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The Impact of Digital Leadership on Digital Maturity: A South African Case Study

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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 the field of Digital Business

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ABSTRACT

In the rapidly evolving landscape of digital transformation, the role of digital leadership in driving organizational maturity has become increasingly crucial. This study investigates the impact of digital leadership on digital maturity within the South African fintech sector, aiming to provide insights into the mechanisms through which leadership practices influence digital maturity at a factor level. This was broken down into two key areas: identifying the most critical indicators of digital maturity and investigating the impact of digital leadership on five factors of digital maturity based on the digital maturity model used. Drawing upon a conceptual framework rooted in the literature on digital leadership and digital maturity, the study utilises an established digital maturity instrument, the Unified Digital Maturity Model by Armstrong & Lee (2021). The research employed a quantitative approach, utilizing a sample of 150 employees from various fintech companies in South Africa. Data was collected through a structured survey instrument, and statistical analysis, including regression analysis, was conducted to examine the relationship between digital leadership behaviours and organizational digital maturity levels. The findings reveal significant positive correlations between digital leadership and all five factors of digital maturity studied, namely Customer Orientation & Engagement, Digital Product Innovation, Workforce Enablement & Performance, Core Processes Digitisation and New Value Streams & Business Models. The study identifies the top three most critical digital maturity constructs as Organisational Culture, Workforce Enablement & Performance, Customer Orientation and at indicator level, found eight critical variables. These results underscore the importance of cultivating digital leadership capabilities to foster high digital maturity and in turn, streamline digital transformation in the South African fintech context. The study concludes by highlighting the imperative for organizations to prioritize investments in digital leadership development as a strategic imperative for navigating the digital landscape effectively.

KEYWORDS

Digital Leadership, Digital Maturity, Digital Transformation

DECLARATION

I, Aasma Jaffer, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in the field of Digital Business at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Name: Aasma Jaffer Signature: 

Signed at Sandton

On the 19 day of July 2024.

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CHAPTER 1. INTRODUCTION

1.1 Statement of purpose

The purpose of this quantitative study is to investigate the impact of digital leadership on digital maturity at a South African fintech group.

1.2 Background of the study

The global business environment and operations are rapidly evolving due to digital transformation AlNuaimi et al. (2022). The phenomenon has attracted significant attention from scholars and practitioners worldwide, with research indicating that organizations that successfully embrace digital transformation can achieve numerous benefits such as improved efficiency, increased innovation, and enhanced customer satisfaction (Westerman et al., 2014). Alongside this, digital maturity, which is used to measure transformation efforts, has also gained popularity. Despite the spotlight on digital transformation, many organizations struggle with digital transformation, and some fail in their attempts.

Furthermore, the impact of digitalisation is changing the nature of industries, markets and competition, at a broad level (Can, 2021). At a lower level, digitalisation is changing processes, relationships, group dynamics, attitudes and behaviours (Can, 2021). The associated risks, uncertainties and challenges necessitate an understanding into the role of leadership in technology change and digital transformation processes (Porfírio et al., 2021).

South Africa, like many other African countries, faces unique challenges in adopting digital transformation due to factors such as limited resources, inadequate infrastructure, and a lack of technical skills. These challenges include policy and legislation due to their important role in governing the digital environment (Chourabi et al., 2012), a need for greater investment in innovation and R&D (Manda & Backhouse, 2017), and digital readiness and inclusion in terms of skills and intellectual capital (Manda & Backhouse, 2017). The South African government has recognized the importance of digital transformation and has taken steps to address some of these

challenges. For example, the government has implemented policies and initiatives such as the National Integrated ICT Policy White Paper, which aims to promote the growth of the ICT sector in the country (South African Government, 2016). However, the success of digital transformation in South Africa remains uncertain.

This research aims to contribute to the existing body of knowledge of leadership practices in relation to digital transformation and digital maturity within the South African context. It will also provide unique insights into the leadership challenges and successes at specific South African organisations.

Methodologically, this study provides insights into the application of quantitative methods to assess digital leadership and maturity. Furthermore, this research aligns with several Sustainable Development Goals (SDGs), including SDG 9 (Industry, Innovation, and Infrastructure) and SDG 4 (Quality Education), by promoting an understanding of digital transformation processes that can drive economic growth and development.

1.3 Research problem

The digital business field is constantly evolving, with new technologies emerging at a rapid pace. This evolution necessitates effective digital leadership and management to aid with successful digital transformation.

Leadership itself continues to evolve in response to changes in the social, economic, and technological landscape. In the context of the digital age, leadership has evolved to include the use of technology and digital tools to facilitate communication, collaboration, and innovation (Andal-Ancion et al., 2003). This evolution has given rise to the concept of digital leadership.

Despite the growing interest in the role of leadership in digital transformation, literature appears to lack essential connections between leadership and the outcomes of digital transformation (Can, 2021). This gap in the literature highlights the need for research to explore the relationship between leadership and digital transformation.

In support of the requirement for research in leadership, Kane (2018) reports that 4300 global executives indicate that organisations require new leaders to thrive in the digital age, with 68% indicating that their organisation currently requires new leadership to be competitive. Further, they have found that more than 50% of digitally maturing companies report a lack strong leadership. These findings suggest a shortage of leaders with the necessary skills for the digital world, emphasizing the importance of developing new leaders with specific skills to drive digital transformation. This underscores the need for research connecting leadership to digital transformation.

A lack of understanding of the relationship between digital leadership and both digital transformation and digital maturity creates a gap in implementing suitable leadership in the digital economy, ultimately decreasing the effectiveness of digital transformation efforts.

This study seeks to address the problem of leadership challenges that organizations face in successfully implementing digital transformation initiatives. Although many organizations recognize the benefits of digital transformation, they often struggle to achieve successful outcomes. The limited or lack of effective and relevant leadership, particularly digital leadership, is a key factor hindering these initiatives.

Therefore, this study will focus on exploring the relationship between digital leadership and digital maturity. It will investigate the characteristics of digital leadership and how they can effectively enhance organizational maturity.

1.4 Research objectives

The objectives are based on the Digital Maturity model by Armstrong and Lee (2021b). Armstrong and Lee (2021b) definition of “Leadership & Architecture” or “Leadership & Strategy” as per the model version used, is adopted to represent Digital Leadership.

The model is viewed at four levels: model-level (digital maturity), dimension-level (Digital Leadership and Digital Application & Impact), factor-level (factors within each dimension) and indicator-level (sub-factors). The objectives and hypotheses are stated below.

Primary Objective: Determine the impact of Digital Leadership on Digital Maturity at a South African fintech group. The following sub-objectives emanate from the main objective.

Objective 1 - To determine the critical factors and variables influencing Digital Maturity at a South African fintech group.

Objective 2 - To determine the impact of Digital Leadership on Digital Maturity Factors.

a) **Objective 2.1** - To determine the impact of Digital Leadership on Customer Orientation & Engagement.
    - Hypothesis**:** Digital Leadership has a positive impact on Customer Orientation & Engagement.
b) **Objective 2.2 -** To determine the impact of Digital Leadership on Digital Product Innovation.
    - Hypothesis**:** Digital Leadership has a positive impact on Digital Maturity Factors.
c) **Objective 2.3 -** To determine the impact of Digital Leadership on Workforce Enablement & Performance.
    - Hypothesis**:** Digital Leadership has a positive impact on Workforce Enablement & Performance.
d) **Objective 2.4 -** To determine the impact of Digital Leadership on Core Processes Digitisation.
    - Hypothesis**:** Digital Leadership has a positive impact on Core Processes Digitisation.
e) **Objective 2.5 -** To determine the impact of Digital Leadership on New Value Streams & Business Models.
    - Hypothesis**:** Digital Leadership has a positive impact on New Value Streams & Business Models.

1.5 Rationale

The increasing digitization of business has created a pressing need for organizations to adopt digital transformation initiatives to remain competitive and relevant in today's

market. The success of such initiatives is heavily influenced by leadership, with digital leadership and transformational leadership both playing key roles in driving and supporting digital transformation efforts.

However, despite the growing interest in the role of leadership in digital transformation, literature appears to lack essential connections between the two (Can, 2021). There is a lack of research that specifically examines the relationship between digital leadership and transformational leadership components and digital transformation outcomes (Can, 2021).

Empirically, the study builds on existing literature in digital transformation, leveraging digital maturity as a measure of digital transformation. It explores the components of the leadership styles that are associated with digital transformation success.

The study is significant in that it contributes to the understanding and practice of digital business and business leadership in the context of digital transformation. Firstly, by examining the relationship between digital leadership and its impact on digital transformation outcomes, the study addresses this gap and provides valuable insights. Secondly, by identifying the specific leadership components associated with digital transformation organisations can gain a better understanding of and develop the necessary leadership capabilities. Organisations can in turn enhance their leadership development programs and align leadership strategies to achieve digital transformations goals. Thirdly, the study aims to provide insights and practical implications of effective leadership practices considering digital transformation.

1.6 Delimitations of the study

The delimitations of the study are:

- South African context.
- Limited to a specific group of companies, therefore findings may not necessarily be generalised.
- A quantitative study is performed due to the limited duration of the study. More nuanced aspects may be missed, but quantitative is still suitable for the study.

- The study only focuses on certain components of digital leadership and digital maturity as per the selected digital maturity model. Selection was based on what was deemed most applicable to the organisations in study, and to control the length of the survey. There is scope to study further areas of digital maturity.'

1.7 Definition of terms

The key terms of the study are defined in Table 1 and detailed in Section 2.2.

Term	Definition
Digital Leadership	The adequate leadership of an organisation, its employees and oneself (self-leadership) as well as the ability to lead a sustainably successful strategic position of an organisation in the digital age, factoring the accompanying challenges and conditions of the digital age (Imhof & Grivas, 2022). In this study, Digital Leadership adopts Armstrong & Lee's definition of Leadership & Architecture.
Digital Maturity	The extent to which an organization has successfully integrated digital technologies into its operations and has the ability to adapt to the constantly changing digital landscape (Kane et al., 2015).
Digital Transformation	The sum-total of organisational change efforts in response to technological change (Armstrong & Lee, 2021b).

Table 1: Definition of terms

1.8 Assumptions

- The organisation in study has undergone or is currently undergoing some form of digital transformation.

1.9 Chapter Outline

An outline of the document is presented in Table 2.

ORIENTATION	
Chapter 1	Chapter 1 outlines the purpose of the study, the context of the study, research problem, research objectives, research questions and significance of the study.
LITERATURE REVIEW	
Chapter 2	Chapter 2 defines key concepts and critically reviews literature around the relationships between digital leadership and digital maturity.
RESEARCH METHODOLOGY	
Chapter 3	Chapter 3 outlines the methodology that will be used in carrying out the study. It covers research design, research method, population & sampling, validity & reliability, data collection, limitations, and ethical considerations.
RESULTS	
Chapter 4	Chapter 4 will present the results obtained from the data analysis of the interviews.
DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS	
Chapter 5	Chapter 5 will provide a discussion of the results and findings, draw conclusions, discuss practical implications, and provide recommendations.

Table 2: Chapter outline

CHAPTER 2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

The aim of this chapter is to define key concepts and review prior studies in this area.

First, it looks at terms related to Digital Transformation and Digital Maturity. Research is used to establish the relationship between the two and explains why, despite not explicitly defining digital transformation as a key concept under study, it is inherently factored through its link to digital maturity. It also supports why literature on both digital maturity and digital transformation is reviewed.

Secondly, leadership areas and underlying theories are unpacked.

Thirdly, the relationships between Digital Leadership and Digital Transformation or Digital Maturity are reviewed.

2.2 Definitions

Before delving into the relationship between the leadership styles and digital transformation, key concepts are defined.

To understand digital leadership and digital maturity, certain topics need to be explained first. Digital topics such as technological disruption and the fourth industrial revolution are first defined. This is for two reasons, the first is that these terms are often confused or used synonymously, and secondly, as digital transformation and digital maturity are often linked to the base terms. On the leadership side, traditional leadership styles are first defined, firstly because digital leadership has roots in other traditional leadership styles and secondly, to show that digital leadership is assumed to be the most suitable for digital transformation.

2.2.1 *Digital Definitions*

This section looks at definitions related to digital transformation and digital maturity.

2.2.2 *A Build-Up to Digital Transformation*

There are multiple terms in circulation associated with digital. This includes digital, digitisation, digitalisation, digital transformation, digital maturity, technological change and 4IR. This section unpacks these terms and defines them for its use in the paper.

Digitisation is a technical term that refers to the conversion of analogue information to discrete data (Koch, 2017), such as binary which is a computer-readable format. Examples of digital technologies includes computers, cloud computing and AI. Autio (2017) defines digitalisation as the application of digital technology in business, economy, and society. Digital disruption then refers to the transformative impact of digitalisation on the operation on business, economy and society (Autio, 2017).

In this paper, digital refers to not only the underlying technologies related to computation, storage and networking (such as artificial intelligence and internet of things) but also extended to include any emerging technology that greatly impacts the business, social, economic or political landscape in accordance with the definition by Armstrong and Lee (2021b).

An immense driver of technological change is the fourth industrial revolution (4IR). It is described as the advent of cyber-physical systems (Schwab & Davis, 2018). Emerging 4IR trends include cloud computing, the internet of things (Salviotti et al.), artificial intelligence (AI), robotics and robotic process automation (RPA), virtual and augmented reality, blockchain, big data, cybersecurity, additive manufacturing, and biotechnology. The fourth industrial revolution represents a fundamental change in the way we live, work and interact with each other (Schwab & Davis, 2018).

2.1.1.1 Digital Transformation Definition

Digital transformation has become a buzzword in recent years, but there is no widely accepted definition of the term. At its core, digital transformation refers to the integration of digital technologies into all aspects of an organization, fundamentally changing how it operates and delivers value to customers (Westerman et al., 2014). This involves not only the adoption of new technologies, but also the transformation of processes, culture, and customer experience (Berman & Marshall, 2019).

Digital transformation in this paper is viewed as a process, rather than an outcome, and is supported by the statements to follow. The definitions digital transformation explored below closely support this view.

Digital transformation is often driven by the need to keep up with changing customer expectations and the rapid pace of technological change (Gupta et al., 2019). As such, it is a continuous process of innovation and adaptation, rather than a one-time event (Gupta et al., 2019).

Armstrong & Lee (2021, p. 7) define digital transformation as the sum-total of organisational change efforts in response to technological change. They further state that this process can be strategic, deliberate, or emergent. The end goal is a desired state of digital maturity, which is described in a section below. The result is a marked change in the form and nature of the organisation, particularly with the end-state of organisational improvement (Armstrong & Lee, 2021b).

2.1.1.2 Digital Maturity Definition

There are several definitions in literature of digital transformation, most of which refer to it being a measure of an organisation's digital transformation state at a point in time. This section explores various definitions, which was then used to adopt a definition for the purpose of this study.

With maturity as a measure at a point in time, digital transformation is the process that takes an organisation from a current to a desired future digital maturity state (Armstrong, 2022).

According to Kane et al., (2015) digital maturity is the extent to which an organization has successfully integrated digital technologies into its operations and has the ability to adapt to the constantly changing digital landscape(Kane et al., 2015). It is a measure of an organization's digital readiness, capability, and agility to meet the demands of the digital age.

Armstrong and Lee (2021c, p. 7) define digital maturity as "a measure of an organisations ability to achieve desired strategic and operational outcomes in the

presence of and embracing profound technological change. It is a measure of where an organisation is in its digital transformation journey".

The latter definition is used as the primary definition of digital maturity in this study.

2.1.1.3 Digital Maturity as part of Digital Transformation

Digital transformation is a part of digital transformation, specifically it is an end-state of digital transformation. This section serves to clearly point out the interrelatedness of the two, and act as rationalisation for why using digital maturity as a key concept is still inclusive of digital transformation without explicitly investigating digital transformation.

To reiterate, digital transformation is a process, while digital maturity is a state at a point in time. The end goal of a digital transformation process is a desired state of digital maturity (Armstrong & Lee, 2021b, p. 7).

2.1.2 Leadership Concepts Definition

While digital leadership is the focus of this study, leadership as a whole must be unpacked first. The reason is that some components of digital leadership are deep-rooted in other foundational leadership theories. This section then defines multiple leadership styles and theories.

Beginning with a definition of leadership itself, Northouse (2019) defines leadership as the ability of an individual or group to influence and guide others towards a common goal or objective. It involves the use of various skills and strategies to motivate, inspire, and direct people towards achieving a desired outcome (Northouse, 2019). According to Bass and Riggio (2006), leadership involves the interaction between a leader and their followers, with the aim of achieving a shared vision or goal.

2.1.2.1 Transformational Leadership Definition

Transformational leaders motivate and inspire followers to accomplish outstanding results while also honing their own leadership skills (Bass & Riggio, 2006).

Transformational leaders stimulate and inspire followers to achieve extraordinary outcomes while also developing their own leadership abilities.

Transformational leadership has three attributes (Can, 2021): setting employees vision and values, (Van der Weerd et al., 2017) concern for employees and their expectations, (3) aiding employees in building capabilities to solve issues in new ways (Bass, 1999).

Transformational leadership is better suited to human-intensive environments where the focus is on influencing through motivation and respecting their emotions based on common goals, beliefs, and values (Khan et al., 2016).

2.1.2.2 Transactional Leadership Definition

Transactional Leadership Style uses contingent rewards systems to communicate performance expectation and acknowledges excellent performance. The style views contractual agreements are the primary motivators and employ rewards systems to motivate employees (Khan et al., 2016).

Transactional leadership is preferred in situations requiring a high degree of precision, technical expertise and time constraints such as in technology intensive applications (Khan et al., 2016).

2.1.2.3 Digital Leadership Definition

Leadership continues to evolve in response to changes in the social, economic, and technological landscape. In the context of the digital age, leadership has evolved to include the use of technology and digital tools to facilitate communication, collaboration, and innovation (Andal-Ancion et al., 2003). This has given rise to the concept of digital leadership.

Looking at the nature and roots of digital leadership, digital leadership is multi-dimensional and contains elements from authentic leadership, transactional leadership and transformational leadership (Abbu et al., 2022-5-4; Prince, 2018). Digital leadership focuses on implementation of digital transformation and enables an

organisation to digitise their environment and learning culture (Sağbaş & Erdoğan, 2022).

Imhof & Grivas (2022) define digital leadership as the adequate leadership of an organisation, its employees and oneself (self-leadership) as well as the ability to lead a sustainably successful strategic position of an organisation in the digital age, factoring the accompanying challenges and conditions of the digital age.

2.3 Theoretical framework underpinning the study

Digital leadership and digital maturity are a relatively new and evolving fields and, as such, draw on various theoretical frameworks. Some of the key associated leadership styles and digital maturity frameworks are stated below. The researcher will then select the two most relevant frameworks to proceed with the study.

2.3.1 *Great Man Theory*

According to Great man theory, leaders are born with innate qualities that make them exceptional (Spector, 2016). In other words, good leadership is genetic (Uslu, 2019). Leaders of the great man theory have inherent qualities such as intelligence, charisma, and assertiveness that allow them to emerge organically as leaders (Spector, 2016).

Uslu (2019) criticises great man theory for lacking empirical evidence, scientific rigor, and reality. He also criticises its lack of situational factors and male-favoured gender bias (Uslu, 2019). Tolstoy agrees in part, constructing a counter-narrative claiming that the theory is inadequate and that it only persists because of the biases incorporated into its narratives. Tolstoy's theory depicts leaders of the great man theory as vain, their power as an illusion and their directives as ineffective (Mouton, 2019).

2.3.2 *Trait Theory*

Rather than innate characteristics like in the great man theory, trait theory focuses on actions and behaviours of leaders, making no assumptions as to whether traits were genetically or otherwise acquired (Khan et al., 2016). According to trait theory, personality traits such as intelligence, self-confidence, integrity emotional intelligence

are linked to good leadership (Zaccaro, 2007). Trait based leaders are thought to have a complete set of leadership characteristics (Uslu, 2019).

Uslu (2019) criticises the theory for lacking empirical evidence, failing to account for situational factors and failure to provide clear measurement characteristics.

2.3.3 *Behavioural Theory*

Behavioural theory is distinguished from trait and personality-based approaches described in the previous theories and instead focuses on how leaders behave and what they do (Northouse, 2021). According to Northouse (2021) literature revealed two behaviour types: task behaviours (for achieving goals) and relationship behaviours (aid followers in feeling comfortable with themselves and the situation), where the effective combination of the two in reaching a goal is the ultimate goal of behavioural theory. Behaviours according to this theory can be seen and learned and effective leaders can be trained (Uslu, 2019).

Two major studies have been conducted into behavioural leadership: The Ohio State Studies and The University of Michigan Studies. The Ohio State Studies identified two key dimensions of leadership behaviour: consideration (for relationships) and initiating structure (task orientation) (Schriesheim & Bird, 1979). The Michigan State Studies identified two leadership styles: employee-oriented and production-oriented (Sashkin, 1987).

Criticism of this theory includes inconsistency in the findings of this theory and it also lacks situational factoring (Uslu, 2019).

2.3.4 *Contingency Theory*

In contingency theory, the best leadership style is dependent on the situation, so there isn’t an all-round optimal leadership style (Uslu, 2019). The behaviour of leaders is thought to be adaptable, in that the leader adapts their behaviour according to characteristics of the follower and situation (Yukl, 2011).

A disadvantage of contingency theory is that it assumes that the leader is capable of accurately diagnosing elements of both the leadership and follower situation (Yukl, 2011). Similar to the aforementioned theories, contingency theory lacks empirical evidence (Yukl, 2011).

2.3.5 *Situational Leadership*

Situational Leadership proposes that leadership effectiveness is dependent on the leaders ability to match their style to the competence and commitment of their followers (Northouse, 2021).

Northouse (2021) includes a dimension of follower competence, summarising contingency theory to require its leaders to adapt their style depending on the competence and commitment of its followers.

Situational leadership has limited empirical research and fails to describe how follower commitment levels are weighted (Northouse, 2021).

2.3.6 *Path-Goal Theory*

According to Situational Leadership theory, leadership effectiveness is determined by the leader's capacity to adapt their style to the developmental readiness of their followers (House & Mitchell, 1975). A leader must use the style that best meets the followers motivational requirements which is achieved by selecting behaviours that complement or supplement missing behaviours (Northouse, 2021).

Path-goal theory has a good theoretical framework to understand the relationship between leadership behaviours affect followers performance and satisfaction (Northouse, 2021).

Despite its strengths, the theory has only partial empirical research support, is very complex making interpretation difficult, and does not sufficiently explain the relationship between leadership behaviour and follower motivation (Northouse, 2021).

2.3.7 *Unified Model for Digital Maturity*

Armstrong and Lee (2021a) consolidate models from global advisory firms, literature, books and additional authors to develop a unified model for digital maturity. The result is a model with 2 dimensions, 12 factors and 54 indicators.

The two dimensions are Leadership & Strategy and Digital Application and Impact. The 12 factors are: Vision and Strategy, Organisational Culture, Organisation and Governance, Innovation & Investment, Digital Ethics, Customer Orientation & Engagement, Digital Product Innovation, Workforce Enablement & Performance, Core Process Digitalisation, New Value Streams and Business Models, Digital Skills, and Technology Excellence. These factors are then broken down into indicators as per Figure 1.

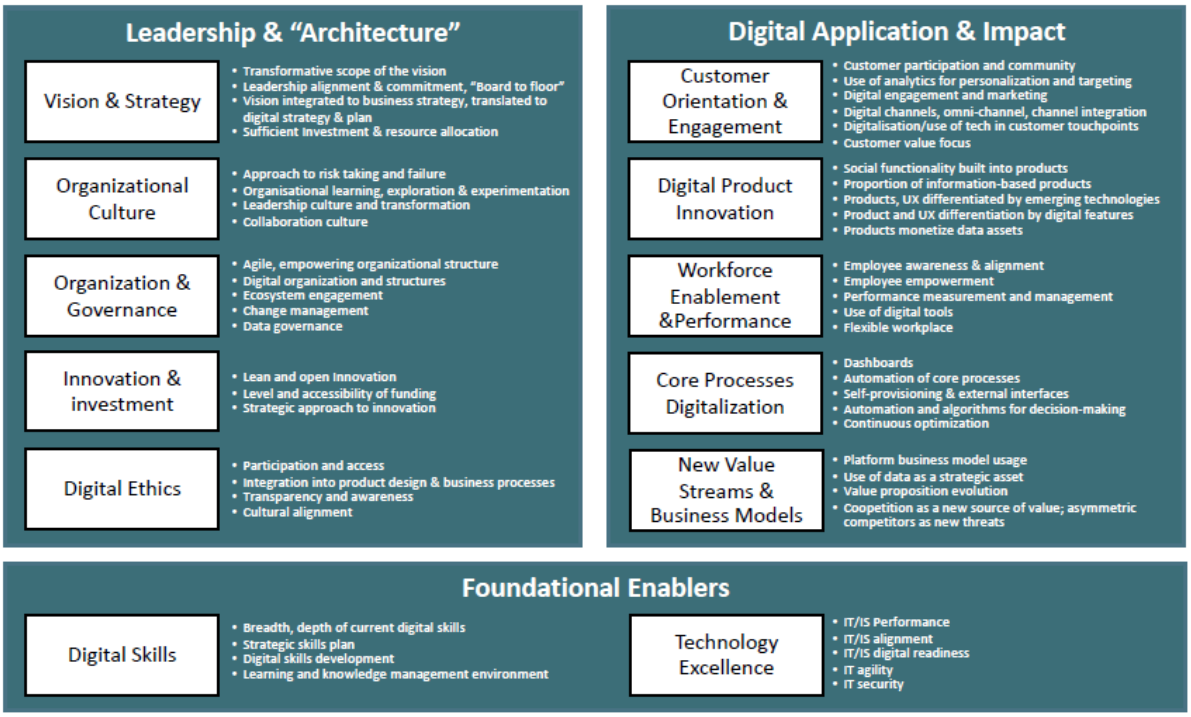

Figure 1: The Unified Digital Maturity Model (Armstrong & Lee, 2021c)

2.3.8 *Conceptual Framework*

The Unified Model for Digital Maturity by Armstrong and Lee (2021a) is selected as the most suitable model. While the leadership theories described are relevant to the

study, this model was deemed to have the greatest applicability. A few of the reasons are stated below.

Firstly, the model covers digital maturity as it is by definition a digital maturity model. Digital leadership is covered as one of the models two components “Leadership & Strategy”.

Secondly, the model covers the key concepts in this study (digital leadership and digital maturity) in one model, which eliminates the issue of possible overlaps or conflicting definitions when using separate models for the concepts.

Thirdly, the model covers the concepts comprehensively in the appropriate context. It looks at digital maturity in the context of digital transformation, making it more relevant and specific. It also captures leadership in the digital age and describes how digital leadership influences maturity.

The Unified Model for Digital Maturity by Armstrong and Lee (2021a) is then used as the conceptual framework going forward.

2.4 Prior Studies and Literature

This section looks at digital transformation and digital maturity models and then expands into the relationship between both digital leadership and transformational leadership with digital transformation.

2.4.1 *Digital Leadership*

Imhof & Grivas (2022) illustrate four main digital leadership areas within an organisation as in, namely Strategic Position Leadership, Organizational Leadership, Employee Leadership, and Self-Leadership as per Figure 2. The combination, which overlaps and shows an interrelationship, represents an organisation embedded in the digital economy in the digital age (Imhof & Grivas, 2022).

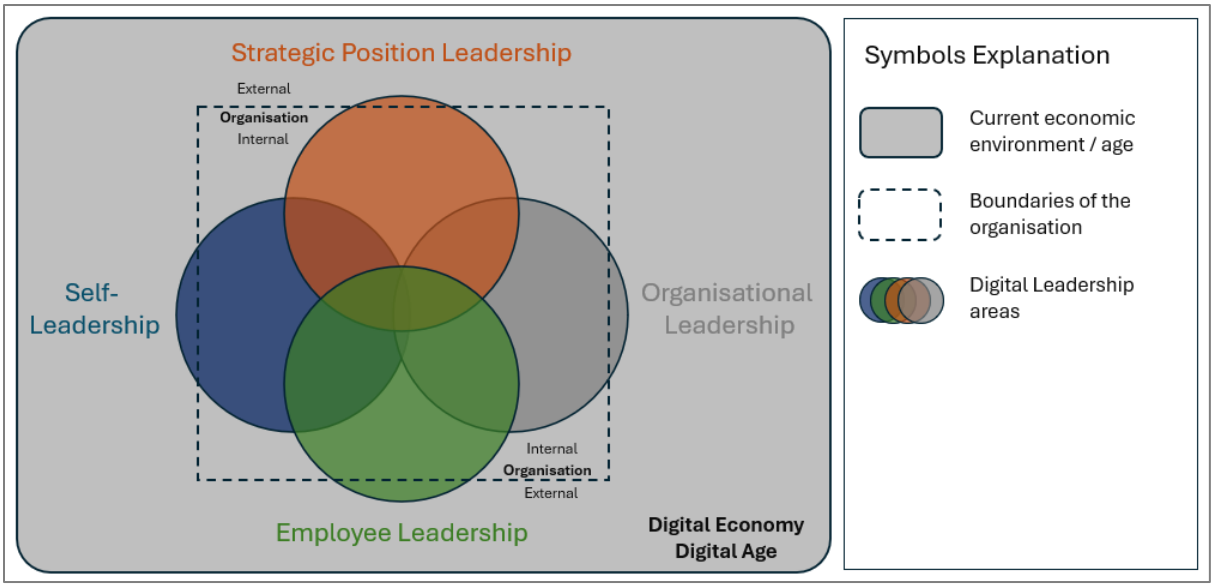

Figure 2: The big picture of Digital Leadership with four main Digital Leadership areas in an organisation (Imhof & Grivas, 2022).

Digital Leadership Characteristics

Since characteristics of digital leadership must be identified to link to digital transformation, literature of digital leadership characteristics is reviewed. The various characteristics of digital leadership are covered below.

Koen (2019) proposes five skills that every digital leader needs, which are innovativeness, technological relevance, collaboration, agility, and data-driven decision making.

Kane (2018) used digital maturity levels as a basis for digital transformation success and found the following traits for successful digital leaders: direction (vision and purpose), innovation, execution (empowering out of the box thinking), collaboration, inspirational leadership, business judgement (decisions in an uncertain context), continuous talent development and influencing talent abilities.

Sullivan (2019) mentions eight top skills of today's digital leaders as digital literacy, digital vision, advocacy, presence, communication, adaptability/agility, self-awareness, and cultural awareness.

Abbu et al. (2022) in a study which emphasises the importance of the human element in digital leadership and ultimately successful digital transformation propose a scale to

assess digital leadership capabilities. The 15 dimensions are honesty, humility, courage, ethical AI, growth mindset, transparent agenda, data focus, inspire engagement, storytelling, digital literacy, positive attitude, skills acquisition, knowledge sharing, participative style and track record (Abbu et al., 2022).

Roe (2018) proposes 7 Skills and Characteristics of a Successful Digital Workplace Leader as intellectual curiosity, understanding human and customer nature, vision of where business is headed, and passion and purpose.

Gorton (2018) proposes Six Characteristics of Digital Leadership as people and ways of working, digital skill development, integrating digital technologies, integrating digital technologies, customer focus and inspiring stakeholders.

Promsri (2019) performs and analysis to find the top traits using commonality in models. The model proposes the “Six Characteristics of a Digital Leader for Digital Transformation Success” indicated that digital leaders surveyed demonstrated six key characteristics: digital knowledge and literature, vision, customer focus, agility, risk-taking and collaboration.

The Armstrong and Lee (2021a) Unified Digital Maturity Model, under the classification of Leadership & Strategy, have the following factors: Vision & Strategy, Culture, Organisation & Governance, New Value Streams and Business Models, Innovation and Investment, and Digital Ethics.

A common theme and traits arise in the above models. Imhof and Grivas (2022) analyse multiple models and introduce the 20 most relevant factors for successful and sustainable digital leadership and provides implementation guidance. The factors are: Digital Openness, Customer Centricity, Focus on Uniqueness, Collective Intelligence, Leadership Approach (Participative), Agility, Intraprenuership, Innovation Culture, Cybersecurity, Organisational Structures (Flatness), Mistake-Making Culture (Positive), Culture of Trust, Culture of Esteem, Meaningfulness of Work, Empathy, Flexible Working, Remote Work, Digital Responsibility, Self-Determination, and Self-Engagement.

2.4.2 *Digital Leadership Linked to Traditional Leadership Styles*

Digital leadership is multi-dimensional and contains elements from authentic leadership, transactional leadership and transformational leadership (Prince, 2018).

By applying modern day terminology to transformational leadership terms, we see the link between the two. The transformational leadership attributes are first re-stated, then the mapped to digital leadership in the paragraph to follow.

Transformational leadership has three attributes (Can, 2021): setting employees vision and values (Van der Weerd et al., 2017), concern for employees and their expectations (Van der Weerd et al., 2017), (3) aiding employees in building capabilities to solve issues in new ways (Bass, 1999).

To link transformational to digital leadership, the first attribute speaks to digital vision, finding new technologies and business models. The second deals with personalisation such as customised training based on new digital technologies. The third speaks to intellectual stimulation (Can, 2021).

2.4.3 *Digital Leadership Linked to Digital Transformation and Digital Maturity*

Transformation from a leadership perspective, refers to creating an evident difference, which requires new leader mindsets and qualities (Williams, 2006).

This section looks at the relationships between digital leadership and both, digital transformation and digital maturity in literature including prior studies.

Relationship Between Digital Leadership & DT

Even with growing interest in the role of leadership in digital transformation, literature appears to lack essential connections between the two (Can, 2021).

The relationship between digital leadership and digital transformation is crucial in the current digital era. Several studies have investigated links between digital leadership and digital transformation, as outlined below.

Abbu et al. (2022) states that digital leaders play a vital role in digital transformation by raising the confidence needed to embark on disruptive and high-risk initiatives. They state that the human dimensions of digital leadership play a major role in digitally mature organisations (Abbu et al., 2022). The outcome of the quantitative global study is an instrument for assessing the human dimensions of digital leadership for successful digital transformation.

A qualitative study on German employees by Weber et al. (2022) indicate that new leadership roles emerge and are necessary for successful digital transformation and that ultimately, digital transformation requires leaders with a high level of behavioural complexity to solve associated challenges. The study builds on the competing values framework. The key leadership roles that the authors suggest being part of the *digital transformation leadership framework* are identified as the digital pioneer, the innovator, the enabler, the mentor, the networker and the manager (Weber et al., 2022).

Mutwa (2021) in a South African qualitative study explores the role of leaders in embedding a digital transformation culture. The leadership adopted here focuses on innovation, collaboration, and cross-department communication, and as such the findings of this study is grouped under digital leadership due to the resemblance to this leadership styles traits. The results indicate that awareness and organisational learning are critical in development of a common and shared knowledge of digital transformation culture and anticipated behaviour.

Imhof and Grivas (2022) states that digital leadership enables an organisation to lead adequately and in the digital age and to stay competitive. The global qualitative exploratory study reveals 20 Factors for understanding and developing digital leadership. These factors include digital openness, customer centricity and agility (Imhof & Grivas, 2022).

A global study by Westerman et al. (2012) indicates that digital leaders outperform peers across all industries, with the highest category performing better by 6-9% by revenue. The authors propose a model that links digital intensity to transformation management intensity, thereby measuring digital maturity. The *digrati,* which is posed as the ‘ideal’ response, links business value to the transformation traits of

transformative vision, careful governance engagement and sufficient investment in new opportunities (Westerman et al., 2012).

In a USA-based qualitative study, Sow and Aborbie (2018) argue that a combination of leadership styles or traits are essential for digital transformation. While stating favourable characteristics of transformational leadership, they also highlight additional essential characteristics (which resemble digital leadership characteristics as per literature in this paper) as: understanding of processes, embrace change and innovation, employee trust, support diverse organisational culture, flexibility and support of employees (Sow & Aborbie, 2018).

A qualitative global study by (Kane, 2018) through a study of 4300 executives indicated that organizations require new leaders to succeed in the digital age to compete effectively. It states the importance of digital leadership is essential to compete in a changing environment, emphasising the need of leaders to adapt their organization and leadership styles to compete. Findings results in key leadership requirements as direction, innovation, execution, collaboration, inspirational leadership, business judgment, talent building and influence amongst the top leadership traits of digitally mature organizations.

A study by Magesa and Jonathan (2022) found that a good digital leader fosters economic growth, promotes innovation and entrepreneurship and improves service delivery. The quantitative study was carried out in Tanzania. The outcome of the study was attributes of a leader in digital transformation.

On the other hand, a study by Kokot et al. (2023) indicates a negative correlation between the level of digital leadership and digital maturity in Croatian organisations. The quantitative study examined 156 small and medium Croatian organisations. It further found that gender had an impact on digital maturity.

2.5 Digital Maturity Factors

This section looks at the influence of certain demographics on the factors of digital maturity. The demographic categorical variables analysed are based on those most relevant to the study and are age, gender, tenure, position, and education. The digital

maturity factors are aligned with those in the selected model by Armstrong and Lee (2021a).

An empirical study by Wang et al. (2018) performed on Chinese organisations found that digital transformation is affected by the leader's gender, age, educational background, and experience in the industry. A study by Wiersema and Bantel (1992) states that corporate strategic change is supported by lower age, higher education level and lower organisational tenure.

Along with other sources, each of the above will be unpacked by demographic in the sub-sections to follow.

2.5.1 *Gender*

Male CEO's produce higher digital transformation outcomes that female CEOs (Wang & He, 2024).

2.5.2 *Age*

A study by Vroom and Pahl (1971) found that age impacts innovation, specifically risk taking. The paper groups ages and links it to risk taking capabilities. Executives under 40 are inexperienced, senior executives (40 – 59) are at the peak of their careers and are energetic and risk taking; executives over 50 are approaching retirement and are risk averse (Vroom & Pahl, 1971). They summarise to say that executives at middle-age (40-49) are more inclined to drive digital transformation.

Wang and He (2024) state that middle-aged (40's and 50's) executives are most effective at improving digital transformation than other age groups.

A study by Wiersema and Bantel (1992) opposes the above, saying that a lower age groups are better at change management than older groups. This refers to the change component, which is more digital transformation than digital maturity (the outcome part), which must be factored in analysis.

2.5.3 *Education*

A study by Wiersema and Bantel (1992) states that a higher education level is associated with better corporate strategic change management. Leaders with higher levels of education are better at processing information and are better at cross-functional roles (Wiersema & Bantel, 1992) and (Schroder et al., 1967). Wang and He (2024) found that highly educated CEO's improve digital transformation.

2.5.4 *Tenure*

A study by Wiersema and Bantel (1992) states that a shorter organisational tenure level is associated with corporate strategic change management.

2.6 Conclusion

The numerous amounts of diverse and often opposing leadership views, makes leadership a complex area. Digital transformation, known for being a disruptive force, further adds to the complexity of successfully combining the two.

The changing customer demands that digital transformation brings about such as agility, the use of ground-breaking technologies and new business models often means that traditional leaders might need to pivot their approaches to navigate organizations to success properly. This also means that new leadership roles emerge, which give rise to digital leadership.

The main objective analyses the impact of digital leadership on digital maturity at a South African fintech group. This is aimed at understanding what impact this leadership style, and components thereof, have on certain dimensions of digital transformation.

CHAPTER 3. RESEARCH METHODOLOGY

This chapter covers the research design, research method, population and sampling, and data collection methods. It then goes through the research instrument, data analysis, validity, limitations, and ethical considerations.

3.1 Research approach

Quantitative research numerically describes population trends by analysing a sample and generalising about a population (Creswell, 2003). For this reason, a quantitative approach was used for the measurement of variables related to digital leadership and digital maturity. It allowed generation of numerical data which was statistically analysed to detect trends and calculate the strength of relationships between variables. Data collection using a quantitative approach for this study yielded greater responses in a cost-effective manner.

Data was collected from online questionnaires to gain a better understanding of the relationship between digital leadership and digital transformation. Selected individuals within the South African fintech group were targeted to participate in the survey.

Despite the benefits of the chosen method, a quantitative method would not detect the full depth of participant experiences and would likely omit nuanced observations. Given the duration of the project, which is less than a year, the researcher has decided that the quantitative method was able to cover significant ground.

3.2 Research design

A survey was used in this study. The survey will be cross-sectional, which consists of data collection at a point in time obtained from questionnaires sent out to a sample of participants. A Likert scale was used to measure participant responses. The questionnaire was subject to supervisor review.

The research objective is aimed at determining the impact of digital leadership on certain dimensions of digital maturity in the South African context.

A cross-sectional survey was suitable for evaluating the relationship between leadership and digital maturity variables. In addition, it was an efficient way of gathering data, given the timeframe of the study. A survey also aided with standardisation, which helped compare data across participants and facilitated statistical analysis to determine relationships between variables and strengths thereof.

The advantages are that surveys allow collection of a large sample, making it easier to generalise. The quantifiable data produced enabled the use of statistical techniques so that relationships can be drawn, and quantitative conclusions drawn.

The downsides were a possible response bias, limited contextual understanding and the potential for measurement limitations in that accuracy of participant responses were dependent on their understanding of questions. There were also no open-ended questions to determine more nuanced aspects.

3.3 Data collection methods

Data was collected through online questionnaires sent out to a sample of the population. Links to the online questionnaires were distributed via email. The questionnaire was created in Qualtrics. A Likert scale was used primarily as a measurement scale in participant responses. Questionnaires were subject to supervisor approval prior to sending out.

The collection method is suitable for answering research questions as it can produce large amounts of quantitative data, which can be used for statistical analysis in determining correlations and strengths of relationships. It is also an efficient method of collecting large amounts of data.

To mitigate common method bias, questions were mixed across survey.

A pilot study was first sent out to test face validity. The pilot size was 30 and it was targeted at respondents from the different leadership levels and organisations (i.e., Group HR lead, junior developers, senior developers, and business unit leads). The outcomes from the pilot study reduced the initial number of questions by 8 due to survey length and relevance. Feedback also led to further adaptation of questions to the organisation, to make the questions clearer and arrive at the most accurate

response. These adjustments improved the survey's face validity by reducing response bias (removing less relevant questions), improving accuracy (by clarifying questions and adapting terminology to organisation, and by changing response type).

The changes made:

- Remove two sections of questions (a total of 8) – these only apply to one version of the maturity model and is not used in analysis.
- Rephrasing questions and adapting terminology to organisation's terminology – ensures respondents understand questions and thereby provide more accurate responses.
- Adapting information sheet by summarising and explaining role and place at the group of companies – this explained the survey better and due to it's brevity, promoted better reading.

3.4 Population and sample

3.4.1 *Population*

The population in this case is at South African group of fintech companies that have undergone some form of digital transformation – Organisation X, Organisation Y, Organisation Z and Group Level. Employees across the organization at varying leadership levels (positions), gender, age and tenure are targeted.

Companies in the fintech group offer a combination of the following services: Software design and development, cloud services, data services, and digital advisory. The largest employee group is software developers.

The researcher was, at the time of the study, employed at Organisation X. As a result, the researcher and certain respondents were colleagues. The researcher reported to potentially one respondent, however, due to the anonymity of the survey it isn't known if the specific employee at Organisation X participated in the survey. There was no direct line of reporting from respondents to the researcher.

The largest organization within the group is Organisation X. The organization with the highest percentage of people in leadership at group level is Organisation X. Organisation Y and Organisation Z are smaller companies which were only later acquired by the fintech group.

The exact numbers were not known to the researcher. Organisation X has roughly 500 employees, while Organisation Y and Organisation Z have around 200 and 100 employees respectively. 60 respondents were sampled from Organisation X in an aim to obtain diversified views, the number was maintained with Organisation Y and Z, knowing that the sampled percentage in Organisation Y and Z would be greater than in Organisation X.

Owing to the method used, sharing the survey through a company-wide email, the exact targeted proportion from each organisation could not be guaranteed.

3.4.2 *Sample*

The sample targeted 60 participants per organisation, across the four organisations. An anonymous link to the survey was shared with each of the participants by a human resources representative of each of the Organisations in a bulk mail with recipients being the entire mailing list of organisation. The survey contained contact details of the researcher, allowing the respondent to contact the researcher if there are questions or required clarity. Further, a message was sent out to the company-wide MS Teams chat with an anonymous link to the survey. The final outcome was a total of 150 participants between two organisations.

3.4.3 *Sampling method*

Purposive sampling was used to obtain responses at varying positions, or leadership levels within the organisation. The number 60 is chosen due to the size of the organisations and nature on information collected. Also, the aim was to get views from different leadership levels as this influences perception of digital maturity, the 60 is sufficient for this.

The demographic variation included: position, tenure, education, gender and age.

3.5 The research instrument

The questionnaire was based on the six research objectives and follows the structure below. See Appendix for the detailed questionnaire.

Part 1: Demographics

The questions were aimed at collecting basic demographic information and leadership level.

Part 2: Digital Maturity

The questions were based on the digital maturity model from Armstrong and Lee (2021a).

3.6 Data analysis strategies and interpretation

Data received from the questionnaire in Qualtrics was cleaned to remove unfit data. It was then transferred to SPSS, a statistical analysis tool for further analysis.

Statistical analyses were conducted using SPSS (Statistical Package for the Social Sciences) software, due to its comprehensive capabilities in handling both descriptive and inferential statistical procedures. The software's reliability and ease of use for performing complex statistical analyses made it an ideal choice for this research.

3.6.1 *Descriptive Stats*

The primary objective of employing descriptive statistics in this report is to provide a clear and concise summary of the data collected from the survey. This approach allowed us to present the basic features of the data in a manner that is easily understandable, setting the stage for more complex inferential statistical analyses. By analysing frequencies, means, standard deviations, and distributions, we aim to gain an initial understanding of the variables under study, including demographic characteristics and main variables related to digital leadership and digital maturity.

To achieve this, we followed a structured approach to descriptive statistical analysis:

- Data Preparation: Data cleaning and preparation for analysis. Data cleaning involved checking for and handling missing values, outliers, and ensuring that data is correctly coded for statistical software. Imputed values will be used in place of missing values. There were no incomplete responses as all questions after demographics were set to compulsory.
- Frequency Distributions: Calculating frequency distributions for categorical variables, such as gender, age groups, and position within the fintech industry. This step helps in understanding the composition of our sample and in presenting the demographic background of the respondents.
- Measures of Central Tendency: For continuous variables, calculate means to identify the average responses for key variables. This provides insight into the general tendencies within the data.
- Measures of Dispersion: Alongside means, calculate standard deviations to assess the variability or spread of responses around the mean. This is crucial for understanding how homogeneous or heterogeneous the responses are, indicating the level of agreement or diversity in perceptions among participants.

3.6.2 *Inferential Stats*

The utilization of inferential statistics in our research served a dual purpose: firstly, to explore and identify significant relationships between variables related to digital leadership and digital maturity, and secondly, to rigorously test the research hypotheses developed from the literature review. This approach enables us to infer from our sample data to the broader population, providing a robust basis for drawing conclusions about the impact of digital leadership on organizational digital maturity within the South African fintech industry.

Correlation Analysis

The objective is to examine the strength and direction of relationships between continuous variables, such as the level of digital leadership and measures of digital maturity.

We used Pearson's correlation coefficient to assess these relationships. A correlation coefficient (r) was calculated for each pair of continuous variables, with values ranging

from -1 to +1 indicating the strength and direction of the relationship. Significance levels were set at $p < .05$ to determine the statistical significance of the correlations.

The correlations indicated by different correlation coefficients are shown below:

Correlation range	Correlation strength
0.00 – 0.19	Very weak
0.2 – 0.39	Weak
0.4 – 0.59	Moderate
0.6 – 0.79	Strong
0.8 – 1.00	Very strong

Table 3: Correlation values

Multivariate Analysis of Covariance (MANCOVA)

The objective was to investigate the effect of digital leadership (independent variable) on multiple outcome variables related to digital maturity (dependent variables), while controlling for covariates that might influence the dependent variables.

MANCOVA was conducted, with digital leadership as the independent variable, dimensions of digital maturity as dependent variables, and factors such as company size and market segment as covariates. The analysis helped in understanding how digital leadership impacts various aspects of digital maturity when accounting for other influencing factors. Significance was evaluated based on Wilks' Lambda, with $p<0.05$ indicating statistically significant effects.

A. Independent-Samples Kruskal-Wallis Test

The objective was to assess whether there are significant differences in the distributions of a dependent variable (e.g., Vision & Strategy) across three or more independent groups defined by a categorical variable (e.g., age, gender, position, tenure).

The test was applied to compare the median scores of the dependent variable across different groups. This is particularly useful for data that do not meet the assumptions of normality required for ANOVA. For each comparison, the Kruskal-Wallis H statistic

will be computed, and the p-value was used to assess the significance of the differences observed. Significant results ($p < .05$) will indicate that there was sufficient evidence to suggest that the distribution of responses differs across a categorical variable.

B. Regression Analysis

The objective was to predict the impact of digital leadership (independent variables) on digital maturity (dependent variable), providing a model that quantifies this relationship.

Linear regression analysis was employed to develop a model that described the relationship between digital leadership and digital maturity. The regression equation included coefficients representing the impact of each independent variable on the dependent variable, allowing for predictions of digital maturity based on levels of digital leadership. The model's overall fit was evaluated using R-squared, and individual predictors were assessed for significance with p-values.

Based on parameter estimates from MANCOVA, the regression equation was arrived at by the following:

$$Y_i = \mathrm{c} + \beta X_i$$

Where Y_i is the Digital Maturity Factor, X_i is Digital Leadership, c is the intercept and β is the regression coefficient. The subscript i is an element of the digital maturity factors.

In other wordst:

$$\text{Digital Maturity Factor} = \text{Intercept} + (\text{Digital Leadership} \times \beta)$$

3.7 Validity and Reliability

Heale and Twycross (2015) suggest checking the reliability and validity prior to publishing a survey. A pilot study was conducted with 30 participants and the feedback incorporated. Cronbach's Alpha will be used to assess consistency and, eventually, dependability. Cronbach's Alpha values vary from 0 to 1.0. Taylor (n.d.) supplied the following scale for testing Cronbach Alpha values:

Cronbach Alpha Value	Internal consistency interpretation
0.6	Poor
0.7 – 0.79	Adequate
0.8 – 0.89	Good
0.9 – 0.99	Strong

Table 4: Cronbach Alpha value interpretation

3.7.1 *Internal Validity*

The use of a cross-sectional study aids in strengthening internal validity. To increase internal validity the researcher documented assumptions made, used standardised measurement instruments, and clearly defined research questions.

The instrument used, which was based on the Digital Maturity Model by Armstrong and Lee (2021a) is a standardised instrument, contributing to high validity.

3.7.2 *Objectivity*

To increase objectivity a structured questionnaire was used using a Likert scale for data collection, conducting data analysis using SPSS which is well known for objectivity and clearly documenting the research process.

3.8 Limitations

Certain limitations of the study are presented:

- Generalisation: a possible strong bias towards the organisations within the fintech group surveyed, making it less generalisable.
- Self-report bias: participants providing responses that make them feel better about the situation.
- Cross-sectional data: only provides a picture of the situation at a point in time, reducing the ability to establish general relationships.
- Specific to one digital maturity model.

- Time and resource constraints: due to the limited amount of time the survey can be carried out.

3.9 Ethical Considerations

The following will be considered to ensure that ethics are complied with:

- The questionnaire is purely voluntary.
- The participant can decline to answer any questions or withdraw from the process with no penalties.
- Consent will be gained from the participant and the survey will be accompanied by a letter with the researcher's details.
- No mandatory personally identifiable information will be collected.
- Identity of organisations will remain confidential.
- All data will be used only for academic purposes.
- Data will only be collected post Wit's ethics clearance.
- Personal information will be protected according to POPIA.
- Organisational strategy information for each of the companies are treated as confidential.

CHAPTER 4. PRESENTATION OF RESULTS / FINDINGS

4.1 Introduction

Chapter 4 focuses on presentation, processing, and interpretation of results from the survey conducted. In alignment with the methodological framework laid out in Chapter 3, this chapter is set out to sequentially address the various stages of data analysis.

Raw data is transformed into evidence to shed light on the dynamics between digital leadership and digital maturity, within the context of the study. Both descriptive and inferential statistical processing is performed.

The chapter is structured as follows:

- Descriptive Statistics
- Objective-specific results presentation and data analysis including regression analysis
- Reliability and normality testing
- Inferential statistics including the Kruskal-Wallis Test and correlation analysis

4.2 Data Preparation and Cleaning

The sample consisted of 129 participants from the fintech group. Most respondents were from Organisation X, Organisation Y and Group Level, with no responses from Organisation Z (see Section 4.3.1 for breakdown). Organisation Z, due to a lack of responses, will be excluded from analysis going forward.

Data from Qualtrics was exported to IBM SPSS Statistics version 29 for analysis.

Missing Values

The survey was set so that all questions on Digital Maturity were compulsory to answer. This minimised missing values but have affected accuracy of responses.

Out of the 129 cases, missing values were present. The missing values followed a pattern and were still used. The missing values and the corresponding imputed values are shown in the table in Appendix B1: Missing Values.

4.3 Demographic Analysis

This purpose of this section is to detail the demographic makeup of the sample. This involves presenting the distribution of respondents across various demographic variables, such as age, gender, position. The purpose of this analysis is to offer insights into the sample's diversity and to contextualize the inferential analyses that follow.

The demographic variables analysed are Age, Gender, Company, Education Level, Position and Tenure.

4.3.1 *Company*

The distribution of respondents by company are presented in Figure 3.

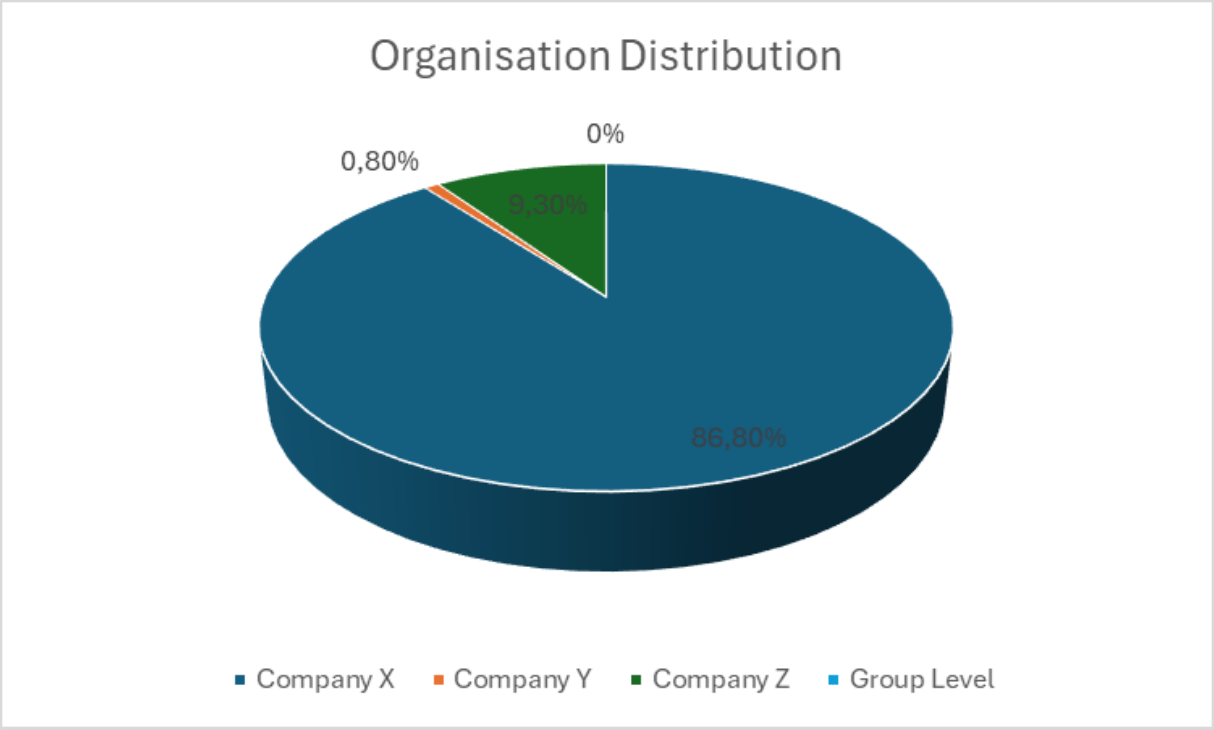

Figure 3: Respondent company distribution

Most of the participants, 86.8% are from Organisation X. The second most is 9.30% at group level. Organisation Y has 1 response. There are no responses from Organisation Z, and as such, both Organisations Y and Organisation Z are disregarded from the analysis.

4.3.2 *Age*

The age distribution from respondents is shown in Figure 4.

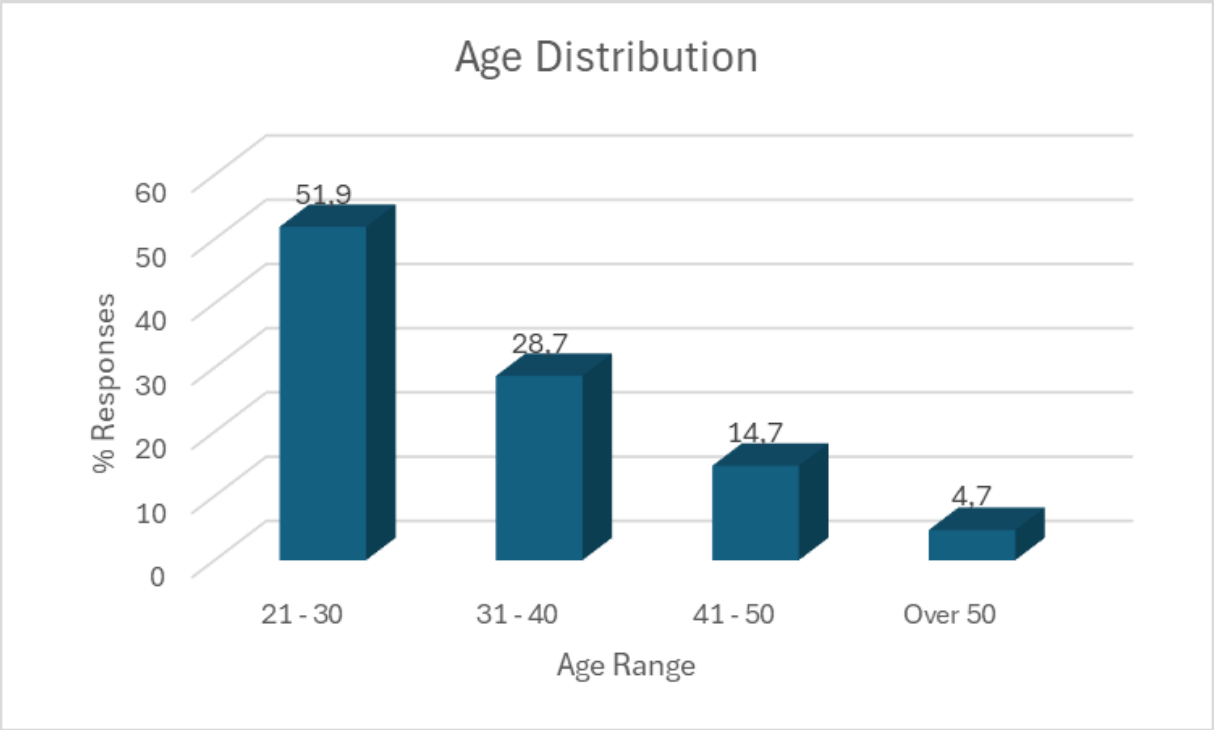

Figure 4: Respondent age distribution

There were 129 respondents in total. The majority, 51.9%, were between the ages of 21 and 30. The next largest group, 28.7%, were between 31 and 40 years old. Those between 41 and 50 years old made up 14.7% of the respondents, while those over 50 years old were the smallest group, constituting 4.7% of the sample. The percentages sum up to 100%, indicating that these age groups encompass all survey participants.

4.3.3 *Gender*

The gender distribution from respondents is shown in Figure 5.

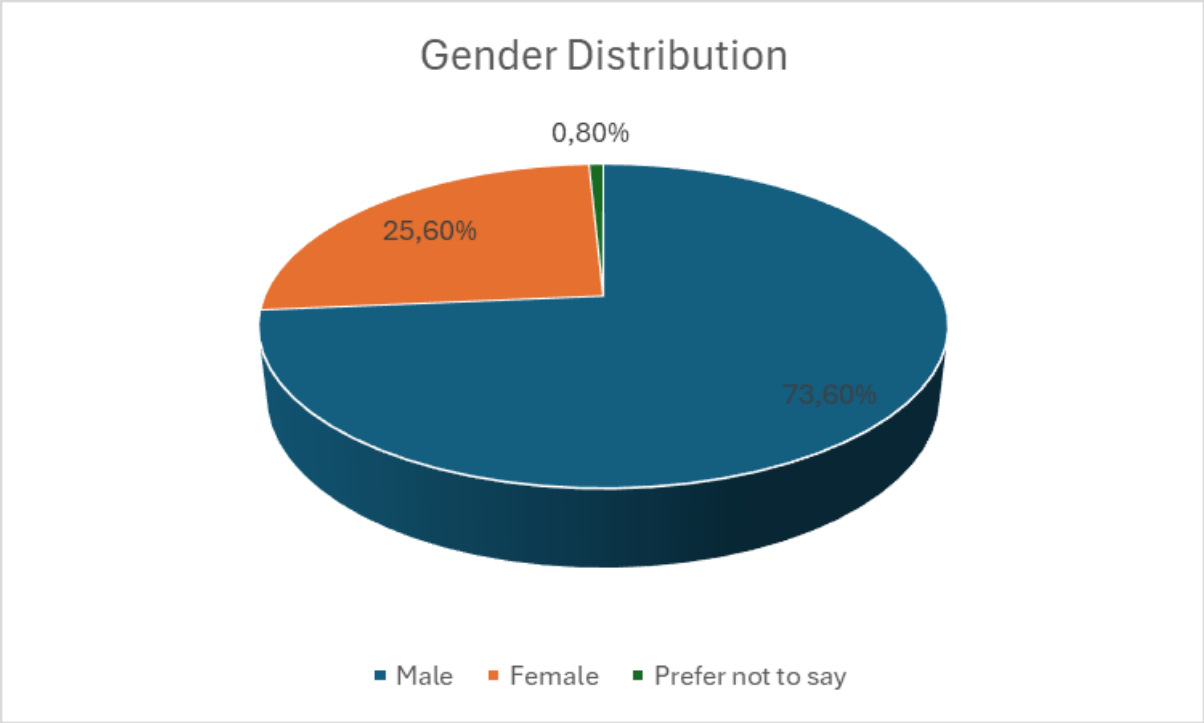

Figure 5: Gender distribution

This shows a significant majority of respondents are male. The organisations currently have a higher level of males than females employed.

4.3.4 *Education Level*

The education distribution from respondents is shown in Figure 6.

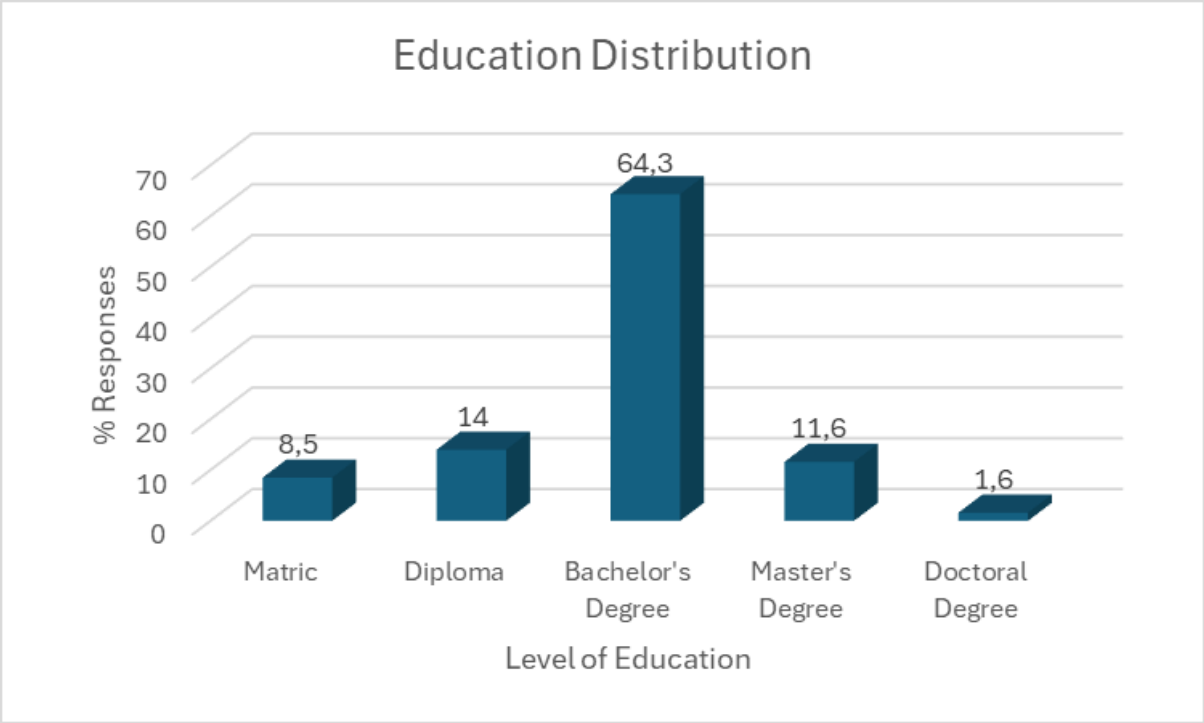

Figure 6:Respondent education distribution

The results show that most respondents have at least a diploma, indicating an educated sample. Of the respondents, 8.5% have only a matric, 14.0% have a diploma. The most common level of education is a Bachelor's degree with 64% of respondents at this level. 11.6% have a master's degree and only 1.6% have a doctoral degree.

4.3.5 *Position*

The responses and distribution of participant position is shown in Figure 7.

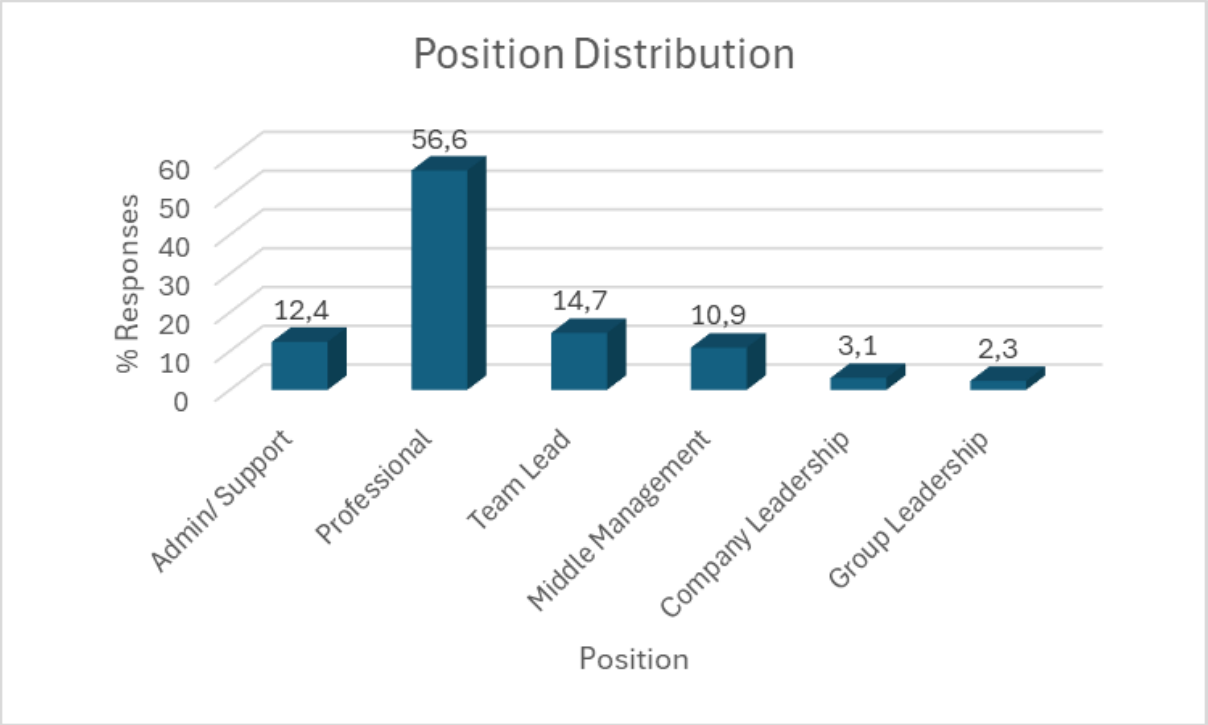

Figure 7: Respondent position distribution

The survey results revealed diverse roles among the participants. The administrative or support role category accounted for 12.4% of the total, with 16 respondents. The largest group was composed of professionals, such as developers, accounting for 56.6% with 73 respondents. Team leads were represented by 19 individuals, making up 14.7% of the total. Middle management, specifically department leads, consisted of 14 respondents, representing 10.9%. Company-level leadership had a smaller presence, comprising 3.1% with four respondents. The smallest reported group was the group-level leadership, which comprised 2.3% with only three respondents. Overall, the survey included 129 participants, representing a complete sample of the population under investigation. The data shows a majority of respondents are in professional roles, with relatively fewer in leadership positions.

4.3.6 *Tenure*

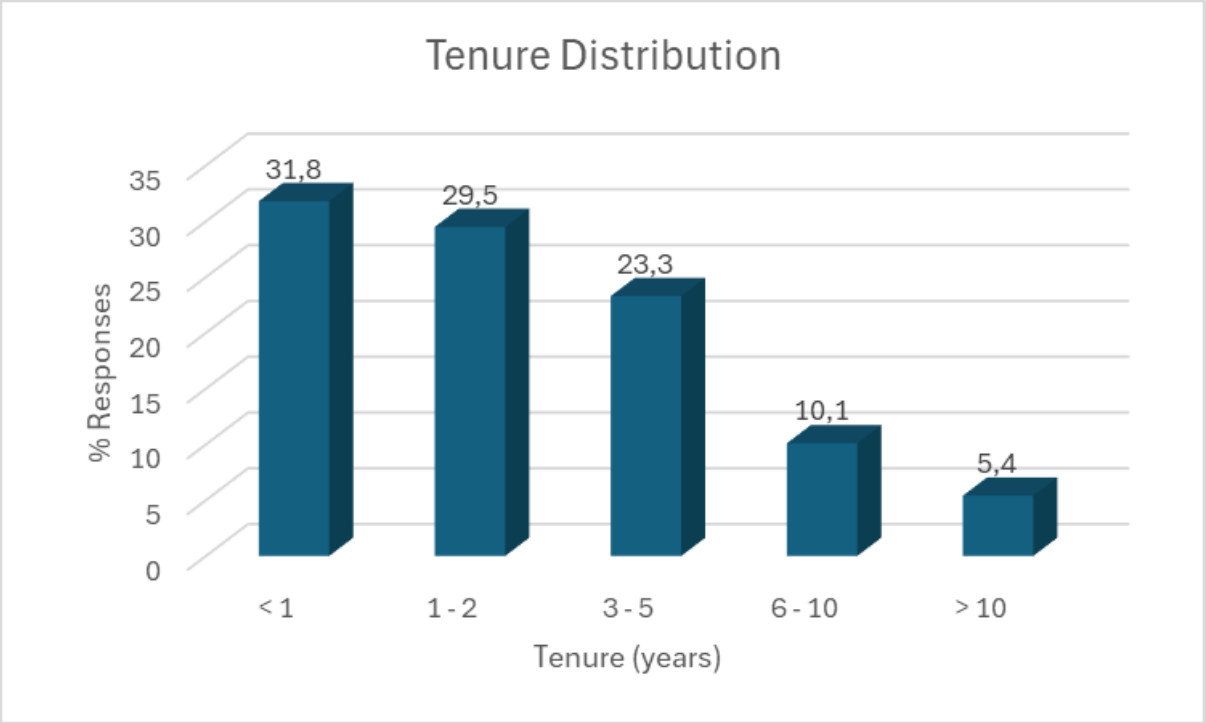

Table 5: Respondent tenure distribution

In terms of the survey results, there was a diversity of roles among the respondents. Sixteen individuals, accounting for 12.4% of the total, had administrative or support roles. The largest group consisted of 73 professionals, such as developers, representing 56.6% of the respondents. Nineteen respondents, making up 14.7%, held team lead positions. Fourteen individuals (10.9%) were in middle management as department leads. Company-level leadership was represented by four respondents, equivalent to 3.1% of the total. The smallest group reported was the group-level leadership, with only three respondents, comprising 2.3%. Overall, the survey encompassed a total of 129 participants, representing the entire sample population.

4.4 Descriptive Statistics

4.4.1 *Digital Maturity Construct or Factor-Level Statistics*

The descriptive analysis begins at construct level.

Statistic	N	Min	Max	Mean	Std. Dev	Skew-ness	Kurt-osis
Vision & Strategy	129	1,00	5,00	3,6725	,81598	-,639	,581
Culture	129	1,25	5,00	4,3295	,59784	-1,553	4,838
Organisation & Governance	129	2,00	5,00	3,8527	,64848	-,285	,222
Innovation	129	1,00	5,00	3,6472	,84769	-,357	,178
Digital Ethics	129	1,25	5,00	3,5252	,82730	-,325	,069
Digital Leadership	129	1,68	5,00	3,8137	,61808	-,537	1,043
Customer Orientation & Engagement	129	1,83	5,00	3,9277	,62079	-,471	,560
Product Innovation	129	1,60	5,00	3,8415	,63427	-,420	1,102
Workforce Enablement and Performance	129	1,38	5,00	4,1415	,62202	-1,102	2,599
Core Process Digitisation	129	1,20	5,00	3,7723	,74590	-,788	1,073
New Business Models	129	1,25	5,00	3,7416	,73862	-,564	,768
Digital Application & Impact	129	1,82	5,00	3,9191	,56767	-,686	1,309
Valid N (listwise)	129						

Table 6: Construct-level descriptive statistics

Interpretation:

- **Vision & Strategy** has a mean of 3.6725, suggesting a moderately positive perception, with a slight skew towards lower scores (-.639), indicating a minority of lower responses.
- **Culture** scored higher on average (4.3295), with the lowest standard deviation (.59784), showing that responses were more consistently positive and significantly skewed towards higher ratings (-1.553), along with a high kurtosis (4.838), suggesting a peaked distribution with some respondents rating it exceptionally high.
- **Organisation & Governance** shows a relatively high mean (3.8527) with low skewness and kurtosis, indicating a relatively balanced and moderate distribution of responses.

- **Innovation** has a wide range of responses (std. deviation of .84769) with a mean of 3.6472, suggesting varied perceptions of innovation efforts.
- **Workforce Enablement and Performance** stands out with the highest mean (4.1415), indicating the most positive perception among the constructs. However, it also has a significant negative skew (-1.102) and a relatively high kurtosis (2.599), indicating a distribution that leans heavily towards higher scores with some extreme positive ratings.
- **Digital Ethics, Digital Leadership, Customer Orientation & Engagement, Product Innovation, Core Process Digitisation, New Business Models,** and **Digital Application & Impact** show a range of perceptions with generally moderate to slightly positive averages and varying degrees of skewness and kurtosis, indicating differences in how respondents view these aspects of digital maturity.

4.4.2 *Digital Maturity Variable-Level Statistics*

Table 7 show descriptive statistics at a variable level. The table presents survey results related to digital leadership and digital application & impact. The findings highlight the ratings and perceptions of respondents across various categories and variables. Overall, the survey reveals positive ratings for vision, culture, governance, innovation & investment, digital ethics, customer orientation, digital application & impact, workforce enablement, process digitalization, and new value streams. However, certain variables, such as participation and access in digital ethics and continuous optimization in process digitalization, received relatively lower ratings. These insights provide an overview of the strengths and areas for improvement in the organization's digital transformation efforts.

Category	Variable	Variable Description	Mean	SD
Digital Leadership				
1 Vision & Strategy	**1,1**	**Transformative scope of the vision**	**3,97**	**0,829**
1 Vision & Strategy	**1,2**	**Leadership alignment & commitment, "Board to floor"**	**3,67**	**0,946**
1 Vision & Strategy	**1,3**	**Leadership alignment & commitment, "Board to floor"**	**3,56**	**0,984**
1 Vision & Strategy	**1,4**	**Sufficient Investment & resource allocation**	**3,5**	**1,062**
2 Culture	**2,1**	**Approach to risk taking and failure**	**4,11**	**0,803**
2 Culture	**2,2**	**Organisational learning, exploration & experimentation**	**4,55**	**0,673**
2 Culture	**2,3**	**Leadership culture and transformation**	**4,43**	**0,683**
2 Culture	**2,4**	**Collaboration culture**	**4,22**	**0,85**
3 Governance	**3,1**	**Agile, empowering organizational structure**	**3,78**	**0,877**
3 Governance	**3,2**	**Digital organization and structures**	**3,95**	**0,753**
3 Governance	**3,3**	**Ecosystem engagement**	**4,11**	**0,71**
3 Governance	**3,4**	**Data governance**	**3,58**	**1,028**
4 Innovation & Investment	**4,1**	**Lean and open Innovation**	**3,85**	**0,911**
4 Innovation & Investment	**4,2**	**Level and accessibility of funding**	**3,48**	**1,089**
4 Innovation & Investment	**4,3**	**Strategic approach to innovation**	**3,61**	**0,971**
5 Digital Ethics	**5,1**	**Participation and access**	**2,87**	**1,155**
5 Digital Ethics	**5,2**	**Integration into product design & business processes**	**3,75**	**0,936**
5 Digital Ethics	**5,3**	**Transparency and awareness**	**3,62**	**1,025**
5 Digital Ethics	**5,4**	**Cultural alignment**	**3,86**	**0,933**
6 Customer Orientation	**6,1**	**Customer participation and community**	**3,95**	**0,856**
6 Customer Orientation	**6,2**	**Use of analytics for personalization and targeting**	**3,56**	**0,999**
6 Customer Orientation	**6,3**	**Digital engagement and marketing**	**3,77**	**0,93**
6 Customer Orientation	**6,4**	**Digital channels, omni-channel, channel integration**	**4,02**	**0,81**
6 Customer Orientation	**6,5**	**Digitalisation/use of tech in customer touchpoints**	**3,67**	**0,876**
6 Customer Orientation	**6,6**	**Customer value focus**	**4,6**	**0,656**
Digital Application & Impact				

7 Product Innovation	**7,1**	**Social functionality built into products**	**3,28**	**1,007**
7 Product Innovation	**7,2**	**Proportion of information-based products**	**4,09**	**0,696**
7 Product Innovation	**7,3**	**Products, UX differentiated by emerging technologies**	**4,19**	**0,697**
7 Product Innovation	**7,4**	**Product and UX differentiation by digital features**	**4,16**	**0,734**
7 Product Innovation	**7,5**	**Products monetize data assets**	**3,49**	**1,008**
8 Workforce Enablement	**8,1**	**Employee awareness & alignment**	**3,81**	**0,919**
8 Workforce Enablement	**8,2**	**Employee empowerment**	**4,33**	**0,731**
8 Workforce Enablement	**8,3**	**Use of Digital Tools**	**4,05**	**0,809**
8 Workforce Enablement	**8,4**	**Employee Digital Skills**	**4,38**	**0,684**
8 Workforce Enablement	**8,5**	**Means of digital upskilling available**	**4,28**	**0,838**
8 Workforce Enablement	**8,6**	**Learning and knowledge management platforms**	**4,16**	**0,899**
8 Workforce Enablement	**8,7**	**Business metrics to adapt to meet changes in strategy**	**3,77**	**0,986**
8 Workforce Enablement	**8,8**	**Flexible workplace**	**4,36**	**0,67**
9 Process Digitalisation	**9,1**	**Dashboards**	**3,47**	**1,008**
9 Process Digitalisation	**9,2**	**Automation of core processes**	**3,4**	**0,947**
9 Process Digitalisation	**9,3**	**Self-provisioning & external interfaces**	**4,35**	**0,777**
9 Process Digitalisation	**9,4**	**Automation and algorithms for decision-making**	**3,8**	**0,938**
9 Process Digitalisation	**9,5**	**Continuous optimization**	**3,84**	**0,972**
10 New Value Streams	**10,1**	**Platform business model usage**	**3,55**	**1,015**
10 New Value Streams	**10,2**	**Use of data as a strategic asset**	**3,76**	**1,006**
10 New Value Streams	**10,3**	**Value proposition evolution**	**3,99**	**0,861**
10 New Value Streams	**10,4**	**Coopetition as a new source of value; asymmetric competitors as new threats**	**3,66**	**0,921**

Table 7: Variable-level descriptive stats

4.5 Objective 1: Critical Factors of Digital Maturity

In this section, we perform a multifaceted analysis of the descriptive statistics derived from the dataset, which captures a broad spectrum of variables pertinent to assessing digital maturity within organizations.

The analysis was performed in three interconnected stages:

- **Mean Ranking Analysis:** We prioritize variables based on their mean scores. This ranking illuminates the areas that respondents collectively regard as most characteristic or prevalent within the context of digital maturity. This step is instrumental in addressing Objective 1 of our study, guiding us toward identifying the variables deemed most impactful by participants.
- **Standard Deviation and Further Analysis:** Recognizing the limitations of relying solely on mean values for comprehensive analysis, we integrate standard deviation into our ranking process. This addition allows us to appreciate the consensus or divergence among responses, thereby refining our identification of truly significant variables. The standard deviation is ranked in ascending order as higher consensus is indicated by a lower standard deviation. The journey through our dataset culminates in a correlation analysis, where we explore the relationships between variables to discern the most significant determinants of digital maturity.
- **General Statistical Overview**: First perform a foundational examination of each variable, delineating their mean, standard deviation, skewness, and kurtosis. This step furnishes a holistic view of the dataset, spotlighting the central tendencies and variability inherent to our collected responses. It lays the groundwork for a nuanced understanding of the dataset's characteristics, offering preliminary insights into the digital maturity landscape as perceived by the respondents.

Mean Ranking

The mean analysis is performed to identify the variables considered most valuable or prevalent by participants. Data is ranked by mean, with the top 20 variables presented in the table below in Table 8. The corresponding standard deviation is also presented as standard deviation becomes important in this process as described in the approach above.

Rank	Variable	Variable Description	Mean	SD
1	**6,6**	**Customer value focus**	**4,6**	**0,656**
2	**2,2**	**Organisational learning, exploration & experimentation**	**4,55**	**0,673**
3	**2,3**	**Leadership culture and transformation**	**4,43**	**0,683**
4	**8,4**	**Employee Digital Skills**	**4,38**	**0,684**
5	**8,8**	**Flexible workplace**	**4,36**	**0,67**
6	**9,3**	**Self-provisioning & external interfaces**	**4,35**	**0,777**
7	**8,2**	**Employee empowerment**	**4,33**	**0,731**
8	**8,5**	**Means of digital upskilling available**	**4,28**	**0,838**
9	**2,4**	**Collaboration culture**	**4,22**	**0,85**
10	**7,3**	**Products, UX differentiated by emerging technologies**	**4,19**	**0,697**
11	**7,4**	**Product and UX differentiation by digital features**	**4,16**	**0,734**
12	**8,6**	**Learning and knowledge management platforms**	**4,16**	**0,899**
13	**2,1**	**Approach to risk taking and failure**	**4,11**	**0,803**
14	**3,3**	**Ecosystem engagement**	**4,11**	**0,71**
15	**7,2**	**Proportion of information-based products**	**4,09**	**0,696**
16	**8,3**	**Use of Digital Tools**	**4,05**	**0,809**
17	**6,4**	**Digital channels, omni-channel, channel integration**	**4,02**	**0,81**
18	**10,3**	**Value proposition evolution**	**3,99**	**0,861**
19	**1,1**	**Transformative scope of the vision**	**3,97**	**0,829**
20	**3,2**	**Digital organization and structures**	**3,95**	**0,753**

Table 8: Top variables by mean

Similarly, a ranking of the top (or lowest standard deviation) 20 variables by standard deviation is performed to determine variables with the most consensus amongst participants. For standard deviation, “top” refers to lowest standard deviations. The table is presented below. The standard deviation top 20 are shown in Table 9.

Rank	Variable	Variable Description	SD	Mean
1	**6,6**	**Customer value focus**	**0,656**	**4,6**
2	**8,8**	**Flexible workplace**	**0,67**	**4,36**
3	**2,2**	**Organisational learning, exploration & experimentation**	**0,673**	**4,55**
4	**2,3**	**Leadership culture and transformation**	**0,683**	**4,43**
5	**8,4**	**Employee Digital Skills**	**0,684**	**4,38**
6	**7,2**	**Proportion of information-based products**	**0,696**	**4,09**
7	**7,3**	**Products, UX differentiated by emerging technologies**	**0,697**	**4,19**
8	**3,3**	**Ecosystem engagement**	**0,71**	**4,11**
9	**8,2**	**Employee empowerment**	**0,731**	**4,33**
10	**7,4**	**Product and UX differentiation by digital features**	**0,734**	**4,16**
11	**3,2**	**Digital organization and structures**	**0,753**	**3,95**

12	**9,3**	**Self-provisioning & external interfaces**	**0,777**	**4,35**
13	**2,1**	**Approach to risk taking and failure**	**0,803**	**4,11**
14	**8,3**	**Use of Digital Tools**	**0,809**	**4,05**
15	**6,4**	**Digital channels, omni-channel, channel integration**	**0,81**	**4,02**
16	**1,1**	**Transformative scope of the vision**	**0,829**	**3,97**
17	**8,5**	**Means of digital upskilling available**	**0,838**	**4,28**
18	**2,4**	**Collaboration culture**	**0,85**	**4,22**
19	**6,1**	**Customer participation and community**	**0,856**	**3,95**
20	**10,3**	**Value proposition evolution**	**0,861**	**3,99**

Table 9: Top 20 variables by standard deviation

The tables, or top 20 variables by mean and top 20 variables by standard deviation, are juxtaposed to determine the level of consensus amongst top variables. The areas where variables appear in the top 11 of both are highlighted.

Rank	Category	Variable	Variable Description	Mean	SD	SD Rank
Top 20 by Mean						
1	**6 Customer Orientation**	**6,6**	**Customer value focus**	**4,6**	**0,656**	**1**
2	**2 Culture**	**2,2**	**Organisational learning, exploration & experimentation**	**4,55**	**0,673**	**3**
3	**2 Culture**	**2,3**	**Leadership culture and transformation**	**4,43**	**0,683**	**4**
4	**8 Workforce Enablement**	**8,4**	**Employee Digital Skills**	**4,38**	**0,684**	**5**
5	**8 Workforce Enablement**	**8,8**	**Flexible workplace**	**4,36**	**0,67**	**2**
6	**9 Process Digitalisation**	**9,3**	**Self-provisioning & external interfaces**	**4,35**	**0,777**	
7	**8 Workforce Enablement**	**8,2**	**Employee empowerment**	**4,33**	**0,731**	**9**
8	**8 Workforce Enablement**	**8,5**	**Means of digital upskilling available**	**4,28**	**0,838**	
9	**2 Culture**	**2,4**	**Collaboration culture**	**4,22**	**0,85**	
10	**7 Product Innovation**	**7,3**	**Products, UX differentiated by emerging technologies**	**4,19**	**0,697**	**7**
11	**7 Product Innovation**	**7,4**	**Product and UX differentiation by digital features**	**4,16**	**0,734**	**10**
12	**8 Workforce Enablement**	**8,6**	**Learning and knowledge management platforms**	**4,16**	**0,899**	
13	**2 Culture**	**2,1**	**Approach to risk taking and failure**	**4,11**	**0,803**	**13**
14	**3 Governance**	**3,3**	**Ecosystem engagement**	**4,11**	**0,71**	**8**
15	**7 Product Innovation**	**7,2**	**Proportion of information-based products**	**4,09**	**0,696**	**6**
Top 20 by Standard Deviation						
Rank	**Category**	**Variable**	**Variable Description**	**SD**	**Mean**	**Mean Rank**
1	**6 Customer Orientation**	**6,6**	**Customer value focus**	**0,656**	**4,6**	**1**
2	**8 Workforce Enablement**	**8,8**	**Flexible workplace**	**0,67**	**4,36**	**5**
3	**2 Culture**	**2,2**	**Organisational learning, exploration & experimentation**	**0,673**	**4,55**	**2**
4	**2 Culture**	**2,3**	**Leadership culture and transformation**	**0,683**	**4,43**	**3**
5	**8 Workforce Enablement**	**8,4**	**Employee Digital Skills**	**0,684**	**4,38**	**4**
6	**7 Product Innovation**	**7,2**	**Proportion of information-based products**	**0,696**	**4,09**	
7	**7 Product Innovation**	**7,3**	**Products, UX differentiated by emerging technologies**	**0,697**	**4,19**	**10**
8	**3 Governance**	**3,3**	**Ecosystem engagement**	**0,71**	**4,11**	
9	**8 Workforce Enablement**	**8,2**	**Employee empowerment**	**0,731**	**4,33**	**7**
10	**7 Product Innovation**	**7,4**	**Product and UX differentiation by digital features**	**0,734**	**4,16**	**11**

11	**3 Governance**	**3,2**	**Digital organization and structures**	**0,753**	**3,95**	
12	**9 Process Digitalisation**	**9,3**	**Self-provisioning & external interfaces**	**0,777**	**4,35**	**6**
13	**2 Culture**	**2,1**	**Approach to risk taking and failure**	**0,803**	**4,11**	
14	**8 Workforce Enablement**	**8,3**	**Use of Digital Tools**	**0,809**	**4,05**	
15	**6 Customer Orientation**	**6,4**	**Digital channels, omni-channel, channel integration**	**0,81**	**4,02**	

Table 10: Top 20 digital maturity factors by mean and standard deviation

The resultant table with a top 8 features is shown in the table below. The means in this table range from 4.1 – 4.6 and the standard deviations range from 0.656 – 0.734. The filtered variables are listed first in order of mean ranking then standard deviation. Other information included is the rank, factor, variable, and ranking of the standard deviation.

Rank	Category	Variable	Variable Description	Mean	SD	SD Rank
1	6 Customer Orientation	6,6	Customer value focus	4,6	0,656	1
2	2 Culture	2,2	Organisational learning, exploration & experimentation	4,55	0,673	3
3	2 Culture	2,3	Leadership culture and transformation	4,43	0,683	4
4	8 Workforce Enablement	8,4	Employee Digital Skills	4,38	0,684	5
5	8 Workforce Enablement	8,8	Flexible workplace	4,36	0,67	2
6	8 Workforce Enablement	8,2	Employee empowerment	4,33	0,731	9
7	7 Product Innovation	7,3	Products, UX differentiated by emerging technologies	4,19	0,697	7
8	7 Product Innovation	7,4	Product and UX differentiation by digital features	4,16	0,734	11

Table 11: Eight most critical digital maturity variables

A similar analysis is performed at a factor level, producing the table below. To arrive at the factor means and standard deviations of the indicators within each factor are averaged.

Rank	Row Labels	Average of Mean	Average of SD	SD Ranking
1	2 Culture	4,33	0,75	1

2	8 Workforce Enablement	4,14	0,82	2
3	6 Customer Orientation	3,93	0,85	5
4	3 Governance	3,86	0,84	4
5	7 Product Innovation	3,84	0,83	3
6	9 Process Digitalisation	3,77	0,93	6
7	10 New Value Streams	3,74	0,95	7
8	1 Vision	3,68	0,96	8
9	4 Innovation & Investment	3,65	0,99	9
10	5 Digital Ethics	3,53	1,01	10

Table 12: Digital maturity factor ranking

The top three factors are shown in the table below along with their means and standard deviations.

Rank	Row Labels	Average of Mean	Average of SD	SD Ranking
1	2 Organisational Culture	4,33	0,75	1
2	8 Workforce Enablement	4,14	0,82	2
3	6 Customer Orientation	3,93	0,85	5

Table 13: Top 3 digital maturity factors

4.6 Objective 2: Impact of Digital Leadership on Digital Maturity Factors

MANCOVA

Multivariate tests are performed to identify relationships between the independent variable (digital leadership) and the dependent variables (digital maturity factors). Table 14 below shows various multivariate tests performed to check if Digital Leadership has an impact on several independent variables (Customer Orientation & Engagement, Digital Product Innovation, Workforce Enablement & Performance, Core Processes Digitalization, New Value Streams & Business Models).

The factors will be treated separately later in this chapter, but this test was performed as it also identifies interrelationships and dependencies between digital leadership and various outcomes.

Effect		Value	F	Hypothesis df	Error df	Sig.	Outcome
Digital Leadership	Pillai's Trace	,753	74,910[b]	5,000	123,000	<,001	Statistically Significant
	Wilks' Lambda	,247	74,910[b]	5,000	123,000	<,001	Statistically Significant
	Hotelling's Trace	3,045	74,910[b]	5,000	123,000	<,001	Statistically Significant
	Roy's Largest Root	3,045	74,910[b]	5,000	123,000	<,001	Statistically Significant
a. Design: Intercept + L_A							
b. Exact statistic							

Table 14: MANCOVA Multivariate Tests

4.6.1 *Objective 2.1: Customer Orientation & Engagement*

MANCOVA

The inclusion of the Tests of Between-Subjects variables is included to allow for the evaluation of the collective impact of Digital Leadership on the dependent variables, accounting for potential interactions or dependencies among them. Results are shown in Table 15. The full table can be found in Table 37: MANCOVA Tests of between subjects variables in the Appendix.

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Result
Digital Leadership	**Customer Orientation & Engagement**	**29,345**	**1**	**29,345**	**186,484**	**<,001**	**Significant**
R Squared = ,595 (Adjusted R Squared = ,592)							

Table 15: MANCOVA Tests of between subject variables

Parameter Estimates

The table below provides parameter estimates. The table focuses on the specific estimates of the effect of Digital Leadership on the dependent variable, providing detailed information about the magnitude, direction, and significance of these effects. The B variable becomes important for regression analysis.

Dependent Variable	Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
						Lower Bound	**Upper Bound**
Customer Orientation & Engagement	**Intercept**	**,973**	**,219**	**4,441**	**<,001**	**,540**	**1,407**
	Digital Leadership	**,775**	**,057**	**13,656**	**<,001**	**,662**	**,887**

Table 16: MANCOVA Parameter Estimates

The table presents parameter estimates from a multiple regression analysis examining the effects of "Digital Leadership" on "Customer Orientation & Engagement". Parameters estimated for both the intercept and the effect of Digital Leadership.

Regression

Based on the Parameter Estimates in the previous section, a multiple regression equation is arrived at. The values on the table indicate the results of the regression model for the dependent variable "Customer Orientation & Engagement." The intercept term is 0.973, which represents the expected value of Customer Orientation & Engagement when the predictor variable (Digital Leadership) is zero. The coefficient for Digital Leadership is 0.836, with a standard error of 0.775. This coefficient represents the change in Customer Orientation & Engagement for a one-unit increase in Digital Leadership. The t-value associated with Digital Leadership is 13.656, indicating that the effect of Digital Leadership on Customer Orientation & Engagement is statistically significant ($p < 0.001$). The 95% confidence interval for the coefficient ranges from 0.662 to 0.887, suggesting with 95% confidence that the true population coefficient falls within this interval.

The regression equation is:

$$\text{Customer Orientation \& Engagement} = 0.973 + 0.775 * \text{Digital Leadership}$$

This indicates how changes in Digital Leadership affects changes in Customer Orientation & Engagement.

4.6.2 *Objective 2.2: Digital Product Innovation*

MANCOVA

The inclusion of the Tests of Between-Subjects variables is included to allow for the evaluation of the collective impact of Digital Leadership on the dependent variables, accounting for potential interactions or dependencies among them. This is shown in Table 17. The full table can be found in Table 37: MANCOVA Tests of between subjects variables in the Appendix.

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Result
Digital Leadership	**Digital Product Innovation**	**26,523**	**1**	**26,523**	**134,898**	**<,001**	**Significant**
c. R Squared = ,515 (Adjusted R Squared = ,511)							

Table 17: MANCOVA Tests of between subject variables

Parameter Estimates

The table below provides parameter estimates. The table focuses on the specific estimates of the effect of Digital Leadership on the dependent variable, Digital Product Innovation, providing detailed information about the magnitude, direction, and significance of these effects. The B variable becomes important for regression analysis.

Dependent Variable	Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
						Lower Bound	**Upper Bound**
Product Innovation	**Intercept**	**1,033**	**,245**	**4,216**	**<,001**	**,548**	**1,518**
	Digital Leadership	**,736**	**,063**	**11,615**	**<,001**	**,611**	**,862**

Table 18: MANCOVA Parameter Estimates

The table presents parameter estimates from a multiple regression analysis examining the effects of Digital Leadership on Digital Product Innovation. Parameters are estimated for both the intercept and the effect of Digital Leadership.

Regression

Based on the Parameter Estimates in the previous section, a multiple regression equation is arrived at. The values on the table indicate the results of the regression model for the dependent variable "Digital Product Innovation." The intercept term is 1.033, which represents the expected value of Digital Product Innovation when the predictor variable (Digital Leadership) is zero. The coefficient for Digital Leadership is 0.736, with a standard error of 0.063. This coefficient represents the change in Digital Product Innovation for a one-unit increase in Digital Leadership. The t-value associated with Digital Leadership is 11.615, indicating that the effect of Digital Leadership on Digital Product Innovation is statistically significant ($p < 0.001$). The 95% confidence interval for the coefficient ranges from 0.611 to 0.862, suggesting with 95% confidence that the true population coefficient falls within this interval.

The regression equation is:

$$\text{Product Innovation} = 1.033 + 0.736 * \text{Digital Leadership}$$

This indicates how changes in Digital Leadership affects changes in Digital Product Innovation.

4.6.3 *Objective 2.3: Workforce Enablement & Performance*

MANCOVA

The inclusion of the Tests of Between-Subjects variables is included to allow for the evaluation of the collective impact of Digital Leadership on the dependent variables, accounting for potential interactions or dependencies among them. The full table can be found in Table 37: MANCOVA Tests of between subjects variables in the Appendix.

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Result
Digital Leadership	**Workforce Enablement and Performance**	**29,313**	**1**	**29,313**	**184,192**	**<,001**	**Significant**
d. R Squared = ,592 (Adjusted R Squared = ,589)							

Table 19: MANCOVA Tests of between subject variables

Parameter Estimates

The table below provides parameter estimates. The table focuses on the specific estimates of the effect of Digital Leadership on the dependent variable Workforce Enablement & Performance, providing detailed information about the magnitude, direction, and significance of these effects. The B variable becomes important for regression analysis.

Dependent Variable	Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
						Lower Bound	**Upper Bound**
Workforce Enablement and Performance	**Intercept**	**1,189**	**,220**	**5,394**	**<,001**	**,753**	**1,625**
	Digital Leadership	**,774**	**,057**	**13,572**	**<,001**	**,661**	**,887**

Table 20: MANCOVA Parameter Estimates

The table presents parameter estimates from a multiple regression analysis examining the effects of "Digital Leadership" on "Workforce Enablement and Performance". Each row in the table corresponds to a specific dependent variable, with parameters estimated for both the intercept and the effect of Digital Leadership.

Regression

Based on the Parameter Estimates in the previous section, a multiple regression equation is arrived at. What the values on the table mean is that for the dependent variable “Workforce Enablement and Performance”, the regression model yielded the following results: The intercept term is 1.189, indicating the expected value of "Workforce Enablement and Performance" when the predictor variable (Digital Leadership) is zero. The coefficient for Digital Leadership is 0.774, with a standard

error of 0.057. This coefficient represents the change in "Workforce Enablement and Performance" for a one-unit increase in Digital Leadership. The t-value associated with Digital Leadership is 13.572, indicating that the effect of Digital Leadership on "Workforce Enablement and Performance" is statistically significant ($p < 0.001$). The 95% confidence interval for the coefficient ranges from 0.661 to 0.887, suggesting with 95% confidence that the true population coefficient falls within this interval.

The regression equation is:

$$\text{Workforce Enablement \& Performance} = 1.189 + 0.774 * \text{Digital Leadership}$$

This indicates how changes in Digital Leadership affects changes in Workforce Enablement and Performance.

4.6.4 *Objective 2.4: Core Processes Digitalisation*

MANCOVA

The inclusion of the Tests of Between-Subjects variables is included to allow for the evaluation of the collective impact of Digital Leadership on the dependent variables, accounting for potential interactions or dependencies among them. The full table can be found in Table 37: MANCOVA Tests of between subjects variables in the Appendix.

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Result
Digital Leadership	**Core Process Digitisation**	**37,780**	**1**	**37,780**	**143,509**	**<,001**	**Significant**
e. R Squared = ,531 (Adjusted R Squared = ,527)							

Table 21: MANCOVA Tests of between subject variables

Parameter Estimates

The table below provides parameter estimates. The table focuses on the specific estimates of the effect of Digital Leadership on the dependent variable, providing

detailed information about the magnitude, direction, and significance of these effects. The B variable becomes important for regression analysis.

Dependent Variable	Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
						Lower Bound	**Upper Bound**
Core Process Digitisation	**Intercept**	**,420**	**,283**	**1,482**	**,141**	**-,141**	**,981**
	Digital Leadership	**,879**	**,073**	**11,980**	**<,001**	**,734**	**1,024**

Table 22: MANCOVA Parameter Estimates

The table presents parameter estimates from a multiple regression analysis examining the effects of "Digital Leadership" on the dependent variable "Core Process Digitisation." Each row in the table corresponds to a specific dependent variable, with parameters estimated for both the intercept and the effect of Digital Leadership.

Regression

Based on the Parameter Estimates in the previous section, a multiple regression equation is arrived at. What the values on the table mean is that for the dependent variable “Core Process Digitisation”, the regression model yielded the following results: The intercept term is 0.420, indicating the expected value of " Core Process Digitisation" when the predictor variable (Digital Leadership) is zero. The coefficient for Digital Leadership is 0.879, with a standard error of 0.073. This coefficient represents the change in "Core Process Digitisation" for a one-unit increase in Digital Leadership. The t-value associated with Digital Leadership is 11.980, indicating that the effect of Digital Leadership on " Core Process Digitisation " is statistically significant ($p < 0.001$). The 95% confidence interval for the coefficient ranges from 0.734 to 1.024, suggesting with 95% confidence that the true population coefficient falls within this interval.

The regression equation is:

$$\text{New Value Streams \& Business Models} = 0.554 + 0.836 * \text{Digital Leadership}$$

This indicates how changes in Digital Leadership affects changes in Core Process Digitisation.

4.6.5 *Objective 2.5: New Value Streams & Business Models*

MANCOVA

The inclusion of the Tests of Between-Subjects variables is included to allow for the evaluation of the collective impact of Digital Leadership on the dependent variables, accounting for potential interactions or dependencies among them. The full table can be found in Table 37: MANCOVA Tests of between subjects variables in the Appendix.

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Result
Digital Leadership	**New Value Streams & Business Models**	**34,171**	**1**	**34,171**	**121,692**	**<,001**	**Significant**
a. R Squared = ,489 (Adjusted R Squared = ,485)							

Table 23: MANCOVA Tests of between subject variables

Parameter Estimates

The table below provides parameter estimates. The table focuses on the specific estimates of the effect of Digital Leadership on each dependent variable, providing detailed information about the magnitude, direction, and significance of these effects. The B variable becomes important for regression analysis.

Dependent Variable	Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
						Lower Bound	**Upper Bound**
New Value Streams & Business Models	**Intercept**	**,554**	**,293**	**1,891**	**,061**	**-,026**	**1,133**
	Digital Leadership	**,836**	**,076**	**11,031**	**<,001**	**,686**	**,986**

Table 24: MANCOVA Parameter Estimates

The table presents parameter estimates from a multiple regression analysis examining the effects of "Digital Leadership" on the dependent variable "New Value Streams &

Business Models". Each row in the table corresponds to a specific dependent variable, with parameters estimated for both the intercept and the effect of Digital Leadership.

Regression

Based on the Parameter Estimates in the previous section, a multiple regression equation is arrived at. What the values on the table mean is that for the dependent variable “New Value Streams & Business Models”, the regression model yielded the following results: The intercept term is 0.554, indicating the expected value of "New Business Models" when the predictor variable (Digital Leadership) is zero. The coefficient for Digital Leadership is 0.836, with a standard error of 0.076. This coefficient represents the change in "New Business Models" for a one-unit increase in Digital Leadership. The t-value associated with Digital Leadership is 11.031, indicating that the effect of Digital Leadership on "New Business Models" is statistically significant ($p < 0.001$). The 95% confidence interval for the coefficient ranges from 0.686 to 0.986, suggesting with 95% confidence that the true population coefficient falls within this interval.

The regression equation is:

$$\text{New Value Streams \& Business Models} = 0.554 + 0.836 * \text{Digital Leadership}$$

This indicates how changes in Digital Leadership affects changes in New Business Models.

4.7 Reliability Analysis

Internal consistency of the scales used to measure various constructs was rigorously examined to ensure the reliability of the survey instruments. The reliability of a measurement instrument reflects its ability to produce consistent and stable results over time, thus underpinning the validity of the conclusions drawn from the data. To this end, Cronbach's alpha, a statistic commonly used to assess the internal consistency of a set of items in a survey, was employed for each construct category under investigation.

Cronbach's alpha values range from 0 to 1, with higher values indicating greater internal consistency among the items that compose the scale. Generally, a Cronbach's alpha value above 0.7 is considered acceptable, indicating that the items measure the same underlying construct reliably.

Before delving into the factors of each category, a reliability analysis per category is presented.

Category	Cronbach's alpha	Number of items
Digital Leadership	0,933	19
Digital Application & Impact	0,949	28

Table 25: Cronbach's alpha per category

In this study, all constructs exceeded this threshold, suggesting that the survey instruments are both reliable and suitable for further analysis.

Interpretation:

- **Digital Leadership** has a Cronbach's alpha of 0.933, based on 19 items. This is a high value, indicating excellent internal consistency among the items within this category. It suggests that the survey questions grouped under Digital Leadership are measuring the same underlying construct and are reliably interrelated.
- **Digital Application & Impact** This construct has an even higher Cronbach's alpha of 0.949, based on 28 items. Similar to Digital Leadership, this value indicates a very high level of internal consistency and reliability for the scale.

This suggests that the survey or assessment tool used is highly reliable for both the Digital Leadership and Digital Application & Impact scales.

4.7.1 *Factor-Level Analysis*

Table 26 below analyses reliability per construct, or factor of the digital maturity model used.

No.	Construct Name	Cronbach's Alpha	Result	Number of items
1	Vision & Strategy	0.873	Good	4
2	Organisational Culture	0.800	Good	4
3	Organisation & Governance	0.759	Acceptable	4
4	Innovation & Investment	0.814	Good	3
5	Digital Ethics	0.830	Good	4
6	Customer Orientation & Engagement	0.815	Good	6
7	Digital Product Innovation	0.810	Good	5
8	Workforce Enablement & Performance	0.892	Good	8
9	Core Processes Digitisation	0.860	Good	5
10	New Value Streams & Business Models	0.788	Acceptable	4

Table 26: Cronbach's alpha for constructs

All constructs have Cronbach's alpha of >0.7 which indicate at the very least an acceptable level of internal consistency among the items measuring the constructs. This suggests that the items are well-aligned and collectively provide a reliable measure of the each of the constructs towards digital maturity.

The constructs related to the digital maturity model exhibit good to excellent reliability, with Cronbach's alpha values ranging from acceptable to excellent across all constructs. This indicates that the survey items within each construct are well-chosen and collectively provide a reliable measurement of the various aspects of digital maturity. Constructs with higher alpha values (e.g., Workforce Enablement & Performance) are particularly robust, whereas those with alpha values closer to 0.7 (e.g., Organisation & Governance) might benefit from a review of items to ensure optimal alignment and consistency.

For each of the constructs, the following applies.

		N	%
Cases	Valid	129	100,0
	Excluded[a]	0	,0
	Total	129	100,0
a. Listwise deletion based on all variables in the procedure.			

Table 27: Construct detail

4.7.2 *Variable-Level Analysis*

Table 28 below analyses reliability per construct, or factor of the digital maturity model used.

Variable	Variable Description	Mean	SD	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1,1	**Transformative scope of the vision**	**3,97**	**0,829**	**10,72**	**6,828**	**0,725**	**0,843**
1,2	**Leadership alignment & commitment, "Board to floor"**	**3,67**	**0,946**	**11,02**	**6,179**	**0,76**	**0,825**
1,3	**Leadership alignment & commitment, "Board to floor"**	**3,56**	**0,984**	**11,13**	**6,006**	**0,763**	**0,823**
1,4	**Sufficient Investment & resource allocation**	**3,5**	**1,062**	**11,19**	**5,97**	**0,686**	**0,859**
2,1	**Approach to risk taking and failure**	**4,11**	**0,803**	**13,21**	**3,417**	**0,558**	**0,779**
2,2	**Organisational learning, exploration & experimentation**	**4,55**	**0,673**	**12,77**	**3,539**	**0,682**	**0,723**
2,3	**Leadership culture and transformation**	**4,43**	**0,683**	**12,88**	**3,494**	**0,689**	**0,719**
2,4	**Collaboration culture**	**4,22**	**0,85**	**13,09**	**3,273**	**0,56**	**0,783**
3,1	**Agile, empowering organizational structure**	**3,78**	**0,877**	**11,64**	**4,015**	**0,553**	**0,705**
3,2	**Digital organization and structures**	**3,95**	**0,753**	**11,47**	**4,391**	**0,561**	**0,704**
3,3	**Ecosystem engagement**	**4,11**	**0,71**	**11,3**	**4,509**	**0,569**	**0,704**
3,4	**Data governance**	**3,58**	**1,028**	**11,83**	**3,439**	**0,585**	**0,697**
4,1	**Lean and open Innovation**	**3,85**	**0,911**	**7,09**	**3,72**	**0,546**	**0,855**
4,2	**Level and accessibility of funding**	**3,48**	**1,089**	**7,47**	**2,751**	**0,7**	**0,712**
4,3	**Strategic approach to innovation**	**3,61**	**0,971**	**7,33**	**2,955**	**0,77**	**0,635**
5,1	**Participation and access**	**2,87**	**1,155**	**11,23**	**6,649**	**0,498**	**0,869**
5,2	**Integration into product design & business processes**	**3,75**	**0,936**	**10,35**	**6,51**	**0,747**	**0,75**

5,3	Transparency and awareness	3,62	1,025	10,48	6,095	0,752	0,742
5,4	Cultural alignment	3,86	0,933	10,24	6,778	0,68	0,779
6,1	Customer participation and community	3,95	0,856	19,61	10,381	0,501	0,802
6,2	Use of analytics for personalization and targeting	3,56	0,999	20,01	9,028	0,641	0,772
6,3	Digital engagement and marketing	3,77	0,93	19,8	9,443	0,624	0,775
6,4	Digital channels, omni-channel, channel integration	4,02	0,81	19,55	9,708	0,695	0,762
6,5	Digitalisation/use of tech in customer touchpoints	3,67	0,876	19,89	9,681	0,628	0,775
6,6	Customer value focus	4,6	0,656	18,97	11,703	0,388	0,821
7,1	Social functionality built into products	3,28	1,007	15,93	6,301	0,542	0,799
7,2	Proportion of information-based products	4,09	0,696	15,12	7,125	0,658	0,762
7,3	Products, UX differentiated by emerging technologies	4,19	0,697	15,01	6,932	0,719	0,746
7,4	Product and UX differentiation by digital features	4,16	0,734	15,05	6,906	0,678	0,754
7,5	Products monetize data assets	3,49	1,008	15,72	6,447	0,507	0,811
8,1	Employee awareness & alignment	3,81	0,919	29,33	18,975	0,617	0,885
8,2	Employee empowerment	4,33	0,731	28,81	19,921	0,66	0,88
8,3	Use of Digital Tools	4,05	0,809	29,09	19,342	0,67	0,878
8,4	Employee Digital Skills	4,38	0,684	28,75	20,21	0,664	0,88
8,5	Means of digital upskilling available	4,28	0,838	28,85	19,099	0,677	0,878
8,6	Learning and knowledge management platforms	4,16	0,899	28,97	18,204	0,749	0,87

8,7	**Business metrics to adapt to meet changes in strategy**	**3,77**	**0,986**	**29,36**	**17,723**	**0,731**	**0,873**
8,8	**Flexible workplace**	**4,36**	**0,67**	**28,77**	**20,532**	**0,623**	**0,884**
9,1	**Dashboards**	**3,47**	**1,008**	**15,39**	**8,894**	**0,665**	**0,835**
9,2	**Automation of core processes**	**3,4**	**0,947**	**15,47**	**8,987**	**0,709**	**0,822**
9,3	**Self-provisioning & external interfaces**	**4,35**	**0,777**	**14,51**	**10,357**	**0,59**	**0,852**
9,4	**Automation and algorithms for decision-making**	**3,8**	**0,938**	**15,06**	**8,893**	**0,739**	**0,814**
9,5	**Continuous optimization**	**3,84**	**0,972**	**15,02**	**8,938**	**0,693**	**0,826**
10,1	**Platform business model usage**	**3,55**	**1,015**	**11,42**	**4,832**	**0,642**	**0,692**
10,2	**Use of data as a strategic asset**	**3,76**	**1,006**	**11,21**	**5,018**	**0,599**	**0,717**
10,3	**Value proposition evolution**	**3,99**	**0,861**	**10,97**	**5,904**	**0,498**	**0,766**
10,4	**Coopetition as a new source of value; asymmetric competitors as new threats**	**3,66**	**0,921**	**11,3**	**5,338**	**0,598**	**0,717**

Table 28: Detailed reliability showing impact if item deleted

4.8 Normality Test

Testing for normality was performed to determine whether a given dataset follows a normal distribution. Normality tests help in assessing if the data meets the assumptions of certain statistical analyses that require a normal distribution, such as many parametric tests like correlations and t-tests, ANOVA. The Kolmogorov-Smirnov Test: was performed to test for normal distribution. The normality test results are shown in Table 29.

	Kolmogorov-Smirnov[a]			
	Statistic	df	Sig.	Interpretation
Vision & Strategy	,129	129	<,001	Significant
Culture	,163	129	<,001	Significant
Organisation & Governance	,123	129	<,001	Significant
Innovation	,108	129	<,001	Significant
Digital Ethics	,103	129	,002	Significant
Digital Leadership	,076	129	,065	
Customer Orientation & Engagement	,097	129	,005	
Product Innovation	,115	129	<,001	Significant
Workforce Enablement and Performance	,094	129	,007	
Core Process Digitisation	,112	129	<,001	Significant
New Business Models	,109	129	<,001	Significant
Digital Application & Impact	,096	129	,005	
a. Lilliefors Significance Correction				

Table 29: Normality tests

4.8.1 *Normality Results Discussion*

The normality test performed using the Kolmogorov-Smirnov statistic checks whether the data distribution deviates from a normally distributed set of data (Gaussian distribution). The 'Sig.' column lists p-values for each construct.

If the p-value is less than 0.05 (which is used as a threshold for significance), it suggests that the data for that construct does not follow a normal distribution, meaning

that it significantly deviates from normality. This has implications for what kind of statistical tests can be used since many tests assume normality of the data.

The results are as follows:

- For Vision & Strategy, Culture, Organisation & Governance, Innovation, Product Innovation, Core Process Digitisation, and New Business Models, the p-values are less than 0.001, indicating a significant deviation from normality.
- For Digital Ethics, Customer Orientation & Engagement, Workforce Enablement and Performance, and Digital Application & Impact, the p-values are less than 0.01 but greater than 0.001, also indicating significant deviations from normality.
- Digital Leadership has a p-value of 0.065, which is above the 0.05 threshold, suggesting that the data for this construct may not significantly deviate from a normal distribution.

4.9 **Kruskal-Wallis Test**

An Independent-Samples Kruskal-Wallis Test is then used to determine how the five digital application and Impact factors vary by demographic (see Section 3.6 for details).

The demographic variables analysed are Age, Gender, Company, Education Level, Position and Tenure.

4.9.1 *Age*

The results are shown in Table 30

Hypothesis Test Summary			
	Null Hypothesis	Sig.a ,b	Decision
1	The distribution of Vision & Strategy is the same across categories of How old are you.	0,262	Retain Null hypothesis.
2	The distribution of Culture is the same across categories of How old are you?.	0,196	Retain Null hypothesis.

3	The distribution of Organisation & Governance is the same across categories of How old are you?.	0,052	Retain Null hypothesis.
4	The distribution of Digital Ethics is the same across categories of How old are you?.	0,326	Retain Null hypothesis.
5	The distribution of New Business Models is the same across categories of How old are you?.	0,132	Retain Null hypothesis.
6	The distribution of Innovation is the same across categories of How old are you?.	<,001	Reject Null hypothesis.
7	The distribution of Customer Orientation & Engagement is the same across categories of How old are you?.	0,71	Retain Null hypothesis.
8	The distribution of Product Innovation is the same across categories of How old are you?.	0,375	Retain Null hypothesis.
9	The distribution of Workforce Enablement and Performance is the same across categories of How old are you?.	0,635	Retain Null hypothesis.
10	The distribution of Core Process Digitisation is the same across categories of How old are you?.	0,567	Retain Null hypothesis.
11	The distribution of Digital Leadership is the same across categories of How old are you?.	0,033	Reject Null hypothesis.
12	The distribution of Digital Application & Impact is the same across categories of How old are you?.	0,503	Retain Null hypothesis.
a. The significance level is ,050.			
b. Asymptotic significance is displayed.			

Table 30: Age Kruskal Wallis results

Results:

- For Innovation, with a significance value of less than 0.001, there is evidence to suggest that there are differences in how different age groups view innovation.
- For the remaining categories, there is not enough evidence to suggest that the distribution of these responses differs by age, so the null hypothesis is rejected.

4.9.2 *Gender*

The results from the Independent-Samples Kruskal-Wallis Test are shown in the table below.

Hypothesis Test Summary			
	Null Hypothesis	**Sig.a, b**	**Decision**
1	The distribution of Vision & Strategy is the same across categories of What is your gender?.	0,274	Retain null hypothesis.
2	The distribution of Culture is the same across categories of What is your gender?.	0,253	Retain null hypothesis.
3	The distribution of Organisation & Governance is the same across categories of What is your gender?.	0,305	Retain null hypothesis.
4	The distribution of Digital Ethics is the same across categories of What is your gender?.	0,685	Retain null hypothesis.
5	The distribution of New Business Models is the same across categories of What is your gender?.	0,452	Retain null hypothesis.
6	The distribution of Innovation is the same across categories of What is your gender?.	0,654	Retain null hypothesis.
7	The distribution of Customer Orientation & Engagement is the same across categories of What is your gender?.	0,281	Retain null hypothesis.
8	The distribution of Product Innovation is the same across categories of What is your gender?.	0,112	Retain null hypothesis.
9	The distribution of Workforce Enablement and Performance is the same across categories of What is your gender?.	0,317	Retain null hypothesis.
10	The distribution of Core Process Digitisation is the same across categories of What is your gender?.	0,176	Retain null hypothesis.
11	The distribution of Digital Leadership is the same across categories of What is your gender?.	0,342	Retain null hypothesis.
12	The distribution of Digital Application & Impact is the same across categories of What is your gender?.	0,321	Retain null hypothesis.

a. The significance level is ,050.		
b. Asymptotic significance is displayed.		

Table 31: Gender Kruskal Wallis results

For all 12 hypotheses tested, the decision is to "Retain the null hypothesis", meaning there's no statistical evidence to suggest differences in the distribution of responses across gender categories for any of the tested organizational characteristics.

The highest p-value observed is for Digital Ethics (0.685), suggesting a strong likelihood that gender does not influence how respondents perceive digital ethics in their organization. The closest to potentially showing a difference is Product Innovation (0.112), but it still does not meet the threshold to reject the null hypothesis.

4.9.3 *Education Level*

This shows that the majority of survey participants have at least a bachelor's degree, indicating a highly educated sample.

Hypothesis Test Summary			
	Null Hypothesis	Sig .a, b	Decision
1	The distribution of Vision & Strategy is the same across categories of highest level of education completed?.	0,953	Retain null hypothesis
2	The distribution of Culture is the same across categories of highest level of education completed?.	0,886	Retain null hypothesis
3	The distribution of Organisation & Governance is the same across categories of highest level of education completed?.	0,447	Retain null hypothesis
4	The distribution of Digital Ethics is the same across categories of highest level of education completed?.	0,419	Retain null hypothesis
5	The distribution of New Business Models is the same across categories of highest level of education completed?.	0,705	Retain null hypothesis

6	The distribution of Innovation is the same across categories of highest level of education completed?.	0,218	Retain null hypothesis
7	The distribution of Customer Orientation & Engagement is the same across categories of highest level of education completed?.	0,78	Retain null hypothesis
8	The distribution of Product Innovation is the same across categories of highest level of education completed?.	0,607	Retain null hypothesis
9	The distribution of Workforce Enablement and Performance is the same across categories of highest level of education completed?.	0,992	Retain null hypothesis
10	The distribution of Core Process Digitisation is the same across categories of highest level of education completed?.	0,696	Retain hypothesis
11	The distribution of Digital Leadership is the same across categories of highest level of education completed?.	0,522	Retain null hypothesis.
12	The distribution of Digital Application & Impact is the same across categories of highest level of education completed?.	0,787	Retain null hypothesis.
a. The significance level is ,050.			
b. Asymptotic significance is displayed.			

Table 32: Education Kruskal Wallis results

The Kruskal-Wallis Test results suggest that within this sample, the respondents' highest level of education does not appear to influence their views on the various organizational characteristics surveyed.

4.9.4 *Position*

The results of the Independent-Samples Kruskal-Wallis Test are shown in Table 33.

Hypothesis Test Summary			
	Null Hypothesis	Sig. a,b	Decision
1	The distribution of Vision & Strategy is the same across categories of Position?	0,004	Reject the null hypothesis.
2	The distribution of Culture is the same across categories of Position?	0,248	Retain the null hypothesis.
3	The distribution of Organisation & Governance is the same across categories of Position?	0,048	Reject the null hypothesis.
4	The distribution of Digital Ethics is the same across categories of Position?	0,006	Reject the null hypothesis.
5	The distribution of New Business Models is the same across categories of Position?	0,03	Reject the null hypothesis.
6	The distribution of Innovation is the same across categories of Position?	<,001	Reject the null hypothesis.
7	The distribution of Customer Orientation & Engagement is the same across categories of Position?	0,075	Retain the null hypothesis.
8	The distribution of Product Innovation is the same across categories of Position?	0,109	Retain the null hypothesis.
9	The distribution of Workforce Enablement and Performance is the same across categories of Position?	0,007	Reject the null hypothesis.
10	The distribution of Core Process Digitisation is the same across categories of Position?	0,131	Retain the null hypothesis.
11	The distribution of Digital Leadership is the same across categories of Position?	<,001	Reject the null hypothesis.
12	The distribution of Digital Application & Impact is the same across categories of Position?	0,011	Reject the null hypothesis.
a. The significance level is ,050.			
b. Asymptotic significance is displayed.			

Table 33: Position Kruskal Wallis Results

For several characteristics, the null hypothesis is rejected, indicating a significant difference in perception across different job positions:

- **Vision & Strategy**: p = 0.004; the null hypothesis is rejected, suggesting different job positions perceive vision and strategy differently.
- **Organisation & Governance**: p = 0.048; rejection of the null hypothesis indicates differing perceptions.
- **Digital Ethics**: p = 0.006; again, perceptions differ by job position.
- **New Business Models**: p = 0.03; job position seems to affect views on this matter.
- **Innovation**: p < 0.001; a clear rejection of the null hypothesis, showing strong differences in views on innovation across different roles.
- **Workforce Enablement and Performance**: p = 0.007; different roles perceive this differently.
- **Digital Leadership**: p < 0.001; a strong indication of differing perceptions based on job role.
- **Digital Application & Impact**: p = 0.011; job position impacts perception.

For the other characteristics, the null hypothesis is retained, suggesting no significant difference in perception across job positions. These include Culture, Customer Orientation & Engagement, Product Innovation, and Core Process Digitisation.

In summary, the test results suggest that an individual's position or role within the organization significantly affects how they perceive certain aspects of their company's operations and strategies, particularly in areas such as vision & strategy, innovation, and leadership.

4.10 Tenure

The hypothesis testing table investigates whether the distribution of perceptions on various organizational characteristics is the same across different lengths of tenure within the organization, using the Independent-Samples Kruskal-Wallis Test.

Null Hypothesis	Significance.a,b	Decision
The distribution of Vision & Strategy is the same across categories of Tenure	<,001	Reject Null hypothesis.
The distribution of Culture is the same across categories of Tenure	,001	Reject Null hypothesis.
The distribution of Organisation & Governance is the same across categories of Tenure	,002	Reject Null hypothesis.
The distribution of Digital Ethics is the same across categories of Tenure	,040	Reject Null hypothesis.
The distribution of New Business Models is the same across categories of Tenure	,021	Reject Null hypothesis
The distribution of Innovation is the same across categories of Tenure	<,001	Reject Null hypothesis.
The distribution of Customer Orientation & Engagement is the same across categories of Tenure	,010	Reject Null hypothesis.
The distribution of Product Innovation is the same across categories of Tenure	<,001	Reject Null hypothesis.
The distribution of Workforce Enablement and Performance is the same across categories of Tenure	<,001	Reject Null hypothesis.
The distribution of Core Process Digitisation is the same across categories of Tenure	,038	Reject Null hypothesis.
The distribution of Digital Leadership is the same across categories of Tenure	<,001	Reject Null hypothesis.
The distribution of Digital Application & Impact is the same across categories of Tenure	<,001	Reject the null hypothesis.

Table 34: Tenure Kruskal Wallis

All 12 hypotheses tested resulted in a rejection of the null hypothesis, suggesting that there are significant differences in how employees perceive various aspects of the organization depending on how long they have been with the company.

Given the rejection of the null hypothesis across all tested categories, it is evident that tenure has a significant impact on employees' perceptions of organizational characteristics. This should be an important consideration when analysing the organizational culture, structure, and effectiveness.

4.11 Correlation Analysis

This section delves into the interrelationships between different constructs of digital maturity, employing Spearman’s correlation analysis. Spearman's correlation is chosen for its ability to measure the strength and direction of association between two ranked variables, making it particularly suitable for data that do not necessarily follow a normal distribution. This analysis aims to uncover significant correlations between constructs, offering insights into how various aspects of digital maturity interrelate within organizations.

4.11.1 *Spearman’s Correlation Analysis*

Table 35 below presents the Spearman’s correlation coefficients among the constructs of digital maturity. A double asterisk (**) indicates that the correlation is significant at the 0.01 level (2-tailed), suggesting a strong and statistically significant association between the constructs.

	Vision & Strategy	Culture	Organisation & Governance	Innovation	Digital Ethics	Digital Leadership	Customer Orientation & Engagement	Product Innovation	Workforce Enablement and Performance	Core Process Digitisation	New Business Models	Digital Application & Impact
Vision & Strategy	--											
Culture	,629**	--										
Organisation & Governance	,635**	,602**	--									
Innovation	,606**	,536**	,485**	--								
Digital Ethics	,608**	,520**	,627**	,532**	--							
Digital Leadership	,854**	,782**	,820**	,759**	,804**	--						
Customer Orientation & Engagement	,656**	,589**	,625**	,579**	,520**	,727**	--					
Product Innovation	,574**	,516**	,548**	,548**	,413**	,616**	,593**	--				
Workforce Enablement and Performance	,627**	,651**	,596**	,600**	,549**	,721**	,702**	,616**	--			
Core Process Digitisation	,598**	,481**	,628**	,469**	,620**	,678**	,599**	,580**	,682**	--		
New Business Models	,594**	,487**	,548**	,530**	,465**	,639**	,687**	,645**	,591**	,627**	--	
Digital Application & Impact	,705**	,650**	,705**	,623**	,610**	,801**	,840**	,768**	,875**	,844**	,805**	--

Table 35: Spearman's correlation results

**. Correlation is significant at the 0.01 level (2-tailed)

The correlation table shows the relationships between various constructs related to digital maturity. Specifically:

- **Vision & Strategy** has a very strong positive correlation with **Digital Leadership** (0.854), which suggests that vision and strategy are closely tied to the leadership approach and structural decisions within the organization.
- **Culture** shows strong positive correlations with **Digital Leadership** (0.782), **Workforce Enablement and Performance** (0.651), and **Digital Application & Impact** (0.650), indicating that the organizational culture significantly influences leadership, employee performance, and digital application outcomes.
- **Digital Application & Impact** is highly correlated with almost all constructs, especially **Digital Leadership** (0.801), **Customer Orientation & Engagement** (0.840), and **Workforce Enablement and Performance** (0.875). This indicates that the digital applications' impact is deeply integrated with how leadership is executed, how customers are engaged, and how the workforce is enabled.
- The strong correlation between **Customer Orientation & Engagement** and **New Business Models** (0.687) suggests that customer-focused strategies are important for developing innovative business models.
- **Core Process Digitisation** is strongly correlated with **Workforce Enablement and Performance** (0.682) and **Digital Application & Impact** (0.844), suggesting that digitizing core processes significantly contributes to workforce performance and the overall impact of digital applications.

In all cases, the double asterisks (**) indicate that these correlations are statistically significant at the 0.01 level, which means there's less than a 1% probability that these correlations are due to random chance, thus they are likely to represent real associations in the data set.

4.11.2 *Correlation Discussion*

These correlations informs our understanding of the critical factors for digital maturity by highlighting which elements of the model are most interconnected.

We will explore how these interrelated constructs can be leveraged to enhance digital maturity within the South African fintech context.

Seeing as Culture is the leading category in the top 10 variables, the organisation can see what it is best to couple culture with. It is strongly correlated with Digital Leadership (0.782), Workforce Enablement and Performance (0.651), and Digital Application & Impact (0.650), indicating that the organizational culture significantly influences leadership, employee performance, and digital application outcomes.

It makes sense that it is mostly strongly correlated with leadership and architecture as it falls within this category. The other two can be used to determine the organization's way forward (Workforce Enablement & Performance and Digital Application and Impact).

4.12 Summary

Chapter 4 looks at the empirical findings from the study on the impact of Digital Leadership on organizational performance across various digital leadership factors including Customer Orientation & Engagement, Digital Product Innovation, Workforce Enablement & Performance, Core Process Digitization, and New Value Streams & Business Models. The chapter employs multiple regression analysis and MANCOVA tests to assess these impacts, revealing significant positive effects of Digital Leadership across all dimensions explored. Regression equations for each five factors are produced.

Key findings include:

- Customer Orientation & Engagement: Demonstrated significant improvements because of enhanced Digital Leadership, emphasizing the importance of leadership in driving customer-focused strategies.
- Digital Product Innovation: Showed a positive impact from Digital Leadership, indicating the role of leadership in fostering an innovative environment for product development.

- Workforce Enablement & Performance: Revealed that Digital Leadership plays a crucial role in empowering employees and optimizing performance through digital tools.
- Core Process Digitization: Highlighted the necessity of effective Digital Leadership in successfully digitizing core business processes.
- New Value Streams & Business Models: Underlined the importance of Digital Leadership in creating new business opportunities and models in the digital age.
- Additionally, reliability and correlation analyses underscored the significance of Digital Leadership, with strong internal consistency among scales and significant correlations between Digital Leadership and other dimensions of digital maturity.

CHAPTER 5. DISCUSSION OF THE RESULTS OR FINDINGS

5.1 Introduction

This chapter embarks on a detailed discussion of the research results, contrasting the findings against the objectives stipulated in Chapter 1. This section aims to unravel the practical implications of the findings derived from the in-depth analysis in Chapter 4. It navigates through the intricacies of the findings, examining it against literature, placing it in context and sets the stage for practical implications that can guide organisations in the South African fintech space.

The chapter is structured as follows:

- Summary of key findings
- Discussion of findings per objective
- Reliability and generalisability
- Implications of the study. Both theoretical and practical

5.2 Summary of Key Findings

The key findings from Chapter 4, linked to the objectives in Chapter 1 are as follows:

- Objective 1. The top eight critical factors that influence digital maturity at a South African fintech group are Customer value focus, Organisational learning, exploration & experimentation, Leadership culture and transformation, Employee Digital Skills, Flexible workplace, Employee empowerment, Products, UX differentiated by emerging technologies, and Product and UX differentiation by digital features. At a higher level, the top five constructs contributing to digital maturity are Organisational Culture, Workforce Enablement & Performance, Customer Orientation, Governance, Product Innovation.

- Objective 2 and it's sub-objectives Digital Leadership has a positive impact on the Digital Maturity factors of Customer Orientation & Engagement, Digital Product Innovation, Workforce Enablement & Performance, Core Processes Digitisation and New Value Streams & Business Models. A simple linear regression for each of the five constructs are produced.

5.3 Objective 1: Critical Factors Influencing Digital Maturity

Generalisability

The respondent organisation distribution has an impact on generalisability of the study. Demographic analysis by company showed that majority, or 86.8%, of participants came from organisation X with the second most of 9.3% at Group Level. This means that inferring results for Organisation X is well supported, but generalising across organisation Y is currently not well supported and could benefit from further evidence.

Because organisation X has the highest percentage of employees within the group and highest percentage representation at group-level compared to the other organisations in the group, generalisation may apply to group level strategy, though not necessarily strategy at organisation level for other organisations (except Organisation X) within the group.

The analysis and discussion below regarding to Objective 1 will then apply to Organisation X overall, and the fintech group at a strategic level.

Digital Maturity Factor Ranking

A descriptive statistics approach was used to meet Objective 1, with outcome shown in Table 11: Eight most critical digital maturity variables. The analysis involved ranking the 47 digital maturity indicators by their mean values and separately by their standard deviation values, and then identifying overlaps between them as shown in Table 10 in Section 0. The mean and standard deviation ranges of the top 8 critical factors influencing digital maturity are 4.1 – 4.6 and 0.656 – 0.734 respectively, which are high and low (to moderate) for mean and standard deviation respectively. The low to moderate standard deviation indicates general consensus with slight differences. The indicators with high mean values were interpreted as being highly important by the

respondents, reflecting the collective assessment of their significance. Conversely, low standard deviations were used to indicate a greater consensus amongst respondents among respondents regarding the importance of specific variables, suggesting uniformity in their perceptions.

The essence of combining high mean values with low standard deviation lies in its ability to signify indicators that are not only valued highly across the board but also consistently agreed upon by respondents. This combination is seen as the ideal scenario because it points to a strong, shared recognition of specific indicators as crucial. Such a consensus is vital for prioritising areas of focus in digital maturity initiatives, as it highlights variables that are both important and uncontroversially agreed upon, thereby providing a solid foundation for targeted improvement strategies.

At a variable level, the most critical digital maturity indicators are shown in the table below. This feeds the practical implementation strategy for Organisation X as discussed in the section to follow.

Rank	Digital Maturity Indicator
1	Customer value focus
2	Organisational learning, exploration & experimentation
3	Leadership culture and transformation
4	Employee Digital Skills
5	Flexible workplace
6	Employee empowerment
7	Products, UX differentiated by emerging technologies
8	Product and UX differentiation by digital features

Table 36: Top 8 Critical Digital Maturity Factors

A similar approach was followed at a factor level. The mean and standard deviation ranges here were 3.93 – 4.33 and 0.75 – 0.84, respectively, indicating that these factors are both important to digital maturity and uncontroversially agreed upon by respondents.

As with the top indicators, the top factors have practical implications in the organisation's digital maturity and digital transformation journey, as described later in this section.

Literature Comparison & Contributions

- **Critical Factors for Digital Maturity**: The identification of factors such as customer value focus, organizational learning, and leadership culture mirrors the discussion by Andal-Ancion et al. (2003) and Koch (2017), highlighting these as essential for digital transformation success.
- **The Role of Workforce Enablement and Organizational Culture**: Seeing as these are the top two factors. This aligns with Berghaus and Back (2016) and Ross and Martin (2018), where the development of digital skills within the workforce and fostering a culture conducive to digital innovation are seen as foundational for digital maturity.
- **Demographic Insights on Digital Transformation Perceptions**: The nuanced effects of demographic factors like age, gender, and education on perceptions of digital transformation efforts find resonance in Mutwa (2021) and Parsons (2015), who explore the influence of age on innovation capacity and the impact of diversity on digital initiatives.
- Looking at the Berghaus and Back (2016) digital maturity model, multiple factors align with the findings of the study. The Berghaus and Back (2016) model provides nine top factors: Customer experience, product innovation, strategy, organisation, process digitisation, collaboration, information technology, culture expertise and transformation management. There is overlap in multiple areas*:* 1. *Customer experience* with *Customer value focus*; 2. *Product Innovation* with *UX differentiated by emerging technologies* and *Product and UX differentiation by digital features;* 3. *Culture Expertise and Transformation* with *Organisational learning*.

  It makes sense that there are multiple overlaps or similar variables as the Unified Digital Maturity Model used in this study was influenced and certain elements from the Berghaus and Back (2016) model.

Practical Implications

Practically, the top 8 critical factors for digital maturity identified serve as a foundation for an organisations digital maturity journey. The implications are beyond digital maturity. Given that digital maturity, as stated by Kane et al. (2015), is the extent to which an organization has successfully integrated digital technologies into its operations and has the ability to adapt to the constantly changing digital landscape, these factors have implications to the organisations digital transformation journey.

The suggested starting points to in Organisation X's digital maturity journey are therefore the top eight factors shown in Table 11 in Section 0. These are (1) Customer value focus, (2) Organisational learning, exploration & experimentation, (3) Leadership culture and transformation, (4) Employee Digital Skills, (5) Flexible workplace, (6) Employee empowerment, (7) Products, UX differentiated by emerging technologies, and (8) Product and UX differentiation by digital features. A practical implementation plan at indicator level is shown in the figure below.

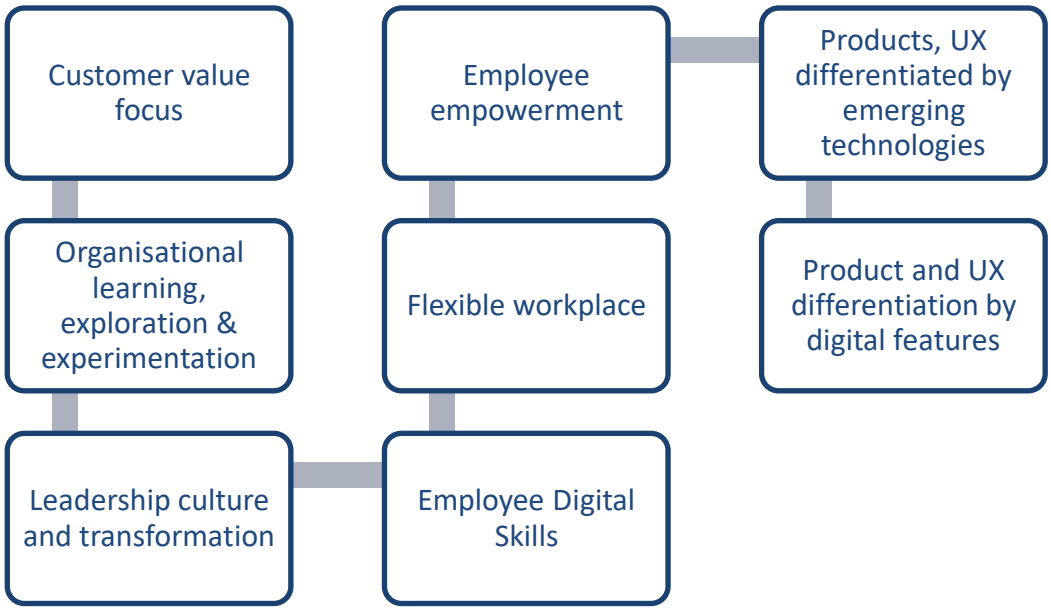

Figure 8: Digital Maturity practical improvement plan at factor level

Should Organisation X wish to start their digital maturity improvement at a factor level, which is the suggested approach, the top three factors provide a solid foundation. A three-step plan based on the top three factors are graphically illustrated in Figure 9.

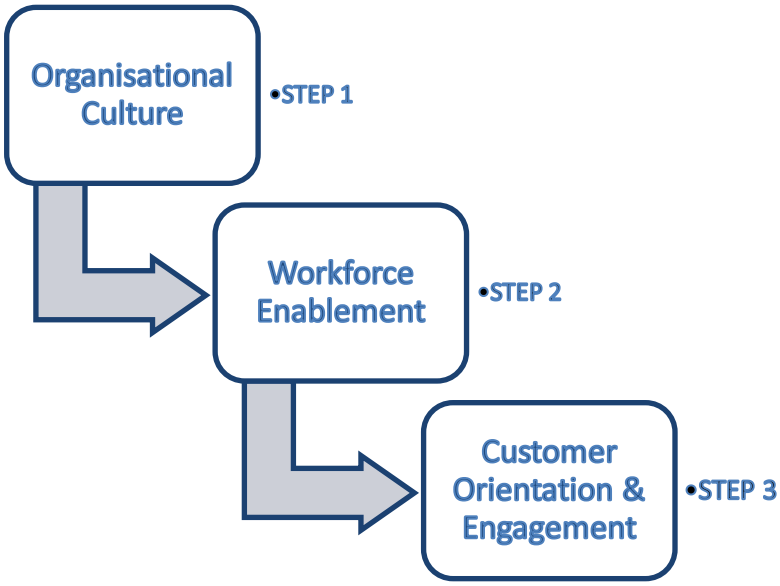

Figure 9: Digital Maturity increase implementation plan by factor

5.4 Objective 2: Impact of Digital Leadership on Digital Maturity Factors

The MANCOVA and hypothesis testing outcomes indicate that digital leadership significantly impacts various constructs of digital application and impact, including customer orientation, digital product innovation, workforce enablement, process digitization, and new business models.

These results highlight the broad and significant influence of digital leadership across all areas of digital application and impact. The uniform support for the hypotheses across different constructs underscores the foundational role of digital leadership in enhancing digital maturity. This is further evidenced by the significant correlations between Digital Leadership and other constructs, indicating a strong association between effective digital leadership and improved outcomes in digital maturity.

Generalisability

The respondent organisation distribution has an impact on generalisability of the study. Demographic analysis by company showed that majority, or 86.8%, of participants came from organisation X with the second most of 9.3% at Group Level. This means that inferring results for Organisation X is well supported, but generalising across organisation Y is currently not well supported and could benefit from further evidence.

Because organisation X has the highest percentage of employees within the group and highest percentage representation at group-level compared to the other organisations in the group, generalisation may apply to group level strategy, though not necessarily strategy at organisation level for other organisations (except Organisation X) within the group.

The analysis and discussion below regarding to Objective 2 will then apply to Organisation X in general, and the fintech group at a strategic level.

MANCOVA

The multivariate tests performed as part of MANCOVA were intended to identify the relationship between the independent variable (digital leadership) and the five digital maturity factors which are Customer Orientation & Engagement, Digital Product Innovation, Workforce Enablement & Performance, Core Processes Digitalization, New Value Streams & Business Models.

The results on all four multivariate tests were significant. The statistically significant results on all four multivariate tests (<0,001) indicates that Digital Leadership has a substantial influence on the overall five digital maturity factors. This means that changes in digital leadership are associated with changes in all five digital maturity factors simultaneously.

Literature Comparison & Contribution

- Literature is light in this area of research. Chapter 1 clearly mentions a lack of research in this area, particularly focusing on the level of detail. Can (2021) mentions the lack of research that examines the relationship between digital leadership and digital transformation at component and outcome level, respectively.

  The study aids in filling the gap which is done by laying out a framework (that incorporates standardised instruments) to identify relationships between Digital Leadership and Digital Maturity outcomes, which then also lead to regression equations.
- **Digital Leadership and Digital Maturity**: The findings about the critical role of digital leadership in enhancing digital maturity correlate well with the assertions

made by Gupta et al. (2019) and Kane et al. (2015). They emphasize that leadership is a pivotal factor in driving digital transformation efforts.

5.4.1 *Objective 2.1: Customer Orientation & Engagement*

MANCOVA

The main outcomes here are the parameter estimates, but the Tests of Between-Subjects are included to factor in interactions and relationships between the variables. The outcomes show significant results for all five factors of digital maturity. This shows that Digital Leadership has an influence on all digital maturity factors with possible interactions and relationships between these factors.

Regression

MANCOVA was used to arrive at parameter estimates for the regression model, with results presented in Table 16: MANCOVA Parameter Estimates in Chapter 4.

With a coefficient of .775 ($p < .001$), digital leadership shows a substantial positive influence on enhancing customer orientation and engagement. This underscores the importance of digital leadership in prioritizing and improving the ways in which the organization interacts with and serves its customers, leveraging digital tools to enhance engagement and satisfaction.

5.4.2 *Objective 2.2: Digital Product Innovation*

MANCOVA

The main outcomes here are the parameter estimates, but the Tests of Between-Subjects are included to factor in interactions and relationships between the variables. The outcomes show significant results for all five factors of digital maturity. This shows that Digital Leadership has an influence on all digital maturity factors with possible interactions and relationships between these factors.

Regression

MANCOVA was used to arrive at parameter estimates for the regression model, with results presented in Table 16: MANCOVA Parameter Estimates in Chapter 4.

The analysis presents a coefficient of .736 ($p < .001$) for digital leadership, indicating its significant positive impact on digital product innovation. This means that Digital leadership plays a pivotal role in encouraging and facilitating innovation, particularly in the development of new and improved products. Leaders who are digitally savvy can create an environment that nurtures innovation and leverages digital technologies to meet evolving market demands.

5.4.3 *Objective 2.3: Workforce Enablement & Performance*

MANCOVA

The main outcomes here are the parameter estimates, but the Tests of Between-Subjects are included to factor in interactions and relationships between the variables. The outcomes show significant results for all five factors of digital maturity. This shows that Digital Leadership has an influence on all digital maturity factors with possible interactions and relationships between these factors.

Regression

MANCOVA was used to arrive at parameter estimates for the regression model, with results presented in Table 16: MANCOVA Parameter Estimates in Chapter 4.

The coefficient for digital leadership (.774, $p < .001$) signifies a strong positive effect on workforce enablement and performance. This means that digital leadership is essential in empowering the workforce, enhancing performance through digital tools and technologies, and fostering a culture that supports continuous learning and adaptation in a digital era.

5.4.4 *Objective 2.4: Core Processes Digitalisation*

MANCOVA

The main outcomes here are the parameter estimates, but the Tests of Between-Subjects are included to factor in interactions and relationships between the variables. The outcomes show significant results for all five factors of digital maturity. This shows that Digital Leadership has an influence on all digital maturity factors with possible interactions and relationships between these factors.

Regression

MANCOVA was used to arrive at parameter estimates for the regression model, with results presented in Table 16: MANCOVA Parameter Estimates in Chapter 4.

With a coefficient of .879 ($p < .001$), digital leadership demonstrates a significant positive impact on the digitization of core processes. This means that digital leaders are crucial in driving the transformation of core business processes through digitization, streamlining operations, and improving efficiency through the strategic use of digital technologies.

5.4.5 *Objective 2.5: New Value Streams & Business Models*

MANCOVA

The main outcomes here are the parameter estimates, but the Tests of Between-Subjects are included to factor in interactions and relationships between the variables. The outcomes show significant results for all five factors of digital maturity. This shows that Digital Leadership has an influence on all digital maturity factors with possible interactions and relationships between these factors.

Regression

MANCOVA was used to arrive at parameter estimates for the regression model, with results presented in Table 16: MANCOVA Parameter Estimates in Chapter 4.

The coefficient for digital leadership ($B = .836$, $p < .001$) indicates a strong, positive impact on the development of new business models. This statistically significant relationship suggests that digital leadership is a critical driver in fostering innovative business models within the organization.

This means that the presence of effective digital leadership significantly correlates with an organization's ability to innovate and develop new business models, highlighting the role of leadership in championing innovation and supporting the organizational shift towards new, digital-centric business strategies.

5.4.6 *Study Objective: Impact of Digital Leadership on Digital Maturity at a South African Fintech Group*

The discussion below applies to both Objective 1 and Objective 2, so the objective of the study, and are detailed below to avoid duplication of information.

Generalisability

The respondent organisation distribution has an impact on generalisability of the study. Demographic analysis by company showed that majority, or 86.8%, of participants came from organisation X. The second most was 9.3% at Group Level. This means that inferring results for Organisation X is well supported, but generalising across organisation Y and the fintech is currently not well supported and requires further evidence. Generalisations are therefore made for Organisation X, and in-part, for group-level leadership.

Results from the regression analysis, obtained from MANCOVA, indicate a few things. It indicates that across all five measured factors, digital leadership emerges as a fundamental driver of digital maturity. The significant positive coefficients for digital leadership in influencing new business models, customer orientation & engagement, product innovation, workforce enablement and performance, and core process digitization underscore the pivotal role of leadership in navigating and steering the digital transformation journey. These findings not only reinforce the importance of cultivating strong digital leadership within organizations but also highlight the broad and impactful role such leadership plays in enabling digital maturity across various facets of an organization.

Findings

Objective 1 and Objective 2 combine to answer the studies overall objective. Looking at Objective 2 and it's sub-objectives 2.1 – 2.5, it is found that Digital Leadership positively influences the five digital maturity dimensions.

This means that an improvement in Digital Leadership practices will increase the Digital Maturity of the fintech group. We have established the tight link between digital transformation and digital maturity, so in turn can state that an improvement in Digital Leadership also has the benefit of aiding the fintech group in their digital transformation journey.

Influence of Demographic Variables

The following is based on the results of the Independent Samples Kruskal-Wallis Test. This looks to see if the perception of the dependent variables, in this case, digital maturity factors, are significantly influenced by the categorical variables, which are in this case age, tenure, education and gender.

- **Age**: Differences in perception of constructs by age. Innovation is the only category where Age was found to have a notable impact. This is likely because creativity and innovation and creativity are influenced by age. This is supported by Parsons (2015) where he states that innovation declines with age, but the ability to capitalise on innovation increases with age. Vroom and Pahl (1971) supports this, specifically commenting on the risk-taking component. Practically, Organisation X could gather ideas from the younger audience and implementation be driven by the older audience. Though this area may be analysed in more detail to examine the exact differences in innovation with age, in that is it higher or lower with age.

- **Gender**: There has been no observable impact of Gender on any of the constructs. This is contrary to the study of Wang and He (2024), who found that male CEO's produce superior digital transformation outcomes to their female counterparts. For the fintech group and this survey in particular, the lack of a significant observation may be attributed to a relatively small female representation (25.7%) of respondents compared to males of 73.6% and other of 0.8%.

- **Education**: There has been no observable impact of Education on any of the constructs, which is contrary to the findings of Wang and He (2024),and Wiersema

and Bantel (1992), which show an improvement in digital transformation and change management results, respectively. This is likely because most of the sample (91.5%) have at least a diploma. Tertiary studies often expose students more to technology, than those who have not undergone tertiary studies. This is especially the case at the selected fintech as the bulk of employees are software developers, which is a field highly exposed to digital technologies.

- **Position**: There has been no observable significant difference in perception across job position in Culture, Customer Orientation & Engagement, Product Innovation, and Core Process Digitisation. This could be because the fintech puts a large focus on driving a specific inclusive, low-hierarchy, open and innovative culture, which then levels the perception across positions. For core process digitisation, this is likely because ground level staff or professionals are exposed to process digitisation due to their tech nature, and leaders are also well-aware as they drive it. There are notable differences in Vision & Strategy. This makes sense as leadership is typically much more exposed to strategy than ground-level staff, but they can often miss nuanced details of the actual situation due to their distance from it in day-to-day activities. Innovation, as per the analysis on Education, shows significant variation for similar reasons.

- It has been found that the majority of respondents are in professional roles, with relatively few in leadership roles. This is likely due to two reasons. Firstly, as per company structures it makes sense to have fewer leaders than professionals. This is because typically one leader has multiple professionals working under their supervision. Also, it could be that leadership time to answer a survey is more costly than those of professionals, meaning that a relatively lower percentage of leadership responded to the survey.

- **Tenure**: Significant differences in Vision & Strategy are seen. This could also be because newer employees are less exposed to strategy than more seasoned employees. Similarly for Organisation & Governance, except that for this one, new employees often come with a fresh and less biased view of these aspects. For Digital Ethics, this is likely due to a combination of the above reasons. and Wiersema and Bantel (1992) found that shorter tenure is associated with better change management.

Further Notes on Practical Implementation

Noting that demographics influence digital maturity factors, the following practical suggestions are made:

- To enhance the digital innovation factor of digital maturity, Organisation X could gather ideas from the younger audience and implementation be driven by the older audience. This is because in this study age has shown a significant impact on innovation, which is supported by literature. Literature provides an explanation for this.

5.5 Generalisability

Majority of responses came from Organisation X (86.8). This means that respondents views are representative, or biased towards Organisation X, thus making it difficult to generalise to the fintech under study, and more so, to fintech's in South Africa in general. Though the greater response rate on Organisation X makes the results more generalisable to organization X.

5.6 Reliability

As per Cronbach's alpha tests, it was found that the tool has an acceptable to good reliability across all constructs. This is expected as the Armstrong & Lee Digital Maturity Model is well researched and tested, with good credibility. This means that we can eliminate instrument and model shortfalls from our findings.

5.7 Implications of Study

5.7.1 *Theoretical Implications*

This section discusses how the findings contribute to existing theories and concepts within the field.

Can (2021) mentioned a lack of research that specifically examines the relationship between digital leadership and digital transformation outcomes. By diving deeper into

digital leadership within the context of maturity, this study unpacks digital leadership, making it easier to identify digital leadership areas in need of improvement as well as areas that are doing well. This creates greater visibility and level of detail for leadership challenges to be identified and addressed. The study also suggests areas to prioritise to improve maturity.

This research enriches the existing literature by providing empirical evidence from the South African fintech sector, highlighting the nuanced role of digital leadership in driving digital maturity. By linking findings with the literature, this underscores the relevance of this research to both academic and practical fields, offering valuable insights for future studies and strategic decision-making in the fintech industry.

The study also provides an approach for organizations in the South African fintech, and possibly within the same group, to identify starting points for improving their digital maturity through enhancements in digital leadership practices. The approach also sheds light on how to determine the potential impact of digital leadership on specific areas of digital maturity such as New Value Streams & Business Models, Organizational Culture, Organization & Governance, Innovation & Investment and Digital Ethics.

5.7.2 *Practical Implications*

This section discusses how the findings can be applied in practical settings, suggesting actions for the fintech group and extending it further.

The study is valuable because it simplifies the path to improving digital leadership by identifying key driving factors. It proves the positive impact of increasing digital maturity on multiple areas within Digital Application & Impact. It makes this more specific to the fintech. It is also valuable in that it gives the fintech group an evaluation of their digital maturity, seeing as the instrument used was a full digital maturity assessment.

These eight variables are a good starting point for the organisation to improve their digital maturity. It helps because instead of looking at 47 variables, which will be

resource intensive and likely wasteful, there is a prioritised list of key areas that influence them most.

Another avenue for the organisation to improve their digital maturity is to explore and implement improvements in the areas within this construct. Particularly: New Value Streams & Business Models, Organizational Culture, Organization & Governance, Innovation & Investment and Digital Ethics.

CHAPTER 6. CONCLUSIONS & RECOMMENDATIONS

6.1 Introduction

The research aimed to explore the impact of digital leadership on digital maturity within a South African fintech group. Key findings indicated that digital leadership plays a pivotal role in enhancing digital maturity, particularly in areas of customer engagement, digital innovation, workforce enablement, process digitization, and exploring new business models. Effective digital leadership was correlated with higher levels of digital maturity, suggesting that leadership qualities such as visionary thinking, adaptability, and a collaborative approach significantly influence an organization's digital transformation journey. Eight critical factors affecting digital maturity at the South African fintech were found, including the top 5 constructs.

6.2 Conclusions

The study concluded that digital leadership is a critical factor in achieving digital maturity. Leaders who embrace digital trends, foster a culture of innovation, and invest in digital skills within their teams are more likely to lead their organizations successfully through digital transformation. This research contributes to both theoretical and practical understandings of digital transformation, highlighting the indispensable role of leadership in navigating the complex digital landscape.

6.3 Theoretical Implications

This study enriches the theoretical landscape by illustrating the direct impact of digital leadership on digital maturity. It supports the notion that leadership is not just a facilitator but a crucial driver of digital transformation. The findings suggest revisiting existing theories on leadership in the context of digital transformation, potentially leading to new frameworks that better encompass the digital era's challenges and opportunities.

6.4 Practical Implications

For organizations, the study underscores the importance of nurturing digital leadership capabilities. This includes continuous learning, adaptability to change, and fostering a culture that values innovation and digital literacy. Businesses are encouraged to prioritize leadership development programs that focus on these digital competencies to stay competitive in the digital age.

6.5 Limitations and Future Research

The study acknowledges limitations such as its focus on a single sector within a specific geographical location, which may affect the generalizability of the findings. Future research could explore diverse industries and regions to understand the universal applicability of these findings. Additionally, longitudinal studies could provide insights into the evolving nature of digital leadership and its long-term impact on digital maturity.

6.6 Recommendations

- Based on the findings, it is recommended that organizations:
- Invest in leadership development programs with a focus on digital competencies.
- Foster a culture of innovation and continuous improvement.
- Encourage collaboration and knowledge sharing across all levels of the organization.
- Regularly assess and adapt their digital strategies to ensure alignment with evolving digital trends.
- Further factors to explore:
    - Influence of background (in the industry) on digital maturity.

For scholars, further research could explore the impact of digital leadership on specific aspects of digital maturity factors to develop a more nuanced understanding of digital transformation processes.

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APPENDIX A: Research Instrument

Part 1 - Demographic Information

1. What is your age?
    - Under 20 years
    - 21 - 30 years
    - 31 - 40 years
    - 41 - 50 years
    - 51 - 60 years
    - Over 60 years
2. What is your gender?
    - Female
    - Male
    - Other
3. To which company do you belong?
    - Company W
    - Company X
    - Company Y
    - Company Z
    - Other
4. What is your highest level of education completed?
    - Below matric
    - Matric
    - Diploma
    - Bachelor's Degree
    - Honours Degree
    - Master's Degree
    - Doctoral Degree
5. What is your current position or role within the organization?
    - Group Executive
    - General Manager
    - Senior Management
    - Middle Management

- Management
- Professional
- Administration

6. How long have you been with your current organization?
    - Less than 1 year
    - 1-2 years
    - 3-5 years
    - 6-10 years
    - More than 10 years

Part 2 - Digital Maturity and Digital Leadership Questions

The questions from the survey are adapted from The Unified Model for Digital Maturity by Armstrong (2022).

Questions here are grouped according to factors in the maturity model. In the instrument sent out to participants, the questions will be randomised to mitigate common method biased.

A Likert scale is as options to answer the question with responses ranging from 1-5 as follows:

1. Not at all
2. Slightly
3. Moderately
4. Very
5. Extremely

Please rate the following questions based on your organisation as per the Likert scale above.

Vision & Strategy

1. To what extent does your organization's vision encompass a transformational approach to digital technology adoption?
    - Not at all
    - Slightly

- Moderately
- Very
- Extremely

2. How aligned and committed is your organization's leadership, from the board to the floor, to driving digital transformation initiatives?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
3. To what degree is your organization's digital vision integrated into its overall business strategy and translated into a digital strategy and plan?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
4. How well does your organization allocate resources and investment for digital transformation efforts?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely

Culture

5. How open is your organization to taking risks and learning from failures in the context of digital transformation?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely

6. To what extent does your organization encourage exploration and experimentation in its digital transformation efforts?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
7. How well does your leadership foster a culture of transformation and innovation in your organization?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
8. How collaborative is the culture within your organization in the context of digital transformation?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely

Organisation & Governance

9. To what extent is your organization's structure agile and empowering in facilitating digital transformation?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
10. How well is your organization structured to support digital transformation efforts?
    - Not at all
    - Slightly

- Moderately
- Very
- Extremely

11. To what extent does your organization engage with external ecosystems (partners, suppliers, etc.) in your digital transformation efforts?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
12. How effective is your organization's change management process in facilitating digital transformation?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
13. To what extent does your organization have a well-defined data governance framework in place for digital transformation initiatives?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely

Digital Ethics

14. How accessible are digital transformation initiatives to all relevant stakeholders within your organization?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely

15. How seamlessly are digital strategies integrated into product design and core business processes?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
16. To what extent is your organization transparent in its communication and awareness about digital transformation efforts?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
17. How aligned is your organization's culture with the goals and values of digital transformation?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely

New Business Models

18. How extensively does your organization utilize platform business models in its digital transformation strategies?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
19. To what extent is data treated as a strategic asset in your digital transformation efforts?
    - Not at all

- Slightly
- Moderately
- Very
- Extremely

20. How often does your organization evolve its value proposition in the context of digital transformation?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
21. To what extent does your organization engage in coopetition (collaboration with competitors) to create value or address threats?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely

Innovation

22. How actively does your organization embrace lean and open innovation in the digital transformation process?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
23. How accessible and sufficient is the funding for digital transformation initiatives in your organization?
    - Not at all
    - Slightly
    - Moderately
    - Very

- Extremely

24. How strategic is your organization's approach to innovation in the digital transformation context?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely

Customer Orientation & Engagement

25. To what extent do customers actively participate and engage in your digital transformation initiatives?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
26. How extensively does your organization use analytics for personalization and targeting in digital customer interactions?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
27. How effective is your digital engagement and marketing strategy in reaching and connecting with your target audience?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
28. How well are digital channels and an omni-channel approach integrated into your customer engagement strategy?

- Not at all
- Slightly
- Moderately
- Very
- Extremely

29. How extensively is technology used in customer touchpoints to enhance the customer experience?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
30. To what extent is your organization focused on delivering value to the customer in digital transformation?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely

Product Innovation

31. How well is social functionality integrated into your products and services in the digital context?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
32. How effectively does your organization differentiate its products and user experience through emerging and disruptive technologies?
    - Not at all
    - Slightly
    - Moderately

- Very
- Extremely

33. How extensively does your organization offer information-based products and services in digital transformation?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
34. How well are your products and user experience differentiated by digital features?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
35. To what extent do your products and services monetize data assets in digital transformation?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely

Workforce Enablement and Performance

36. How aware and aligned are employees with the goals and strategies of digital transformation?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
37. To what extent are employees empowered to contribute to digital transformation initiatives?

- Not at all
- Slightly
- Moderately
- Very
- Extremely

38. How effectively are digital tools utilized within your organization for various digital transformation tasks?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
39. How broad and deep is the current pool of digital skills within your organization?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
40. To what extent does your organization invest in developing digital skills among its employees?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
41. How conducive is the learning and knowledge management environment for digital transformation?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
42. How effective is the performance measurement and management system in place for digital transformation initiatives?

- Not at all
- Slightly
- Moderately
- Very
- Extremely

43. To what extent does your organization offer a flexible workplace to support digital transformation?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
44. How well are dashboards utilized for tracking and monitoring digital transformation progress and results?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely

Agile, Empowering Organisational Structure

45. How extensively are core processes automated to support digital transformation?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
46. How accessible and user-friendly are self-provisioning and external interfaces in the digital transformation context?
    - Not at all
    - Slightly
    - Moderately
    - Very

- Extremely

47. How widely are automation and algorithms used for decision-making within your organization's digital initiatives?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
48. To what extent does your organization continuously optimize its digital processes and strategies?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely

IT Excellence

49. How well does your organization assess and manage IT performance in the context of digital transformation?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
50. How aligned is your IT function with the goals and strategies of digital transformation?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely

51. How ready is your IT department to support and lead in digital transformation efforts?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
52. To what extent is your IT department agile and responsive to the changing needs of digital transformation?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
53. How effective is your IT security framework in protecting digital assets during the transformation process?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely

Results

54. How well do your digital initiatives directly generate value for the organization?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely
55. To what extent is your legacy business expanding or evolving through digital transformation efforts?
    - Not at all
    - Slightly

- Moderately
- Very
- Extremely

56. How effective are digital transformation efforts in improving the functionality and processes within your organization?
    - Not at all
    - Slightly
    - Moderately
    - Very
    - Extremely

APPENDIX B: Survey Analysis

Appendix B1: Missing Values

The table below shows missing values from the data analysis along with the imputed values.

Question	Valid	Missing	Imputed Missing Values
Q5_4 New Business Models To what extent do you agree with the following as it relates to the organisation within which you are employed? - We view competition as broader than our current industry.	**128**	**1**	**3.662**
Q6_2 Innovation To what extent do you agree with the following as it relates to the organisation within which you are employed? - We have dedicated funding for innovation.	**128**		**Valid**
Q30_3 Customer Orientation & Engagement To what extent do you agree with the following as it relates to the organisation within which you are employed? - Marketing is used to engage with customers.	**127**	**2**	**3.767**
Q31_1 Product Innovation To what extent do you agree with the following as it relates to the organisation within which you are employed? - Social functionality is built into products.	**128**	**1**	**3.283**
Q31_5 Product Innovation To what extent do you agree with the following as it relates to the organisation within which you are employed? - Our products monetise data assets.	**128**	**1**	**3.501**
Q32_4 Workforce Enablement & Performance To what extent do you agree with the following as it relates to the organisation within which you are employed? - Employees have strong digital and ICT skills.	**127**	**2**	**4.378**
Q32_5 Workforce Enablement & Performance To what extent do you agree with the following as it relates to the organisation within which you are employed? - Means of digital upskilling are readily available.	**128**	**1**	**4.279**
Q32_6 Workforce Enablement & Performance To what extent do you agree with the following as it relates to the organisation within which you are employed? - Learning and knowledge-management programs exist.	**128**	**1**	**4.163**
Q32_7 Workforce Enablement & Performance To what extent do you agree with the following as it relates to the organisation within which you are employed? - Business metrics adapt to meet changes in strategy.	**127**	**2**	**3.763**
Q32_8 Workforce Enablement & Performance To what extent do you agree with the following as it relates to the organisation within which you are employed? - We have flexible working methods (e.g., agile).	**128**	**1**	**4.355**
Q33_3 Core Process Digitisation To what extent do you agree with the following as it relates to the	**128**	**1**	**4.357**

organisation within which you are employed? - We use modern architectures (API's cloud etc.)			
Q33_4 Core Process Digitisation To what extent do you agree with the following as it relates to the organisation within which you are employed? - We use data and data analytics in decision-making.	**128**	**1**	**3.806**

APPENDIX B2: MANCOVA Data

The table below shows data from the tests of between-subjects variables

Source	Dependent Variable	Type III Sum of Squares	df	Mean squares	F	Sig
Corrected Model	New Business Models	34,171[a]	1	34,171	121,692	<,001
	Customer Orientation & Engagement	29,345[b]	1	29,345	186,484	<,001
	Product Innovation	26,523[c]	1	26,523	134,898	<,001
	Workforce Enablement and Performance	29,313[d]	1	29,313	184,192	<,001
	Core Process Digitisation	37,780[e]	1	37,780	143,509	<,001
Intercept	New Business Models	1,004	1	1,004	3,575	,061
	Customer Orientation & Engagement	3,104	1	3,104	19,727	<,001
	Product Innovation	3,495	1	3,495	17,775	<,001
	Workforce Enablement and Performance	4,630	1	4,630	29,096	<,001
	Core Process Digitisation	,578	1	,578	2,197	,141
Digital Leadership	New Business Models	34,171	1	34,171	121,692	<,001
	Customer Orientation & Engagement	29,345	1	29,345	186,484	<,001
	Product Innovation	26,523	1	26,523	134,898	<,001
	Workforce Enablement and Performance	29,313	1	29,313	184,192	<,001
	Core Process Digitisation	37,780	1	37,780	143,509	<,001
Error	New Business Models	35,662	127	,281		
	Customer Orientation & Engagement	19,985	127	,157		
	Product Innovation	24,970	127	,197		
	Workforce Enablement and Performance	20,211	127	,159		
	Core Process Digitisation	33,434	127	,263		
Total	New Business Models	1875,770	129			
	Customer Orientation & Engagement	2039,404	129			
	Product Innovation	1955,188	129			
	Workforce Enablement and Performance	2262,188	129			
	Core Process Digitisation	1906,960	129			
Corrected Total	New Business Models	69,833	128			
	Customer Orientation & Engagement	49,329	128			
	Product Innovation	51,493	128			
	Workforce Enablement and Performance	49,524	128			
	Core Process Digitisation	71,214	128			

a. R Squared = ,489 (Adjusted R Squared = ,485)
b. R Squared = ,595 (Adjusted R Squared = ,592)

c. R Squared = ,515 (Adjusted R Squared = ,511) **d. R Squared = ,592 (Adjusted R Squared = ,589)** **e. R Squared = ,531 (Adjusted R Squared = ,527)**

Table 37: MANCOVA Tests of between subjects variables

APPENDIX B3: Reliability data.

Question	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q1_1 Vision & Strategy To what extent do you agree with the following as it relates to the organisation within which you are employed? - Has a compelling long-term vision for its digital future.	**10,72**	**6,828**	**,725**	**,843**
Q1_2 Vision & Strategy To what extent do you agree with the following as it relates to the organisation within which you are employed? - All levels in the organisation, from board to floor, are aligned and committed to digital transformation.	**11,02**	**6,179**	**,760**	**,825**
Q1_3 Vision & Strategy To what extent do you agree with the following as it relates to the organisation within which you are employed? - Has a clear digital strategy and digital transformation roadmap are in place.	**11,13**	**6,006**	**,763**	**,823**
Q1_4 Vision & Strategy To what extent do you agree with the following as it relates to the organisation within which you are employed? - Sufficient resources are allocated to digital transformation.	**11,19**	**5,970**	**,686**	**,859**

Table 38: Reliability Data Vision & Strategy

Question	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q2_1 Culture To what extent do you agree with the following as it relates to the organisation within which you are employed? - Open to taking risks with a no-blame culture.	**13,21**	**3,417**	**,558**	**,779**
Q2_2 Culture To what extent do you agree with the following as it relates to the organisation within which you are employed? - Encourages exploring new ideas and learning.	**12,77**	**3,539**	**,682**	**,723**
Q2_3 Culture To what extent do you agree with the following as it relates to the	**12,88**	**3,494**	**,689**	**,719**

organisation within which you are employed? - Leadership is open to new ideas, innovation and digital technology.				
Q2_4 Culture To what extent do you agree with the following as it relates to the organisation within which you are employed? - Has a collaborative, knowledge-sharing culture with cross-functional teams.	**13,09**	**3,273**	**,560**	**,783**

Table 39: Reliability Data Organisational Culture

Question	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q17_1 Organisation & Governance To what extent do you agree with the following as it relates to the organisation within which you are employed? - Agile organization with flat structure and decentralized decision-making.	**11,64**	**4,015**	**,553**	**,705**
Q17_2 Organisation & Governance To what extent do you agree with the following as it relates to the organisation within which you are employed? - Teams are cross-functional and contain digital skills.	**11,47**	**4,391**	**,561**	**,704**
Q17_3 Organisation & Governance To what extent do you agree with the following as it relates to the organisation within which you are employed? - Work well with external partners and ecosystems to achieve goals.	**11,30**	**4,509**	**,569**	**,704**
Q17_4 Organisation & Governance To what extent do you agree with the following as it relates to the organisation within which you are employed? - Well-defined data governance frameworks are in place.	**11,83**	**3,439**	**,585**	**,697**

Item-Total Statistics				
	Scale Mean if Item Deleted	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Cronbach's Alpha if Item Deleted**
Q26_1 Digital Ethics	**11,23**	**6,649**	**,498**	**,869**

To what extent do you agree with the following as it relates to the organisation within which you are employed? - We have an anonymous issue reporting system or avenue.				
Q26_2 Digital Ethics To what extent do you agree with the following as it relates to the organisation within which you are employed? - Digital ethics is incorporated into products and business processes.	10,35	6,510	,747	,750
Q26_3 Digital Ethics To what extent do you agree with the following as it relates to the organisation within which you are employed? - We have explicit and well-explained ethics procedures.	10,48	6,095	,752	,742
Q26_4 Digital Ethics To what extent do you agree with the following as it relates to the organisation within which you are employed? - Ethics practices are representative of the market we operate in.	10,24	6,778	,680	,779

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q5_1 New Business Models To what extent do you agree with the following as it relates to the organisation within which you are employed? - Platform businesses are a core part of what we do.	11,42	4,832	,642	,692
Q5_2 New Business Models To what extent do you agree with the following as it relates to the organisation within which you	11,21	5,018	,599	,717

are employed? - We use data as a strategic asset.				
Q5_3 New Business Models To what extent do you agree with the following as it relates to the organisation within which you are employed? - Changing customer needs define our value proposition.	**10,97**	**5,904**	**,498**	**,766**
Q5_4 New Business Models To what extent do you agree with the following as it relates to the organisation within which you are employed? - We view competition as broader than our current industry.	**11,30**	**5,338**	**,598**	**,717**

Item-Total Statistics				
	Scale Mean if Item Deleted	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Cronbach's Alpha if Item Deleted**
Q6_1 Innovation To what extent do you agree with the following as it relates to the organisation within which you are employed? - We use lean innovation (innovate in rapid cycles, using prototypes to learn quickly).	**7,09**	**3,720**	**,546**	**,855**
Q6_2 Innovation To what extent do you agree with the following as it relates to the organisation within which you are employed? - We have dedicated funding for innovation.	**7,47**	**2,751**	**,700**	**,712**
Q6_3 Innovation To what extent do you agree with the following as it relates to the organisation within which you are employed? - Innovation occurs regularly with a well-established innovation capability.	**7,33**	**2,955**	**,770**	**,635**

	Scale Mean if Item Deleted	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Cronbach's Alpha if Item Deleted**
Q30_1 Customer Orientation & Engagement To what extent do you agree with the following as it relates to the organisation within which you are	**19,61**	**10,381**	**,501**	**,802**

employed? - The customer is involved in product development.				
Q30_2 Customer Orientation & Engagement To what extent do you agree with the following as it relates to the organisation within which you are employed? - Customer data analytics is used to tailor products and services.	**20,01**	**9,028**	**,641**	**,772**
Q30_3 Customer Orientation & Engagement To what extent do you agree with the following as it relates to the organisation within which you are employed? - Marketing is used to engage with customers.	**19,80**	**9,443**	**,624**	**,775**
Q30_4 Customer Orientation & Engagement To what extent do you agree with the following as it relates to the organisation within which you are employed? - Both physical and digital channels are used to interact with customers.	**19,55**	**9,708**	**,695**	**,762**
Q30_5 Customer Orientation & Engagement To what extent do you agree with the following as it relates to the organisation within which you are employed? - Customer touchpoints are digitized.	**19,89**	**9,681**	**,628**	**,775**
Q30_6 Customer Orientation & Engagement To what extent do you agree with the following as it relates to the organisation within which you are employed? - There is a strong focus on delivering value to customers.	**18,97**	**11,703**	**,388**	**,821**

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q31_1 Product Innovation To what extent do you agree with the following as it relates to the organisation within which you are employed? - Social functionality is built into products.	**15,93**	**6,301**	**,542**	**,799**
Q31_2 Product Innovation To what extent do you agree with the following as it relates to the organisation within which you are	**15,12**	**7,125**	**,658**	**,762**

employed? - Product/service offering uses new technologies.				
Q31_3 Product Innovation To what extent do you agree with the following as it relates to the organisation within which you are employed? - Products/services are digitized.	**15,01**	**6,932**	**,719**	**,746**
Q31_4 Product Innovation To what extent do you agree with the following as it relates to the organisation within which you are employed? - The user experience contains digital features.	**15,05**	**6,906**	**,678**	**,754**
Q31_5 Product Innovation To what extent do you agree with the following as it relates to the organisation within which you are employed? - Our products monetise data assets.	**15,72**	**6,447**	**,507**	**,811**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q33_1 Core Process Digitisation To what extent do you agree with the following as it relates to the organisation within which you are employed? - We use metrics and dashboards internally.	**15,39**	**8,894**	**,665**	**,835**
Q33_2 Core Process Digitisation To what extent do you agree with the following as it relates to the organisation within which you are employed? - Core processes are automated.	**15,47**	**8,987**	**,709**	**,822**
Q33_3 Core Process Digitisation To what extent do you agree with the following as it relates to the organisation within which you are employed? - We use modern architectures (API's cloud etc.)	**14,51**	**10,357**	**,590**	**,852**
Q33_4 Core Process Digitisation To what extent do you agree with the following as it relates to the organisation within which you are employed? - We use data and data analytics in decision-making.	**15,06**	**8,893**	**,739**	**,814**
Q33_5 Core Process Digitisation To what extent do you agree with the following as it relates to the organisation within which you are employed? - There is continuous internal process optimization.	**15,02**	**8,938**	**,693**	**,826**
Q33_5 Core Process Digitisation	**15,02**	**8,938**	**,693**	**,826**

To what extent do you agree with the following as it relates to the organisation within which you are employed? - There is continuous internal process optimization.				