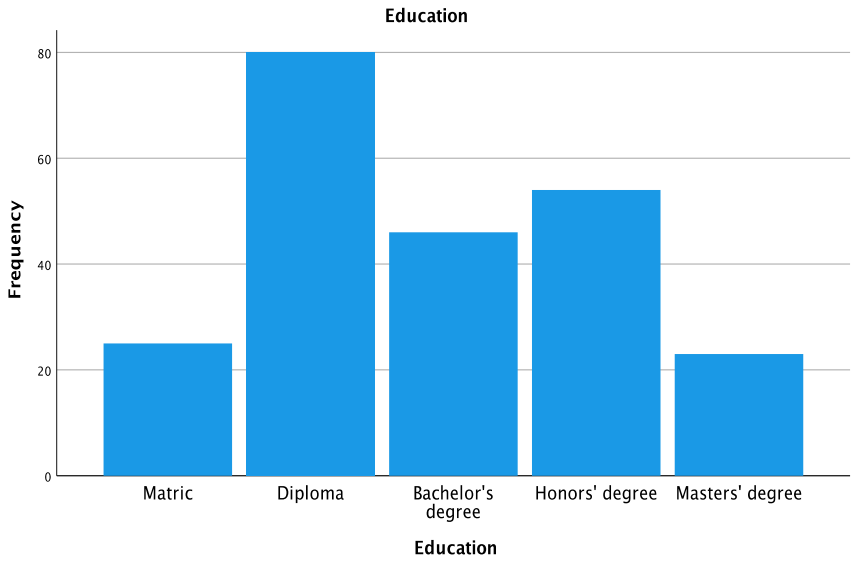


Figure 5: Education Levels

4.5.4. Employment status

The Researcher aimed to ascertain respondents' employment status to determine potential variations in their responses. The findings showed that 96% of the respondents were employed full-time, concluding that employment status held no significance regarding variations. The results are presented graphically in the following diagram.

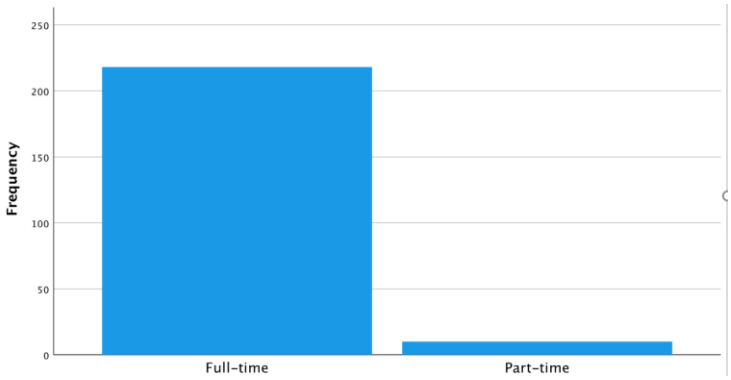


Figure 6: Employment Status

4.5.5. Job Position

Figure 5 illustrates the participants' characteristics based on their job positions. The study revealed that most of the workforce, accounting for a combined 50%, belonged to the overall management category (executives, 9%; senior managers, 12%; managers, 28%; and supervisors, 1.3%). The second-highest bracket was the general staff, comprising non-managerial and specialist roles at 30%, while sales/marketing positions accounted for 20% of the respondents. The findings showed that the questionnaire was prominent among participants in various occupational positions. The graphic below shows the distribution of respondents based on their job positions.

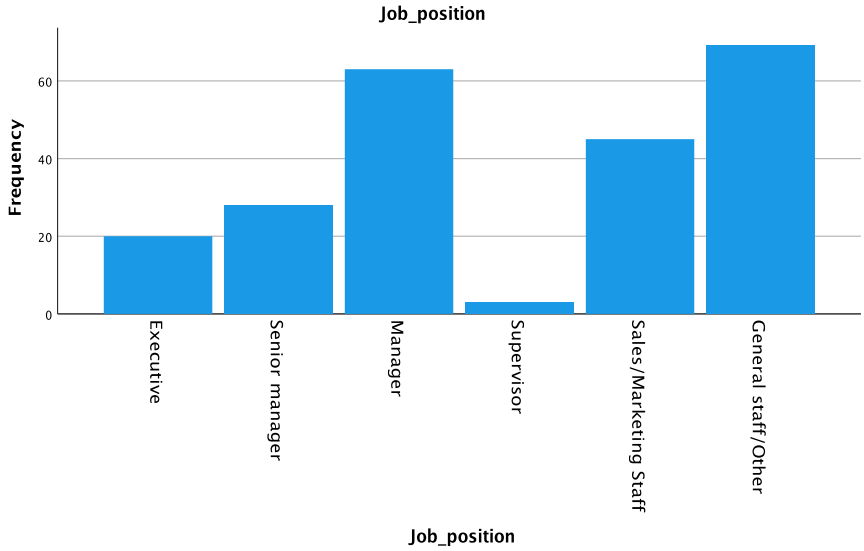


Figure 7: Job Position

4.5.6. Age Vs Education

Researchers' interest in collating age and education data is to assess the response order effects. The research advocates that educational differences and age may reflect differences in the response order.

Respondents were primarily aged between 35 and 44 years, coinciding with respondents with the highest education levels. A total of 101 respondents had tertiary qualifications, with 90 having the highest number. The age group between 45-54 accounted for 55 respondents, with 48 having tertiary qualifications. Those aged 55-64 accounted for 38 participants, with 34 having tertiary qualifications. Finally, 32 respondents from the age group of 25-34 accounted for 32 respondents, with 29 having tertiary qualifications. Those above 65 years were only two with tertiary qualifications.

The researcher concluded that the survey met the standards for respondents in the research sector. Educational qualifications were essential based on the data collected, which indicated that the sector employs educated people.

Table 6: Age * Education Crosstabulation

*Age * Education Crosstabulation*

Count

		Education					Total
		Matric	Diploma	Bachelor's degree	Honours' degree	Masters' degree	
Age	25 – 34	3	7	7	14	1	32
	35 - 44	11	37	21	21	11	101
	45 - 54	7	23	7	11	7	55
	55 - 64	4	13	10	7	4	38
	65 or older	0	0	1	1	0	2
Total		25	80	46	54	23	228

4.5.7. Age Vs Job Position

The findings indicate that the age bracket of 35-44, comprising 101 participants, is evenly distributed across various job roles. The next group, 45-54, had 55 respondents and was evenly distributed across job positions. The age group of 55-64 had 38 respondents, with most of them at the management level, representing 24 participants, out of which the majority were in management (15 participants). The 25-34 age group had an even spread of job positions, with only ten respondents as managers and 13 as General Staff. In contrast, the respondents aged 65 and above totalled only two, representing sales/marketing (one participant) and General Staff / Other others (one

participant). This survey cross-tabulated age and job position to evaluate the participants' proficiency and experience regarding culture and innovation.

Table 7: Age * Job Position Crosstabulation

*Age * Job_position Crosstabulation*

Count

		Job_position						Total
		Executive	Senior manager	Manager	Supervisor	Sales/Marketing Staff	General staff/Other	
Age	25 - 34	2	1	10	0	6	13	32
	35 - 44	11	13	26	1	21	29	101
	45 - 54	5	7	12	2	11	18	55
	55 - 64	2	7	15	0	6	8	38
	65 or older	0	0	0	0	1	1	2
Total		20	28	63	3	45	69	228

4.5.8. Education Vs Job Position

The results based on education and job position indicate that most respondents had a diploma at 80, followed by an honour's degree at 54, and then a bachelor's degree at 46. The Master's degree accounts for 23, and only matric 25 is evenly spread. This indicates that the quality of the survey was appropriate for the respondents.

Table 8: Education * Job Position Crosstabulation

*Education * Job position Cross-tabulation*								
Count								
		Job position						Total
		Executive	Senior manager	Manager	Supervisor	Sales/Marketing Staff	General staff/Other	
Education	Matric	0	0	5	0	2	18	25
	Diploma	8	6	18	1	20	27	80
	Bachelor's degree	2	5	16	1	10	12	46
	Honours' degree	6	3	22	1	12	10	54
	Masters' degree	4	14	2	0	1	2	23
Total		20	28	63	3	45	69	228

4.6. Internal Reliability

This is in reference to the questionnaire's reliability regarding the consistency of a measure involving multiple tests, leading to consistent results (Zikmund et al., 2003). The pilot test aimed to ensure that the questions were short, clear, unbiased, and reliable. Cronbach's alpha for each construct was tested for internal consistency, presided over composite reliability. This measure was used to understand the set of questions regarding construct validity and reliability. (Field, 2013). Notably, Cronbach's alpha has limitations; for example, scores consisting of a low number of items associated with them tend to produce lower reliability. The sample size can also influence the results for better or worse.

The independence of the Researcher, Internal consistency were important to ensure the replicability of this study. A table showing the acceptable internal consistency measures is displayed below.

Table 9: Internal Consistency Measures

α ≥ 0.9	Excellent.
0.9 > α ≥ 0.8	Good.
0.8 > α ≥ 0.7	Acceptable.
0.7 > α ≥ 0.6	Questionable.
0.6 > α ≥ 0.5	Poor.
0.5 < α	Unacceptable.

Source: (Field, 2013)

4.7. Digital Innovation

The Cronbach's alpha value for digital innovation was 0.816, which is higher than the recommended minimum of 0.7. It was concluded that the dataset was suitable for statistical analysis.

Table 10: Digital Innovation Cronbach Alpha

Reliability Statistics	
Cronbach's Alpha.	Items no
.816	6

4.8. Digital Orientation

The Digital Orientation score was 0.866; hence, it was concluded that suitability was perfect because it was higher than the recommended minimum of 0.7.

Table 11: Digital Orientation Cronbach Alpha

Reliability Statistics	
Cronbach's Alpha.	Items no
.866	4

4.9. Digital Capability

Digital Capability scored 0.935, which is higher than the recommended minimum of 0.7. This result was excellent, indicating that the measurements were reliable and that the items measured the same characteristics.

Table 12: Digital Capability Cronbach Alpha

Reliability Statistics	
Cronbach's Alpha.	Items no
.935	5

4.10. Culture

The value for Culture was 0.706, higher than 0.7 minimum recommended

Table 13: Culture Cronbach Alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
.706	4

4.11. Confirmatory Factor Analysis

In line with most studies, this investigation looked at determining the connection between variables in the actual world, not only in their sample. Forecasting, estimation, and hypothesis testing are examples of inferential statistics used to draw conclusions from populations based on the data collected through sampling (Durrheim, 1999). Furthermore, the objective was to determine the existence of any distinction between zero and the relationship between variables. If the correlation between the two variables was 0, there was no connection, and statistical independence was considered to exist (Bailey, 1982). The inference that a connection existed between variables in the population where the correlation was statistically significant was that

the relationship observed in the sample was not an outlier or the result of an error in sampling (Bailey, 1982).

Confirmatory factor analysis was used to examine the entire measuring model and verify the reliability and validity of the constructs. Discriminant and convergent validity were tested to evaluate the validity of the measurement model properly. The degree to which the components that are meant to assess a certain concept are truly unrelated is measured by discriminant validity (Wang & Wang, 2012)..

The original model is as follows.

The optimised measurement model is as follows:

```
model = '
DI =~ DI1+DI2+DI6
DO =~ DO1+DO2+DO3+DO4
DC =~ DC1+DC2+DC3+DC4+DC5
#regressions
DI ~ DO + DC

#modification indices
DO4 ~~ DC2
DC2 ~~ DC4
DC1 ~~ DC2
DC3 ~~ DC4
'
```

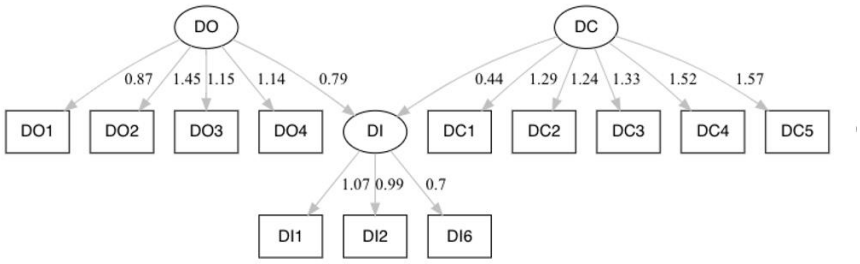


Figure 8: Confirmatory Factor Analysis Model

4.11.1. *Composite Reliability*

Table 14: Composite Reliability Results

	DI	DO	DC
Alpha	**0.879**	**0.86645**	**0.95661**

Composite reliability measures the internal consistency of scale items. It determines the most important contributions or items. Considering load factors such as Cronbach's alpha, the item in question must have a CR value greater than 0.7. (Netemeyer, 2003).

An indicator of maximum reliability considered the average variance extracted as the common variance among all the latent constructs. It estimates how much variance latent construct indicators share in construct measurements (Hair et al. 1998). Based on Table 14, all three constructs had a composite reliability score greater than 0.6, and it was concluded that all constructs exhibited internal consistency.

4.11.2. Average Variance Extracted (AVE)

Table 15: Average Variance Extracted Results

	DI	DO	DC
AVE	**0.743**	**0.64008**	**0.81426**

The Average Variance Extracted (AVE) determines convergent validity, and it is considered a construct capacity that shares items or statements to describe or confirm validity with a recommended score above 0.5 to establish a strong positive correlation that indicates the existence of convergent validity.

The total variance in the indicators was attributed to the latent construct based on the variance extracted (Hair et al., 2010).

All constructs satisfied the convergent validity requirement.

- AVE greater than 0.5.
- Standardized factor loading of all items not less than 0.5; and
- Composite reliability of not less than 0.7.

4.11.3. Testing Discriminant Validity by Comparing the Square Root of AVE and the inter-factor Correlations

The goal of discriminant validity was to demonstrate a concept that did not correlate with tests assessing the various components. When the data revealed no association, it was determined that there was high discriminant validity; when the results indicated a lower correlation, low discriminant validity existed.

A discriminant validity test was performed, and all factors were found to be valid. This was done to determine whether the square-rooted average variance extracted (AVE) for each component was more significant than its correlation with the other constructs (Fornell & Larcker, 1981).

The bivariate correlations between the latent components below demonstrated a desirable feature: the inter-factor connection scored less than 0.85. (Field, 2009). The results demonstrated that the construct correlation was very small, which may have resulted in multicollinearity. (Field, 2009).

Table 16: Bivariate Correlations of Constructs

	DI	DO	DC
DI	**1.000**		
DO	**1.172**	**1.000**	
DC	**1.126**	**0.867**	**1.000**

The diagonal values represent the square root of the AVE for each latent variable (construct/factor). Discriminant validity was assessed using Fornel and Larcker (1971)

by comparing each AVE square root on the diagonal against the correlation coefficients (off-diagonal) for each construct in the relevant rows and columns. All constructs passed the test, as the square root of each construct's AVE was greater than the correlation coefficient, considering other constructs.

4.11.4. Normal Q-Q Plot

The figure below shows the normal quintile Q-Q plot residuals, which show the results of an assessment of the normality of the residuals. By inspection, the residual points did not deviate significantly from normality.

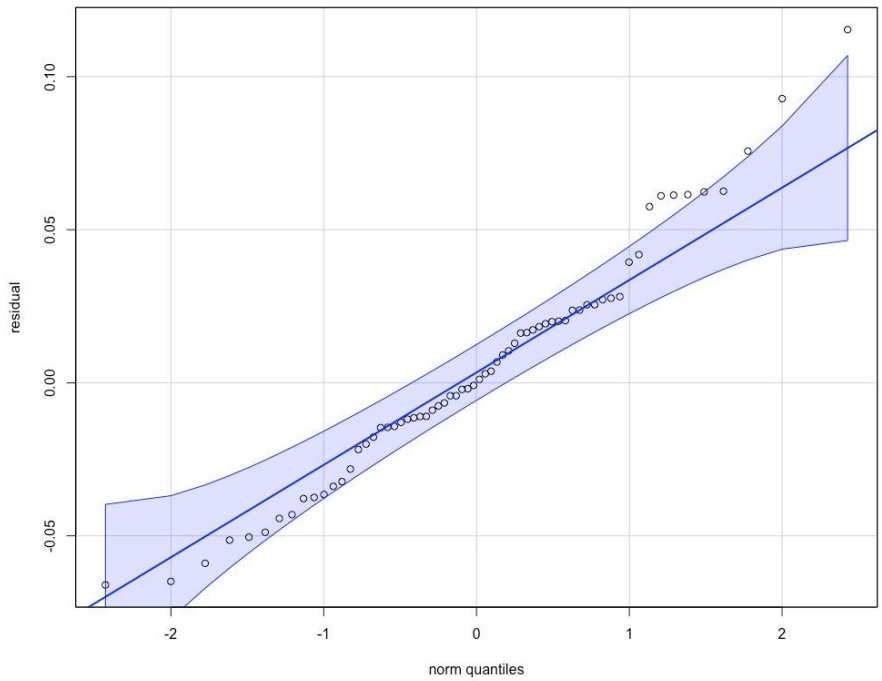


Figure 9: Normal Q-Q Plot

4.11.5. Fit Indices

This test involved checking the indices' fit to establish whether the model was acceptable overall. This was presided over by establishing specific paths if the model was accepted. It is easier to obtain high fit indices; however, this does not imply a strong relationship between the variables. To demonstrate the best proposed superior model fit, according to McDonald and Ho (2002), absolute fit indices are used to determine the best fit of the sample data and demonstrate that the proposed model has the best fit.

As expected, the degree of freedom for the model was 47, which was positive (Suhr, 2011).

4.11.6. Goodness of fit

The traditional measure, chi-squared, was used to evaluate the overall model fit and assess the magnitude of discrepancy between the sample and fitted covariance matrices (Hu and Bentler, 1999:2). As an insignificant threshold, the expected model fit was 0.5 as an insignificant result threshold (Barrett, 2007). The test assumes multivariate normality and significant departures from normality, which may result in model rejection even when accurately described (McIntosh 2006). The goodness of fit was examined using the root mean square residual (RMR) and standardised root mean square residual (SRMR). These were the square roots of the residuals based on the sample covariance matrix minus the residuals of the hypothesised covariance model. The RMR range was determined using the scales of each indicator, and it is important to note that because a questionnaire comprised items of varied levels, it would have been difficult to understand (Kline, 2005). This problem was solved using SRMR, which made it simpler to comprehend. The SRMR has a value range of 0 to 1.0, with well-fitting models yielding values less than.05 (Byrne, 1998; Diamantopoulos and Siguaw, 2000). An SRMR of 0 suggests a perfect fit, although it should be noted that the SRMR will be lower when the model has more parameters and is based on large sample sizes.

The estimated parameters in the model were accepted as suitable for the assessed model fit (Suhr 2011). This was based on the following results.

Table 17: Model Fit Indices

Test for fit	Result	Threshold	Verdict
CFI	0.976	> 0.90	Passed.
GFI	0.987	> 0.90	Passed.
NFI	0.960	> 0.90	Passed.
RMSEA	0.078	< 0.08	Passed.
SRMR	0.032	< 0.08	Passed.
NNFI	0.966	> 0.90	Passed.
TLI	0.966	> 0.90	Passed.
AGFI	0.976	> 0.90	passed.
RFI	0.943	Stegier (2007) suggests proximity to 1	Passed.
PNFI	0.683	> 0.50	Passed.
IFI	0.976	> 0.90	Passed.
Chi-squared	0.001	Hu and Bentley (1999) suggest proximity to 0	Passed.

4.11.7. Factor Loadings:

This shows the individual contribution of each variable to the construct.

Table 18: Latent Variables Factor Loadings

Construct	Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std.all
DI =~						
DI1	1.072	0.064	16.641	0	1.668	0.961
DI2	0.992	0.06	16.52	0	1.545	0.945
DI6	0.702	0.069	10.237	0	1.093	0.644
DO =~						
DO1	0.873	0.071	12.382	0	0.873	0.73
DO2	1.446	0.092	15.798	0	1.446	0.861
DO3	1.153	0.088	13.097	0	1.153	0.76
DO4	1.135	0.079	14.324	0	1.135	0.805
DC =~						
DC1	1.29	0.08	16.161	0	1.29	0.862
DC2	1.243	0.073	17.118	0	1.243	0.893
DC3	1.329	0.081	16.324	0	1.329	0.868
DC4	1.523	0.083	18.331	0	1.523	0.929
DC5	1.566	0.083	18.857	0	1.566	0.943

This shows the individual contributions of each variable to the overall model.

Model Fit Indices	Acceptable Level
Variable	Estimate
DI1	0.923
DI2	0.893
DI6	0.415
DO1	0.533
DO2	0.741
DO3	0.577
DO4	0.648
DC1	0.742
DC2	0.797

Model Fit Indices	Acceptable Level
DC3	0.754
DC4	0.863
DC5	0.888
DI	0.587

4.11.8. Path Diagram

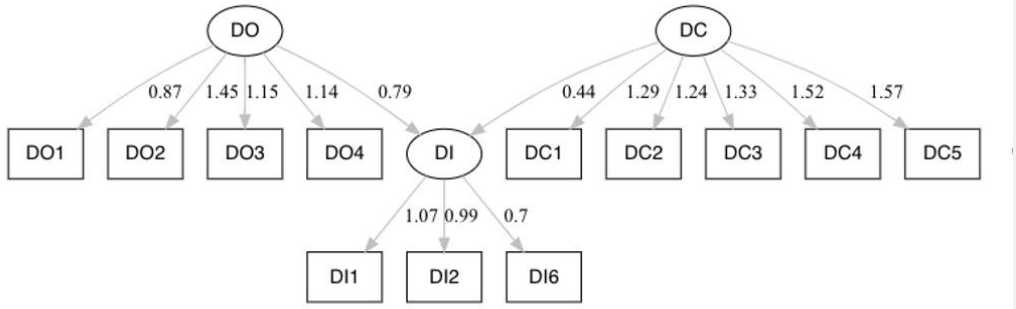


Figure 10: Path Diagram

4.12. Hypothesis Testing

4.12.1. Hypothesis 1

Hypothesis 1: DO influences DI.

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The hypothesis was tested using simple linear regression. This method enabled the researcher to summarise and study the relationships between two continuous quantitative independent and dependent variables. DO was identified as the independent variable and DI as a dependent variable by verifying that the underlying assumptions of the regression were satisfied, and most assumptions were confirmed as part of the regression output.most of the assumptions were confirmed as part of the regression output. The following assumptions were made.

1. **Assumption 1:** The constructs DI and DO are continuous variables – passed.
2. **Assumption 2:** The two variables must have a linear relationship that is correlated. DI and DO have a positive correlation – passed.
3. **Assumption 3:** No significant outliers are present – passed.
4. **Assumption 4:** The cases are independent; the Durbin–Watson statistic is between 1.5 and 2.5 – passed.
5. **Assumption 5:** Data show homoscedasticity.
6. **Assumption 6:** The residuals (errors) of the regression approximate normal distribution – passed.

Variables used for linear regression

Table 19: Regression Variables Entered Hypothesis 1

Variables Entered/Removed[a]			
Model	Variables Entered	Variables Removed	Method
1	DO[b]	.	Enter
a. Dependent Variable: DI			
b. All requested variables entered.			

Model Summary

The relationship between the model and the strength of the dependent variable is presented in the summary table. (Frost, 2019a). Below the Model Summary Table 20, provided the *R* and R^2 values. The R-value represented a multiple correlation coefficient of 0.673, indicating a moderately strong correlation between DI and DO. An R^2 value of 0.453 indicated the extent of the total variation in the dependent variable (DI), which could be explained by the independent variable (DO). In this case, the value of 45.3% was moderately high, implying that the model explained 45.3% of the

variance in the dependent variable. Autocorrelation refers to the degree of correlation between the values of the same predictors (Statistics Solutions 2020). Durbin Watson, a method that tests autocorrelation, showed a value of 2.105. The rule of thumb is that values between 1.5 and 2.5 are relatively normal (Statistics, 2013), implying no autocorrelation problem.

Table 20: Regression Model Summary Hypothesis 1

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.673[a]	.453	.450	1.12678	2.105
a. Predictors: (Constant), DO					
b. Dependent Variable: DI					

ANOVA – Analysis of Variance

The test objective was to find out if survey results were significant by comparing variances across the means of different groups, and to determine whether the first hypothesis was supported or not.

A p-value is a number that results from a statistical test calculated to describe the researcher's likelihood of finding a particular set of observations if the null hypothesis is true. Table 21 shows a p-value <0.001, which was less than p=0.05. The regression model was found to be statistically significant and fit the data. *The F*-ratio is a statistic obtained by dividing two sample variances that are assumed to emanate from normally distributed populations to compare two or more groups in determining whether the variability of means is larger than the within-group variability of the individual values to test whether the overall regression model was a good fit for the data collected. The model explaining the relationship between DI and DO is shown in the table as statistically significant ($F(1, 225) = 186.025$, $p < 0.05$).

Table 21: Regression ANOVA Hypothesis 1

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	236.182	1	236.182	186.025	<.001[b]
	Residual	285.666	225	1.270		
	Total	521.847	226			
a. Dependent Variable: DI						
b. Predictors: (Constant), DO						

COEFFICIENTS

This refers to a number placed with a variable that may include positive numbers, negative numbers, and zero, multiplied by the variable and written next to it. The table below shows that the intercept (constant) was not statistically significant, but DO had a p-value of less than 0.05.

The resultant regression model was DI = 0.673*DO.

The model showed that the DI and DO were directly proportional to each other. A unit increase in DO resulted in an increase in DI by 0.673.

Table 22: Regression Coefficients Hypothesis 1

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.222	.340		.654	.514
	DO	.826	.061	.673	13.639	<.001
a. Dependent Variable: DI						

The distribution of the residuals following a normal distribution that satisfies the regression assumption is shown in figure 11.

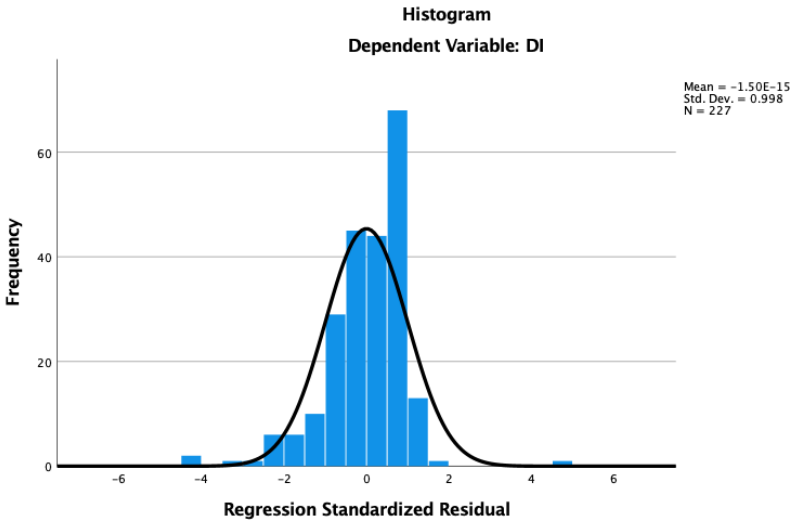


Figure 11: Regression Standardized Residuals for Hypothesis 1

Conclusion

DO significantly predicted DI, with degrees of freedom of F (1, 225) = 186.025. $p < 0.05$, by running a simple linear regression and the variance explained $R^2 = .453$. It was concluded that the hypothesis is supported and that DO influences DI.

4.12.2. Hypothesis 2

Hypothesis 2: DC influences DI.

Simple linear regression was used for the second hypothesis to test how one variable influences the other. DC was the independent variable and DI was the dependent variable. The researcher verified that the underlying regression assumptions were satisfied. Most assumptions were confirmed as part of the regression output. The same assumptions for Hypothesis 1 were applied to Hypothesis 2.

The table below shows the variables used in this study.

Table 23: Regression Variables Entered Hypothesis 2

Variables Entered/Removed[a]			
Model	Variables Entered.	Variables Removed.	Method.
1	DC[b]	.	Enter
a. Dependent Variable: DI			
b. All requested variables entered.			

Model Summary

The strength of the relationship between the model and the dependent variable is illustrated by the Model Summary. (Frost, 2019a). The R-value in Table 24 represents a multiple correlation coefficient of 0.681, indicating a moderately strong correlation between the DI and DC. The R^2 value of 0.464 indicates the extent of the total variation in the dependent variable (DI), which can be explained by the independent variable (DC). In this instance, the value of 46.4% is moderately high. The degree of correlation between the values of the same predictors is called autocorrelation (Statistics Solutions 2020). Autocorrelation showed a value of 1.901 using the Durbin–Watson method. A generally accepted rule of thumb states that values between 1.5 and 2.5 are relatively normal (Statistics, 2013). Based on this, it was implied that there was no autocorrelation.

Table 24: Regression Model Summary Hypothesis 2

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.681[a]	.464	.462	1.11490	1.901
a. Predictors: (Constant), DC					
b. Dependent Variable: DI					

ANOVA – Analysis of Variance

The p-value was <0.001 in Table 25, which is less than p=0.05. The Researcher concluded that the regression model is statistically significant and fits the data. The overall regression model was a good fit for the data tested using the F-ratio. This relationship between DI and DC was statistically significant, F (1,225) = 194.831, p < 0.05, as shown in the table.

Table 25: Regression ANOVA Hypothesis 2

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	242.174	1	242.174	194.831	<.001[b]
	Residual	279.673	225	1.243		
	Total	521.847	226			
a. Dependent Variable: DI						
b. Predictors: (Constant), DC						

COEFFICIENTS

Both the intercept (constant) and DC were found to be statistically significant, with a p-value less than 0.05, as shown in Table 26. Resultant regression model was DI = 0.277 + 0.681*DC. DI and DC were directly proportional to each other. A unit increase in DC would result in an increase in DI of 0.681.

Table 26: Regression Coefficient Hypothesis 2

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.018	.277		3.676	<.001
	DC	.723	.052	.681	13.958	<.001
a. Dependent Variable: DI						

Figure 12 shows that the assumption satisfying the regression illustrated by the distribution of the residuals followed a normal distribution.

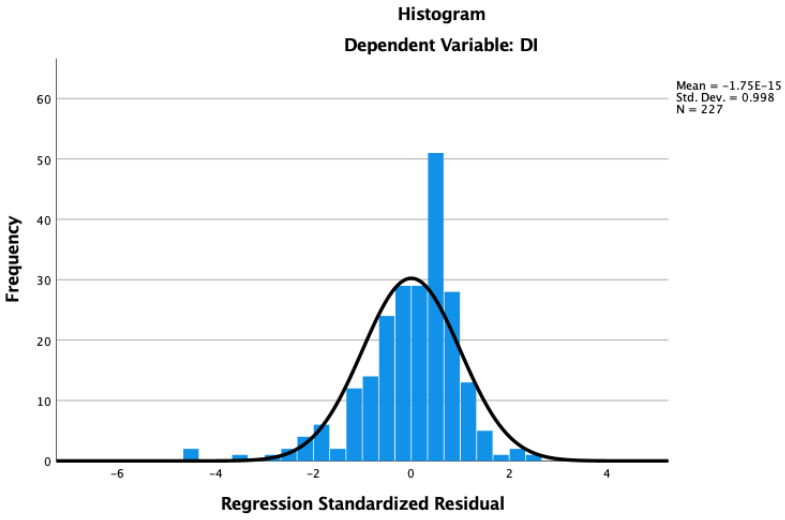


Figure 12: Regression Standardized Residuals for Hypothesis 2

Conclusion

Simple linear regression was used to predict the dependent variable (DI) and independent variable (DC). DC significantly predicted DI, with degrees of freedom of F (1, 225) = 194.831, $p < 0.05$, and variance explained $R^2 = .464$. The study supported the hypothesis and accepted that DC influences DI.

4.12.3. Hypothesis 3

Hypothesis 3: CU moderates the relationship between DO and DI.

The researcher performed a moderated multiple regression in which CU served as a moderator of the relationship and analysis to predict a company's DI from its DO.

The researcher mean centred the independent variable DO and the moderator variable CU for this analysis.

Mean-centring makes it easier to interpret regression parameters, particularly when 0 does not lie within the range of values relating to the independent variable. (Hayes, 2018).

In SPSS, Researcher selected the +/-1 standard deviation to probe the interaction option to show the moderator variable in three categories: low, medium, and high. The link between the independent and dependent variables was examined at three levels: high, low, and medium. As a result of setting p-values to less than 0.10, only conditional associations with p0.10 appeared in the results.

The output was configured to allow probing of the independent and dependent variables depending on the significance across the three levels of the moderator variable.

The model was such that DI = Y, DO = X, and the moderator variable CU = W is highlighted below:

Model: 1

Y: DI

X: DO

W: CU

The outcome variable was DI, which was a sample size of 227 respondents.

Sample Size: 227

OUTCOME VARIABLE: DI

As shown in the summary below, the R-squared value indicates a 49.65% explanation of the variance in the dependent variable.

Table 27: Regression Model Summary Hypothesis 3

R	R-sq	MSE	F	df1	df2	p
0.7046	0.4965	1.1782	73.3002	3	223	0

There was no statistical significance for the interaction term Int_1 (b=-0.101, p>0.05), although the relationship between DI and DO was statistically significant when the moderating variable was controlled. Therefore, CU did not moderate DI's relationship between DI and DO.

Table 28: Regression Coefficients Hypothesis 3

	Coeff	se	t	p	LLCI	ULCI
Constant	4.7379	0.077	61.5126	0	4.5861	4.8897
DO	0.7175	0.0658	10.9107	0	0.5879	0.8471
CU	0.2618	0.06	4.3606	0	0.1435	0.3802
Int_1	0.0101	0.0417	0.2431	0.8081	-0.0721	0.0924

4.12.4. Hypothesis 4

Hypothesis 4: CU moderates the relationship between DC and DI.

CU served as a moderator to predict a company's relationship considering DI from DC using a moderated multiple regression analysis. The researcher mean-centred the independent and moderator variables DC and CU. The same approach to mean-centring and determining significance that was used for Hypothesis 3 was also applied to Hypothesis 4.

The model shows DI = Y, DC = X, and the moderator variable (CU=W) illustrated below:

Model: 1

Y: DI

X: DC

W: CU

The sample size was 227 respondents, with DI as the outcome variable.

Sample Size: 227

OUTCOME VARIABLE: DI

As shown in the summary below, the R-squared value indicates a 49.01% explanation of the variance in the dependent variable.

Table 29: Regression Model Summary Hypothesis 4

R	R-sq	MSE	F	df1	df2	p
0.7001	**0.4901**	**1.1933**	**71.4409**	**3**	**223**	**0**

There was no statistical significance for the interaction term Int_1 (b=0.0315, p>0.05), although the relationship between DI and DO was significant when the moderating

variable was controlled. Therefore, CU did not moderate DI's relationship between DI and DO.

Table 30: Regression Coefficients Hypothesis 4

	Coeff	se	t	p	LLCI	ULCI
constant	4.7163	0.0804	58.666	0	4.5579	4.8747
DC	0.6503	0.0616	10.5549	0	0.5289	0.7717
CU	0.1954	0.0638	3.0644	0.0024	0.0697	0.321
Int_1	0.0315	0.0388	0.8121	0.4176	-0.0449	0.1079

4.13. Theoretical Framework

The theoretical model based on the hypothesis tests on the data is illustrated in Figure 13.

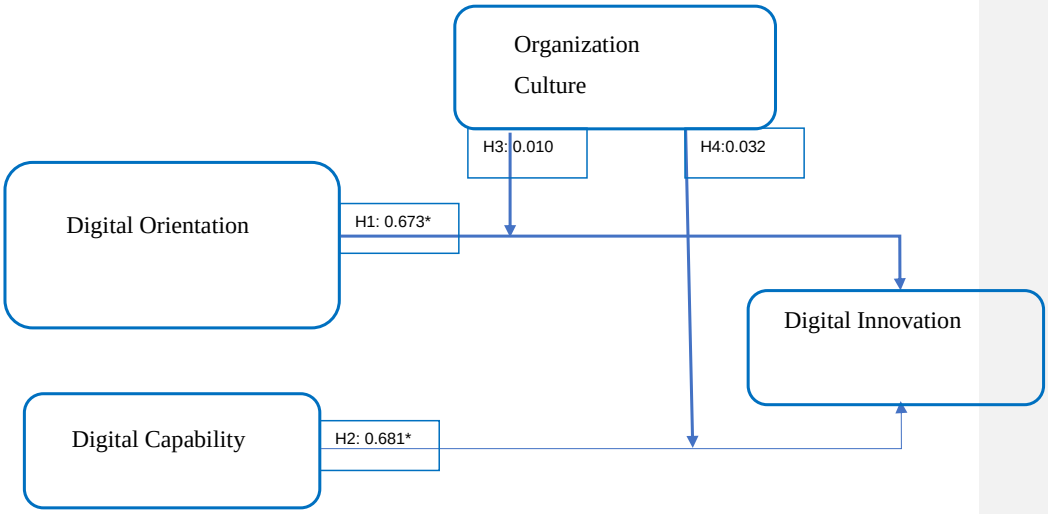


Figure 13: Theoretical Framework

5. CHAPTER 5: DISCUSSION OF THE RESULTS

5.1. Introduction

This section discusses the results of the research hypotheses. The first section elaborates on demographic characteristics, while the subsequent sections focus on the findings of the four research hypotheses.

5.2. Demographic profile of respondents

The demographic results illustrated in Figures 2 to 8 reveal that the typical participants in this research were between the ages of 35-44 and consisted of respondents educated in the accounting profession.

In terms of demographic characteristics, there was an even split between male and female respondents; the age group 35-44 was the most common. This finding is important because having a sample equitably divided between males and females can be an essential factor in ensuring the validity and generalisability of the study's findings. In addition, a gender- or age-balanced sample ensures that the results represent a larger population and increases the study's statistical power.

Furthermore, the most common qualification level was a diploma. It was also found that 96% of the respondents were employed full-time. This is important because the sample possesses specific academic credentials, such as degrees or certificates. This sample type may be more prevalent in applied research, which seeks solutions to immediate problems and issues, than in scholarly research, aiming to contribute more knowledge creation towards research.

Considering this, it was found that most staff represented overall management accounting, and the perceptions shared on the study variables adequately assisted in filling gaps identified in the existing literature.

5.3. Discussion of Hypothesis 1 Results

The first research hypothesis sought to determine whether DO influences DI. Table 22 highlights that DO significantly predicted DI. This finding is supported by Khin and Ho

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(2018), who argue that digitally oriented businesses are more receptive to digital technology, which is very likely to adopt digital projects swiftly and wholeheartedly.

From a theoretical perspective, this finding supports the notion that businesses with robust digital orientation are better positioned to leverage digital technologies for innovation and competitive advantage. The concept of digital orientation emphasises the importance of creating a culture that values and prioritises digital technologies and develops the necessary skills, resources, and infrastructure to support digital initiatives (UNCTAD, 2019). Thus, the finding that digitally oriented businesses are more receptive to digital technology and are very likely to adopt digital projects suggests that digital orientation is a crucial factor in driving digital innovation.

From a practical perspective, this study has several implications. First, businesses that are not yet digitally oriented may need to invest in developing a digital culture and infrastructure to remain competitive in the digital landscape (Jahanmira and Cavadas, 2018). This may involve developing digital skills, investing in IT infrastructure, and fostering a culture of innovation that values and prioritises digital initiatives. Second, digitally oriented businesses may need to continue to prioritise and invest in digital initiatives to maintain their competitive edge (Hitt et al., 2016). This may involve investing in emerging technologies, developing new digital products or services, or collaborating with other digitally oriented businesses to drive innovation.

Furthermore, the finding that digitally oriented businesses are more receptive to digital technology and are very likely to adopt digital projects swiftly and wholeheartedly has broader implications for the digital transformation of society and the economy (Khin and Ho, 2018). As more businesses become digitally oriented and prioritise digital initiatives, innovation, productivity, and economic growth can increase (Ireland et al., 2002). However, the digital divide between digitally and non-digitally oriented companies may also exacerbate existing inequalities, as businesses that lack digital capabilities may struggle to compete in the marketplace and may be left behind in digital transformation.

The Researchers concluded that companies prioritising digital initiatives and investments are better positioned to leverage digital technologies for innovation and competitive advantage. However, this finding emphasises the necessity of bridging the digital divide and ensuring that all firms possess the digital skills required to compete in the digital economy.

Therefore, it can be concluded that this hypothesis is supported, and this study affirms that DO influences DI.

5.4. Discussion of Hypothesis 2 Results

The second research hypothesis sought to determine whether DC influences DI. Table 26 shows that DC significantly predicted DI. This conclusion is supported by Carcary et al. (2016), who argue that for an organisation to undergo digital transformation successfully, it must first develop several capabilities in a wide variety of fields. These capabilities may vary depending on the industry in which the organisation operates, as well as the particular requirements of the organisation.

From a theoretical perspective, this finding highlights the importance of understanding the nuances of digital capability development in different industries and organisations.this finding highlights the importance of understanding the nuances of digital capability development within different industries and organisations. This suggests that a one-size-fits-all approach to digital capability development may not be practical, and that organisations need to consider the specific requirements and challenges of their industry and organisation when developing digital capabilities (Teece and Pisano, 1994; Teece et al.,1997). This underscores the importance of a contextualised approach to digital capability development that considers each organisation's unique characteristics (Steyaert and Katz, 2004).

From a practical perspective, this study has several implications. First, organisations need to thoroughly assess their digital capabilities and identify areas in which they need to improve to remain competitive in their particular industry (Yunis et al., 2017). This may involve investing in new technologies, enhancing digital skills and infrastructure, or developing new digital products and services. Second, organisations

must identify their industry's specific requirements and challenges and expand digital capabilities tailored to their needs. For example, a healthcare organisation may need to prioritise digital capabilities related to data security and privacy. In contrast, retail organisations may need to focus on digital marketing and e-commerce.

Furthermore, recognising that the development of digital capabilities may vary depending on the industry, and particular organisational requirements have broader implications in the digital transformation of society and the economy (Chandler et al., 2000). This suggests that digital capability development is not just a matter of technological advancement, but also requires a deep understanding of the social, economic, and cultural contexts in which organisations operate. This underscores the importance of collaboration among industry, government, and academia in developing digital capabilities that are both technically advanced and socially responsible (Carcary et al., 2016).

In conclusion, recognising that the development of digital capabilities may vary depending on the industry, and particular organisation requirements have significant implications for theory and practice. It highlights the need for a contextualised approach to digital capability development that considers the unique characteristics of each organisation and industry. This approach can help organisations remain competitive in the digital landscape and contribute to the broader digital transformation of society and the economy.

Therefore, it can be concluded that this hypothesis is supported, and this study affirms that DC influences DI.

5.5. Discussion of Hypothesis 3 Results

The third research hypothesis sought to determine whether CU moderated the relationship between DO and DI. Table 28 shows that there is no statistical significance for the interaction term Int_1. This finding is supported by Klein (2011), who argues that an organisation's culture and innovation should be complementary to achieve high innovation capability. Furthermore, organizational theorists (Barney, 1986; Kuratko & Welsch, 2004; Hall, 1993) have hypothesised that organisational

culture and innovation strategies are inextricably linked. According to Lau et al. (2004), a business's innovation strategy reflects managers' and employees' desired behaviour. Organisations must foster an environment that encourages innovation when implementing the proposed innovation plan.

From a theoretical perspective, this finding highlights the importance of understanding the role of organisational culture and leadership in driving innovation. This suggests that managers' and employees' attitudes, behaviours, and values play a critical role in shaping the organisation's approach to innovation (Fitzgerald et al., 2014). Thus, the innovation strategy that a business chooses to pursue should reflect the desired behaviours of its managers and employees. This underscores the importance of a people-centric approach to innovation that empowers employees to contribute to the innovation process and fosters a culture of innovation.

From a practical perspective, this study has several implications. First, organisations must foster an environment that encourages innovation through digital orientation. This may involve investing in digital technologies, developing digital skills and infrastructure, and providing opportunities for employee training and development (Morris et al., 2008). Second, organisations must include employees in the innovation process and empower them to contribute to developing and implementing innovation strategies. This can help foster a culture of innovation and ensure that the innovation strategy reflects the desired behaviours of managers and employees.

Furthermore, recognising that the innovation strategy a business chooses to pursue reflects the desired behaviours of its managers and employees has broader implications for digital transformation. This suggests that innovation is not just a matter of technological advancement, but also requires a people-centric approach that empowers employees to contribute to the innovation process (Kuratko and Welsch, 2004). This can help drive innovation, boost productivity, and enhance competitiveness, while fostering a culture of innovation that contributes to the broader digital transformation of society and the economy (Klein, 2011).

In conclusion, recognising that a business's innovation strategy reflects the desired behaviours of its managers and employees and that organisations must foster an environment that encourages innovation through digital orientation has significant implications for both theory and practice. It highlights the importance of adopting a people-centric approach to innovation that empowers employees to contribute to the innovation process and fosters a culture of innovation. This can help drive innovation, boost productivity, and enhance competitiveness, while contributing to the broader digital transformation of society and the economy.

As a result, although DI and DO show a statistically significant relationship when the moderating variable is controlled, the conclusion can be drawn that CU does not moderate this relationship.

5.6. Discussion of Hypothesis 4 Results

The fourth research hypothesis seeks to determine whether CU moderates the relationship between DC and DI. Table 30 highlights that there was no statistical significance for the interaction term Int_1. This finding is supported by Hall (1993), who asserts that entrepreneurial culture is an organisation's capability that is unique and impossible to replicate in other organisations. An entrepreneurial culture encourages employees to take risks and try new ideas (Hall, 1993). Research on strategic management has generally concluded that entrepreneurial culture is a crucial factor to consider when attempting to explain how organisations operate and when formulating strategies to make those organisations more efficient and innovative (Prajogo and Sohal, 2001). Although many factors, such as national systems, knowledge transfers, and labour markets, influence both incremental and radical innovation through the creation of digital capabilities, it is generally acknowledged that entrepreneurial culture is a significant factor in determining an organisation's propensity to innovate. Although many factors influence both incremental and radical innovation (Tidd, Bessant, & Pavitt, 2001), this is the case.

From a theoretical perspective, this finding highlights the complexity of the innovation process and the importance of understanding the multiple factors that influence it. This suggests that innovation is not just a matter of technological advancement but also

depends on social, cultural, and economic factors that shape the innovation ecosystem (Tidd et al., 2001). Therefore, a comprehensive understanding of the innovation process requires an interdisciplinary approach that considers multiple factors.

From a practical perspective, this study has several implications. First, organisations must develop digital capabilities tailored to their needs and context (Teece and Pisano, 1994; Teece et al.,1997). This may involve collaborating with other organisations, investing in digital skills and infrastructure, and developing new digital products or services. Second, organisations must foster an entrepreneurial culture that encourages innovation and risk-taking (Hall, 1993). This can help create an environment that supports innovation and enables organisations to adapt to changing market conditions.

Furthermore, recognising that many factors influence both incremental and radical innovation through the creation of digital capabilities (Iansiti and Lakhani, 2014), while entrepreneurial culture is a significant factor in determining an organisation's propensity towards innovation, it has broader implications for the digital transformation of society and the economy. This suggests that innovation is a complex and multifaceted process that requires coordinated efforts from multiple stakeholders, including governments, businesses, and academia (Nambisan et al., 2017). This underscores the importance of collaboration and partnership in driving innovation and promoting digital transformation.

Recognising that many factors influence both incremental and radical innovation by creating digital capabilities has significant implications for theory and practice. It highlights the importance of a comprehensive and interdisciplinary approach to innovation that considers multiple social, economic, and cultural factors. Furthermore, there is an emphasis on the importance of creating an environment conducive to entrepreneurship that encourages innovation and risk-taking, promotes collaboration and partnerships to drive innovation, and facilitates digital transformation by developing ground-breaking digital capabilities (Ghobakhloo and Tang, 2013).

As a result, although DI and DC show a statistically significant relationship when the moderating variable is controlled, the conclusion can be drawn that CU does not moderate this relationship.

5.7. Conclusion

The Researcher discussed key findings concerning the existing theory and literature. The next section presents the conclusions, implications, and recommendations that can be drawn from this study.

6. CHAPTER 6: CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

6.1 Introduction

The results and interpretation of the research findings are presented in Chapters 4 and 5, respectively. After discussing the main findings, the researcher drew conclusions on the main aspects of the study's goals and objectives. The final section provides recommendations for DO, DI, DC, and CU for further research, including a reference to the study's limitations.

6.2 Conclusions of this study

This study aimed to investigate not only the factors influencing digital innovation (digital orientation and digital capability) but also the moderating role that organisational entrepreneurship culture (CU) plays in the relationship between digital innovation (DI), digital orientation (DO), and digital capability (DC). This research aims to fill this gap in the existing literature by generating key investigation findings.

The first significant finding of this study was that DO influenced DI. This finding suggests that businesses with robust digital orientation are better positioned to leverage digital technologies for innovation and competitive advantage. This has implications for theory and practice, as companies prioritising digital initiatives and investments are better positioned to leverage digital technologies for innovation and competitive advantage. It also highlights the importance of addressing the digital divide and ensuring that all businesses have the digital capabilities necessary to compete in the digital landscape.

The second significant finding of this study is that DC influences DI. This finding highlights the importance of understanding the nuances of digital capability development in different industries and organisations. This suggests that organisations need to consider their industry-specific requirements and challenges and develop digital capabilities tailored to their needs. It also highlights the need for collaboration among industry, government, and academia to develop digital capabilities that are both technically advanced and socially responsible. This approach

can help organisations remain competitive in the digital landscape and contribute to the digital innovation of society and the economy.

The third significant finding of this study was that CU did not moderate the relationship between DI and DO. This finding highlights the importance of understanding the role of organisational culture and leadership in driving innovation. This suggests that managers' and employees' attitudes, behaviours, and values play a critical role in shaping the organisation's approach to innovation. From a practical perspective, organisations need to foster an environment that encourages innovation through a digital orientation and involves employees in the innovation process. It also has implications for digital innovation transformation in society and the economy. This can help drive innovation, boost productivity and enhance competitiveness.

The fourth and final significant finding of this study was that CU did not moderate the relationship between DC and DO. This finding highlights the complexity of the innovation process and the need for an interdisciplinary approach that considers multiple factors. It also suggests that organisations must develop digital capabilities tailored to their specific needs and foster an entrepreneurial culture to encourage innovation and risk taking. Collaboration and partnerships are essential to drive innovation and promote digital transformation.

6.3 Implications and Recommendations

The following implications and recommendations can be drawn based on the conclusions of this study:

- Adopting a digital orientation for corporate organisations can spur innovation by nurturing a culture of continuous learning and development, ultimately resulting in a market advantage. By leveraging technological advancements, organisations can create novel products, services, and business models, thereby increasing market share and profitability.
- Academic practitioners can use digital orientation to improve their research capabilities, facilitate interdisciplinary collaboration, and disseminate knowledge more effectively.

- Digital orientation can enhance corporate and academic efficiency as well as effectiveness. Digital tools can streamline processes, reduce costs, and improve collaboration across departments and geographies for corporate organisations.
- Academic practitioners can benefit from expanded access to resources, such as digital libraries and online databases, and the ability to collaborate with counterparts worldwide. Nevertheless, increased reliance on digital technologies may raise concerns about cybersecurity, data privacy, and robust IT infrastructure. Hence, as digital orientation becomes more prevalent, there is a greater demand for competent professionals with knowledge of digital technologies.
- Digital orientation's influence on innovation can have far-reaching societal and economic consequences. On the one hand, digital innovation can contribute to economic development, new jobs, and improved quality of life. Access to digital resources and the ability to benefit from digital innovation may be limited to specific segments of the population, exacerbating existing disparities. Additionally, increased automation and digitisation may result in job loss and necessitate a transition in workforce skills.
- Digital capability can considerably impact an organisation's capacity for innovation and market competitiveness. Corporate organisations with robust digital capabilities can leverage emergent technologies to develop innovative products, services, and business models, thereby increasing market share and profitability.
- Digital capabilities can increase efficiency and efficacy in both corporate and academic settings. Strong digital capabilities can streamline processes, reduce costs, and enhance collaboration across departments and geographies for corporate organisations.
- The growing significance of digital capability in promoting innovation creates a demand for professionals with knowledge of digital technology.
- Academic practitioners can devise and provide relevant courses and training programs to educate the workforce to meet the evolving requirements of the

corporate sector. Organisations may need to invest in reskilling and upgrading their employees to remain competitive in the digital landscape. Additionally, the prevalence of remote work and virtual collaboration may have implications for employee engagement, work-life balance, and organisational culture.

- Digital capability's influence on innovation can have far-reaching societal and economic consequences. Economic growth, employment creation, and an enhanced quality of life can all benefit from digital innovation.
- Access to digital resources and the ability to benefit from digital innovation may be limited to specific segments of the population, exacerbating existing disparities. Additionally, increased automation and digitisation may result in job loss and necessitate a transition in workforce skills.

6.4 Limitations of the study

These were identified as follows:

- This study's choice of methodology does not permit the richness or profundity of the results (limitation of quantitative). The study was not longitudinal but cross-sectional. Future longitudinal studies utilising the same sample in multiple periods may produce differing findings regarding the moderating influence of CU. Longitudinal research is not a practical option because of the constrained timeframe for this investigation.
- This study was conducted with an inherent common method bias using a self-administered online questionnaire survey. To encourage participation, the promise of maintaining anonymity and confidentiality was emphasised. In addition, no sensitive information is requested.
- Most of the respondents were members of the general accounting profession. This limits the generalisability of the results to the specific demographic profile of respondents.

6.5 Suggestions for further research

The following recommendations are made for future research:

- There is a need to establish further robustness of the CU concept measures presented in this study, using larger samples, or even exploring this concept in a qualitative setting, to identify any additional nuances that were not evaluated in the research instrument used for this study.
- Future longitudinal studies to establish whether CU can moderate the initial or future relationships with DO and DC.
- Future studies should focus on entrepreneurial culture proactiveness in corporate environments. The culture of most South African corporations is very rigid, and senior stakeholders are unwilling to take risks to upset the status quo.

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8. APPENDIX A: CONSISTENCY MATRIX

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Research question stated here: What are the factors influencing digital innovation? Aims of research	Literature Review	Hypotheses or Propositions or Research Questions	Source of data	Type of data	Analysis
To examine the influence of digital orientation on digital innovation of organisations in the Financial services sector.	(Paladino, 2017), (Zhou et al., 2005), (Zhou and Wu, 2010) (Gatignon and Xuereb, 1997)	H_1: Digital orientation has a positive influence on the digital innovation of organisations in the Financial services sector.	ID: DO (1 to 4) DV: DI (1 to 6)	Scale	Linear Regression
To investigate the influence of digital capability	(Zhou and Wu, 2010)	H_2: Digital capability has a positive influence	ID: DC (1 to 5)	Scale	Linear Regression

on digital innovation of organisations in the Financial services sector.	(Gatignon and Xuereb, 1997)	on the digital innovation of organisations in the Financial services sector.	DV: DI (1 to 6)		
To analyse the role of entrepreneurship culture on the relationship between digital orientation and digital innovation of organisations in the Financial services sector.	(Gatignon and Xuereb, 1997) (Yunis et al., 2017)	H_3: Organisation culture positively moderate the relationship between Digital orientation and Digital innovation of organisations in the Financial services sector.	DV: DI (1 to 6)	Scale	Hierarchical Multiple Regression Analysis
To analyse the role of	Fitzgerald et al. (2014)	H_4: Entrepreneurship		Scale	Hierarchical Multiple

entrepreneurship culture on the relationship between digital capability and digital innovation of organisations in the Financial services sector.	Morris et al. (2011) (Zhou and Wu, 2010) Nambisan et al. (2017) (Teece et al., 2016)	culture positively moderate the relationship between Digital capability and Digital innovation of organisations in the Financial services sector.	DV: DI (1 to 6)		Regression Analysis

9. APPENDIX B: RESEARCH INSTRUMENT



I would be grateful if you could take part in this research survey that is being conducted to investigate the factors that influence JSE-listed companies' use of digital innovation technology. This study was conducted as a component of my Master of Management in Entrepreneurship and New Venture Creation program at the University of the Witwatersrand's Faculty of Commerce, Law, and Management. It was done in partial fulfilment of the requirements for the Master of Management in Entrepreneurship and New Venture Creation degree.

We will not enquire about your identity by requesting your name, ID number, contact number, or other private information. You are under no obligation to respond to any of the questions. Your replies will be reviewed in complete confidence and will only be used for the scholarly aspects of this investigation. After you have finished filling out this questionnaire, no one will get in touch with you again for any purpose about this study.

If there is anything on this questionnaire that you need clarified, please don't hesitate to ask me. Kennedy Mateyo, Student No 417989, a student in the School of Economic and Business Sciences at the University of the Witwatersrand studying for a Master's in Entrepreneurship and New Venture Creation, is the person who can answer your questions directly. Cell: 083 704 2611

Survey consent

○ I consent to begin the study (1)

○ I do not consent to begin the study (3)

Skip To: End of Survey If Survey consent = I do not consent to begin the study

Section A: Digital innovation

The following collection of questions uses Likert scales with 7 points, where 1 indicates strong disagreement, and 7 indicates strong agreement. Please indicate the degree to which you agree or disagree with this statement.

The following survey is designed to evaluate the level of digital innovation within the firm.

Code	Statement	1	2	3	4	5	6	7
DI 1	The quality of our digital solutions is superior compared to our competitors.							
DI 2	The features of our digital solutions are superior compared to our competitors.							
DI 3	The applications of our digital solutions are totally different from our competitors.							
DI 4	Our digital solutions are different from our competitors in terms of product platform.							
DI 5	Our new digital solutions are minor improvements of existing products							
DI 6	Some of our digital solutions are new to the market at the time of launching.							

Section B: Digital orientation

The following collection of questions uses Likert scales with 7 points, where 1 indicates strong disagreement, and 7 indicates strong agreement. Please indicate the degree to which you agree or disagree with this statement. Please indicate your level of agreement or disagreement with the statements below

The following survey is designed to evaluate the level of digital orientation within the firm.

Code	Statement	1	2	3	4	5	6	7
DO 1	We are committed to use digital technologies in developing our new solutions.							
DO 2	Our solutions have superior digital technology.							
DO 3	New digital technology is readily accepted in our organisation.							
DO 4	We always look out for opportunities to use digital technology in our innovation.							

Section D: Digital Capacity

The following collection of questions uses Likert scales with 7 points, where 1 indicates very low, and 7 indicates very high. Please indicate the degree to which you agree or disagree with this statement. Please indicate your level of agreement or disagreement with the statements below

The following survey is designed to evaluate the level of digital capacity within the firm.

Code	Statement	1	2	3	4	5	6	7
DC 1	Acquiring important digital technologies							
DC 2	Identifying new digital opportunities							
DC 3	Responding to digital transformation							
DC 4	Mastering the state-of-the-art digital technologies							
DC 5	Developing innovative products/service/process using digital technology							

Section E: Organisation Culture

The following collection of questions uses Likert scales with 7 points, where a Seven-point scale: 1 = Not at all like us; 7 = Very much like us. Please indicate the degree to which you agree or disagree with this statement. Please indicate your level of agreement or disagreement with the statements below

The following survey is designed to evaluate the level of digital innovation within the firm.

Code	Statement	1	2	3	4	5	6	7
Clan Cultural Orientation (Seven-point scale: 1 = Not at all like us; 7 = Very much like us)								
OC 1	This is a very personal place. It's like an extended family. People seem to share a lot of themselves.							
OC 2	The head of my division is generally considered to be a mentor, sage, or a father or a mother figure.							
OC 3	The glue that holds my division together is loyalty and tradition. Commitment to this firm runs high.							
OC 4	Our company emphasizes human resources. High cohesion and morale in the firm are important.							
Adhocracy Cultural Orientation (Seven-point scale: 1 = Not at all like us; 7 = Very much like us)								
OC 5	This is a very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks.							
OC 6	The head of this company is generally considered to be an entrepreneur, an innovator, or a risk taker.							
OC 7	The glue that holds us together is a commitment to innovation and development. There is an emphasis on being first.							
OC 8	Our company emphasizes growth and acquiring new resources. Readiness to meet new challenges is important.							

Hierarchy Cultural Orientation (Seven-point scale: 1 = Not at all like us; 7 = Very much like us)								
OC 9	We are an organised and structured place. Detailed procedures help people know what to do.							
OC 10	The head of this company is generally considered to be a coordinator, an organiser, or an administrator.							
OC 11	The glue that holds us together is formal rules and policies. Maintaining a smooth-running institution is important here.							
OC 12	Our company emphasizes permanence and stability. Efficient, smooth operations are important.							
Market Cultural Orientation (Seven-point scale: 1 = Not at all like us; 7 = Very much like us)								
OC 13	Our firm is very production oriented. The major concern is with getting the job done. People aren't very personally involved.							
OC 14	The head of this company is generally considered to be a producer, a technician, or a hard driver.							
OC 15	The glue that holds us together is an emphasis on tasks and goal accomplishment. A production orientation is shared.							
OC 16	Our company emphasizes competitive actions and achievement. Measurable goals are important.							

SECTION E: Demographics

Demographics

Q1.2 Are you currently employed as a manager or senior manager or executive, and or IT professional by a company that is listed on the Johannesburg Stock Exchange?

If yes, then continue with the survey.

- Yes (1)
- No (2)

Skip To: End of Survey If Are you currently employed as a manager or senior manager or executive and or IT professional by... = No

Q2.1 Please choose the industry.

- ○ Financial Service (1)
- ○ Media and Telecommunication (2)
- ○ Manufacturing (3)
- ○ Retail (4)
- ○ Agriculture (5)
- ○ Mining (6)
- ○ Other (7)

Q2.2 Which role do you currently occupy?

- ○ Executive (1)
- ○ Senior Manager (2)
- ○ Manager (3)
- ○ IT professional (4)
- ○ Other (6)

Q2.3 What is your gender?

- Male (1)
- Female (2)
- Non-binary / third gender (3)
- Prefer not to say (4)

Q2.4 Do you have any child?

- Yes (1)
- No (2)

Q2.5 What is the highest level of education completed?

- Below Grade 12 (1)
- Grade 12 (2)
- Diploma (3)
- Degree (4)
- Honours (5)
- Masters (6)
- PhD (7)

Q2.5 What is your age?

- Under 18 (1)
- 18 - 24 (4)
- 25 - 34 (5)
- 35 - 44 (6)
- 45 and above (7)

Q2.6 What is your job status?

- Full-time (1)
- Part-time (2)
- No response (3)