

**Gordon Institute
of Business Science**
University of Pretoria

**TRANSFORMATIONAL LEADERSHIP STYLE: THE RELATIONSHIP
TO COMPANIES THAT ARE DIGITAL LEADERS**

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

7 November 2016

DECLARATION

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination purpose at any other University. I further declare that I have obtained the necessary authorisation and consent to carry out the research.

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ABSTRACT

The objective of the study was to explore the relationship between companies that are digitally mature and the leadership style of their C-level executives, with a specific focus on transformational leadership. Success in the digital era requires not only an investment in digital capabilities, but also a change in organisational culture that only strong leadership can inspire. Transformational leadership instils major changes at the organisational level, through changing attitudes and assumptions at the individual level and creating collective engagement. Moreover, this leadership approach facilitates organisational innovation and learning, and generates a shared, inspiring vision for the future

The purpose this study was two-fold: Firstly, to explore the relationship between transformational leadership and having higher digital maturity levels - becoming a digital master. Secondly, to determine whether one or more of the transformational leadership factors has an effect on the digital maturity of South African companies (represented by four basic transformational leadership behaviours, or “I’s”).

An online survey, specifically addressing the research question, was sent to C-level executives from South African companies that fit the population criteria, using moderator regression models to determine if transformational leadership and its associated behaviours have an effect on a company’s digital maturity. For the sample population, it was determined that two of the transformational leadership behaviours had a positive effect on digital maturity, namely idealised influence and individualised consideration and that one transformational leadership behaviour, inspirational motivation, has a negative effect on digital maturity.

Keywords

- Leadership
- Strategy
- Innovation
- Digital
- Information technology

TABLE OF CONTENTS

	Page
DECLARATION.....	ii
ABSTRACT	iii
LIST OF TABLES	xii
LIST OF FIGURES	xiv
1.1. Introduction	1
1.2. Background	1
1.3. Purpose of the study	4
1.4. Research problem	5
1.5. Research objectives	5
1.6. Scope.....	5
1.7. Structure of the project.....	6
2. CHAPTER 2: THEORY AND LITERATURE REVIEW	7
2.1. Introduction	7
2.2. Digital innovation and maturity.....	8
2.2.1. Innovation and information technology	8

2.2.2.	Digital maturity	8
2.2.2.1	Digital Beginners	9
2.2.2.2	Digital Fashionistas	10
2.2.2.3	Digital Conservatives.....	10
2.2.2.4	Digirati.....	10
2.2.3.	Digital capabilities and transformation	10
2.2.3.1.	Business models	12
2.2.3.2.	Big data.....	13
2.2.4.	Digital masters' conclusion	14
2.3.	Corporate strategy and digital strategy	15
2.3.1.	Strategy as a portfolio of competencies	16
2.3.1.1.	South African context	16
2.3.2.	Strategic thinking.....	17
2.3.2.1.	System perspective	18
2.3.2.2.	Creativity	19
2.3.2.3.	Vision	19
2.3.3.	Strategy conclusion	19

2.4.	Leadership	20
2.4.1.	Laissez-Faire leadership	21
2.4.2.	Transactional leadership	21
2.4.2.1	Contingent rewards	21
2.4.2.2	Management by exception	22
2.4.3	Transformational leadership	22
2.4.3.1	Idealised influence (charisma)	22
2.4.3.2	Individual consideration	23
2.4.3.3	Inspirational motivation	24
2.4.3.4	Intellectual stimulation	24
2.4.4	Leadership conclusion	25
3.	CHAPTER 2: HYPOTHESIS	26
3.1	Research Objective 1:	26
3.2	Research Objective 2	27
4	CHAPTER 4: RESEARCH METHODOLOGY	29
4.1	Introduction	29
4.2	Rationale for research methodology	29

4.3	Research design	30
4.3.1	Leadership section - MLQ	31
4.3.1.1	Leadership measurement.....	32
4.3.2	Digital maturity/intensity.....	33
4.4	Population and unit of analysis	34
4.4.1	Population	34
4.5	Sample and sampling method	35
4.6	Data collection and data management	36
4.7	Levels of statistical analysis	37
4.8	Potential research limitations.....	38
4.9	Conclusion	39
5	CHAPTER 5: RESULTS.....	40
5.1	Introduction	40
5.2	Demographics	40
5.2.1	Personal demographics.....	40
5.2.1.1	Highest positional level.....	40
5.2.1.2	Job function.....	41

5.2.1.3	Age	42
5.2.1.4	Gender	43
5.2.2	Company demographics.....	44
5.2.2.1	Industry represented	44
5.2.2.2	Start of business operations	45
5.2.2.3	Company size	46
5.2.2.4	Company revenue	47
5.3	Revisiting methodology	47
5.3.1	Sample and weighting	48
5.3.1.1	Weight applied	49
5.3.2	Leadership style and transformational factors	49
5.3.3	Digital maturity	50
5.4	Instrument reliability	51
5.5	Derived variables and weights.....	53
5.5.1	Normality of the variables	53
5.6	Research Objective 1: Results	57
5.7	Research Objective 2 - results.....	59

5.7.1	Unweighted regression.....	59
5.7.1.1	Hypothesis 2	60
5.7.1.2	Hypothesis 3	61
5.7.1.3	Hypothesis 4	61
5.7.1.4	Hypothesis 4	61
5.7.2	Weighted regression – job function equals CIO.....	62
5.7.2.1	Hypothesis 2	63
5.7.2.2	Hypothesis 3	63
5.7.2.3	Hypothesis 4	64
5.7.2.4	Hypothesis 5	64
5.7.3	Weighted regression - CIO and operation period of company	65
5.7.3.1	Hypothesis 2	66
5.7.3.2	Hypothesis 3	66
5.7.3.3	Hypothesis 3	67
5.7.3.4	Hypothesis 4	67
5.8	Summary of Hypotheses	68
6.	CHAPTER 6: DISCUSSION OF RESULTS	70

6.1	Introduction	70
6.2	Demographics	70
6.3	Research objective 1: Hypothesis 1.....	71
6.3.1	Discussion of results	71
6.3.2	Actual versus expected results.....	72
6.4	Research objective 2.....	74
6.4.1	Hypothesis 2: Idealised influence	74
6.4.2	Hypothesis 3: Individual consideration.....	75
6.4.3	Hypothesis 4: Inspirational motivation	76
6.4.4	Hypothesis 5: Intellectual stimulation.....	77
6.5	Summary of findings.....	77
7.	CHAPTER 7: CONCLUSION AND RECOMMENDATIONS.....	79
7.1	Introduction	79
7.2	Main findings	79
7.2.1	Objective 1: Hypothesis 1.....	79
7.2.2	Objective 2: Hypothesis 2-5.....	80
7.3	Managerial implications.....	82

7.4	Limitations to research	83
7.5	Recommendations for future study	83
7.6	Conclusion	84
6	REFERENCES	85
	Appendix A: Online survey	92

LIST OF TABLES

Table	Page
Table 1: Levels of Respondents	41
Table 2: Job descriptions of respondents	41
Table 3: Industries represented	45
Table 4: Derived variables leadership.....	50
Table 5: Derived variables digital maturity	50
Table 6: Digital score vs maturity.....	51
Table 7: Cronbach Alpha for Idealized Influence Q01 Q08 Q15.....	51
Table 8: Cronbach Alpha for Inspirational Motivation Q02 Q09 Q16.....	51
Table 9: Cronbach Alpha for Intellectual Stimulation Q03 Q10 Q17.....	51
Table 10: Cronbach Alpha for Individualized Consideration Q04 Q11 Q18.....	51
Table 11: Cronbach Alpha for Contingent Reward Q05 Q12 Q19.....	52
Table 12: Cronbach Alpha for Management-by-exception Q06 Q13 Q20	52
Table 13: Cronbach Alpha for Laissez-faire Leadership Q07 Q14 Q21.....	52
Table 14: Cronbach Alpha for Digital Maturity Q22 to Q31	52
Table 15: Descriptive statistics of derived variables.....	53

Table 16: Correlation of derived variables	55
Table 17: Correlation of derived variables (detail).....	56
Table 18: T-Test Transformational leadership factors relation to digital maturity quadrants	57
Table 19: ANOVA (unweighted).....	59
Table 20: Variance explained (unweighted).....	59
Table 21: Regression coefficients (unweighted)	60
Table 22: ANOVA (CIO weighted)	62
Table 23: Variance explained (CIO weighted).....	62
Table 24: Parameter estimates (CIO weighted).....	62
Table 25: ANOVA (CIO & Period in operations - weighted)	65
Table 26: Variance explained (CIO & Period in operations- weighted).....	65
Table 27: Parameter estimates (CIO & Period in operations - weighted)	65

LIST OF FIGURES

Figure	Page
Figure 1: Four levels of digital maturity	9
Figure 2: Elements of strategic thinking (Bonn, 2005).....	18
Figure 3: Age breakdown of respondents	43
Figure 4: Gender breakdown of respondents.....	44
Figure 5: Start of business operations	46
Figure 6: Company size.....	46
Figure 7: Company revenue	47
Figure 8: Histograms of leadership factors	54
Figure 9: Histogram of digital scores	55
Figure 10: Distribution TL factors.....	58
Figure 11: Scatter graph.....	58

CHAPTER 2: INTRODUCTION TO THE RESEARCH PROBLEM

Success in the digital era requires not only an investment in digital capabilities, but also a change in organisational culture that only strong leadership can inspire. “The reasons that companies fall short of digital mastery aren’t mysterious or too numerous to list. Companies that struggle with becoming truly digital fail to develop digital capabilities to work differently and the leadership capabilities required to set a vision and execute on it” (Westerman, Bonnet & McAfee, 2014, p.5)

1.1. Introduction

The title of this research project is “Transformational leadership style: the relationship to companies that are digital leaders”. The study attempts to explore the relationship between companies that are digitally mature and the leadership style of their C-level executives, with a specific focus on transformational leadership.

This chapter will provide the background and context of the research problem, as well as motivating the need for this research. It will introduce and define the research problem. Finally, the scope of the research will be discussed

1.2. Background

Digital business doesn’t just disrupt markets, it disrupts tried-and-true management behaviours as well (Waller & Raskino, 2015). Across many companies, spanning different industries and sectors, digital technologies (viewed as combinations of information, computing, communication and connectivity technologies) are fundamentally transforming business strategies, business processes, company capabilities, products and services, and key inter-firm relationships in extended business networks (Bharadwaj, Sawy, Pavlou & Venkatraman, 2013). Digital disruption is used to describe the impact of digital technologies and rapid innovation on business processes and customer experience (Scheibach, 2016).

Digital business strategy can be viewed as being inherently *transfunctional and is*

therefore broader, more prominent, more embedded, and more encompassing than other functional strategies (Bharadwaj et al., 2013). As companies and industries become more digital and rely on information, communication and connectivity functionality, digital strategy will become the business strategy with no separation between the two (Bharadwaj et al., 2013).

This transfunctional strategy is evident when considering that digital leaders (hereafter referred to as masters) encourage a strong relationship between their information technology (IT) leaders and business leaders (Bharadwaj et al., 2013). Together, such company leaders cultivate the technology-leadership capabilities essential to driving transformation based on digital technologies (Westerman et al., 2014).

The terms “digital” and “innovation” are interchangeable. Yoo, Lyytinen & Boland (2008) state that digital innovation refers to the use of information and communication technology (ICT) as a driving force for innovation, having an impact on the structure, processes and organisational landscape. Previous research has shown that poor performance in digital innovation is a serious inhibitor to good business performance and that high efficiency and effectiveness in digital innovation is associated with superior organisational performance (Carlson & McNurlin, 1992).

Corporate innovation requires input from various departments and role players within the organisation. Due to rapid rate of technological change, a defined IT strategy plays an important role in an organisation’s innovation efforts (Zahara & Bogner, 2000). The ideation cycle is usually a team effort, requiring a champion who understand various facets of the organisation (Gobble, Petrick & Wright, 2012). It could therefore be argued that IT, and the associated C-Level Executive (i.e. Chief Information Officer) is best suited to contribute towards the organisation’s digital and innovation evolution, since IT is closely coupled with every unit in the organisation and is also responsible for technology strategy, which is an innovation catalyst.

The 2015 PwC’s Digital IQTM Survey, however, highlights the way that more CEOs are leading the digital charge, setting the tone for their organisations. PwC underline that digital is essential and warn that few organisations understand the specific leadership behaviours that drive digital performance. A 2014 McKinsey report states that CEOs should own and direct the digital agenda personally, from the top down (Hirt & Willmott, 2014). That may, indeed, be necessary if digitisation is a top-three agenda item for a

company or group, if substantial resources are needed from the organisation as a whole, or if pursuing new digital priorities requires navigating “political minefields” in business units or functions (Hirt & Willmott, 2014).

The McKinsey and PwC studies confirm that cross-functional teams are essential in achieving an organisation’s transfunctional strategies, as highlighted by Bharadwaj et al., (2013). The actions of leaders are particularly important to cross-functional teams and their development (Webber, 2002). Digital masters create leadership capabilities to get most of their digital activities (Westerman et al., 2014). For this reason, organisations that are digital masters employ leaders who create a clear vision, start critical initiatives, engage with employees to build the vision over time and stay involved in the transformation (Westerman et al., 2014), since leaders have to drive the digital awareness (Westerman et al., 2014).

Lopez (2015) highlights the importance of synchronising digital business strategy with IT strategy in order to drive digital awareness throughout an organisation. Although Westerman et al., (2014) are clear that leadership is essential in digital mastery, the type of leadership behaviour being displayed is not explicitly named.

Transformational leadership is about renovating an organisation, inspiring the firm to follow a new vision that will lead to the evolution of the organisation’s culture (Tichy, & Ulrich, 1984). In addition, the appeal of transformational leadership has been both conceptually (Waldman, Bass & Einstein, 1987) and empirically (Ehrlich, Meindl, & Viellieu, 1990) supported in a high-technology context. Previous research has also suggested that leader support for innovation (Bass, 1990) can serve as a moderating variable between transformational leader behaviour and follower performance (Howell, & Avolio, 1993).

The causal links between transformational leadership and positive outcomes for organizations and employees are numerous. These positive outcomes include employee sense of well-being, organisational citizenship behaviour, productivity, and organisational commitment (Arthur & Hardy 2014; Edwards & Gill 2012; Krishnan 2012; Muchiri et al. 2012). Bass et al. (1990) also clarify that transformational leaders articulate revolutionary ideas about what may be possible by changing the contextual framework of followers.

A correlation between digital disruption and transformational leadership is evident when considering Bass' (1985) suggestion that transformational leadership is more likely to appear in organisations that deal with a turbulent marketplace, because in unpredictable situations leaders need to provide new solutions, stimulate rapid responses, develop their teams, and provide reasons for coping.

Transformational leadership advocates interactions among interested parties that are organised around a collective purpose in such a way that it motivates, enhances and transforms ethical aspirations and the actions of the leader (Simola, Barling & Turner, 2012). A transformational leadership style seeks positive transformations "in those who follow" and that achieves desired changes through both the organisation's strategy and the structure of the organisation (Geib & Sewenson, 2013).

Success in today's business environment is not achievable without employing an effective leadership style that can enable organisations to accomplish their goals (Alon & Higgins, 2005). Transformational leadership instils major changes at the organisational level, through changing attitudes and assumptions at the individual level and creating collective. Moreover, this leadership approach facilitates organisational innovation and learning, and generates a shared and inspiring vision for the future (Bolden, Gosling, Marturano & Dennison, 2003). These tasks are highly necessary when operating in global environments (Ghasabeh, Soosay & Reaiche, 2015).

1.3. Purpose of the study

To remain competitive during this period of accelerating digital transformation, organisations must continually develop leaders who will support innovation and emerging technology. Digital transformation represents a fundamental social, cultural and technological shift for organisations (Macdorman, & Aron, 2015).

At present, the relationship between transformational leader behaviour and being an organisation that is a digital mature is unclear. Based upon previous research, and Bass' (1985) conceptualisation of transformational leadership, the author postulates that companies that are leading the digital race would likely exhibit a significant relationship with transformational leadership behaviours (Bass, 1985). Such a relationship is not expected with transactional or laissez-faire leader behaviours. In addition, the writer

anticipates that companies with mostly transformational leaders overall would be digital masters, to a greater extent than companies with transactional or laissez-faire leaders.

The purpose of the current study is, therefore, two-fold: Firstly, to explore the relationship between transformational leadership and having higher digital maturity levels i.e. becoming a digital master. Secondly to determine whether one or more of the transformational leadership factors have an effect on the digital maturity of South African companies (represented by four basic components or “I’s”).

1.4. Research problem

The literature review has highlighted that the combination of leadership and digital capabilities is essential to becoming a digital master. It is not, however, clear which type of leadership style or associated characteristics is needed. Organisations can therefore potentially fail, if an inappropriate leadership style is dominant. This study will research the question: “Which style of leadership is associated with being, or becoming, a digital master”.

1.5. Research objectives

This study has two research objectives:

RO1: To explore the relationship between transformational leadership and having higher digital maturity levels, that is becoming a digital master.

RO2: To determine whether one or more of the transformational leadership factors has an effect on the digital maturity of South African companies.

1.6. Scope

This research project focused on digital maturity of South African companies and the leadership style of their leaders. As a quantitative research study, the researcher

adopted a positivistic ontology and pragmatic epistemology. The research may offer value to the scholarly study of leadership, digital innovation and strategy while highlighting practical business challenges and providing insight into the importance of leadership and digital innovation that would increase South African companies' competitiveness.

1.7. Structure of the project

This document follows the layout of a research report. The literature review discusses the current academic literature relating to digital innovation, leadership and strategy. Chapter two defines the research problem based on pertinent literature and indicates the need for the research into digital maturity and its relationship with a transformational leadership style. Chapter three defines the precise purpose of the research and outlines the hypotheses and research questions used in testing the specified propositions. Chapter four articulates the methodology used for research and tables the potential limitations of the study.

The results of the various statistical and other tests conducted on received data are presented in Chapter five. Chapter six further discusses and analyses the results, in the context of the formulated research questions and literature review. The final chapter, chapter seven, highlights the main contributions of the research. This final chapter also provides recommendations for business and academic applications.

2. CHAPTER 2: THEORY AND LITERATURE REVIEW

2.1. Introduction

In industries from mining to hospitality and financial services, executives are leading their companies through a process of digital transformation – using fast-moving digital technologies like social media, mobility and analytics to radically improve the performance or reach of their enterprises (Bonnet, 2013). Wade (2015) posits that digital business transformation is organisational change that uses digital technologies and business models to improve performance.

This definition is based on the pragmatic need of business leaders to derive performance benefits from their investments in digital tools and technologies (Wade, 2015). Through advanced analytics, mobility, the cloud, robots, smart sensors and a host of other advances, technology is reaching every corner of the business world – every industry, company, process, decision, job – and bringing deep changes that create a new playing field with new rules and new winners and losers (Bonnet, 2013)

Becoming a digital master requires more than mere digital investment. It also requires building leadership capabilities to envision and drive transformation. In order to harness technology's disruptive power, an organisation needs to excel within two dimensions: it must have high digital intensity – astute investments in adopting new ways of doing business digitally – and also high leadership intensity: being able to deliver the vision and move the company forward efficiently (Westerman et al., 2014).

Research Objective 1 (RO1) aims to explore the relationship between transformational leadership and becoming a digital master. The literature review below provides context for this, and the need for research into what current digital masters practice as their leadership approach, in fulfilment of Research Objective 2 (RO2).

2.2. Digital innovation and maturity

2.2.1. Innovation and information technology

In the late 1960's innovation was traditionally linked to science and technology and thus technology was identified as a key element of the innovation domain (Myers & Marquis, 1969). Technological change and innovation are the main forces at the centre of competitive advantage, as they are the main drivers of economic growth (Cainelli, Evangelista & Savona, 2006).

This outlook is supported in the World Competitiveness Report of 2014 which defined 12 distinct pillars, two of which are pertinent to this study:

- I. Technological readiness: “Measures the agility with which an economy adopts existing technologies to enhance the productivity of its industries, with specific emphasis on its capacity to fully leverage information and communication technologies (World Economic Forum, 2015, p 7).
- II. Innovation: “Innovation can emerge from new technological and non-technological knowledge. Non-technological innovations are closely related to know-how, skills and working conditions that are imbedded in organisations” (World Economic Forum, 2015, p 8).

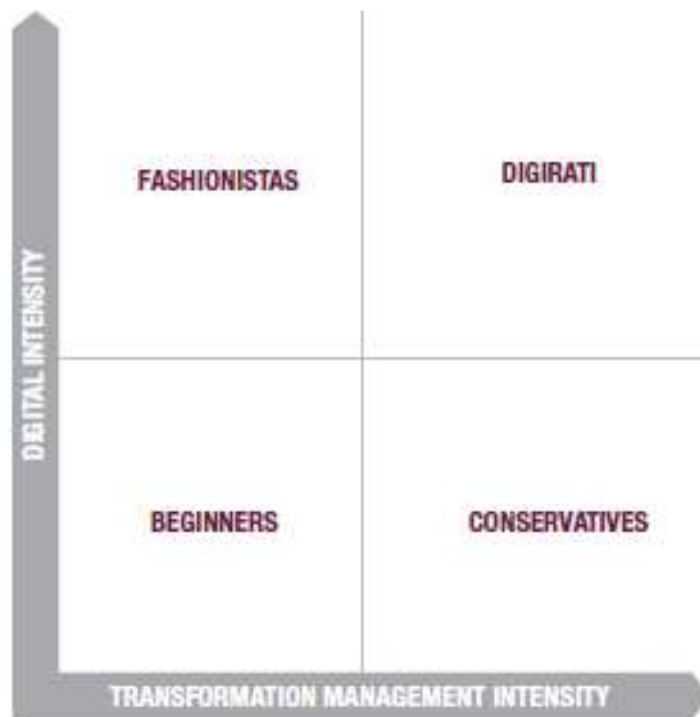
Yoo, et al, confirms that “technology” and “innovation” are interchangeable (2008) and further elaborates that digital innovation refers to the use of ICT as a driving force for innovation that has an impact on the structure, processes and the organisational landscape.

2.2.2. Digital maturity

“Digital masters excel in two critical areas: the *what* of technology (*digital* capabilities) and the *how* of leading change (*leadership* capabilities). Neither area, or dimension, is enough on its own. Each is associated with different types of financial performance, and each provides only partial advantage” (Westerman, Tannou, Bonnet, Ferraris & McAfee, 2012. p 5).

Putting these two dimensions together yields advanced levels of digital mastery and therefore competitive advantage. Digital masters, then, seem to excel at both dimensions. Placing the two dimensions into a graph, then, companies can find themselves predominantly occupying one of four quadrants, comprising either high or low digital intensity combined with high or low transformation management intensity (Westerman et al., 2012).

Figure 1: Four levels of digital maturity



Adapted from Westerman et al. (2012)

2.2.2.1 Digital Beginners

Organisations in the lower left quadrant are termed Digital Beginners. Although they might be mature in terms of more traditional applications (such as ERP or electronic commerce), these organisations do very little about advanced digital capabilities. Organisations in this quadrant may be unaware of opportunities, or may start small investments without effective transformation management. Many beginners use

regulation or privacy as an excuse for inaction (Westerman et al., 2014).

2.2.2.2 Digital Fashionistas

Digital Fashionistas are organisations positioned in the top left quadrant, who have implemented or experimented with many sexy digital applications, yet they lack the mechanisms, or systems, to coordinate activities and build synergies across investments (Westerman et al., 2012). Fashionistas often lack governance and build a wide variety of incompatible flavour-of-the-month processes and systems which may seem like progress, but actually limit bigger opportunities (Westerman et al., 2012).

2.2.2.3 Digital Conservatives

Favouring prudence over innovation gives Conservatives a capability profile opposite to “Fashionistas” (Westerman et al., 2014). Although sceptical of the value of digital trends, “Conservatives” understand the need for strong, unifying vision, governance and corporate culture, to ensure that investments are managed well (Westerman et al., 2012). Conservatives often miss valuable opportunities, though, as result of their over-cautious approach, focused as it is on control and certainty (Westerman et al., 2014).

2.2.2.4 Digirati

In the top right quadrant are the Digirati, the organisations that have the digital maturity to build digital innovations and drive enterprise-wide transformation. Digirati out-perform their less digitally-mature competitors on revenue generation, profitability and market valuation (Westerman et al., 2012). Digirati organisations become digital masters, because they build both digital capabilities and leadership capabilities that are better than other organisations (Westerman et al., 2014). The study will explore the factors within the leadership approach that enables them to do so.

2.2.3. Digital capabilities and transformation

Transformation is fundamentally about change, and organisational change is the foundation for digital transformation (Wade, 2015). Companies operate in an environment that is constantly changing, due to physical, technological, social and

economic circumstances that are fickle and unpredictable (Boyne & Meier, 2009). At the centre of this evolving drama is the critical need for organisations to adapt to volatile environments (Krantz, 1990). Organisational change - related to people, processes, strategies, structures and competitive dynamics - is where most of the challenges and opportunities lie (Wade, 2015). Companies are, then, placing themselves at risk if they do not constantly rethink their direction, and plan ways to grow and stay profitable in a disruptive and turbulent context (Kotter, 2014).

Digital transformation is a comparatively new concept and, to some extent, has arisen out of the blending of personal and corporate IT environments, often referred to as the consumerisation of IT (White, 2012). Digital technology provides a wealth of opportunities for those willing to change their business to take advantage of it (Garcia, Tabio, Bonnet & Buvat, 2015). A recent study by the Global Center for Digital Business Transformation (an IMD Business School and Cisco Initiative) found that 95% of the 941 executives, across ten of the twelve industries surveyed (including retail, hospitality, telecommunications, financial services and entertainment), predicted that at least three of the current market leaders would fall out of the top ten in the next five years (Wade, 2015).

Through digital transformation, organisations redefine the way business processes are executed within and across organisational boundaries and the way the company understands and services customers (Garcia et al., 2015). The majority of digital transformation value is unlocked through business change that leads to faster innovation, higher productivity, increased efficiency in processes and enhanced customer experience (Wade, 2015). More mature organisations, however, differentiate themselves by using digital technologies to transform their business (Phillips et al., 2015).

The pressure points of change are increasing, too, it seems. Globalisation is dictating efficient integration of businesses, which can only be achieved through digital processes and collaborative tools. Employees and customers are also demanding new, responsive ways of working. As competitors and new entrants make digitally-enabled practices a reality in an industry, other firms need to follow or fall out of contention (Menesguen et al., 2011). Digital technology transformation differs from other transformational drivers such as political, social, cultural and economic shifts in that the technologies and business models underpinning it are not fixed. They vary over time and also by industry and geography (Wade, 2015). Currently, the following technologies are most significantly

associated with digital business transformation (Wade, 2015):

- Analytics tools and applications, including big data
- Mobile tools and applications
- Platforms upon which to build shareable digital capabilities, such as cloud solutions and application marketplaces
- Social media tools and applications
- The Internet of Things (IoT), including connected devices and smart networks

Together, these digital technologies are having a profound effect on how organisations and industries are transforming, often as result of new technology-enabled business models (Wade, 2015).

This does not mean, however, that digital transformation is universally embraced with open arms. Political players feel threatened by innovation and try and bury it, coalitions may build up in companies, or groups of executives may decide to work against disruptive new innovation (Garcia, Tabio, Bonnet & Buvat, 2015). At Apple, on the other hand, Steve Jobs played a centralising function as a leader and was able to bring the different warring parts of the company together, to ensure they all worked towards the same vision (Garcia et al., 2015). For this reason, the role of leadership in digital transformation has been earmarked for research in this study.

2.2.3.1. Business models

A key response to digital disruption is to constantly innovate business models (Garcia et al., 2015), which are constantly under threat. A business model represents the way a business creates the value it provides to customers and how it then captures its economic profits (Day, 2011). Furthermore, business models are well defined system of interdependent processes, structures and activities that assist a company to create value for customers and the appropriateness of value appropriation for itself and its partners (Sorescu, Frambach, Singh, Rangaswamy & Bridges, 2011).

Business model changes often affect both value creation and value appropriation and its underlying strategies (for example, operational excellence for value appropriation and customer efficiency for value creation) (Sorescu et al., 2011). The effect of digital technology on business models is well documented in retailing (Alba et al., 1997). Serguei Netessine, professor at INSEAD in Singapore, believes that most companies do not focus enough on their business models and that is major handicap when they are faced with disruption (Garcia et al., 2015).

The digital economy is turning the traditional rules of the game upside down, as a scan of business press headlines illustrates. “Since 2000, 52% of (the) Fortune 500 have either gone bankrupt, been acquired or ceased to exist” (R. Wang, 2014); “Uber Valued at \$40 Billion in \$1.2 Billion Equity Funding” (Bloomberg, 2014); “Is Silicone Valley the Future of Finance?” (Magazine, 2014) and “How Bitcoin can and will disrupt the financial system” (Capitalist, 2014).

Rita McGrath, Professor at Columbia Business School, is confident that companies can spot the early warning signs of disruption by looking at the right data i.e. lagging, current and leading indicators (Garcia et al., 2015). Leadership challenges result in companies being unable to react to disruptions, therefore presenting the threats as opportunities for others. Companies fail when their leaders enter something of an “identity crisis”, losing their core mental models and trying to preserve the status quo or indulging multiple, conflicting visions, to appease stakeholders (Van Tonder, 2004)

2.2.3.2. Big data

The most important challenge in a digital world is the ability to generate and leverage deep customer insights. In this digital world, big data has become the norm. Big data is defined in terms of five Vs: volume, velocity, variety, veracity, and value (White, 2012). Volume refers to the quantities of big data, which are increasing exponentially, and velocity is the speed of data collection, processing and analysing in the real time. Variety refers to the different types of data collected in a big data environment; veracity represents the reliability of data sources and value refers to the transactional, strategic and informational benefits of big data (Wamba, Akter, Edwards, Chopin & Gnanzou, 2015; Wixom & Todd, 2005).

Big data focuses on three main characteristics: the data itself, analytics and presentation

of the results of the analytics that allow the creation of business value in terms of new products or services (Gantz & Reinsel, 2012). The challenges of big data include capture, curation, storage, search, sharing, transfer, analysis, and visualisation (Snijders, Matzat & Reips, 2012). Because of big data, managers can measure - and hence know - radically more about their businesses, and can directly translate that knowledge into improved decision making and performance (Brynjolfsson & McAfee, 2011). It's not surprising, then, that big data is considered an important source of innovation (Brynjolfsson & McAfee, 2012).

Big data offers ample opportunities to follow customers through their customer journey, such as the journey customers take from awareness or orientation on a product to purchasing and possibly even becoming loyal to the brand or product. Efficiently tracking the customer journey is a key requirement in optimising advertising campaigns and budgets. Technical analysis of customer journeys has become an important role for digital marketing agencies, who follow customers when they seek information, compare products and ultimately take the decision to purchase a product. More research is needed, but companies that systematically analyse traditional data appear to outperform competitors (Davenport, 2006).

The successful companies of the next decade will be the ones whose leaders can embrace big data, while changing the way their organisations make decisions (Brynjolfsson & McAfee, 2011). Leadership continues to be the most studied and least understood topic in social science (Bennis, 1989) and leadership research has been described as the search for the philosopher's stone (Wixom & Todd, 2005). Effective leadership is somewhat dependent upon its context and environment, and it's apparent that emerging technology has forever changed the management landscape. As technologies emerge and advance, it is simply a business imperative that organisational leadership evolves as well.

2.2.4. Digital masters' conclusion

The literature has demonstrated that digital initiatives are closely associated with or essentially part of corporate entrepreneurship and innovation concepts, and that digital transformation is now critical to enabling organisations to compete in the constantly changing global business environment. The next section will outline how strategy is a

core function of the company's leaders and management.

2.3. Corporate strategy and digital strategy

When facing disruptive change, standard strategies do not apply and CEO's need to be innovative and face reality. Under these circumstances, companies are presented with a set of choices that would include: competitive position, product markets, desired capabilities, structure and rewards, staff selection and values (Andrews, 1987).

The concept of strategy is well articulated by Andrews (1987): "Strategy is the pattern in a company that determines and reveals its objectives, purposes, or goals, produces the principle policies and plans for achieving those goals, and defines the range of business the company is to pursue, the kind of economic and human organisation it is or intends to be, and the nature of the economic and non-economic contribution it intends to make to its shareholder".

As seen in the literature, digital leaders need to ensure that strategy applies to the whole enterprise and is therefore a *corporate* strategy. Corporate strategy has the following attributes (Andrews, 1987). It:

- Defines the business markets in which a company will compete
- Focuses resources to turn outstanding competence into competitive advantage
- Remains effective in the long-term
- Commands a significant portion of company resources (time, energy, finances)
- Crystallises the central core attributes and brand image of a company
- Positions an organisation in its industry and markets
- Contains objectives, with their timelines and related implementation decisions
- Formalises goal setting: vision, purpose and mission statement

2.3.1. Strategy as a portfolio of competencies

Strategy focuses the allocation of resources. Anything which does not commit resources is not part of the strategy. Organisations are often faced with resource munificence, which refers to scarcity or abundance of the critical resources needed to operate (Castrogiovanni, 1991). Digitalisation, being disruptive, is naturally resource-intensive. An organisation's digital appetite can therefore be measured against its willingness to allocate scarce resources to the (digital) strategy.

Core competencies are the company's collective knowledge pool about how to coordinate diverse production and skills (Prahalad & Hamel, 2006). The competencies that a company possesses demonstrate its strategic intent. For a company to view a competency as core, the following attributes (Prahalad & Hamel, 2006) should be visible:

- Dominance will decline if the competency is not controlled
- Future opportunities will be lost without the competency
- Access to strategic markets will be minimised without the competency
- Customer benefits will be critically impacted if the competency is absent.

It is imperative that information capabilities are leveraged throughout the entire organisation, resulting in the CIO adopting an innovative role (Peppard, Edwards & Lambert, 2011). In order to win the digital race, however, all leaders, not just the CIO, must be digitally literate and drive this capability in their teams (Hunt, 2015). "Digital literacy requires knowledge and understanding of relevant digital-era concepts, digital tools and systems, and social technology features, platforms, and tools" (Hunt, 2015, p 48).

2.3.1.1. South African context

A CIO survey conducted by Brainstorm magazine in November 2016 highlighted the way that company executives expect CIO's to lead digital transformation and innovation (Kelly, 2016). Digital strategy and innovation is the number one priority for South African CIO's (Kelly, 2016). The survey further clarifies that within the South African context, the

CIO is the most knowledgeable person to own the digital strategy and execution for their companies. It was revealed that 83% of South African CIO's are being forced to change their role and responsibilities to reflect digital migration as their top priority and more than 50% CIO's are the ones driving innovation in their organisations (Kelly, 2016).

2.3.2. Strategic thinking

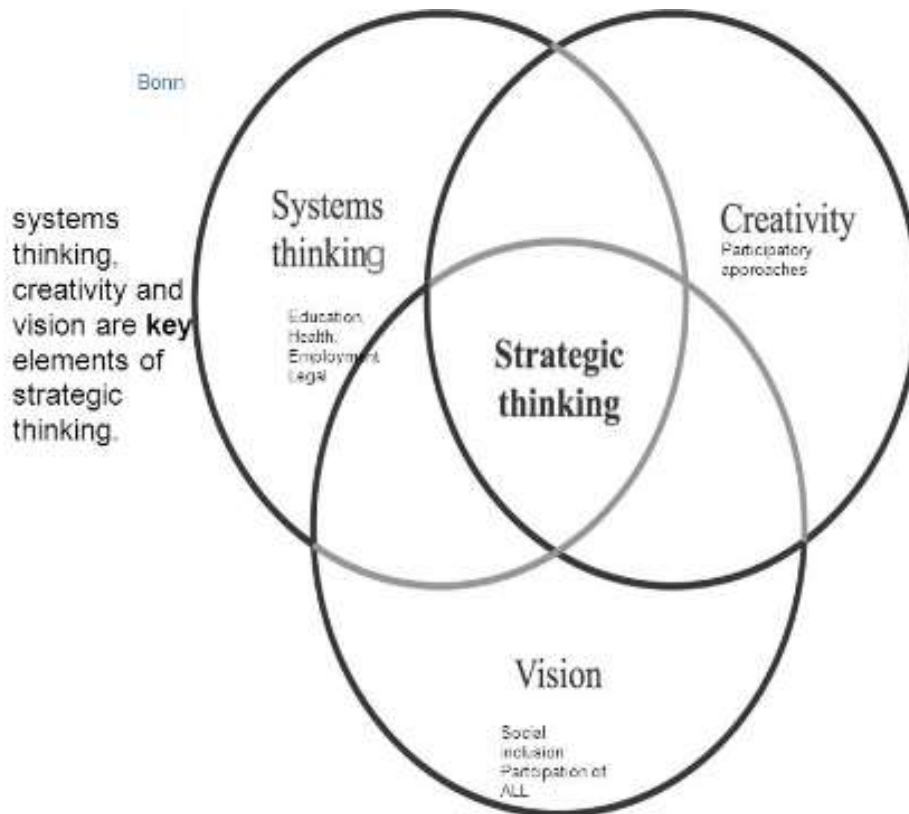
Liedtka (1998), modified the definition of strategic thinking and conceptualised it as a way of solving strategic problems, blending the logical and convergent with the creative and divergent, in a bid to find different ways of competing and providing value to customers (Moon, 2013). Strategic thinking enables managers to make strategic decisions in complex and unclear environments. For this reason, the value and role of strategic thinking is critical in organisations that need their managers to think entrepreneurially and pursue innovation (Zahra & Nabison, 2012).

Although strategic thinking is a discrete activity that comprises many independent elements being considered, it is most beneficial when it takes into consideration both the individual thinker and the organisational dynamics at play (Bonn, 2005). Moon (2013) posited market-oriented thinking, embellishing the view that the effects of group dynamics and the way in which individual strategic thinkers contribute to the overall level of strategic thinking cannot be underestimated.

The focus of this research is to understand the interplays between individual thinking within the group context (as influenced by leaders) and the importance of having the technical knowledge that is part and partial of digitalisation and IT innovation and strategy. Although more simplistic than Liedtka's model (1998) which offers a more granular view of strategic thinking; this research proposes to use Bonn and Moon's (2005, 2013) models, since they include group-level interactions.

Bonn (2005), highlights that strategic thinking within a group is not merely the sum of individual members' strategic thinking ability. Rather, it stems from the interplay between this ability, the agreed culture (preserved diversity in negotiated belief structures) of senior management groups and organisational influences.

Figure 2: Elements of strategic thinking (Bonn, 2005)



2.3.2.1. System perspective

A systemic perspective is a critical antecedent to the ability of an individual to think strategically (Bonn, 2005; Liedtka, 1998; Moon, 2013). *Systems thinking* is critical for individuals to form a complete view of all the relevant interdependencies within a set environment, while also allowing many different perspectives to surface (Senge, Lichtenstein, Kaeufer, Bradbury & Carroll, 2007). These diverse perspectives enable an individual to create an integrated view of an entire organisation, encouraging an understanding of the underlying drivers of business conditions (Moon, 2013). It is critical that individuals grasp the different internal and external factors influencing performance and the way that they interact and impact the greater nature and competitiveness of their organisation (Bonn, 2005; Liedtka, 1998; Moon, 2013).

Considering the integrities and complexities associated with digitalisation and IT Innovation, this research therefore embraces a *systems thinking* perspective as a critical component of becoming a digital master.

2.3.2.2. Creativity

Strategy concerns ideas and the development of solutions to create competitive advantage. Strategic thinkers must search for novel approaches and envision better ways of doing things - being creative – since the organisational environment of the past is vastly different to the 21st Century context. Creativity has been widely researched (Oldham & Cummings, 1996; Woodman, Sawyer & Griffin, 1993), with the most frequently studied creative thinking skills being the ability to generate many alternative solutions to a problem and pattern recognition (Ford, 1996). Imagining multiple alternatives and testing hypotheses is critical for the development of unique strategies and action programs. "Without creativity, we are unable to make full use of the information and experience that is already available to us and is locked up in old structures, old patterns, old concepts, and old perceptions" (De Bono, 1996, p. 17).

2.3.2.3. Vision

Senior managers are faced with a high level of uncertainty and incomplete information. They need to make sense of complex, multi-faceted projects and synthesise many possible meanings (Boland, 1984). These leaders need some sort of guidance or - as Weick (1995, p. 27) has argued "values, priorities and clarity about preferences" - to help them develop viable strategies and design appropriate courses of action. Studies have stressed the importance of common beliefs and vision of the desired future (Collins and Porras, 1998) to convey a sense of direction and provide a focus for all activities within the organisation. At the senior level, a common vision helps to provide meaning and gives a sense of direction in the decision-making process (Liedtka, 1998).

2.3.3. Strategy conclusion

In summary, then, strategy is an important component of modern leadership and has embraced innovation and digital migration as core aspects of the overall business strategy. For the most part, senior executives are still responsible for strategy generation and implementation plans. For this reason, leadership and strategy are closely aligned.

2.4. Leadership

Burns (1979), in his seminal and frequently-cited work, highlighted that at the time 130 definitions of the word strategy were identified in a study. He collated these and defined leadership as the act of leaders encouraging followers to act for certain goals that represent the values and motivations, expectations, aspirations, wants and needs of both leaders and followers (Burns, 1979). Hellriegel and Slocum (1992), similarly found leadership to be the ability to influence, mobilise and steer others towards achieving desired objectives. Leadership is about a relationship between followers and those that desires to lead (Kouzes, & Posner, 2007).

It is the quality of this relationship that matters the most when we're engaged in getting extraordinary things done. The leader management exchange theory also supports the importance of the tacit relationship, the theory concerns the exchange of value between leaders and their team members (Graen & Uhl-Bien, 1995) and partly reveals why transactional leadership is partly needed at the same time as transformational leadership, as Bass proposed. For Maxwell (1999), leadership is “influence – nothing more, nothing less” (Maxwell, 1999). Covey (2004), agrees and concludes that leadership is about communicating people's worth and potential with such great clarity that they gradually view themselves in the same light (Stephen, 2004).

There is, unfortunately, no cure-all formula for successful leadership (Bernds & Nanus, 1997). Technologically-advanced firms have had to alter their hierarchical management systems (Cohen & Bradford, 1989; Kotter, 2010), since emerging technology have eroded the traditional power base of many managers (Kanter, 1989). Formerly dominant approaches no longer apply and organisations require change management, urgency and decisive adaptation (Krantz, 1990). In this sense, organisations often need to revamp their organisational culture to implement appropriate remedial action.

Bass (1985) asserts that in a turbulent environment, a certain type of leader must emerge. This leader will make employees aware of the purpose and mission of the organisation, and will encourage team members to embrace the good of the organisation, not just their own self-interest (Bass, 1990). Burns (1979) labelled this *transformational leadership*. Transformational leadership renovates an organisation; helping people buy into a vision which will evolve the organisation's culture (Tichy &

Ulrich, 1984). Bass (1985), further proposed that transformational leadership behaviour would be more effective during times of organisational change and turbulence, since earlier leadership models could not adequately describe the full range of leadership styles (Avolio, Bass & Jung, 1995).

The current study seeks to investigate whether there is a relationship between leadership style and digital maturity, and to determine if transformational leadership can predict higher digital maturity in South African companies. The literature will therefore primarily focus on transformational leadership, but for the sake of contrast, laissez-faire and transactional leadership styles have also been included and are therefore briefly discussed.

2.4.1. Laissez-Faire leadership

A laissez-faire leader abdicates responsibility and avoids decision-making (Robbins, Judge & Sanghi, 2007). Luthans (2005), clarifies this, revealing that laissez-faire leaders are uninvolved in the work of their team. Managers like this are not attentive, engaged, regularly present or influential (Dubinsky, Yammarino, Jolson & Spangler, 1995).

2.4.2. Transactional leadership

A transactional leadership style is based on an exchange process wherein individuals mutually benefit, which implies reciprocity (Simola, Barling & Turner, 2012). Bass (1990) indicates that transactional leadership can be characterised by several elements: **contingent rewards** and **management-by-exception**.

2.4.2.1 Contingent rewards

This proverbial carrot and stick rewards *good* performance and actively seeks out (and punishes) *poor* performance or non-compliance. The leader endeavours to obtain agreement from followers regarding what should be done, accompanied by appropriate payoff (Northouse, 2001) or avoidance of punishment (Bass, 1985)

2.4.2.2 Management by exception

Management-by-exception involves negative reinforcement, negative feedback and corrective criticism (Northouse, 2001). Transactional leadership can be active or passive. In the latter case, leaders intervene only when set objectives are not achieved.

2.4.3 Transformational leadership

Transformational leaders operate out of deeply-held personal value systems. Burns (1979) refers to these as *end values*. End values cannot be negotiated or exchanged between individuals. By expressing these personal standards, transformational leaders are able to unite their followers and actually inspire changes to followers' goals and beliefs (Bass, 1990; Burns, 1979; Deluga, 1988).

Transformational leadership sees interactions among involved parties being structured around a shared reason for being that transforms, mobilises and embellishes the actions and noble aspirations of followers (Simola, Barling & Turner, 2012). Transformational leaders therefore gain buy-in to the organisational mission by inspiring the ability to look beyond self-interests within followers. A transformational leadership style seeks positive transformations in followers and utilises the strategy and structure of the organisation to affect the desired growth (Geib & Sewenson, 2013). Developing the ability within followers to look beyond self-interest is achieved via charisma, inspiration, challenges or personalised messaging (Bass, 1985).

Bass identified four transformational leadership behaviours which represent four basic components, the "I's" of transformational leadership (Avolio, 1999; Bass & Avolio, 1992).

2.4.3.1 Idealised influence (charisma)

This first "I" is considered by many as the most critical behaviour in the transformational leadership model (Conger, & Kanungo, 1988). Charismatic leadership is a value-based style that leads to emotional bonds between leaders and followers, and self-interest being eclipsed by a belief in a shared purpose (Weng, Chi-Wei, & Yi-Chu, 2011). High moral standards and ethical conduct is part-and-parcel of this: transformational leaders can be counted on to do the *right* thing (Bass & Avolio, 1992; Northouse, 2001)

Murphy and Ensher (2008) reveal how charismatic leaders achieve targeted transformation by strategically communicating vision, being contextually appropriate, personally vulnerable and sensitive to organisational members' needs, along with challenging norms where necessary. Charisma provides not only vision, but also a sense of pride, respect and trust.

Idealised influence, examined at a more granular level, is separated into two aspects: idealised influence attributed and idealised influence behaviour (Loon, Heang & Lian, 2012). There is a fundamental distinction: idealised influence behaviour refers to what leaders actually do, while idealised influence attributed refers to the way leaders are perceived and experienced by followers. Leaders who are perceived as powerful, charismatic and confident people by their followers possess attributed idealised influence (Aydogdu & Asikgil, 2011). Employees who attribute idealised influence to their leaders, or who experience idealised behaviours from their leaders, would likely associate and identify with their leaders and therefore perform beyond expectations and develop willing organisational commitment (Deci & Ryan, 2000).

Beyond team member performance, previous studies have linked Idealised influence to desired organisational outcomes, such as career satisfaction (Joo & Lim, 2013). The behavioural idealised influence that makes such an impact consists of effectively communicating the collective mission of the organisation to team members and explicitly talking about values and beliefs (Kovjanic, Schuh, Jonas, Quaquebeke & Dick, 2012) Consequently, employees develop commitment toward both the leader and their organisation (Aydogdu & Asikgil, 2011).

2.4.3.2 Individual consideration

The fourth transformational "I" concerns providing customised support, encouragement, coaching (Avolio, 1999; Bass, 1998; Yukl, 1998) delegation, advice and feedback for use in the personal development of followers (Bass & Avolio, 1992).

A transformational leader demonstrates individual consideration by paying attention to employee differences. He or she then coaches and advises team members according to their differences. Individualised consideration also identifies and attempts to meet followers' current needs, to maximise and develop followers' full potential (Bass & Avolio, 1990). Individual consideration is useful to identify follower weaknesses constructively.

The transformational leader helps subordinates overcome weaknesses by assigning special projects that will promote self-confidence, utilise their talents or provide opportunities for learning (Bass, 1985).

2.4.3.3 Inspirational motivation

Inspirational motivation, the second transformational leadership behaviour, is usually a companion of idealised influence. It is characterised by the communication of high expectations, using symbols to focus efforts, and expressing important purposes in simple ways (Bass, 1990). Transformational leaders provide others with an aspirational identity, offering followers something that surpasses self-interest (Geib & Sewenson, 2013). Communication of the vision clearly accentuates meaning and the consequences of each action for the organisation and its stakeholders. Transformational leaders exemplify integrity, fairness, clarity of goal-setting and provide resources in the form of support and recognition, stirring up passion to reach for higher goals (Warrick, 2011).

2.4.3.4 Intellectual stimulation

The third behaviour is seen in the promotion of challenging assignments, personal development, rationality and problem solving. Leaders help followers to look at old problems from new and interesting perspectives (Bass, 1990). In addition, followers are also encouraged to take intellectual risks and to question assumptions (Avolio, 1994; Bass, 1998). Support for intellectual stimulation, therefore, helps employees to think innovatively and find alternative working processes that create knowledge and technology, which are essential factors of organisational innovation (Mokhber, bin Wan Ismail & Vakilbashi, 2015).

The intellectually stimulating leader encourages careful problem-solving by showing subordinates new ways to solve and identify problems (Bass, 1985). In this way, followers are encouraged to question their own and their leader's beliefs, assumptions, and values (Bass, 1985) and to attempt problems on their own by being creative. By promoting intellectual stimulation, followers are authorised to question the status quo, and as a result, they create fresh ways to fulfil the organisation's mission (Bass, 1985). Leaders are intellectually stimulating when they can comprehend and articulate the opportunities and threats facing their organisation (Bass, 1985).

2.4.4 Leadership conclusion

Leadership, as defined in this study, concerns the influence-based relationship between leaders and followers. Transformational leadership dominates Leadership Quarterly's most-cited (Scopus, 2016) articles, and therefore forms the mainstay of this research. A transformational approach is substantially interactive, affecting staff performance via increased creativity and engagement (Burns, 1979). Transformational leaders strive to nurture the best in their employees and work-team by showing authentic concern and respect for individuals and empowering individuals in ways that develop their full potential and abilities, and maximise self-efficacy and self-esteem (Wang & Howell, 2010).

Bass advocates a transformational/transactional continuum, in that the two leadership styles should be viewed as a single continuum rather than as mutually independent (Yammarino, 1993, in Northouse, 2001). The leader's effect on performance, broadened as transformational leadership, does not necessarily detract from transactional leadership (Bass, 1998). Transformational and Transactional leadership are distinct entities, but not mutually exclusive processes. A leader may use both styles at different times, in different situations (Bass & Avolio, 1992; Yukl, 1998) or in different volumes (Bass, 1985). Leaders thus retain the ability to act both transformationally and transactionally (Conger & Kanungo, 1998).

For the purpose of the study, the focus will be on transformational leadership factors, since this leadership style has been empirically found to be effective in a high-technology context (Ehrlich, Meindl & Viellieu, 1990). As alluded to in the literature, digitalisation is closely linked to innovation and previous research has shown that leader support for innovation can serve as a moderating variable between transformational leader behaviour and follower unit performance (Howell, & Avolio, 1993). Yoo (2008) confirms that digital innovation is a driving force in business innovation and transformational leadership can lead to substantial organisational rewards (Bass, 1990). This provides the impetus for further investigation into the relationship between transformational leadership factors and digital maturity within South African companies.

3. CHAPTER 2: HYPOTHESIS

Chapters one and two provide the current academic thinking around transformational leadership, including the four factors represented in transformational leadership, and the levels of digital maturity. The gaps in literature are now explained as research questions and hypotheses to be tested in later chapters.

This study has two research objectives (RO), namely RO1 and RO2.

RO1: To explore the relationship between transformational leadership and having higher digital maturity levels, that is, becoming a digital master.

RO2: To determine whether one or more of the transformational leadership factors has an effect on the digital maturity of South African companies.

3.1 Research Objective 1:

As demonstrated in chapters 2 and 3, there are substantial amounts of research that demonstrate the relationship between digital maturity and leadership (Westerman et al., 2014). Past research also demonstrates the relationship between innovation, digital innovation and ensuring a company's future competitiveness (World Economic Forum, 2015). As pointed out in the research problem, however, the relationship between the leadership style employed and digital maturity has not been explored. Hypotheses (H) will now be generated.

RO 1: To explore the relationship between transformational leadership and having higher digital maturity levels i.e. becoming a digital master.

- Ho1: There is no linear relationship between transformational leadership (total of all transformational leadership factors) and digitally mature companies.
- Ha1: There is a linear relationship between transformational leadership (total of all transformational leadership factors) and digitally mature companies.

3.2 Research Objective 2

Bass (1990) asserts that transformational leadership is characterised by several patterns of behaviour, grouped into four basic factors (Avolio, 1999; Bass & Avolio, 1992): idealised influence, inspirational motivation, intellectual stimulation and individualised consideration. A correlation between one or more of the transformational leadership factors and achieving digital maturity has not yet been explored in existing literature, to the best of the researcher's knowledge.

Westerman et al., (2012) point out that success in digitalisation requires not only an investment in digital capabilities, but also a change in the culture, which only strong leadership can inspire. Digital innovation is disruptive (Scheibach, 2016) and as stated by Bass (1985) the current market turbulence necessitates the emergence of a certain type of leader: a Transformational Leader. Ehrlich, et al., (1990) empirically found that transformational leadership factors are effective in a high-technology context (Ehrlich, Meindl & Viellieu, 1990). As eluded to in the literature, digitalisation is closely linked to innovation and leader support for innovation moderates transformational leader behaviour and follower unit performance (Howell, & Avolio, 1993).

Objective 2: To discover which of the four transformational leadership components (if any) are prevalent among current South African companies that are in the top two digital maturity quadrants i.e. that are digital masters.

- **Ho2:** The transformational leadership factor **Idealised Influence** has no effect on the digital maturity of existing South African companies
- **Ha2:** The transformational leadership factor **Idealised Influence** has an effect on the digital maturity of existing South African companies
- **Ho3:** The transformational leadership factor **Individual Consideration** has no effect on the digital maturity of existing South African companies
- **Ha3:** The transformational leadership factor **Individual Consideration** has an

effect on the digital maturity of existing South African companies

- **Ho4:** The transformational leadership factor **Inspirational Motivation** has no effect on the digital maturity of existing South African companies
- **Ha4:** The transformational leadership factor **Inspirational Motivation** has an effect on the digital maturity of existing South African companies
- **Ho5:** The transformational leadership factor **Intellectual Stimulation** has no effect on the digital maturity of existing South African companies
- **Ha5:** The transformational leadership factor **Intellectual Stimulation** has an effect on the digital maturity of existing South African companies

4 CHAPTER 4: RESEARCH METHODOLOGY

4.1 Introduction

In previous chapter, we explored research objectives and defined the hypotheses outlined for this study.

This study seeks to investigate whether there are relationships between the four factors of the transformational leadership style and the digital maturity of South African companies and to determine which, if any, of these factors predict higher digital maturity in South African companies.

The study is descriptive in nature, in that it attempts to describe phenomena or characteristics associate with a subject population (Blumberg, Cooper & Schindler, 2008). Quantitative analysis was conducted on collected data from electronic surveys, to better understand the association between the researched variables.

In conclusion, a positivistic philosophy, using a deductive approach, was used, with a survey strategy chosen as a mono method. Research data was cross-sectional and was then collated and analysed using statistical techniques. This chapter concludes with the limitations of the study

4.2 Rationale for research methodology

The positivistic strand of research philosophy studies observable and measurable variables in certain controllable conditions, to describe the reaction of these variables (Saunders & Lewis, 2012). This study examined the causal relationship between independent variables (idealised influence, individual consideration, intellectual stimulation and inspirational motivation), and a dependent variable (companies' digital maturity). By employing this highly structured method, replication can be facilitated, resulting in law-like generalisations (Saunders & Lewis, 2012). Generalisation assists with understanding the role of transformational leadership factors in moderating the impact on digital maturity and could inform South African companies' digital maturity.

A research approach can either be deductive or inductive, or a combination of both. Induction implies a “bottom-up” approach patterns and repeated occurrences of phenomena allow the researcher to investigate hypotheses (Saunders & Lewis, 2012). Induction is not suitable for this study, as the research questions and hypotheses were stated upfront. Deduction is used to test a theoretical proposition by designing a research strategy to test a hypothesis, a “top-down” approach (Saunders & Lewis, 2012) that explains causal relationships between the variables. Since this study attempting to do exactly this, the deductive approach was selected.

4.3 Research design

A survey was distributed to C-level executives of South African companies with varying degrees of digital intensity (Westerman et al., 2012). The survey was administered online to gather responses from the sample.

A research survey is a research strategy where data is collected from a sizeable population (Saunders & Lewis, 2012). Leadership researchers typically have used quantitative approaches (Antonakis et al., 2004). Quantitative data collection may take the form of structured observation, structured interviews and questionnaires (Saunders & Lewis, 2012). A mono method, which uses only one type of **method** (Saunders & Lewis, 2012), was chosen for the study, namely an online survey questionnaire. In this quantitative study, the data was placed in numerical form and the information was analysed using quantitative data analysis techniques.

The survey allowed for the collection of data from a wide range of different South Africa C-level executives spread demographically, thereby allowing for the affordable collection of data on the same standardised statements from the sample group (Saunders & Lewis, 2012). Blumberg et al., (2008) describe a survey as a highly versatile and cost-effective method of gathering information. The online administration of the survey allowed for quick and easy data gathering and analysis. The online tool, Survey Monkey, was used to administer the survey.

Questions had an upfront filter to assess the demographics of the sample. Personal demographics collected included job function, seniority level in the company, age and gender. Company demographics included company revenue, duration of business

existence and the primary business activity of the executive's organisation. Names were not collected, to ensure anonymity for all participants. The methodology for testing leadership style and digital maturity had been developed in previous literature and is described below:

4.3.1 Leadership section - MLQ

The shortened form of the Multifactor Leadership Questionnaire (MLQ) of Northouse (2001) was used for the leadership questions. Form 6-S (MLQ -6S) was developed by Bass & Avolio (1992). The researcher procured a licence, as well as the technical handbook for interpreting the MLQ instrument, for the research study.

The MLQ instrument is the most frequently and thoroughly researched and validated leadership instrument in the world (Tejeda, Scandura & Pillai, 2001) and is applied to a wide range of organisational settings, across different cultures (Bass, 1998). The instrument is used to measure transformational leadership styles systematically (Northouse, 2001). As highlighted in the literature, transformational leadership behaviours and desired organisational outcomes are associated, in the delivery of successful organisational change.

By examining the resulting agreement among respondents, the reliability of the MLQ has been confirmed (Bass, 1998). A number of approaches based on performance in small groups have historically been used to examine reliability, such as rater consistency, subordinate-superior agreement and peer ratings. In addition, supervisor and direct report performance ratings are also used for evaluations. These have demonstrated a positive relationship between transformational behaviour and high MLQ ratings (Bass, 1995). Similar results were found in multiple organisational settings when the MLQ was employed (Bass, 1995).

This study made use of the shortened MLQ version, since Tejeda (2001) found that a reduced set of items from the MLQ appeared to show preliminary evidence of predictive and construct validity. Secondly, the transformational subscales or items were highly inter-correlated in support of convergent validity and scales were negatively related to both management-by-exception subscales and laissez-faire leadership, providing support for discriminant validity.

The transformational leadership scales comprise the following factors: idealised influence, individualised consideration, intellectual stimulation, and inspirational motivation (Tejeda, 2001), while the transactional scales consist of contingent reward and management-by-exception (active and passive). There is, additionally, a scale dealing with laissez-faire leadership.

Although the multi-rater format was used in this study, only self-ratings of leaders were used. The short version of the MLQ utilises questions with a 5- point Likert scale ranging from (0) - not at all - to (4) - frequently, if not always.

4.3.1.1 Leadership measurement

The transformational leadership scale titles, typical items, and internal reliabilities (Avolio et al., 1995) are as follows:

1. Idealised Influence: Instils pride in being associated with him/her; Talks to us about his/her most important values and beliefs (3 questions)
2. Inspirational Motivation: "Talks optimistically about the future" (3 questions)
3. Intellectual Stimulation: "Seeks differing perspectives when solving problems" (3 questions)
4. Individualised Consideration: "Treats each of us as individuals with different needs, abilities, and aspirations" (3 questions)

The transactional leadership scale titles, typical items, and internal reliabilities are as follows:

5. Contingent Rewards: Makes sure that we receive appropriate rewards for achieving performance targets (3 questions)
6. Management-by-exception: Focuses attention on irregularities, mistakes, exceptions, and deviations from standards; Fails to intervene until problems become serious (3 items)

To complete the continuum of leader behaviour, non-leadership is also identified by the Multifactor Leadership Questionnaire (MLQ):

7. Laissez-Faire: "Is absent when needed" (4 items)

These seven leadership behaviours (idealised influence, inspirational motivation, individualised consideration, intellectual stimulation, contingent rewards, management by-exception and laissez-faire), which Avolio & Bass (1991) refer to as a full range of leader behaviour, served as the independent variables in the current study.

4.3.2 Digital maturity/intensity

The final section of the survey drew from the self-assessment instrument of Westerman et al. (2014). These questions focused on digital maturity alone, since the MLQ already focuses on the leadership components. The range of answers was limited to “yes” or “no”, regarding whether organisations possessed the following digital capabilities:

1. We are using digital technologies (such as analytics, social media, mobile, and embedded devices) to understand our customers better
2. We are using digital technologies (such as online, social media, and mobile) to market our products and services
3. We sell our products and services through digital channels.
4. We use digital channels to provide customer service
5. Technology is allowing us to link customer-facing and operational processes in new ways
6. Our core processes are automated
7. We have an integrated view of key operational and customer information
8. We use analytics to make better operational decisions
9. We use digital technologies to increase the performance or added-value of our existing products and services
10. We have launched new business models based on digital technologies

4.4 Population and unit of analysis

4.4.1 Population

Zikmund (2003), defined a research population as a collection of individuals or objects that form the main focus of the research study. The research population for this study were selected from South Africa-based companies with the following requirements:

1. Respondents needed to hold one of the following titles, or their equivalent:
 - a. Chief Executive Officer
 - b. Chief Information Officer
2. Respondents needed to have one or more of the following leadership responsibilities:
 - a. Head of Department
 - b. Head of Division
 - c. Member of Executive Committee
 - d. Board Member

The population for this study contains Executive Leaders on Director, or C-suite level from various South African organisations, reliant on digital capabilities (what literature refers to as digital intensity) to varying degrees. The specific limitations around C-suite levels and responsibilities occur due to the scope of the research questions, defined in Chapter three. Leaders in the stated context are individuals in authoritative positions, empowered to influence the corporate strategy and therefore digital innovation and (ultimately) an organisation's digital maturity. As highlighted in the literature, digital innovation relies on IT capabilities, hence CIO's or those in a similar position were sought out. The full extent of the available population size could not be ascertained, since no academically reliable information in this regard has been established to date. The

motivation for respondents having to be appointed at a certain seniority level was literature revealing that companies reliant on digital technologies are more likely to have the digital strategy included as part of the corporate strategy, and therefore top-down leadership is required for digital mastery. These limitations contributed towards excluding participants from organisations that have no digital capabilities.

As an additional point of clarity, the population included any South African organisation, irrespective of revenue, employee size, years in business and business activity. The information was gathered in such a way as to allow for further distension or analysis should there be extra-ordinary outliers for certain variables.

4.5 Sample and sampling method

The research sample consisted of 69 participants, who were associated with different companies. There was no ceiling placed on the number of respondents, because of the unknown population size. A minimum of 50 respondents was deemed appropriate (Weiers, 2010). The central limit theorem states that norms may be generated from a minimum of 30 respondents. As result of the specific focus placed on digital maturity and primary job functions such as being a CIO, the researcher included as large a sample as possible to ensure that the range of job functions were covered.

A sample is defined by Saunders & Lewis (2012) as a subgroup of the whole population. The subgroup need to be a recognisable subset of people or employees. Not all executives at a specific institution, then, could be included in the sample. The questionnaire was distributed to C-level executives (in line with earlier sample definition) from a multitude of companies, in different industries, to provide a broad base of results from diverse perspectives.

Cochran (2007) defines non-probability sampling as a sampling method whereby candidates in the population do not have an identical chance of being nominated. This study utilised non-probability sampling because the research questions were of such a nature that the researcher required the candidates to conform to a unique, predetermined research population. The inclusion of this sampling technique in the research methodology ensured that the sample consisted of qualified candidates who were able to provide reliable information and enhance the study. Purposive sampling is a type of

non-probability sampling in which the researcher's judgment is used to select the sample member, based on a range of initial premises (Saunders & Lewis, 2012, p. 138). The researcher made use of several Executive Forums, requesting Forum organisers to promote participation in the survey. Members were approached by Forum organisers via email, with the authorised details of the study and a link to the online survey. In addition, the researcher made use of publications, such as CIO Directory, published by Brainstorm magazine, to obtain email addresses.

Another form of non-probability sampling is snowball sampling, whereby the first sample member is identified, and subsequent members are proposed or implied by the earlier sample member (Saunders & Lewis, 2012, p139). In the communication with C-level executives, the researcher requested that they also approach executive peers who form part of their personal or professional network, to request their participation in the survey.

4.6 Data collection and data management

Questionnaires can be used to collect survey data by telephone, hand, post, face-to-face with an interviewer or online (Saunders & Lewis, 2012). Data for this survey was collected via a personalised email, sent with a brief explanation of the study and why the participant was selected to participate and including a hyperlink to the web survey. Where participants were approached through Executive Forums, the organisers send a similar email to all their members, who were on a blind copy system, protecting their anonymity as per forum guidelines.

The online survey was emailed to C-level executives in South African companies. As the response rate to surveys is notoriously low, a statement from the researcher (who herself is a C-level executive of a Bank) accompanied the online link, requesting peers from other companies to complete the survey. Individuals were also approached personally to complete the survey, but due to C-levels leaders being constantly approached for information, this request was only sent once and no delineated response date was given.

4.7 Levels of statistical analysis

Multiple levels of statistical analysis were performed on the data gleaned from the survey, to test the hypotheses and explore the research questions.

Statistical significance tests were run on all the relevant data. Statistical significance occurs when “there is a good (reason) to believe that the difference does not represent random sampling fluctuations” (Blumberg, Cooper & Schindler, 2008, p 744). In this study the significant level of 0.05 was selected.

The **Cronbach alpha** was used to measure the leadership factors and digital maturity for internal consistency, that is, how closely related a set of items (questions) are as a group. Cronbach alpha is considered a measure of **scale reliability** (or consistency).

Correlation is used to measure the strength of a relationship between variables, while **regression** is used to estimate the nature of the relationship (Blumberg, Cooper & Schindler, 2008). “With regression, an *equation* is developed to predict the values of a dependent variable” (Blumberg et al., 2008, p 790). It was hoped that this study would provide information that enable the prediction of digital maturity, based on the transformational leadership approach of C-level executives.

A **Pearson’s Correlation** test was used in this research project. **Correlation analysis** portrays both the *direction* and the *strength* of the relationship between two variables, even continuous variables (Palant, 2004). Using the Pearson’s Correlation test, a researcher is able to establish whether a change in one variable results in a change in another variable, and to what extent this is prevalent. This research project was particularly concerned with whether changes in any of the transformational leadership factors would result in changes to digital maturity levels at the acceptable confidence level.

Analysis of Variation (**ANOVA**) was used for the **regression testing**. This test allows the researcher to understand if two groups are significantly different, through multiple comparison. The value of this test lies in the ability to understand and gain insight into which specific groups are different from each other. This research project was interested in whether transformational leadership factors have a significant relationship with

enhanced digital maturity (high digital score).

The relationship between the variables was examined through the following lenses (levels of analysis):

1. Simple *descriptive statistics* were examined to determine which of the various transformational leadership factors are associated with digital maturity.
2. *Pearson Correlations* between different transformational factors and digital maturity were calculated, to determine the strength of the relationship between a particular transformational leadership factor and digital maturity.
3. *Correlations* between the extent of digital maturity and the different transformational leadership factors.

4.8 Potential research limitations

In interpreting the results of this research project, the researcher has taken the following limitations into account:

- The researcher might be biased, based on her own perceptions, assumptions and interpretations of leadership
- The outcome of non-probability sampling cannot be generalised to the whole population
- The term *digital masters* is a fairly new concept, with a limited amount of information about the topic, resulting in findings that might be too “generic” and not specific enough when applied to an industry or specific situation.
- In measuring digital maturity (digital masters), since this is a relatively new field of analysis, there is no predefined survey instrument for the researcher to adapt to the population.

4.9 Conclusion

This chapter explained the process that was followed in conducting the research. An online survey was sent to C-suite executives from South African companies. The Multi-factor leadership (MLQ) short-form questionnaire and a digital maturity assessment was included in the survey. Multiple levels of statistical analysis were then performed, to test or further understand the stated research questions and hypotheses.

5 CHAPTER 5: RESULTS

5.1 Introduction

The previous chapter discussed and outlined the research methodology of this study. This chapter will lay out the results of the research that was undertaken, with the information presented in line with the research questions and associated hypotheses in chapter three and the research methodology defined in chapter four.

5.2 Demographics

The demographics of the sample that responded to the survey follow, divided into personal and organisational demographics. The effective sample consists of 67 responses to the adapted MLQ, after accounting for blank responses.

The demographic questions had a two-fold function, namely to ensure that the sample is representative of the population (adhering to the population limitations as defined in chapter 3) and to provide valuable insights into the respondents and their companies.

5.2.1 Personal demographics

This section describes the position that the respondents held within their organisation at the time of the survey. Data was collected about four fields: highest level of seniority within the company, job function, age and gender.

5.2.1.1 Highest positional level

As discussed previously, a population limitation was the respondent's level in their company. Seniority levels of respondents can be seen in Table 1.

Table 1: Levels of Respondents

<i>Level</i>	<i>Frequency</i>	<i>Percent</i>
<i>Board Member</i>	29	43.28
<i>Executive Committee Member</i>	22	32.84
<i>Head of Department</i>	7	10.45
<i>Head of Division</i>	9	13.43

Most respondents were clearly either Board Members (43%) or members of the Company's Executive Committee (33%).

5.2.1.2 Job function

A further limitation of the population was the respondent's job function. The literature in chapter two highlighted the importance of C-level leadership owning digital strategy, but also alludes to the need for a specific function that takes ownership of digital innovation. The literature makes specific reference to the CIO driving digital innovation. The job functions of the respondents are displayed in

Table 2

Table 2: Job descriptions of respondents

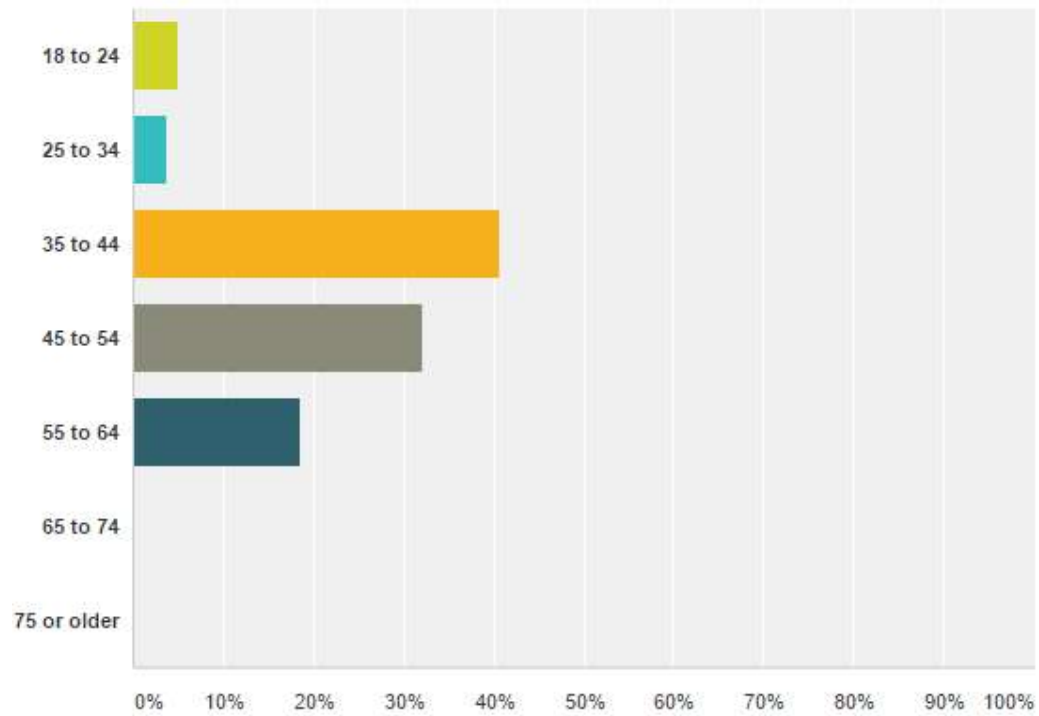
<i>Role</i>	<i>Frequency</i>	<i>Percent</i>
<i>Chief Compliance Officer</i>	1	1.49
<i>Chief Executive Officer</i>	17	25.37
<i>Chief Financial Officer</i>	3	4.48
<i>Chief Information Officer</i>	11	16.42
<i>Chief Marketing Officer</i>	3	4.48
<i>Chief Operating Officer</i>	9	13.43
<i>Chief Risk Officer</i>	3	4.48
<i>Director</i>	19	28.36
<i>Human Resources Director</i>	1	1.49

The majority of the respondents were Directors (28%), followed by Chief Executive Officers (25%) and Chief Information Officers (16%). The response rate from the Chief Information Officers was disappointing, in particular because of the important role literature confirms they play in digital innovation.

5.2.1.3 Age

The age of the respondents was segmented into seven categories: 18-24; 25-34; 35-44; 45-54; 55-64; 65-74 and 75 and older and the results are contained in Figure 3

Figure 3: Age breakdown of respondents

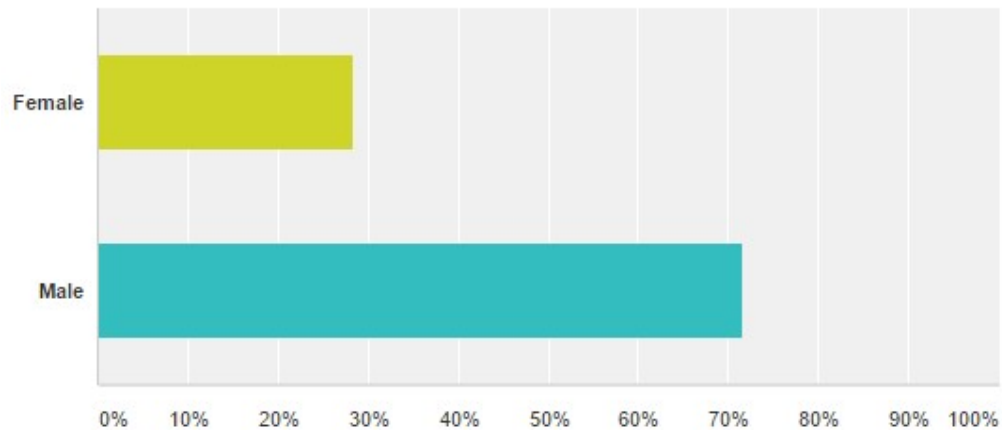


As can be seen from the data, the majority of the respondents fell between the age brackets of 35-44 (40%), 45-54 (31%) and 55-64 (19%). Stated differently, 71% of the executive population of potential digital masters ranged from 35 to 54 years of age.

5.2.1.4 Gender

The gender of the respondents is depicted in Figure 4

Figure 4: Gender breakdown of respondents



Most of the respondents were male (71%), with female respondents therefore only comprising 29%.

5.2.2 Company demographics

Company demographics describe the companies the respondents worked for. The study did not focus on specific demographics, so this information is most useful in the event of specific outlier trends.

5.2.2.1 Industry represented

The industry classification was broken down into a number of industries as can be seen in Table 3:

Table 3: Industries represented

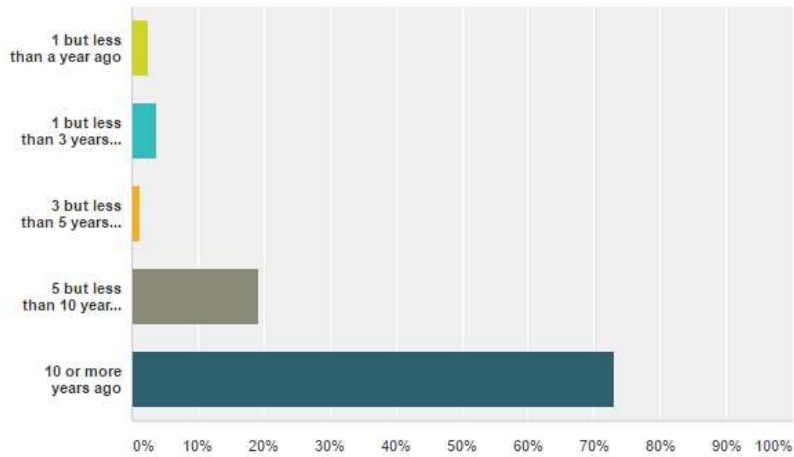
<i>Industry</i>	<i>Frequency</i>	<i>Percent</i>
<i>Agricultural, Forestry and Fishing</i>	1	1.49
<i>Construction</i>	2	2.99
<i>Finance, Insurance and Real Estate</i>	13	19.40
<i>Manufacturing</i>	7	10.45
<i>Mining</i>	2	2.99
<i>Retail Trade</i>	2	2.99
<i>Services</i>	33	49.25
<i>Transportation, Communications, Electric, Gas and Sanitary service</i>	6	8.96
<i>Wholesale Trade</i>	1	1.49

The majority of the respondents were employed by companies in the Services industry (33%), the service industry is inclusive of companies that are in the information technology space. The finance, insurance and real estate industry was represented by the second largest amount of respondents 19%.

5.2.2.2 Start of business operations

Most of the companies (74%) represented by the respondents have been operations for 10 or more years.

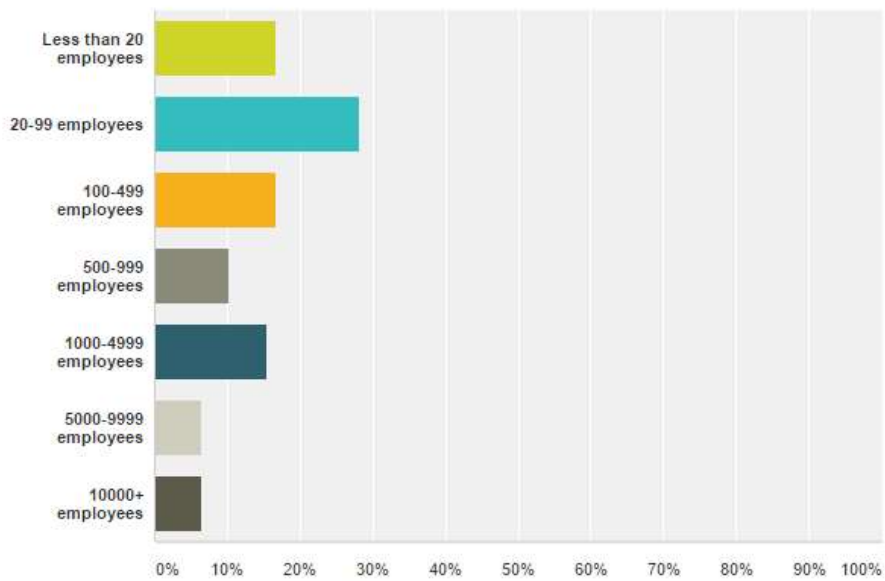
Figure 5: Start of business operations



5.2.2.3 Company size

The size of the companies represented, in terms of permanent employees, reflects a fairly even distribution across the categories with the highest total (28%) being companies that have between 20-99 employees, as depicted in Figure 6

Figure 6: Company size

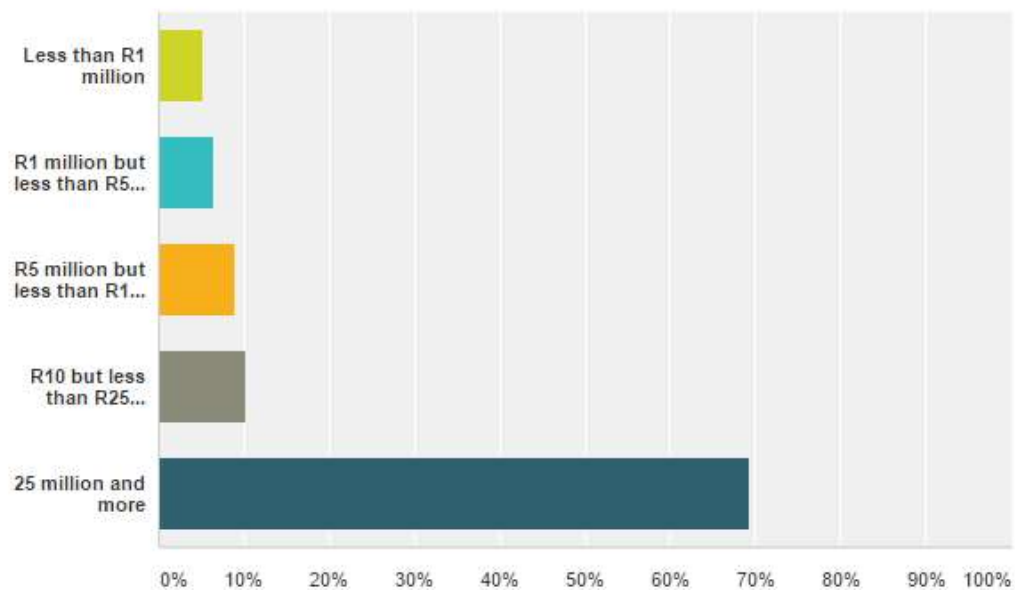


The majority of the respondent organisations fell into three bands: fewer than 20 employees (17%), 20-99 employees (28%) or 100-499 employees (17% again).

5.2.2.4 Company revenue

Most respondents represented companies that reported R25 million or more revenue (69%) the second largest percentage of respondents represented companies that reported between R10 million but less than R25 million (10%).

Figure 7: Company revenue



5.3 Revisiting methodology

The questionnaire consisted of 38 questions. The first two sections of the questionnaire gather personal and company demographics and contained seven questions. These sections required the correspondent to select an option per question. The results of these questions are discussed in 5.2

Section three and four of the questionnaire consisted of 31 questions, labelled Q01 to Q31. The first 21 questions were from the Multifactor Leadership Questionnaire, with

possible responses ranging from 0 (“Not at all”) to 4 (“Frequently, if not always”), and the last ten were yes/no questions (“Yes” = 1, “No” = 0), designed to establish the digital maturity of the respondent’s firm.

5.3.1 Sample and weighting

Weighting was introduced in compiling the results. According to Solon, Haider & Wooldridge (2013) - in their humorously titled working paper “*What are we weighting for?*” - weighting can be used for purposes of estimation either to estimate population descriptive statistics or to estimate causal effects. For the purposes of this study, the focus was on estimation of causal effects. Solon et al., (2013, p 1) discussed three distinct potential motives for weighting when estimating causal effects: “(1) to achieve precise estimates by correcting for heterogeneity (2) to achieve consistent estimates by correcting for endogenous sampling, and (3) to identify average partial effects in the presence of unmodeled heterogeneity of effects”.

The motive for weighting in this study relates to the third motive (Solon et al., 2013). The role of the CIO in digital innovation was highlighted in chapter one. The under-sampling of CIOs might distort the effect that transformational leadership factors have on digital maturity. A population limitation was introduced whereby companies should have three C- levels appointed, since these formal structures are associated with companies that have been in operation longer.

The motivation for introducing weighting is therefore to estimate causal effects by identifying average partial effects: If the impact of transformational leader factor is heterogeneous – if it interacts with other personal or company characteristics – then ordinary least squares (OLS) and weighted least squares (WLS) estimates that do not explicitly account for those interactions may identify different averages of the heterogeneous effects (Solon et al., 2013).

As recommended by Solon et al., (2013) both the weighted and unweighted results are included in the report and the implications are discussed as part of the interpretation of the results.

5.3.1.1 Weight applied

Two separate weights have been applied:

CIO weighting: The default weight of an observation is 1. If the respondent is a CIO, the weight is increased by 1. Each observation is weighted as described, which improves confidence in several parameters.

CIO and Period that the company has been operating: The default weight of an observation is 1. If the respondent comes from a firm that has been in business for more than 10 years, the weight is increased by 1. If the respondent is a CIO, the weight is also increased by 1. Therefore, the maximum possible weight is 3, for respondents who are CIO's of firms that have been in business for longer than 10 years.

5.3.2 Leadership style and transformational factors

The study focussed primarily on the four transformational leadership factors, although two factors for transactional leadership and one for a Laissez-Faire style were also included for testing. The MLQ stipulates that groups of questions are intended to measure seven leadership factors. As explained in chapter four, the MLQ questionnaire requires that every factor be measured by totalling the Likert response of the associated questions. Each question has a maximum value of 4, resulting in a respondent being able to score a maximum of 12 and a minimum of 0 overall for the MLQ. This is done in accordance with the method described in the MLQ instrument instructions.

Table 4: Derived variables leadership

<i>Derived variable</i>	<i>Variable name</i>	<i>Formula</i>
<i>Idealised Influence</i>	<i>Influence</i>	Q01 + Q08 + Q15
<i>Inspirational Motivation</i>	<i>Motivation</i>	Q02 + Q09 + Q16
<i>Intellectual Stimulation</i>	<i>Stimulation</i>	Q03 + Q10 + Q17
<i>Individualised Consideration</i>	<i>Consideration</i>	Q04 + Q11 + Q18
<i>Contingent Reward</i>	<i>Reward</i>	Q05 + Q12 + Q19
<i>Management-by-exception</i>	<i>m_by_e</i>	Q06 + Q13 + Q20
<i>Laissez-faire Leadership</i>	<i>If_lead</i>	Q07 + Q14 + Q21
<i>Digital Score</i>	<i>Digital</i>	Sum of Q22 to Q31

5.3.3 Digital maturity

The digital maturity questions, which measure the reliability and consistency of the ten questions as set-out in chapter four, have not been empirically tested beyond this study. The researcher was therefore specifically interested in the scale reliability and consistency of these questions.

Table 5: Derived variables digital maturity

<i>Derived variable</i>	<i>Variable name</i>	<i>Formula</i>
<i>Digital Score</i>	<i>digital</i>	Sum of Q22 to Q31

The final variable, Digital Score, is not from the MLQ, but rather is the sum of the “Yes” answers to the extra ten questions. The digital score allows for companies to be classified based on their maturity. Companies that have a higher digital maturity are classified as either Fashionistas or Digirati and those with lower maturity are either Beginners or Conservatives. The digital score is a more finely graded version of digital maturity. Specifically, the digital score can be used to deduce the digital maturity by way of Table 6.

Table 6: Digital score vs maturity

<i>Digital Score</i>	<i>Digital Maturity</i>
0 to 2	<i>Beginners</i>
3 to 5	<i>Conservatives</i>
6 to 7	<i>Fashionistas</i>
8 to 10	<i>Digirati</i>

5.4 Instrument reliability

Cronbach Alpha (CA) is a measure of internal consistency, that is, how closely related a set of items are as a group (Palant, 2004). CA is considered to be a measure of scale reliability. A high value for alpha does not imply that the measure is unidimensional (Palant, 2004). In addition to measuring internal consistency, CA provides evidence that the scale in question is unidimensional, and additional analyses can be performed (Palant, 2004).

Exploratory factor analysis is one method of checking dimensionality. Technically speaking, CA is not a statistical test - it is a coefficient of consistency (Palant, 2004). The CA coefficient was calculated for each of these groups and is displayed in Table 7 to Table 14. The final group (Table 14) depicts the questions that measure the extent to which a firm operates digitally.

Table 7: Cronbach Alpha for Idealized Influence Q01 Q08 Q15

<i>Cronbach Coefficient Alpha</i>	
<i>Variables</i>	<i>Alpha</i>
Raw	0.453322
Standardized	0.446338

Table 9: Cronbach Alpha for Intellectual Stimulation Q03 Q10 Q17

Table 8: Cronbach Alpha for Inspirational Motivation Q02 Q09 Q16

<i>Cronbach Coefficient Alpha</i>	
<i>Variables</i>	<i>Alpha</i>
Raw	0.499896
Standardized	0.487648

Table 10: Cronbach Alpha for Individualized Consideration Q04 Q11 Q18

<i>Cronbach Coefficient Alpha</i>	
<i>Variables</i>	<i>Alpha</i>
Raw	0.755538
Standardized	0.756328

Table 11: Cronbach Alpha for Contingent Reward Q05 Q12 Q19

<i>Cronbach Coefficient Alpha</i>	
<i>Variables</i>	<i>Alpha</i>
Raw	0.385524
Standardized	0.392321

Table 12: Cronbach Alpha for Management-by-exception Q06 Q13 Q20

<i>Cronbach Coefficient Alpha</i>	
<i>Variables</i>	<i>Alpha</i>
Raw	0.723414
Standardized	0.732210

Table 13: Cronbach Alpha for Laissez-faire Leadership Q07 Q14 Q21

<i>Cronbach Coefficient Alpha</i>	
<i>Variables</i>	<i>Alpha</i>
Raw	0.198494
Standardized	0.227338

Table 14: Cronbach Alpha for Digital Maturity Q22 to Q31

<i>Cronbach Coefficient Alpha</i>	
<i>Variables</i>	<i>Alpha</i>
Raw	0.637622
Standardized	0.642444

<i>Cronbach Coefficient Alpha</i>	
<i>Variables</i>	<i>Alpha</i>
Raw	0.834056
Standardized	0.834544

As is clear from the preceding tables, several factors score below 0.5. This is in keeping with norms for smaller sample sizes and fewer test items (in this case 3) per factor (Tavakol & Dennick, 2013). As stated in chapter four, the MLQ has been found to be a reliable instrument, meaning that the researcher was not concerned with lower scores on MLQ items.

A significant finding may be seen in Table 14, concerning digital maturity: The alpha coefficient for the four items is 0.834544, suggesting that the items have relatively high internal consistency. A reliability coefficient of .70 or higher is considered acceptable in most social science (Palant, 2004).

5.5 Derived variables and weights

5.5.1 Normality of the variables

Skewness is a measure of symmetry, or more precisely, a lack of symmetry. A distribution, or data set, is symmetric if it looks the same to the left and right of the centre point. Kurtosis is a measure of whether the data is heavy-tailed or light-tailed relative to a normal distribution. Data sets with high kurtosis tend to have heavy tails, or outliers, while low kurtosis would see light tails, or few outliers. A uniform distribution would be an extreme case.

The skewness of a normal distribution is zero, and any symmetric data should have a skewness near zero. Negative values for the skewness indicate data that are skewed left and positive values for the skewness indicate data that are skewed right. If skewed left, the left tail is long relative to the right tail and vice versa. If the data are multi-modal (which is not indicated in histograms of Table 13 and Table 14), then this may affect the skewness.

Table 15: Descriptive statistics of derived variables

<i>Variable</i>	<i>Mean</i>	<i>Std Dev</i>	<i>Minimum</i>	<i>Maximum</i>	<i>N</i>	<i>Sum</i>	<i>Skewness</i>	<i>Kurtosis</i>
influence	9.28	1.15	6	12	67	622	0.03	0.69
motivation	9.06	1.48	4	12	67	607	-0.78	1.64
stimulation	8.93	1.95	4	12	67	598	-0.51	0.38
consideration	9.10	1.69	5	12	67	610	0.03	-0.49
rewards	8.00	2.20	2	12	67	536	-0.50	0.06
m_by_e	8.15	1.60	5	12	67	546	-0.04	-0.27
lf_lead	4.996	2.50	0	11	67	334	0.13	0.27
digital	6.46	3.01	0	10	67	433	-0.57	-0.84

From the calculations depicted in Table 15, Idealised Influence emerges as the leadership factor most strongly represented in this survey. The skewness and kurtosis values in Table 15 are low (i.e. close to normal) for the most part, with the exceptions of Inspirational Motivation and the digital score. This is borne out by the histograms in Figure 8 and 9.

Figure 8: Histograms of leadership factors

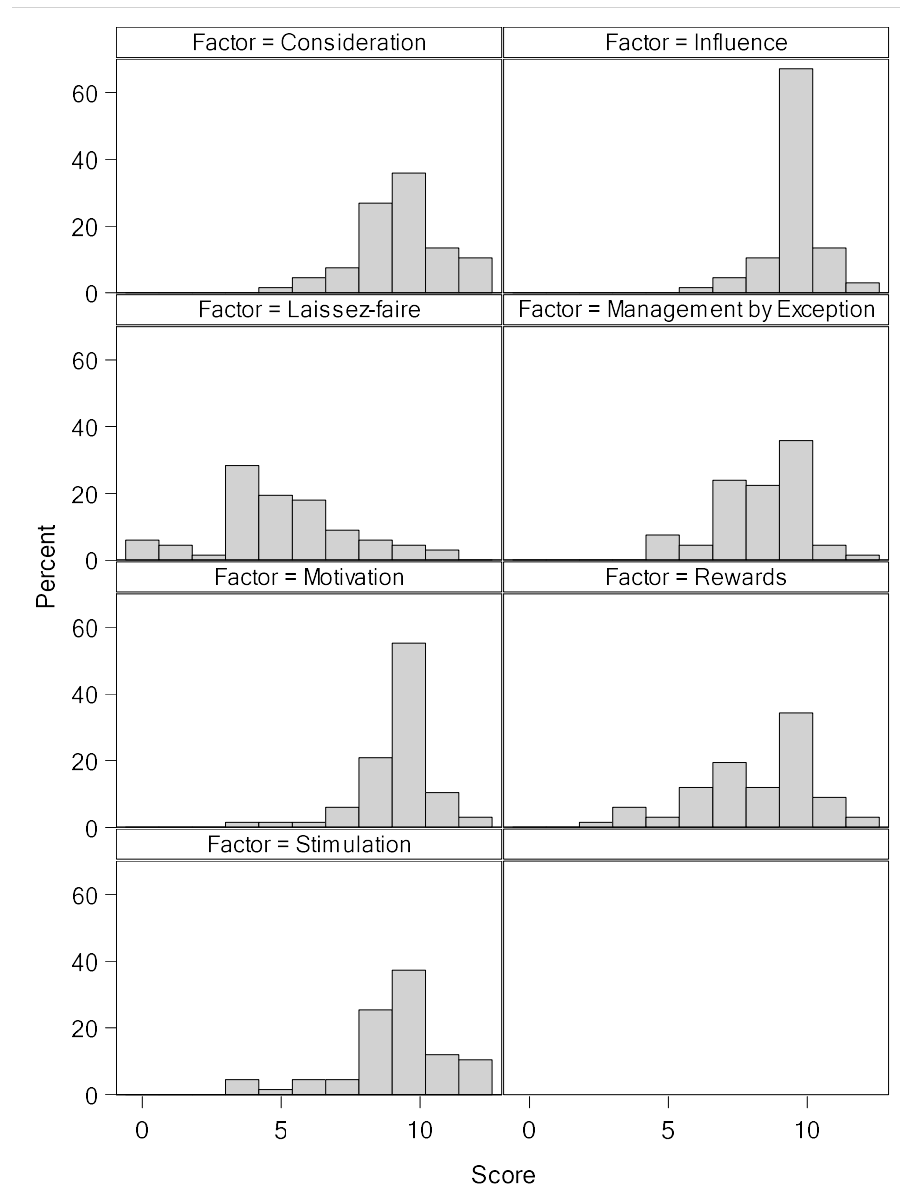


Figure 9: Histogram of digital scores

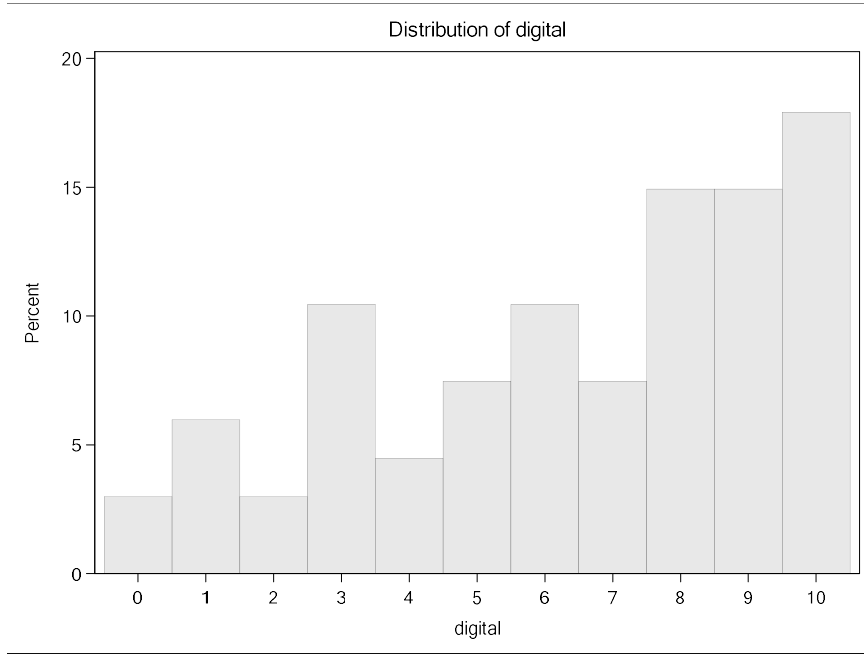


Table 16: Correlation of derived variables

Pearson Correlation Coefficients, N = 67
Prob > |r| under H0: Rho=0
 *= Prob > |r| < 0.05, **= Prob > |r| < 0.01, ***= Prob > |r| < 0.001

	<i>stimulation</i>	<i>rewards</i>	<i>motivation</i>	<i>m_by_e</i>	<i>lf_lead</i>	<i>influence</i>	<i>digital</i>	<i>consideration</i>
<i>stimulation</i>	1							
<i>rewards</i>	0.22	1						
<i>motivation</i>	0.60***	0.45***	1					
<i>m_by_e</i>	0.11	0.38**	0.31*	1				
<i>lf_lead</i>	-0.04	0.13	0.27*	0.50***	1			
<i>influence</i>	0.27*	0.41***	0.42***	0.29*	0.11	1		
<i>digital</i>	0.02	0.04	-0.01	0.23	0.17	0.31*	1	
<i>consideration</i>	0.21	0.64***	0.47***	0.30*	0.15	0.53***	0.25*	1

Table 17: Correlation of derived variables (detail)

Pearson Correlation Coefficients, N = 67								
Prob > r under H0: Rho=0								
	<i>stimulation</i>	<i>rewards</i>	<i>motivation</i>	<i>m_by_e</i>	<i>lf_lead</i>	<i>influence</i>	<i>digital</i>	<i>consideration</i>
<i>stimulation</i>	1							
<i>rewards</i>	0.22 0.07	1						
<i>motivation</i>	0.61 <.0001	0.45 0.0001	1					
<i>m_by_e</i>	0.11 0.39	0.38 0.002	0.31 0.01	1				
<i>lf_lead</i>	-0.04 0.74	0.13 0.30	0.27 0.03	0.50 <.0001	1			
<i>influence</i>	0.27 0.03	0.41 0.0005	0.42 0.0004	0.29 0.02	0.11 0.37	1		
<i>digital</i>	0.02 0.86	0.04 0.73	-0.01 0.96	0.23 0.07	0.17 0.17	0.31 0.01	1	
<i>consideration</i>	0.20 0.10	0.64 <.0001	0.47 <.0001	0.30 0.01	0.15 0.22	0.53 <.0001	0.25 0.04	1

There is a positive correlation between digital and influence. The correlation between consideration and digital is also noteworthy, with the Pearson coefficient showing a relationship between these two factors. When taking regression into account, however, and the way that consideration also correlates with other variables (rewards, influence being the strongest), it is not as significant as influence. Further clarity will emerge from the results of the regression testing.

5.6 Research Objective 1: Results

RO 1: To explore the relationship between transformational leadership and having higher digital maturity levels, that is, becoming a digital master

- Ho1: There is no linear relationship between transformational leadership (total of all transformational leadership factors) and digital mature companies.
- Ha1: There is a linear relationship between transformational leadership (total of all transformational leadership factors) and digital mature companies.

The focus here was on transformational leadership's four "I's" and their effect on digital maturity

Table 18: T-Test Transformational leadership factors relation to digital maturity quadrants

<i>digclass</i>	<i>N</i>	<i>Mean</i>	<i>Std Dev</i>	<i>Std Err</i>	<i>Minimum</i>	<i>Maximum</i>
<i>Immature</i>	23	35.0870	4.2631	0.8889	21.0000	40.0000
<i>Mature</i>	44	37.0455	4.8126	0.7255	24.0000	45.0000
<i>Diff (1-2)</i>		-1.9585	4.6339	1.1923		

<i>digclass</i>	<i>Method</i>	<i>Mean</i>	<i>95% CL Mean</i>	<i>Std Dev</i>	<i>95% CL Std Dev</i>	
<i>Immature</i>		35.0870	33.2435 36.9305	4.2631	3.2970	6.0338
<i>Mature</i>		37.0455	35.5823 38.5086	4.8126	3.9762	6.0976
<i>Diff (1-2)</i>	<i>Pooled</i>	-1.9585	-4.3397 0.4227	4.6339	3.9562	5.5940
<i>Diff (1-2)</i>	<i>Satterthwaite</i>	-1.9585	-4.2634 0.3464			

<i>Method</i>	<i>Variances</i>	<i>DF</i>	<i>t Value</i>	<i>Pr > t </i>
<i>Pooled</i>	<i>Equal</i>	65	-1.64	0.1053
<i>Satterthwaite</i>	<i>Unequal</i>	49.773	-1.71	0.0941

<i>Equality of Variances</i>				
<i>Method</i>	<i>Num DF</i>	<i>Den DF</i>	<i>F Value</i>	<i>Pr > F</i>
<i>Folded F</i>	43	22	1.27	0.5487

Figure 10: Distribution TL factors

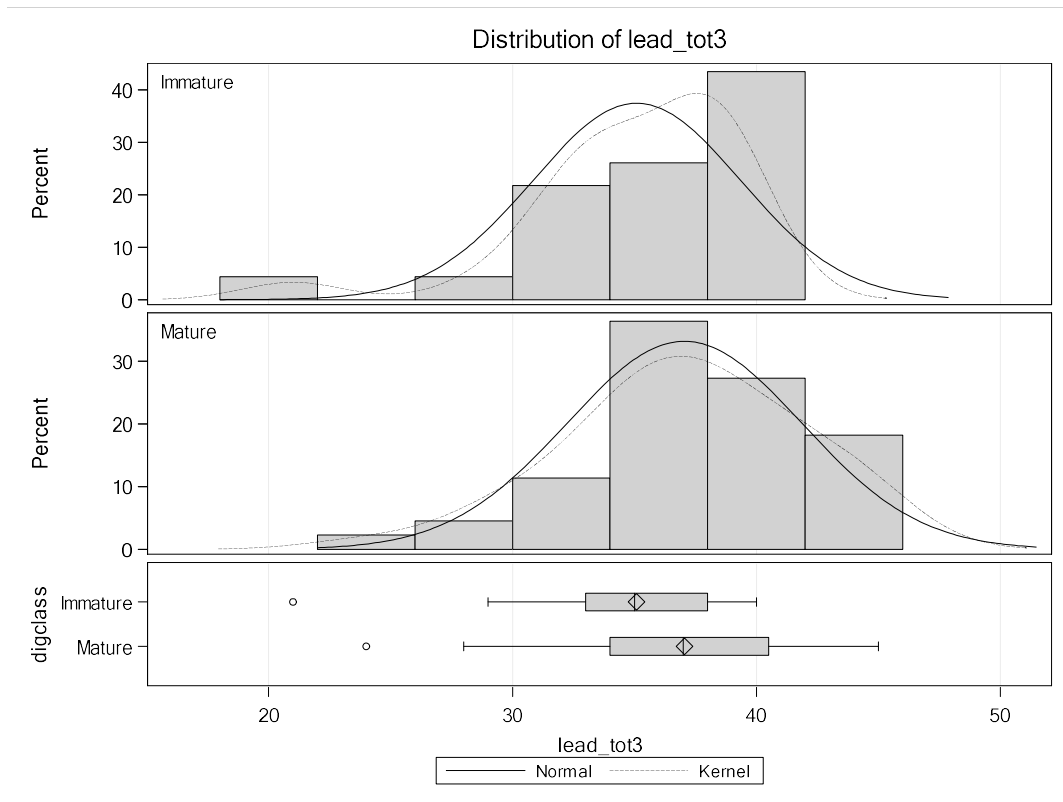
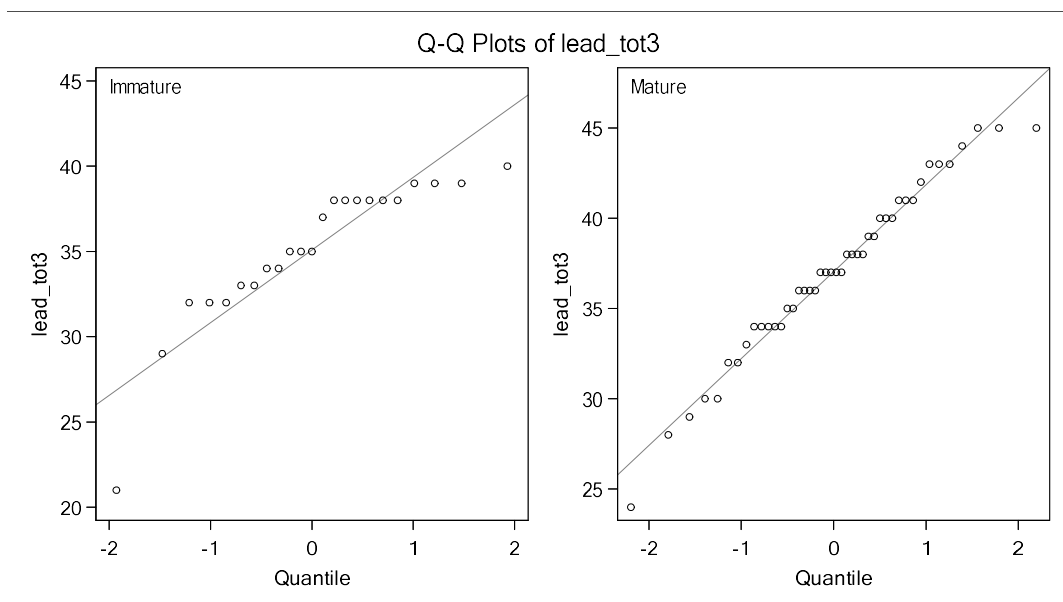


Figure 11: Scatter graph



The data depicted in Figure 10 (specifically the p -values of 0.11) indicates that there is approximately an 11% chance that the null hypothesis is true (that the “lead_tot” values of the mature and immature groups are equivalent). Therefore, the null hypothesis cannot be rejected.

5.7 Research Objective 2 - results

RO 2: To discover whether one, or more, of the four transformational leadership components has an effect on the digital maturity of South African companies.

5.7.1 Unweighted regression

The p -value in Table 19 indicates that the leadership factors are probably influencing the digital score (with better than 95% confidence).

Table 19: ANOVA (unweighted)

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	7	129	18.48	2.33	0.04
Error	59	467	7.92		
Corrected Total	66	597			

Table 20: Variance explained (unweighted)

Root MSE	2.81	R-Square	0.22
Dependent Mean	6.46	Adj R-Sq	0.12
Coeff Var	43.55		

The regression coefficients are displayed in Table 21.

Table 21: Regression coefficients (unweighted)

<i>Parameter Estimates</i>					
<i>Variable</i>	<i>DF</i>	<i>Parameter</i>		<i>t Value</i>	<i>Pr > t </i>
		<i>Estimate</i>	<i>Standard Error</i>		
<i>consideration</i>	1	0.55	0.30	1.88	0.07
<i>influence</i>	1	0.72	0.37	1.96	0.05
<i>if_lead</i>	1	0.16	0.17	0.93	0.36
<i>m_by_e</i>	1	0.30	0.27	1.12	0.27
<i>motivation</i>	1	-0.65	0.36	-1.81	0.08
<i>rewards</i>	1	-0.32	0.22	-1.45	0.15
<i>stimulation</i>	1	0.18	0.23	0.75	0.45

The R-square value of 0.12 expressed as a percentage (12%) confirms that 12% of the dependent variable, digital maturity, is explained by the explanatory (independent) variable leadership factors.

In this regression, the only statistically significant regression coefficient is that of Idealized Influence, although those for Individual Consideration and Inspirational Motivation come close.

5.7.1.1 Hypothesis 2

- **Ho2:** The transformational leadership factor **Idealised Influence** has no effect on the digital maturity of existing South African companies
- **Ha2:** The transformational leadership factor **Idealised Influence** has an effect on the digital maturity of existing South African companies

As the analysis of variance test concluded a significant P value (less than 0.05), the null hypothesis, Ho2, must be rejected and it can be concluded that the fit of the model for hypothesis 2 is significant. The alternative hypothesis, Ha2, is confirmed

If idealised leadership increases by 1 standard deviation point, then, digital maturity is

likely to increase (on average) by 0.72 standard deviations.

5.7.1.2 Hypothesis 3

- **Ho3:** The transformational leadership factor **Individual Consideration** has no effect on the digital maturity of existing South African companies
- **Ha3:** The transformational leadership factor **Individual Consideration** has an effect on the digital maturity of existing South African companies

The analysis of variance test concluded, once again, that there is no significant P value (less than 0.05) and therefore the null hypothesis, Ho5, cannot be rejected.

5.7.1.3 Hypothesis 4

- **Ho4:** The transformational leadership factor **Inspirational Motivation** has no effect on the digital maturity of existing South African companies
- **Ha4:** The transformational leadership factor **Inspirational Motivation** has an effect on the digital maturity of existing South African companies

As the analysis of variance test concluded that there is no significant P value (less than 0.05), the null hypothesis, Ho3, cannot be rejected.

5.7.1.4 Hypothesis 4

- **Ho5:** The transformational leadership factor **Intellectual Stimulation** has no effect on the digital maturity of existing South African companies
- **Ha5:** The transformational leadership factor **Intellectual Stimulation** has an effect on the digital maturity of existing South African companies

As the analysis of variance test concluded that there is no significant P value (less than 0.05), the null hypothesis, Ho4, cannot be rejected.

5.7.2 Weighted regression – job function equals CIO

The regression statistics for CIO weighting are displayed in Table 24 Table 23 and Table 24.

Table 22: ANOVA (CIO weighted)

<i>Analysis of Variance</i>					
<i>Source</i>	<i>DF</i>	<i>Sum of Squares</i>	<i>Mean Square</i>	<i>F Value</i>	<i>Pr > F</i>
<i>Model</i>	7	157	22.39	2.47	0.027
<i>Error</i>	59	535	9.06		
<i>Corrected Total</i>	66	691			

Table 23: Variance explained (CIO weighted)

<i>Root MSE</i>	3.01	<i>R-Square</i>	0.23
<i>Dependent Mean</i>	6.53	<i>Adj R-Sq</i>	0.14
<i>Coeff Var</i>	46.13		

Table 24: Parameter estimates (CIO weighted)

<i>Parameter Estimates</i>					
<i>Variable</i>	<i>DF</i>	<i>Parameter Estimate</i>	<i>Standard Error</i>	<i>t Value</i>	<i>Pr > t </i>
<i>consideration</i>	1	0.59	0.30	1.96	0.06
<i>influence</i>	1	0.80	0.38	2.11	0.04
<i>lf_lead</i>	1	0.15	0.17	0.90	0.37
<i>m_by_e</i>	1	0.21	0.27	0.77	0.44
<i>motivation</i>	1	-0.82	0.36	-2.30	0.02
<i>rewards</i>	1	-0.24	0.22	-1.07	0.29
<i>stimulation</i>	1	0.20	0.23	0.86	0.39

From the *F*-value and *p*-value in Table 22, the leadership factors appear to predict the

digital score to some extent, with better than 97% confidence. However, the *R*-square values in Table 23 show that the leadership factors only explain about 14% of the variance, which is perhaps to be expected. In Table 24, it is apparent that the leadership factors that have significant ($p < 0.05$) relationships with the digital score are Idealised Influence and Inspirational Motivation, with Individualised Consideration coming close. Individualised Consideration and Idealised Influence are positively related with the digital score (parameters are 0.59 and 0.80), but Inspirational Motivation has a negative relationship (-0.82). The other factors have no statistically significant relationships with the digital score. A larger sample would, perhaps, provide more clarity on these factors.

5.7.2.1 Hypothesis 2

- **Ho2:** The transformational leadership factor **Idealised Influence** has no effect on the digital maturity of existing South African companies
- **Ha2:** The transformational leadership factor **Idealised Influence** has an effect on the digital maturity of existing South African companies

As the analysis of variance test concluded a significant P value (less than 0.05), the null hypothesis, Ho2, must be rejected and it can be concluded that the fit of the model for hypothesis 2 is significant and the alternative hypothesis Ha2, is confirmed

The parameter for the Idealised influence variable was significant and illustrates that if idealised leadership increases by 1 point of standard deviation, digital maturity will increase (on average) by 0.80 points.

5.7.2.2 Hypothesis 3

- **Ho3:** The transformational leadership factor **Inspirational Motivation** has no effect on the digital maturity of existing South African companies
- **Ha3:** The transformational leadership factor **Inspirational Motivation** has an effect on the digital maturity of existing South African companies

As the analysis of variance test concluded a significant P value (less than 0.05), the null hypothesis, Ho3, must be rejected and it can be concluded that the fit of the model for

hypothesis 3 is significant and the alternative hypothesis H_{a3} , is confirmed

The parameter for the Idealised influence variable was significant: if inspirational motivation increases by 1 standard deviation, digital maturity will decrease (on average) by 0.82 points.

5.7.2.3 Hypothesis 4

- **Ho4:** The transformational leadership factor **Intellectual Stimulation** has no effect on the digital maturity of existing South African companies
- **Ha4:** The transformational leadership factor **Intellectual Stimulation** has an effect on the digital maturity of existing South African companies

As the analysis of variance test concluded that there is no significant P value (less than 0.05), the null hypothesis, H_{o4} , cannot be rejected.

5.7.2.4 Hypothesis 5

- **Ho5:** The transformational leadership factor **Individualised Consideration** has no effect on the digital maturity of existing South African companies
- **Ha5:** The transformational leadership factor **Individualised Consideration** has an effect on the digital maturity of existing South African companies

As the analysis of variance test concluded that there is no significant P value (less than 0.05), the null hypothesis, H_{o5} , cannot be rejected.

5.7.3 Weighted regression - CIO and operation period of company

The regression statistics are displayed in Table 27

Table 25: ANOVA (CIO & Period in operations - weighted)

<i>Analysis of Variance</i>					
<i>Source</i>	<i>DF</i>	<i>Sum of Squares</i>	<i>Mean Square</i>	<i>F Value</i>	<i>Pr > F</i>
<i>Model</i>	7	277	39.64	2.67	0.018
<i>Error</i>	59	876	14.86		
<i>Corrected Total</i>	66	1154			

Table 26: Variance explained (CIO & Period in operations- weighted)

<i>Root MSE</i>	3.85	<i>R-Square</i>	0.24
<i>Dependent Mean</i>	6.51	<i>Adj R-Sq</i>	0.15
<i>Coeff Var</i>	59.23		

Table 27: Parameter estimates (CIO & Period in operations - weighted)

<i>Parameter Estimates</i>					
<i>Variable</i>	<i>DF</i>	<i>Parameter Estimate</i>	<i>Standard Error</i>	<i>t Value</i>	<i>Pr > t </i>
<i>consideration</i>	1	0.67	0.29	2.28	0.03
<i>influence</i>	1	0.83	0.38	2.17	0.03
<i>lf_lead</i>	1	0.14	0.18	0.77	0.44
<i>m_by_e</i>	1	0.24	0.28	0.86	0.39
<i>motivation</i>	1	-0.81	0.36	-2.23	0.03

<i>Parameter Estimates</i>					
<i>Variable</i>	<i>DF</i>	<i>Parameter Standard</i>		<i>t Value</i>	<i>Pr > t </i>
		<i>Estimate</i>	<i>Error</i>		
<i>rewards</i>	1	-0.34	0.22	-1.56	0.12
<i>stimulation</i>	1	0.22	0.24	0.93	0.35

From the *F*-value and *p*-value in Table 25, it appears that the leadership factors predict the digital score to some extent, with better than 98% confidence. However, the *R*-square values in

Table 26 show that the leadership factors only explain about 15% of the variance. In Table 27, the calculations reveal that the leadership factors that have significant ($p < 0.05$) relationships with the digital score are Individualised Consideration, Idealised Influence and Inspirational Motivation. Individualised Consideration and Idealised Influence are positively related with the digital score (parameters are 0.67 and 0.83), but Inspirational Motivation has a negative relationship (-0.81).

5.7.3.1 Hypothesis 2

- **Ho2:** The transformational leadership factor **Idealised Influence** has no effect on the digital maturity of existing South African companies
- **Ha2:** The transformational leadership factor **Idealised Influence** has an effect on the digital maturity of existing South African companies

As the analysis of variance test concluded a significant *P* value (less than 0.05), the null hypothesis, Ho2, must be rejected and it can be concluded that the fit of the model for hypothesis 2 is significant and the alternative hypothesis Ha2, is confirmed: if idealised leadership increases by 1 point of standard deviation, digital maturity will increase (on average) by 0.83 points.

5.7.3.2 Hypothesis 3

- **Ho3:** The transformational leadership factor **Individualised Consideration** has no effect on the digital maturity of existing South African companies

- **Ha3:** The transformational leadership factor **Individualised Consideration** has an effect on the digital maturity of existing South African companies

As the analysis of variance test concluded a significant P value (less than 0.05), the null hypothesis, Ho5, must be rejected and it can be concluded that the fit of the model for hypothesis 5 is significant and the alternative hypothesis, Ha5, is confirmed: if individualised consideration increases by 1 point of standard deviation, digital maturity will increase (on average) by 0.67 points.

5.7.3.3 Hypothesis 3

- **Ho4:** The transformational leadership factor **Inspirational Motivation** has no effect on the digital maturity of existing South African companies
- **Ha4:** The transformational leadership factor **Inspirational Motivation** has an effect on the digital maturity of existing South African companies

As the analysis of variance test concluded a significant P value (less than 0.05), the null hypothesis, Ho3, must be rejected and it can be concluded that the fit of the model for hypothesis 3 is significant. The alternative hypothesis Ha3, is confirmed: if idealised leadership increases by 1 point of standard deviation, digital maturity will decrease (on average) by 0.81 standard deviations.

5.7.3.4 Hypothesis 4

- **Ho5:** The transformational leadership factor **Intellectual Stimulation** has no effect on the digital maturity of existing South African companies
- **Ha5:** The transformational leadership factor **Intellectual Stimulation** has an effect on the digital maturity of existing South African companies

As the analysis of variance test concluded that there is no significant P value (less than 0.05), the null hypothesis, Ho4, cannot be rejected.

5.8 Summary of Hypotheses

Number	Hypothesis	Unweighted	CIO Weighted	CIO & Comp Weighted
Ha1	There is a linear relationship between transformational leadership (total of all transformational leadership factors) and digitally mature companies.	Unsupported	Unsupported	Unsupported
Ha2	The transformational leadership factor Idealised Influence has an effect on the digital maturity of existing South African companies	Supported	Supported	Supported
Ha3	Ha3: The transformational leadership factor Individualised Consideration has an effect on the digital maturity of existing South African companies	Unsupported	Unsupported	Supported
Ha4	The transformational leadership factor Inspirational Motivation	Not Supported	Supported	Supported

	has an effect on the digital maturity of existing South African companies			
Ha5	The transformational leadership factor Intellectual Stimulation has an effect on the digital maturity of existing South African companies	Not supported	Not supported	Not supported

6. CHAPTER 6: DISCUSSION OF RESULTS

6.1 Introduction

The main purpose of the study, as highlighted in chapter one, was to explore the relationship between transformational leadership and high digital maturity levels, that is, becoming a digital master. It also aimed to determine whether one or more of the transformational leadership factors have an effect on the digital maturity of South African companies (represented by four basic components, or “I’s”). The previous chapter presented the results of the research. This chapter will discuss those results in light of the purpose of the research as well as the literature review conducted.

The demographics of the sample will first be discussed, followed by discussions and analysis of the results for each of the hypothesis formulated in chapter three.

6.2 Demographics

As discussed in chapter five a large majority of the respondents were male and over the age of 35. In interpreting the results, the defined sample was considered. The study did not explore the correlation between age or gender and the leaders’ digital awareness. The sample’s age and gender dynamics minimises or excludes the contribution of digital-natives in digital strategy discussions, in favour of digital-migrants in their mid-30’s to 50’s.

The literature revealed that the best-positioned C-level executive to own and drive digital maturity and spear-head innovation is the CIO (Peppard et al., 2011), since digitalisation and innovation are virtually interchangeable terms (Yoo et al., 2008). Chapter two highlighted the importance of leveraging information capabilities and digital literacy across all leaders (Peppard et al., 2011; Hunt, 2015). Digital literacy, which Hunt (2015) highlights as being critical, was not measured for the C-level executives in this study, since as per PWC (2015) and McKinsey (2014), CIO’s may be assumed to be digitally literate.

6.3 Research objective 1: Hypothesis 1

In testing this hypothesis, this study sought to determine whether transformational leadership behaviour is evident in companies that have higher digital maturity levels, that is, digital masters.

6.3.1 Discussion of results

As the analysis of variance test concluded that there is no significant P value, the null hypothesis, Ho1 cannot be rejected; concluding that the study cannot reject that there is no linear relationship between transformational leadership (total of all transformational leadership factors) and digitally mature companies.

There are noteworthy results in studying the results presented in Table 18 and Figure 10: Distribution TL factors and Figure 11 (which discuss significant results): The results from the T-test highlight that leaders in both digitally mature and less mature companies associate their behaviours with that of transformational leaders.

The mean for companies that are less mature is under 35, which associates them with moderate transformational leadership behaviour, whereas respondents from digitally mature companies scored 36, reflecting higher transformational leadership behaviour. The level of accuracy was, however, less than 95% and the difference in maturity could, perhaps, be considered circumstantial.

Another observation is that 65% of the respondents fell within the digitally mature category. 35% of the respondents' companies is categories as less mature. The respondents were potentially attracted to participate in the study as result of their interest in digital transformation, even if their organisations have not yet reached high digital maturity levels. It could be argued that the respondents of the less digital mature companies might already have an invested interest in digital strategy, the survey only concentrated on already implemented digital solutions.

Respondents in the low digital maturity quadrants might already display strong digital maturity levels as result of their interest in innovation and technology even though their organisations have not yet implemented digital solutions. It could be argued as the

reason that there are not significant differences in the overall transformational leadership factors of the leaders of that of the digital mature and that of the companies that are currently digitally not matured.

6.3.2 Actual versus expected results

Trichy & Ulrich (1984) highlight that transformation leadership is about renovating an organisation; helping people to buy into a vision which will evolve the organisation's culture. Westerman et al., (2014) articulate that being successful in digital innovation will require leaders who create clear vision, start critical initiatives, engage with employees to build the vision and who stay involved in the transformation. Cainelli et al., (2006) make associate technological change and innovation as the main forces of competitive advantage, which is confirmed by the World Competitiveness Report (2014). Mature organisations differentiate themselves by using digital technologies to transform their businesses, and the terms "digital" and "innovation" are virtually interchangeable (Yoo et al., 2008).

In Wade's (2015) study, a clear association was made between digital transformation and organisational change and the profound effect digital technologies have on transforming industries is foregrounded. Bass (1985) articulated that transformational leader behaviour is more effective during times of organisational change and turbulence (Bass, 1985), which is an adequate description of the 21st Century (Johansen, 2010). In addition, support for innovation has been shown to moderate the relationship between transformational leadership and performance (Howell & Avolio, 1993).

Garcia, et al. (2015) highlights that digital technology provides a wealth of opportunity and through digital transformation organisations need to redefine their business process within and across organisational boundaries. Wade (2015) articulated the value of digital transformation value in that it unlocks faster innovation, result in higher productivity, enables increased efficiency in processes and enhance customer experience.

Bharadwaj et al. (2013) state there is no distinction between a company's digital strategy and their business strategy and elaborates that the need for this transfunctional strategy encourages a strong relationship between information technology leaders and business

leaders. Simola et al., confirms the need for a strong relationship when highlighting that transformational leadership advocates interactions among interested parties that are organised around a collective purpose.

Transformation leadership and its association with digital and company strategy and innovation is evident when considering Bass' (1985) suggestion that transformational leadership is more likely to appear in organisations that deal with a turbulent marketplace. Waller & Raskino and Bharadwaj et al., agrees that digitalisation is a disruptive force across many companies spanning different industries and sectors.

Success in today's business environment is not achievable without employing an effective leadership style that can enable organisations to accomplish their goals (Alon & Higgins, 2005).

The researcher therefore hypothesised that transformational leader behaviours would likely share a significant relationship with the digital maturity of the companies that they lead. This conjecture was not confirmed by the results of the study, which relied on leader self-evaluations, which carry a subjective element. Follower evaluations of the leader might add deeper understanding of this phenomenon, as the consideration of the digital strategies of the organisation would. It might also be argued that certain organisations appointed known transformational leaders to drive transformational change, even though the organisation had not yet executed on digital capabilities. This study, therefore, did not focus on future strategies, but rather existing capabilities. Considering the higher response rate from respondents associated with already digitally mature companies, it could be argued that the respondents from the digitally less mature company had a vested interest in digital transformation.

Generalisation of these results should, therefore, be approached cautiously, due to the limited sample. Future research could further examine the relationships highlighted here, studying digital literacy and C-level executives' digital accountability and ownership.

6.4 Research objective 2

This objective set out to discover whether one or more of the four transformational leadership behavioural factors are prevalent among digitally mature companies in South Africa.

Bass (1990) and Avolio (1999) specified four transformational leadership factors – idealised influence, inspirational motivation, intellectual stimulation and individualised consideration. Ehlich et al., (1990) found that these transformational factors are effective within a high technology context. Howell & Avolio (1993) made a distinct association between innovation and digitalisation, and further highlighted the relationship between leadership support for innovation, transformational leader behaviour and the performance of followers.

The results of this study confirm a close association of two of the transformational leadership factors with digital mastery: Idealised influence and individual consideration were found to have a positive association with digital maturity. This is encouraging, as these two behavioural factors are prevalent in the employee engagement literature and track well with the seminal “MacLeod report” (MacLeod & Clarke, 2009). A third association is found although it has an indent affect between inspirational motivation and digital maturity.

The report confirms what is evident in the literature and in the research results: engagement cannot flourish in a strict hierarchical command-and-control culture, often created by predominantly Transactional leadership behaviour. Burns (1979) highlights that transformational and transactional leadership should be viewed as a single continuum. By introducing transformational leadership behaviours, employee engagement is increased and an organisation can cultivate digital innovation and continuous business transformation (Phillips et al., 2015).

6.4.1 Hypothesis 2: Idealised influence

Idealised influence is about walking the talk (living the values - demonstrating ethical and

moral standards) and displaying charisma (communicating vision, context). The study highlights that idealised influence is critical to digital mastery, and therefore innovation, and should be taken seriously in terms of strategy execution.

Leaders that display idealised influence have the ability to effectively communicate the vision and mission of the organisation (Kovjanic et al., 2012). A critical element of strategy is the provision of a sense of direction in the decision-making process: communicating a clear vision (Liedtka, 1998). The more digitally mature companies, therefore, would have leaders who share a common belief and vision of the desired future (Collins & Porras, 1998)

Another component of idealised influence was found to be vulnerability. Patrick Lencioni, in his authoritative *Five Dysfunctions of a Team* (Lencioni, 2002) describes vulnerability in detail, as the building block of trust. He reveals that self-disclosure, admitting failure and feeling confident about one's strengths, yet being willing to acknowledge shortcomings (and get others to assist in those areas), is core to 21st Century team effectiveness (Lencioni, 2002).

Digital transformation has, at its heart, organisational change (Wade, 2015). With organisations having to adapt to volatile environments (Krantz, 1990), their employees become vulnerable, in that they constantly have to rethink their direction, and plan ways to grow, stay profitable and competitive (Kotter, 2014).

Finally, Idealised influence also includes being sensitive to others' needs. This empathy seeks to understand, but still challenges norms where necessary; it is firm, but fair. There are, therefore, immediately associations with Emotional Intelligence – reading one's own emotions, those of others and selecting appropriate action accordingly (Parker et al., 2005).

6.4.2 Hypothesis 3: Individual consideration

It is encouraging that this behavioural factor is associated with digital maturity with specific reference to the weighted results for CIO (17% of respondents) and Companies in operations longer than 10 years (75% of respondents).

Individualised consideration was defined in the literature as the treating of each person as an individual – giving specific encouragement, career support, delegation, coaching, feedback and mentoring (advice). This competency would appear to be especially key for the next generation of leaders (currently new entrants into the world of work) – the so-called “Millennials”. These employees are likely to be digitally advanced, hungry for continuous learning and growth and disinterested in hierarchy, since they will enter the market having never known a world without digital technology in the palm of their hand.

Digitalisation introduces new competencies, as can be seen in the big data revolution (Brynjolfsson & McAfee, 2012) as well as a regular change in business models (Garcia et al., 2015). Information capabilities need to be leveraged across the organisation (Peppard et al., 2011) and transfunctional teams are essential in staying competitive whilst facing digital disruption (Bharadwaj et al., 2013). It is therefore not surprising that there is an association between digital maturity and individual consideration, as transformational leaders place a great emphasis on utilising each person’s talents and providing opportunities for learning (Bass, 1985)

6.4.3 Hypothesis 4: Inspirational motivation

Inspirational motivation has a significant negative correlation with digital maturity with specific reference to the weighted results for CIO (17% of respondents) and Companies in operations longer than 10 years (75% of respondents).

Inspirational motivation is usually a companion of idealised influence. It is characterised by the communication of high expectations, using symbols to focus efforts, and expressing important purposes in simple ways (Bass, 1990).

Perhaps the fact that Inspirational motivation (high expectations - recognition, brand identity) and intellectual stimulation (challenge, personal development, problem-solving) is less closely linked to digitalisation means that people feel that they can do most of that on their own these days. What they want, and need, is support and guidance from someone who is deeply invested – and interested – in them, personally. Belonging, involvement, understanding and psychological availability appear to be resources provided by invested transformational leaders.

6.4.4 Hypothesis 5: Intellectual stimulation

This study did not find a close association between intellectual stimulation and digital maturity. Intellectual stimulation is about helping followers to look at old problems from a new and interesting perspective (Bass, 1990). The lack of association is potentially impacted by C-level leaders' inability to help employees to think innovatively in creating knowledge and technology (Mokhber et al., 2015), as result of a lack of digital literacy (Hunt, 2015).

The lack of association could also be because of the expectation that the CIO should be the digital driver, yet within the South African context more than 40% of CIO's are not driving innovation in their organisations (Kelly, 2016). It could be argued that C-level leaders are facing a dilemma in guiding their teams in an informative and practical manner because of potentially low digital literacy within their organisations. Companies, therefore, might have a digital "vision", but because a lack of shared digital accountability across the C-level executives (differences in perceived importance of transfunctional collaboration), might limit or delay the integration of digitalisation into corporate strategy.

6.5 Summary of findings

In general, the results of this research concerning idealised influence match findings from previous research, whereby technological innovation is linked to transformational leadership behaviour. Both the unweighted and weighted results confirm that idealised influence is associated with digital maturity.

This study demonstrated a difference in the weighted and unweighted results for intellectual stimulation and inspirational motivation. As discussed in the results and highlighted in the literature, the CIO and his/her associated leadership characteristics appear to have a profound influence on the digital maturity of the organisation. An association between intellectual stimulation and digital maturity was confirmed.

Inspirational motivation was also associated with digital maturity, even though there is a negative cause and effect.

Although the study does not provide a direction for all of the relationships, three of the four transformational leadership factors were shown to have a relationship with digital maturity. The results could not, however, confirm that transformational leadership factors are significantly more evident in the digitally matured than in those companies that are less mature.

7. CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7.1 Introduction

The purpose of this study was to establish whether there is a relationship between companies that are digitally mature and the transformational leadership behaviours of these companies' C-level executives. Earlier research, to the best of the researcher's knowledge, does not mention the existence of any such relationship (Wade, 2015). Digitalisation and its impact on company competitiveness is clearly articulated in the literature including the association with leaders who will support innovation and emerging technology (Cainelli et al., 2006; Yoo et al., 2008).

The purpose of this study was two-fold: Firstly, to explore the relationship between transformational leadership and having higher digital maturity levels, that is, becoming a digital master. Secondly, to determine whether one or more of the transformational leadership factors has an effect on the digital maturity of South African companies (represented by four basic components, or "I's").

This chapter concludes this study and contains recommendations for business application and further research. The recommendations made are specifically intended for South African companies, but may be more broadly applicable.

7.2 Main findings

7.2.1 Objective 1: Hypothesis 1

The first hypothesis sought to determine whether transformational leadership behaviour is evident in companies that have higher digital maturity levels. The analysis of variance test concluded that there is no significant P value. The null hypothesis, Ho1, can therefore not be rejected; and the study therefore concludes that there is no direct, linear relationship between transformational leadership (as the total of all transformational

leadership factors) and digitally mature companies.

The study did raise some interesting findings to consider, encouraging high levels of transformational leadership behaviour in both the digitally mature and the digitally “not mature”. The literature highlighted that digital strategy and innovation are the highest priorities for South African CIOs (Kelly, 2016). Cainelli et al., (2006) elaborate on this concept by associating technological change and innovation as the main forces of competitive advantage, which is confirmed by the World Competitiveness Report (2014).

It could be argued that, although digital capability or intensity does not yet exist in the 35% less-mature respondents, they have already invested in digital strategy and innovation concepts. This might conceivably be a reason why the differences in the overall transformational leadership of the leaders within digitally mature organisations, compared to less-mature organisations, is not significant

An encouraging result is the “high” transformational leadership behaviour being displayed in respondents from digitally mature companies - scored at 36. The digitally less-mature score in the “moderate” transformational behaviour.

Trichy & Ulrich (1984) posit that transformation leadership is about renovating an organisation; helping people to buy into a vision which will evolve the organisation’s culture. Companies that are still in the strategic phase and have not yet executed the strategy could arguably fall in this category. Westerman et al., (2014) articulate that being successful in digital innovation will require leaders who envision others with great clarity, pioneer critical initiatives, engage with employees to implement the vision and remain involved in the transformation. Mature organisations differentiate themselves by using digital technologies to transform their businesses, and the terms “digital” and “innovation” are virtually interchangeable (Yoo et al., 2008).

7.2.2 Objective 2: Hypothesis 2-5

In chapter four, clarity was provided concerning the introduction of weighting in analysis of the results. A higher weighting was given to respondents who are CIOs and to companies that have been operating for more than ten years. The weighting was applied to address the prominent role that CIO’s play in digital innovation, potential digital literacy challenges and the population limitations imposed, of necessity, on the study. The latter

required that respondents represent companies that have at least three C-level executives (CIO, CFO and CEO), since having these three positions represented is associated with being in business for more than ten years.

The analysis of variance for Hypotheses 2 leads the researcher to conclude that there is a significant P value (less than 0.05) for weighted and unweighted results.

The transformational leadership factor **Idealised Influence** therefore does have an effect on the digital maturity of existing South African companies. The study highlights that idealised influence is critical to digital mastery, and therefore innovation, and should be taken seriously in terms of strategy execution. The study also confirms the importance of effectively communicating the vision and mission of the organisation (Liedtka, 1998; Kovjanic et al., 2012), which is associated with digital maturity. Companies that are digitally mature recognise the importance of a sense of direction in strategy. The study supports previous literature in their findings that digitally mature companies have leaders who share a common belief and vision of the desired future (Collins & Porras, 1998)

The analysis of variance for Hypotheses 3 reveals that there is a significant P value (less than 0.05) for weighted results – when CIO’s and length of time in business are taken into account.

The transformational leadership factor **individualised consideration** therefore was found to have an effect on the digital maturity of existing South African companies. This behaviour focuses on treating each person as an individual – giving specific encouragement, career support, delegation, coaching, feedback and mentoring (advice). This competency appears to be especially key in including the next generation of leaders (currently new entrants into the world of work) – the so-called “Millennials”. These younger employees are likely to be digitally advanced, hungry for continuous learning and growth and disinterested in hierarchy, since they will enter the market having never known a world without digital technology in the palm of their hand. This study confirms that most likely because of the need for new competencies introduced as result of big data (Brynjolfsson & McAfee, 2012) and a change in business models (Garcia et al., 2015), there is a need to emphasise utilising each person’s talents and providing customised opportunities for learning (Bass, 1985)

The analysis of variance for Hypotheses 4 reveals that there is a significant P value (less than 0.05) for weighted results – where having a CIO and being in business for more than 10 years is factored in. The transformational leadership factor **inspirational motivation**, therefore, has an effect on the digital maturity of existing

South African companies. An interesting observation is that this correlation is negative, meaning that an increase in the one variable will result in a decrease in the other variable. Further research is encouraged regarding whether inspirational motivation (high expectations - recognition, brand identity) and intellectual stimulation (challenge, personal development, problem-solving) being less closely linked to digitalisation means that people feel that they can do most of that on their own in the modern era. What they want, and need, it seems, is support and guidance from someone who is deeply invested – and interested – in them, personally. Belonging, involvement, understanding and psychological availability appear to be resources in demand, provided by invested transformational leaders.

7.3 Managerial implications

This study has business implications in terms of digital strategy, corporate strategy integration, transformational leadership behavioural adoption, transfunctional ownership and digital literacy.

The literature review highlighted the importance of integrating digital strategy and corporate strategy. It further accentuated the importance of transfunctional involvement in digital strategy design and execution. The integrated nature of digitalisation presents organisations with both opportunities and challenges. It follows, therefore, that companies that succeed in truly integrating their digital strategy and their corporate strategy will reap the benefits of big data, adaptive and relevant business models and, ultimately, sustainable competitive advantage.

Transformational leadership behaviour is arguably essential to ensuring success in the digital era, evident in literature associating transformational leadership with success in turbulent environments with high technological change and innovation. Managers would do well to make use of both transactional and transformational behaviours to develop a high-performance workforce that is equipped to face the constant digital challenges and would benefit from the digital opportunities.

The literature raised an interesting concern around the digital literacy of leaders and their followers. Considering the importance of transfunctional teams and the association of digital strategy with corporate strategy, companies may need to invest in digital literacy

across all levels in the company, in order to heighten organisation-wide adoption of strategy.

7.4 Limitations to research

Due to the nature of the study, and the given time constraints of the research project, the following items have been identified as limitations:

- An exploratory factor analysis was not possible to test for validity, as the statistical analysis was limited by the number of respondents
- Transformational behaviour of leaders was not validated beyond self-evaluation, and may be expanded to subordinates or superiors.
- The research was conducted as a cross-sectional study, which excludes the depth of analysis provided by a longitudinal study.
- The research focused on transformational leadership, and did not provide an analysis of the impact of all leadership styles
- The research investigated the causal relationship between transformational leadership behaviour of C-level executives and the digital maturity of companies, but did not examine the effect that transformational leadership has on digital strategy, digital literacy and digital-company strategy integration.

7.5 Recommendations for future study

Further research could explore the need for digital and corporate strategy integration and the impact this will have on strategy design and execution. Such studies would require an understanding of digital literacy and digital responsibility being shared across the organisation. Quantitative research in this regard would be valuable, exploring the current landscape of digital strategy and digital literacy.

The existing questionnaire may be expanded to include strategy and digital maturity variables. This would allow the researchers to ascertain whether there is a relationship between multiple variables, including strategy, digital literacy, C-level and transfunctional ownership and transformational leadership behaviours.

7.6 Conclusion

This study reinforces the idea that digital maturity is closely correlated with leadership and has practical implications for effective leadership behaviour. Although future research is necessary before any definite inferences can be made, this study does suggest that Bass' (1985) model of transformational leadership should be carefully examined as a leadership style appropriate for the digital era – an era of continuous change, driven by escalating technological advancement.

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Appendix A: Online survey

1. Survey Introduction

Please read the information provided below carefully. If you have any questions or concerns at this point or in the future, please feel free to contact:

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WHAT IS THE PURPOSE OF THIS STUDY?

The purpose of this research is to establish if there is a relationship between companies that are digital leaders and the leadership style of their leaders.

WHAT WILL I NEED TO DO AS A PARTICIPANT?

You will be asked to participate in anonymous surveys that ask about your leadership behaviors. The surveys should each take approximately 10-20 minutes to complete.

WHAT ARE THE RISKS AND BENEFITS TO ME?

The risks associated with participation in this study are minimal. A small risk to you is that some of the questions may make you feel uncomfortable. If this occurs, you may skip the question and continue with the survey. To protect our participants, we have limited the information that we ask you to provide so you cannot be identified.

There may not be a direct benefit to you personally for participating in this study. However, the information you provide in the surveys will enrich the knowledge and current literature regarding diversity and leadership.

ARE MY ANSWERS CONFIDENTIAL?

This study is completely anonymous and your confidentiality will be maintained at all times.

WHAT IF I DON'T WANT TO PARTICIPATE?

Your participation in this study is completely voluntary. Your refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled.

You will not be required to answer every question and you can discontinue any survey at any time by simply closing your browser.

Mendeley Desktop

PARTICIPANT'S STATEMENT OF INFORMED CONSENT:

If you agree with the following statement and wish to participate in the study, please click on the circle in front of "I agree" below. If you do not agree, simply close your browser.

* 1. "I am at least 18 years of age, have read and understand the explanation provided to me and voluntarily agree to participate in this study."

I Agree

2. Personal Demographics

Instructions: The questions is descriptive of your position within your currently employed company. Four questions listed below, select the option that closest describe your position in your current company.

2. Highest level that you hold in your current company?

- Head of Department
- Head of Division
- Executive Committee Member
- Board Member

3. Which of the following best describe your job function?

- Chief Executive Officer
- Chief Financial Officer
- Chief Operating Officer
- Chief Digital Officer
- Chief Data Officer
- Chief Information Officer
- Chief Marketing Officer
- Chief Compliance Officer
- Chief Strategy Officer
- Chief Risk Officer
- Human Resources Director
- Director

4. What is your age?

- 18 to 24
- 25 to 34
- 35 to 44
- 45 to 54
- 55 to 64
- 65 to 74
- 75 or older

5. What is your gender?

- Female
- Male

3. Company Demographics

Instructions: The questions in this section is descriptive of the company you currently work for. Four questions listed below, select the option that closest describe current company.

6. Start of business operations?

- 1 but less than a year ago
- 1 but less than 3 years ago
- 3 but less than 5 years ago
- 5 but less than 10 years ago
- 10 or more years ago

7. What is the size of your company?

- Less than 20 employees
- 20-99 employees
- 100-499 employees
- 500-999 employees
- 1000-4999 employees
- 5000-9999 employees
- 10000+ employees

8. What is your organization's primary business activity? (Select one only)

- Agricultural, Forestry and Fishing
- Mining
- Construction
- Manufacturing
- Transportation, Communications, Electric, Gas and Sanitary services
- Wholesale Trade
- Retail Trade
- Finance, Insurance and Real Estate
- Services
- Public Administration

9. Latest reported company revenue?

- Less than R1 million
- R1 million but less than R5 million
- R5 million but less than R10 million
- R10 but less than R25 million
- 25 million and more

4. Multifactor Leadership Questionnaire

Instructions: The questions in this section provides a description of your leadership style. Twenty one descriptive statements are listed below. Judge how frequently each statement fits you. The word "others" may mean your followers, clients, or group members.

* 10. Leadership questionnaire Section 1

	Not at all	Once in a while	Sometimes	Fairly often	Frequently, if not always
I make others feel good to be around me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I express with a few simple words what we could and should do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enable others to think about old problems in new ways.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I help others develop themselves.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tell others what to do if they want to be rewarded for their work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 11. Leadership questionnaire Section 2

	Not at all	Once in a while	Sometimes	Fairly often	Frequently, if not always
I am satisfied when others meet agreed-upon standards.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am content to let others continue working in the same way as always.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Others have complete faith in me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I provide appealing images about what we can do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I provide others with new ways of looking at puzzling things.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. Leadership questionnaire Section 3

	Not at all	Once in a while	Sometimes	Fairly often	Frequently, if not always
I let others know how I think they are doing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
I provide recognition/rewards when others reach their goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
As long as things are working, I do not try to change anything.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Whatever others want to do is O.K. with me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Others are proud to be associated with me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. Leadership questionnaire Section 4

	Not at all	Once in a while	Sometimes	Fairly often	Frequently, if not always
I help others find meaning in their work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I get others to rethink ideas that they had never questioned before.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I give personal attention to others who seem rejected.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I call attention to what others can get for what they accomplish.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tell others the standards they have to know to carry out their work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I ask no more of others than what is absolutely essential.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Digital organisation questionnaire

Instructions: The questions in this section is descriptive of your company's digital capabilities. 10 Descriptive questions are listed below. The questions are just answered by selecting yes or no

14. Digital organisation questionnaire

	Yes	No
We are using digital technologies (such as analytics, social media, mobile, and embedded devices) to understand our customers better	<input type="radio"/>	<input type="radio"/>
We are using digital technologies (such as online, social media, and mobile) to market our products and services	<input type="radio"/>	<input type="radio"/>
We sell our products and services through digital channels.	<input type="radio"/>	<input type="radio"/>
We use digital channels to provide customer service	<input type="radio"/>	<input type="radio"/>
Technology is allowing us to link customer-facing and operational processes in new ways	<input type="radio"/>	<input type="radio"/>
Our core processes are automated	<input type="radio"/>	<input type="radio"/>
We have an integrated view of key operational and customer information	<input type="radio"/>	<input type="radio"/>
We use analytics to make better operational decisions	<input type="radio"/>	<input type="radio"/>
We use digital technologies to increase the performance or added-value of our existing products and services	<input type="radio"/>	<input type="radio"/>
We have launched new business models based on digital technologies	<input type="radio"/>	<input type="radio"/>