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The Role of Managerial Cognitive Capabilities on Digital Transformation of Large-sized Organizations: A Multiple Case Study from South Africa

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The Role of Managerial Cognitive Capabilities on Digital Transformation of Large-sized Organizations: A Multiple Case Study from South Africa

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Abstract

Organizations are constantly transforming, however, this change on an ongoing basis becomes costly, and for it to be agile often compromises efficiency and effectiveness. It is therefore crucial to know when and how much agility is needed for an organization to be effective and efficient. In achieving this, dynamic capability characterized by organizational routines, highly effective cognitive-managerial skills, robust organizational designs, and the company's capacity to unite, establish, and restructure the expertise within it, leads to eventually dealing with, and altering the atmosphere of the organisation in question. This qualitative, multiple-case study describes and documents insights from subject matter experts (SMEs) on how managers from large-sized organizations in South Africa can leverage their cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation. The units of analysis were SME's insights on the topic of the study. Qualitative data was based on insights derived from in-depth interviews with 10 participants who are identified SMEs. The results of this study focussed on recommendations to practitioners on how to support managers in developing their cognitive capabilities to build organizational agility and support the dynamic capabilities of large organizations undergoing digital transformation in the highly dynamic business environment of today's South Africa. All participants agreed that cognitive and dynamic capabilities are crucial to the success of digital transformation. All participants found that fostering partnerships and networking globally, provides integrated knowledge, minimal reinventions, and great insight for organizational; growth and sustainability. Participants concurred that development of cognitive skills, coaching, and incentivizing employees contributes extensively to the growth and sustainability of organizations.

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Chapter 1: Introduction

New business models emphasizing dynamic capabilities were cited as the most promising strategy used by larger organizations in order to thrive in the era of transformational digital ecosystems (Weill & Woerner, 2018). Previous research by Alves, Salvini, Bansi, Neto and Galina, (2016) suggested that building up dynamic capability is an investment for large organizations, however managerial attention was required for the successful appointment and deployment of the right capabilities to impact performance. Teece, Ptereaf and Leih (2016) and Alves, Salvini, Bansi, Neto, and Galina (2016) cited a need for further research on understanding the temporal dynamic of capability building. Today's large organizations have embraced digitalization strategies to expand or enhance their organizations. Modifying rivals' threats while encouraging cultural awareness, plus creating a patent strategy, as well as developing a dynamic capabilities' portfolio has been critical to the sustainability of large organizations looking to survive and thrive in a digital future (Kiron, Kane, Palmer, Phillips, & Buckley, 2016).

Managers that have played a key role within this temporal context in building a firm's dynamic capabilities, and managerial-cognitive capabilities have made a difference in applying effective organizational strategy (Teece, 2007; 2017). Especially when evaluating a large organization's digital transformation, managerial-cognitive capabilities has been one of the most important features for predicting organizational agility (Simester, 2016; Teece, 2017). Consideration of temporal contexts of dynamic capabilities has led to recommendations for qualitative studies that has provided an in-depth understanding of how managers from large organizations attempting digital transformation leverage their competence factors to build organizational agility and

support the dynamic capabilities needed in a highly dynamic business environment (Teece & Linden, 2017; Shepherd, McMullen, & Ocasio, 2017).

Background

Organizations have been in a constant state of transformation, however, to change on an ongoing basis becomes costly, and to be agile often compromises efficiency (Teece, Peteraf & Leih 2016). It was crucial to have known when and how much agility was needed for an organization to be effective and efficient. In achieving this. dynamic capability characterized by organizational routines, highly effective cognitive-managerial skills, robust organizational designs, and the company's capacity to unite, establish, and restructure the expertise within it, had led to eventually dealing with, and altering the atmosphere of the said business (Teece, Peteraf & Leih 2016) A strong foundation for sustainable competitive advantage, when these potentials are extremely engrained in an organization made them less resistant with the executive management team. This led to solid dynamic capabilities. (Albort-Morant, Leal-Rodriguez, Fernandez-Rodriguez, & Ariza-Montes, 2018; Teece, Peteraf, & Leih, 2016; Teece, Pisano, & Shuen, 1997; Teece, 2007). Dynamic managerial capabilities constituted of a specific subsection of dynamic capabilities within the organization's portfolio. These particular capabilities distingush them from the broader category of dynamic capabilities as a whole (Beck & Wiersema 2013). Teece (2007) concurs by stating that the particular level of dynamic capabilities being referred to can be divided into:

1. "Microfoundations", which include adjusting and improving an organizations existing potential, while creating new ones.

2. “High order dynamic capabilities”, where the heads of the company with strong competencies that are sustained by certain administrative procedures, decide what is important in order to sense, seize, and transform what is needed to create and execute a business model.

Dynamic capabilities had a significant influence on the strategic direction of the organizations and provided a better understand of the emergence of the organization’s dynamic-managerial capabilities or high-order capabilities, which were the underlying factor that droves this formation that was needed to be distinguished more explicitly (Beck & Wiersema, 2013; Teece, 2007). Adner and Helfat (2003) insightfully identfiy the three attriburtes underpinning dynamic-managerial or high-order ones as those of human and social capital, as well as cognition; both being managerial types. Included in a system that incorporates resources and strategy are those of dynamic capabilities, which are part of a structure made up of resources and policy, which control an organization’s competive advantage over its rivals (Teece, 2018).

Skills and knowledge obtained by managers are called “managerial-human capital”, and are shaped by personal as well as professional experience, including their level of education. The manager’s capability in accesssing assets because of relationships and networks is referred to as managerial-social capital. The term “managerial cogninition”, points to the opinions and learning models used by managers when making decisions (also referred to as “knowledge structures”) (Eggers & Kaplan, 2013; Walsh, 1995), managerial cognitive capabilites, specific ways of thinking (Helfat & Peteraf, 2014), as well as his/her sensibilities (Hodgkinson & Healey, 2011). All three are interlinked (Kor & Mesko 2013).

In the last decade the competencies of managers have morfed into the sub-field of "dynamic-managerial cognitive capabilities", where the creation and implementation of new models of business is very important (Helfat & Martin, 2015). Today's fast-moving world of technology, may even be its most important feature. Most managers have based their decisions on their capabilities, therefore, moving from the dynamic-organizational capabilities, (Eggers & Kaplan, 2013; Helfat & Peteraf, 2014), and focusing on the dynamic-managerial capabilities. These in turn has been embedded in the managerial cognitive capability. Managerial initiatives had been required to drive a procedure that looks outward and uses an experimental learning process without impacting continuing efficiency-orientated activities of the corporation (Hambrick & Quigley,2014; Adner and Helfat, 2003). To achieve the above, more emprical research was needed on the tactics that help managers increase the quality of their resolves, when they are faced with high unpredictability in the environment of their business, to offer recommndations that bear managerial implcations. (Helfat & Peteraf, 2014).

Statement of the Problem

The problem is there has been a lack of understanding among many managers in large organizations on how to develop cognitive capabilities used for building organizational agility and dynamic capabilities for digital transformation (Albort-Morant et al., 2018; Verma Bharadwaj & Nanda, 2017; Teece, 2017). According to Felipe, Roldán, and Leal-Rodríguez an important dynamic capability, termed organizational agility (OA) is an organization's capacity to facilitate with the sensing of changes in the environment while at the same time being efficient and effective with its response. Researchers have noted that significant and positive influence of dynamic capabilities

confirmed the importance of organizational agility in contributing to the organizational performance (Teece; 2007; Teece & Linden, 2017). Further research was also needed into how dynamic capabilities' effects on performance and innovation outcomes differ throughout all the capability levels. (Pervan, Curak & Kramaric 2017).

Today's large organizations have embraced digitalization strategies to expand or enhance their organizations. Modifying rivals' threats while encouraging cultural awareness, plus creating a patent strategy, as well as developing a dynamic capabilities' portfolio was critical to the sustainability of large organizations looking to survive and thrive in a digital future (Kiron et al. 2016). Recent research considers the temporal context, within which social-psychological processes has been embedded as features of business processes, surrounding the building of dynamic capabilities in large-sized organizations through organizational agility (Alves, Salvini, Bansi, Neto, & Galina, 2016).). In the past decade, research has identified the cognitive capabilities of team leaders as being the 'micro-foundation' for building the literature of dynamic capabilities (Bendig, Strese, Flatten, da Costa, & Brettel, 2018; Helfat & Martin, 2015).

When evaluating an organization's digital transformation, managerial-cognitive capabilities may have even been the most important feature for predicting organizational agility (Teece, 2017), with a focus on managerial factors such as attention to the technology and initiatives (Khanagha, Volberda, & Oshri, 2017), network management (Adomako, Danso, Boso, & Narteh, 2018; Lowe & Rod, 2018; McGrath et al., 2017; Nordin et al., 2017), creativity (Somsing, & Belbaly, 2017) and foresight capability (Balarman, & Sundarraj, 2017). Consideration of temporal contexts of dynamic capabilities has led to recommendations for qualitative studies that has provided an in-

depth understanding of how managers from large organizations attempting digital transformation leveraged their competence factors to build organizational agility and support the dynamic capabilities needed in a highly dynamic business environment (Teece & Linden, 2017; Shepherd, McMullen, & Ocasio, 2017).

Purpose of the Study

The purpose of this qualitative, multiple-case study was to describe and document insights from subject matter experts (SMEs) on how managers from large-sized organizations in South Africa can leverage their cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation. South Africa was an appropriate choice as the local context of this study, given that in this nation 48% of all organizations had initiated transformations that are digital and by 2019, 44% will do the same (IT News Africa, 2017). The research design that was used had been the multiple-case study type, satisfying the aim of this descriptive-case research study in the best manner Yin, (2017) which focused on the following managerial-cognitive capabilities: attention to emerging technology, initiative and exploratory behavior; network management, and foresight capability. The units of analysis has been the SMEs meeting the exclusion and inclusion criteria for participants in the study Yin, (2017).

Qualitative data was based on insights derived from in-depth interviews (Patton, 2014) from the identified participants. Since the study had concentrated on innovative approaches to exploring managerial behaviors from large-sized organizations in South Africa, data collection had been achieved with a purposeful sample using criteria and snowball sampling (Gentles, Charles, Ploeg, & McKibbon, 2015). A semi-structured

interview process was used to elicit the SMEs' expertise and insights regarding the issues raised for this researches' objective Yin, (2017)

Research Questions

The requirement to ask the right research questions has been highlighted by Browne and Keeley (2007). As such, it was important to identify suitable questions for the research. The following questions were used, and had been generated, in order to discuss the purpose and problem of the research.

RQ1: What are the perceptions of SMEs, regarding how managers from large-sized organizations in South Africa attempting digital transformation can leverage attention to emerging technology to build organizational agility, and support dynamic capabilities?

RQ2: What are the perceptions of SMEs, regarding how managers from large-sized organizations in South Africa attempting digital transformation can leverage initiative and exploratory behavior to build organizational agility, and support dynamic capabilities?

RQ3: What are the perceptions of SMEs, regarding how managers from large-sized organizations in South Africa attempting digital transformation can leverage network management to build organizational agility, and support dynamic capabilities?

RQ4: What are the perceptions of SMEs, regarding how managers from large-sized organizations in South Africa attempting digital transformation can leverage foresight capability to build organizational agility, and support dynamic capabilities?

Nature of the Study

The nature of this multi-case study is qualitative. It helped in the exploration of an occurrence in its own setting and used a plethora of data sources, making sure that concepts were not looked at in one particular way, but in a variety of ways thus, allowing for many aspects of the concepts to be explored and comprehended (Baxter and Jack 2008). Case-study research has been the ideal method of research in environments wherein "how" and "why" questions are the main research questions and there is no control over events that are behavioral, in addition, the emphasis is on a present-day occurrence in opposition to a totally historical one Yin, (2017).

The researcher examined each setting specifically, as well as investigated all settings, thus analyzing a variety of cases that provided a better comprehension of the similarities and differences amongst them, when using the methods of multiple or collective-case studies. Under the Research Questions section, the questions asked in this research are either "how" or "why" questions, therefore implying that the researcher has used a case-study research method which was the most relevant in order to conduct this study (Gummesson, 2006). This specific case-study method was a multiple-case study design. Yin, (2017) defines the way and the use of multiple-case studies to either, "predict similar results (a literal replication) or predict contrasting results but for predictable reasons (a theoretical replication)". Nonthaleerak and Hendry (2008) concur by stating that this research method (multiple-case study) provides a unique comparison when searching for the differences and similarities in the way practices are implemented throughout a variety of circumstances.

Eisenhardt and Graebner (2007) and Baxter and Jack (2008) have the opinion that this approach enables more generic conclusions to be reached. There are two methods of generalizing results from empirical studies, as proposed here: statistical generalizations and analytic generalizations, according to (Yin 2017). A deduction was formed in statistical generalization that the universe is based on the empirical information, from which it is collected. In a qualitative-case study, the researcher is likely to strive towards having his/her findings being more general and are 'analytic or based on the lessons acquired during the research. This leads to 'analytic generalization', which goes beyond the environment of the unique case under study. Analytic generalization's purpose is to generalize to a variety of concrete situations and not just to contribute to abstract-theory building (Tsang, 2013).

Stake (1995) presents case studies as being "intrinsic, instrumental, and collective". The researcher uses a case study that is intrinsic when there is an interest in a distinctive situation, which means that there is an intrinsic curiosity in the subject that is being studied and there is an understanding that the results will be transferred in a limited fashion. When the purpose of the research is to acquire awareness and understanding of a phenomenon or a situation, Stake (1995) additionally suggests that in order to have a better comprehension, it is important to use an instrumental-case study. If more than one case is being studied, Stake (1995) mentions that the third case-study method is that of the collective-case study, which occurs when one single case is being researched. Furthermore, this is when the researcher can apply the same strategy used in the description of a multiple-case study.

In-depth interviews required the method, scope, number of interviews, and data for this exploratory study to be defined, refined, and detailed (Bohlmann, Spanjol, Qualls & Rosa, 2013; Neubert, 2016). The inclination for a researcher to find a solution to a question that is very comprehensive, or to have a subject that has too many objectives for the research are two of the common pitfalls connected directly to a case study. This becomes an issue for the researcher to deal with, so, in order to avoid it, quite a few authors including Yin, (2017) and Stake (1995) have suggested that that there should be defined borders around a case; furthermore this problem can be prevented by securing a specific case, which would encompass, the following: the definition and setting (Miles & Huberman), and the time and activity (Stake, 1995).

There was a collection of the data obtained by using observational field notes (Katz, 2014); and SMEs have provided a quality audit through examination and reflection on the data (Patton, 2014). Additionally, the following was conducted: triangulation of the sources of data in order to establish the believability of the researcher's discoveries surrounding the phenomena being studied, plus confidence in the research results. (Guion, Diehl & McDonald, 2011). The data was analyzed using a cross-case synthesis method Yin, (2017). The emerging patterns or concepts from the analysis were structured into general categories, and thereafter themes emerged which addressed the purpose of the study and and research questions. This occurred in order to contribute (Stake, 2013), and to further extend (Teece, 2018) the position on the role of managerial-cognitive capabilities on digital transformation of large-sized organizations with South Africa.

Significance of the Study

The evolution of recommendations for management practices that help steer complicated digital transformations taking place in large companies across the country of South Africa was what made this study important. Implementing disruptive technologies has been sped up by instilling cloud-computing power and new enterprise mobility policies. This study has been especially important in South Africa where 48% of all organizations have initiated the transformation of digitalization, whereas 44% will do the same by 2019 (IT News Africa, 2017).

Such a transition meant that managers needed to be provided with professional development and training on how to reshape their organizations' agility to adapt in the upcoming IT landscape in South Africa. In today's current economic climate, organizations also face extreme turbulent environments, in which high levels of insecurity, complexity and dynamism are the most important features. Large organizations had to formulate strategies, which became a pivotal idea that combines within it the implementation of digital transformation, while including its integration of all the coordination, as well as its prioritization (Weill & Woerner, 2018).

They needed to develop dynamic, managerial-cognitive capabilities that would lead organizations to be agile enough to detect environmental changes early, which in turn gave them the leverage, business opportunities, and a competitive edge to exploit market opportunities (Helfat et al., 2015; Teece, 2017). Foresight work, when joined with and consisting of, corporate culture and work procedures are the advantages for organizations that integrate all this, creating an impact and adding value to customers from the competitive perspective. Networking plays a crucial role in stakeholder

management and building sustainable relationships with customers. New technologies are becoming infused and inciting rapid business growth in South Africa (IT News Africa, 2017).

This study offered recommendations to practitioners on how to support managers in developing their cognitive capabilities to build organizational agility and support dynamic capabilities of large organizations undergoing digital transformation in the highly dynamic business environment of today's South Africa.

Definition of Key Terms

Digital Transformation: This term can be defined as the moment when technological potential can be utilized to alter the business models of interconnected systems as well as their value chains; thus they end up addressing the requirements of customers while services are provided effectively. (Schallmo & Williams 2018).

Dynamic Capability: This term is used to suggest an entity's ability of identifying, shaping, and leveraging threats and opportunities, while remaining competitive through the management of a business enterprise's tangible and intangible resources; and this depends on managerial competence to leverage core dynamic processes (Teece, Pisano, Shuen, 1997; Tecce 2007).

Emerging Technology: This term is used deliberately to describe the capability of technologies to include not just tools and software but also ideas, such as pedagogies; it further describes tools, ideas, innovations, and progress. (Veletsianos, 2010).

Exploratory Behavior: This term refers to the exploring, discovering, and interpretations of new products, services, and markets, instead of prearranged advances and improvements in execution; further, this type of action is acknowledged as important

for corporations that are established, and are confronting technological changes that cause their existing knowledge to become somewhat useless, according to McGrath (2001) and as also cited in Khanagha, Volberda, and Oshri (2015).

Foresight Capacity: This term encompasses technological forecasting and strategic planning within a larger group of procedures and tools, which are accessed, as and when, needed in order to incorporate "foresight" in the broadest possible way into the company. (Gold & Hines 2015)

Managerial cognitive capability: This term describes an individual manager's ability to carry out mental functions, which is analyzed to understand the way dynamic capabilities are supported by managerial-cognitive capabilities. (Helfat & Peteraf, 2014).

Network Management: This term refers to the effectiveness and function of how actors construct, coordinate, and manage a network of partners and resources, while managing and deploying their own resources for their own strategic advantage (Rampersad, Quester & Troshani 2010).

Organizational Agility (OA): This term refers to the ability of a company to allow for the sensing of environmental changes and to respond to them in a successful and methodical manner. (Felipe, Roldán, & Leal-Rodríguez, 2016).

Summary

In today's current economic climate, organizations also face extreme turbulent environments, in which high levels of insecurity, complexity and dynamism are the most important features. There is a need to develop dynamic, managerial-cognitive capabilities which would lead organizations to be agile enough to detect environmental changes early, which in turn gave them the leverage, business opportunities, and competitive edge

to exploit market opportunities (Helfat & Peteraf, 2015; Teece, 2017). The problem addressed in this study is there has been a lack of understanding among many managers in large organizations on how to develop cognitive capabilities used for building organizational agility and dynamic capabilities for digital transformation (Albort-Morant et al., 2018; Verma Bharadwaj & Nanda, 2017; Teece, 2017).

The purpose of this qualitative, multiple-case study was to describe and document insights from subject matter experts on how managers from large-sized organizations in South Africa can leveraged their cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation. South Africa was an appropriate choice as the local context of this study, given that in this nation 48% of all organizations had initiated transformations that are digital and by 2019, 44% will do the same (IT News Africa, 2017). The research design that was used was the multiple-case study type, satisfying the aim of this descriptive-case research study in the best manner (Yin, 2017) which focused on the following managerial-cognitive capabilities: attention to emerging technology, initiative and exploratory behavior; network management, and foresight capability.

The analysis involved ten individual in-depth, open-ended interviews with SMEs participants thereby collecting primary data. Cross-case synthesis using analytical techniques had been employed to aggregate findings of the case studies. (Yin, 2017). The evolution of recommendations for management practices that help steer complicated digital transformations taking place in large companies across the country of South Africa is what made this study important. This study has offered recommendations to practitioners on how to support managers in developing their cognitive capabilities to

build organizational agility and support dynamic capabilities of large organizations undergoing digital transformation in the highly dynamic business environment of today's South Africa.

Chapter 2 contains a detailed exploration of the research relevant to this study's topic, problem, and research questions.

Chapter 2: Literature Review

Documentation

Digital disruption is a result of the rapid digitization of organizations and the combination and ongoing blending of advanced digital technologies (Bradley, Loucks, Macaulay, Noronha, & Wade, 2015). The scope of this literature review is to explore from various scholarly sources the experiences, perceptions and insights on how managers from large-sized organizations in South Africa can leverage their cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation.

This literature review considers an international perspective, whilst focusing on South Africa's demographics and offers an understanding digital transformation and the cognitive capabilities required to build large agile organizations in South Africa as a concept in the literature from the 1960's to the most recent years. This chapter will contain discussions of the recent literature regarding the conceptual framework for the study, leadership, organizational performance and strategic sustainable change, mental activities and cognition, cognitive capabilities, dynamic management capabilities, skills for disruptive digital business managers, cognitive capabilities for managers, building digital transformation in large organizations. Building the digital enterprise in South Africa and competitiveness in digital economy for large organizations in South Africa.

Literature Search Strategy

Search engines used in this literature review included Ebsco Host, Google Scholar, JSTOR, SpringerLink, and World-Wide-Science. Search terms used included leadership, organizational performance, strategic sustainability, mental activities,

cognition, cognitive capabilities, dynamic capabilities, skills for disruptive innovation, managerial attention and initiative's, network management, managerial creativity, foresight capability, digital transformation, large organizations and digital transformation, digital enterprises in South Africa, and competitiveness in digital economy for large organizations in South Africa, and these terms used in Boolean searches with terms such as "and" and "or." The search was particularly focused on literature that explored cognitive capabilities to build organizational agility and support dynamic capabilities for during digital transformation. The search focused on recent (2014-2019) literature, but some earlier seminal works were included as well.

Theoretical/Conceptual Framework

Teece (2007) states the importance of focusing on the micro foundation of individual managers to facilitate factors for strategic change and introduces the concept of managerial cognitive capability to elaborate the importance of capacity to perform both physical and mental activities. For the analyses of the cognitive foundation of managerial dynamic capabilities, Micro foundations of dynamic capabilities needs to be built on. A role for cognition in the 'sensing', 'seizing', and 'reconfiguration' components of dynamic capabilities are suggested by Teece (2007). Extensive research has been completed across varies fields of cognition, from cognitive psychology, cognitive science, social psychology, cognitive neuroscience, and behavioral decision theory and we rely upon these definitions in well-regarded dictionaries of psychology and textbooks, and empirical findings documented in scholarly articles and books (Helfat, 2014). Mental activities and maps from a utilizing and altering information structures

among managers also plays an important part in cognition as stated by (Amit & Schoemaker, 1993; Helfat & Peteraf, 2003; Gary & Wood, 2011).

The first aspect of this study is to review evidence documenting the impact of top executives' cognition, and the impact of that on organizational performance and sustainable strategic change. Expanding this discussion, we begin to unpack the role that mental activities play in cognition, how the capability concept in strategic management relates to mental activities of managers and define what "managerial cognitive capability is. Characteristics of cognitive capabilities, including heterogeneity among individuals are explored. Once we have analyzed all that information, we begin to align that information with Teece's (2007) sensing-seizing-reconfiguring framework and understand various ways in which specific cognitive capabilities may strengthen sensing, seizing and reconfiguring. Further unpacking of how heterogeneity of cognitive capabilities among managers may lead to differential organizational performance under various conditions of change. On completion of the above, an assessment is completed on the cogitative capabilities among managers in different South African organizations at different management levels through a multi-cased study of 10 SME's in different industries in South Africa.

Leadership, Organizational Performance and Strategic Sustainable Change

Finkelstein, Hambrick, and Canella, (2009), form part of management research that has long regarded cognition as a crucial attribute for senior managers, or leadership of organizations, however more recently, advanced research on senior management or leadership cognition, more specifically to strategic change and sustainability has enhanced. Smith and Tushman (2005) suggested that senior management or leadership

needs to build a ‘paradoxical cognition’ for the enablement of exploration and exploitation simultaneously. Miller and Ireland (2005) on the other hand cautions that when firms explore for the latest technology and innovative strategy, intuition and premonitions can have a detrimental impact on the organization, due to much reliance on prior expertise Gavetti (2012) subsequently argues that strategic leadership with superior associative mental processes may prevent these types of incidents and have success in identifying sustainable strategic opportunities that are profitable. Rosenbloom (2000) study of —National Cash Register Company (NCR), demonstrated that managerial cognition from leadership or senior management’s understanding of the NCR business, had a critical impact on both NCR’s difficulty in transitioning to mainframe computer and its ultimate success.

Taylor and Helfat (2009) found that cognition of leadership or senior management helped IBM in its successful transition to mainframe computing. In dissimilarity, Tripsas and Gavetti (2000) noted how leadership or senior management cognition, in terms of how executives conceived of their business, prevented Polaroid from successfully innovating as the camera industry moved to digital imaging technology. Helfat et al. (2007) also documented the way in which the mindset of Rubbermaid’s CEO influence on the organization, which created difficulty in adjusting to a changing marketplace.

CEO cognition on strategic change has also been documented from qualitative studies. Kaplan, Murray, and Henderson (2003) revealed how mental models of senior management or leadership impacted the actions of pharmaceutical organizations in response to the emerging biotechnology industry. Further studies that were completed by Eggers and Kaplan (2009) showed that CEOs in the communications technology sector,

who paid significantly more attention to emerging technologies entered new product markets quicker. Further studies have shown that cognition as an indicator of managerial demographic characteristics, affected the initiation of strategic change at CEO level (Boeker, 1997) and senior management teams (Wiersema & Bantel, 1992). Hermann and Nadkarni (2013) discovered that in a small and medium sized Ecuadorian organization, the CEO personality affected various strategic changes the firm undertook, as well as the successful implementation and outcomes of these changes. A variety of studies document that heterogeneity of senior management cognition is associated with the heterogeneity of strategic outcomes and change efforts, however very little has been researched on the mental activities or process aspect of cognition (Helfat, 2015).

Mental Activities and Cognition

Cognition has been defined as a "process of knowing, including attending, remembering, and reasoning; also, the content of processes, such as concepts or memories", according to The American Psychological Association *Glossary of Psychological Terms* (2009). A similar definition in, *A Dictionary of Psychology (*Colman 2006), published by Oxford University Press, defines 'cognition' as 1. "the mental activities involved in acquiring and processing information" and 2. "an item of knowledge or belief". From a cognitive science perspective, which is a multidisciplinary field inclusive of artificial intelligence as well as cognitive psychology (Luger, 1994), The term 'cognition' applies to any type of mental operation or 'structure'; the latter does not refer to the physical structures in the brain, however the representation of information by the mind (Schneider ad Angelmar, 1993).

The understanding of the relationship between mental representations and mental activities or processes is complex. When a person carries out mental activities or processes, they may retrieve, generate, or modify mental representations. Ericsson and Lehmann (1996:285), noted that computer programmers engaging with problem solving or mental activities established that programmers doing familiar tasks, "often rapidly retrieved or constructed an accurate mental model". Ericson and Lehmann (1996:285) also noted evidence of problem-solving solutions completed by expert computer programmers who "were found to generate an initial…. representation of their design or mental model and to modify it". As an addition to mental models, individuals rely on their beliefs, values. Motivation, and similar factors known as 'mental status' when performing mental activities according to the field of cognitive science (Rokeach, 1970).

Cognitive Capabilities

The term 'capability' in strategic management as ability to perform a function or task in a reliable manner when requested to do so (Amit and Schoemaker, 1993; Helfat & Winter, 2011). As an individual gains experience in an organization performing specific activities or tasks, the capacity to perform this activity or task in the future tends to improve, specifically early development of a capability (Zollo & Winter, 2002). Merriam-Webster (2009) defines a capability as "the quality or state or being capable", where the word capable is defined as 'having attributes required for the performance or accomplishment." Managerial cognitive capabilities on the other hand is the link between capabilities and mental activities, which can be clearly defined as follows according to (Helfat 2014) , "managerial cognitive capability is the capacity of an individual manager to perform one or more of the mental activities that comprise cognition."

As discussed, one of the core psychological underpinnings of dynamic managerial capabilities involves managerial cognition (Adner & Helfat, 2003; Helfat & Peteraf, 2015). Researchers have addressed numerous characteristics of managerial cognition (see Helfat & Martin, 2015, for a review), some of which are mental models and knowledge structures (Eggers & Kaplan, 2013; Walsh, 1995), or mental processes and cognitive capabilities (Helfat & Peteraf, 2015). Another aspect that is of importance is the emotion-related processes and their importance for dynamic managerial capabilities.

A central emotion-related managerial behavior is how managers deal with emotions caused by strategic events and concerns, that is, how managers control their own emotions and those of other stakeholders. Emotion regulation (ER) refers to actions and behaviors aimed at sustaining or adapting one's emotional states (Gross & John, 2003). The impact of ER depends on an understanding of the organization's historical context and culture, knowledge of people and networks in the organization (Zott & Huy, 2018).

ER embodies a means for resource-constrained managers to "create something from nothing" (Baker & Nelson, 2006), or, perhaps more precisely, to maximize what they have, that is, to "squeeze more out" of existing resources. This is a significant theoretical insight through which Zott and Huy (2018) study links the affective underpinnings of dynamic managerial capabilities and resource management literatures with that on organizational resourcing (e.g., Feldman, 2004; Feldman & Quick, 2009). More specifically, the study showed how managerial human and social capital (e.g., the founder's skills and knowledge) is not intrinsically altered (enhanced or diminished) through the practice of ER (as suggested, for example, by Helfat and Martin, 2015).

Rather, the intensity (or frequency) with which these resources are mobilized in pursuit of opportunities increased. Thus, managers' ER behaviors foster opportunity-seizing and enhance the firm's chances of survival by putting existing resources into action. As Penrose (1995, p. 25) notes, “It is never resourcing themselves that are the ‘inputs’ in the production process, but only the services that the resources can render. The services yielded by resources are a function of the way in which they are used.”

Managers’ cognitive capabilities and perception of market research usefulness

Managers are not comfortable with participating on a regular basis in every research process, not to mention, the time required for every stage of those processes, due to they having their own duties, tasks, vision of work, and projects, including limited time to share research duties together with information-producers (Tarka 2018). Managers find it difficult to trust the validity of marketing research and information due to their own poor processing and learning capabilities on the issue (Suttclife & McNamara 2001; Malcomson 2011; Tarka 2019); bounded memory (Wilson 2014), too strong reliance on personal experience (Perkins & Rao, 1990), and problems associated with data and information overloading (e.g., Edmunds & Morris 2000; Jackson & Farzaneh 2012; Hodgkinson, & Healey, 2014).

Tarka (2019) concludes that the memory of managers has a strong association with their capabilities of information processing. If managers have limited memory and cognitive capabilities in information processing, that will undermine their potential to positively view the subject of market research useful. If managers have strong cognitive capability, it will provide a sound mechanism which can be used to focus on key research information (e.g., Armstrong & Hird, 2009; Choo, 1996; Lesca, Caron-Fasan, & Falcy,

2012; Ungson, Braunstein, & Hall, 1981), and will assist them in finding appropriate insight among many prospective informational sources e.g., in the market research reports (Dubof & Spaeth, 2000; Hu, 1986).

A good memory will not only enable one to manage the flow of information, but also assists managers in identifying the most appropriate information from wide selection of available informational options (e.g., Oberauer & Hein, 2012; Reyna et al., 2003). Moreover, it assists even the process of knowledge development (Maula, 2000; Schneider & Bjorklund, 2005). In contrast, poor memory will hamper the reliability and validity assessment of information with which managers conclude after the market research and prevents conducting a critical review of the collected information (Tarka, 2019).

Organizations that function in turbulent markets of high competitiveness, with regular conducting of market research, should identify managers within their organizational structures with a greater-than-average level of cognitive capabilities. This can be completed through various measuring items. On the other hand, managers that are already employed, with lower cognitive capabilities, should be coached and trained on the improvement of their personal cognitive skills (Tarka,2019).

Any training of memory, analytical thinking, and undertaking intellectual coaching, (e.g., psychological training), would lead to an improvement of their memory and information processing capabilities. Thus, managers' natural limitations associated with their cognitive capabilities may be overcome (to some extent) through the training of memory skills or the application of adequate information processing strategies (e.g. task and information simplification) (Gruszka & Nęcka, 2017).

With advancements in technology, managers might have considered 'personalization' of their work and organization of tasks, which will enable not only storing vast quantities of data, but also lead to prompt, and correctly timed retrieval or processing of data/information. Digital transformation also enables the automation of data/information processing, providing efficient synthesis of information from various sources (Tarka,2019).

Technology does create some sort of paradox too, as managers may not necessarily prove their cognitive capabilities are high, although possessing great capabilities enables them to work more effectively - which results in better assimilation of research information and favourable perception of the market research. With a higher level of memory capacity, manager's chances of properly handling information will increase. It appears, therefore, in today's fast-paced competing conditions, managers must aspire to use to develop their personal cognitive capabilities to the optimum (Tarka, 2019).

Dynamic Managerial Capabilities

Organizations need to be in a constant state of transformation, however, to change on an ongoing basis becomes costly, and to be agile often compromises efficiency (Teece, Peteraf, & Leih, 2016). It is crucial to know when and how much agility is needed for an organization to be effective and efficient. To achieve these dynamic capabilities characterized by organizational routines, highly effective cognitive-managerial skills, robust organizational designs, and the company's capacity to unite, establish, and restructure the expertise within it, lead to eventually dealing with, and altering the atmosphere of the said business (Teece, Peteraf, & Leih, 2016).

A strong foundation for sustainable competitive advantage, when these potentials are extremely engrained in an organization makes them less resistant with the executive management team. This leads to solid dynamic capabilities. (Albort-Morant et al., 2018; Teece, Pisano, & Shuen, 1997; Teece, 2007; Teece, Peteraf, & Leih, 2016). Dynamic managerial capabilities constitute a specific subsection of dynamic capabilities within an organization's portfolio.

These particular capabilities distingush them from the broader category of dynamic capabilities as a whole (Beck & Wiersema, 2013). Teece (2007) concurs by stating that the particular level of dynamic capabilities being referred to can be divided into:

1. "Microfoundations", which include adjusting and improving an organizations existing potential, while creating new ones.
2. "High order dynamic capabilities", where the heads of the company with strong competencies that are sustained by certain administrative procedures, decide what is important in order to sense, seize, and transform what is needed to create and execute a business model.

The role of cognitive capabilities in sensing opportunities. The capacity to sense opportunities before they emerge in an uncertain and complex environement, becomes a critical component of dynamic capabilities and entreprenuelral activities (Denrell, Fang, & Winter, 2003). The two cognitive capabilities that these sensing activities are likely to draw upon are perception and attention. Perception as defined by the "APA Glossary of Psychological Terms" is the mental processes or activities "that organize information (in the sensory image) and interpret it as having been produced by

propoties of (objects or) events in the external (three dimensional) world" (American Psychological Association, 2009).

From a psychological perspective, perception is mostly known from sensation, which relates to the identified feeling and experience that oocurs when sensory receptors are activated. (Gazzzniga, Heartheron, & Halpern, 2010), stated that: "Whereas the essece of sensation is detectionm the essence of perception is the construction of useful and meaningful information about a particular environment." In summary, recognizing emerging patterns in the environment, interpreting the data accuraterly, is critical both for accurate opportunity identification and opportunity creation, and facilitation of early recognition of environmantal treats, which will enable more effective and timely responses. Quick recognition or creation of new oppotunities is also crucial, specifically if organizationscan gain long- term advantage from early entry into the market (Lieberman and Montgomery, 1988).

Attention according to the APA Glossary of Psycological Termsis " a state of focused awareness on a subset of available perceptual information". (American Psychological Association, 2009). Attention establishes which stimuli are recognized and identified, through the act of fousing on particular information (Kosslyn and Rosenberg, 2006), therefore attention is critical for perception.There are three major functions of prominence in cognitive accounts of attention: 1. Orientating to sensory events, 2. Detecting signals for focal (conscious) processing, and 3. Maintaining a vigilant or alert state." (Posner & Petersen, 1990:26).

Training and practice improves capabilities for attention as per (Rueda et al., 2005) who cited a number of studies revealing that training prgrams have improved

performance of identified executive attention tasks in brain injured patients, attentional abilities in children struggling with attention deficit hyperactivity disorer, and visual attention tasks in adults. Since practice can improve cognitive capabilties, senior managers or leadership that regularly attend to or percieve opportunities and treats in the environment may improve their ability to do so in the future and are dependent heterogeneity on managerial cognitive capabilities nnd their associated sensing capabilites has a possible contribution to heterogeneity in long-term organizational performance and sustainability, due to the potencial of early mover advantages from sensing of new oppotunites and emerging treats (Helfat, 2014).

Providing a foundation for dynamic managerial capabilities with respect to seizing opportunities and responding to emerging threats, forms part of the second aspect of cognitive capabilities. In addition, seizing an opportunity may require design of a business model for a new venture (Teece, 2007). Cognitive capabilities identified for problem-solving and reasoning will most likely underpin the business model design as well as the capacity for the sound decision making of strategic investments. The APA glossary defines 'problem-solving' as "thinking that is directed towards solving specific problems and that moves from an initial state to a goal state by means of mental operations" (American Psychological Association, 2009). The Oxford Dictionary of Psychology (Colman, 2006) provides a limited definition of 'reasoning' as mental activities "directed at finding solutions to problems by applying formal rules of logic or some other rational procedure".

As the relationship between problem-solving and reasoning are close, further discussions will be dealt with incorporating both aspects. For the management of mental

processing, the application of formal rules of logic and other rational approaches to solving problems comes to play. These rules of logic and rational approaches are associated with factors such as 'fluid intelligence' and 'rational thinking dispositions', also termed 'cognitive styles' (Stanovich, 2009:28-40).

Short-term (working) memory is relied upon by fluid intelligence, and "involves the ability to reason without relying heavily on previous learned knowledge or procedure" (Joslyn & Rosenberg, 2006:387). In disparity, thinking nature has to do with an individual's cognitive propensities such as tendencies to "think extensively about a problem before responding… calibrate the strength of one's opinion according to the amount of evidence available….Think about future consequences before acting… [and] explicitly weigh pluses and minuses of a situation" (Stanovich, 2009:31-32). Senior managers with higher reasoning and problem-solving abilities or capabilities are more likely to design effective business-models and make more astute investment decisions. Heterogeneity in cognitive capabilities for problem- solving and reasoning could lead to heterogeneity in long-term and lived investments and business models, which may lead to ongoing sustainable performance differentials between organizations (Helfat, 2014).

The third aspect of dynamic capabilities according to Teece (2007), involves sustaining growth and profitability, by enhancing, combining, and reconfiguring the organizational assets, resources, and capabilities. "Reconfiguration' is what Teece refers to as the third aspect, which focuses heavily on organizational level phenomena. Helfat et al. (2007) terms it as 'asset orchestration'. Asset orchestration refers to the selection, configuration, alignment, and modification of tangible and intangible assets (Helfat et al., 2007). Coordinated adaption of assets and leading change effectively can benefit from

dynamic capabilities for reconfiguration. These dynamic capabilities are more likely dependent on managers' cognitive capabilities for language and communication, and on social cognitive capabilities.

Asset reconfiguration has a dependency on the ability of leadership or top executives to persuade employees of their organization to undertake new initiatives or implement new solutions. Language can be used as a form of communication for broad messages to foster alignment and alleviate confusion within the organization (Barnard, 1938). Asset reconfiguration can have an impact in developing managerial skills for inducing cooperation among members of the organization (Teece & Pisano, 1994). Attaining that cooperation depends upon a manager's social skills, supported by social cognitive capabilities. Mental activities and cognitive capabilities related to social cognition are those for "perceiving, attending to, and remembering, thinking about, and making sense of people in our social world" (Moskowitz, 2005: 3). These mental activities influence social behaviour involving relationships and interactions between people (Fiske & Taylor, 1991; Pennington, 2000).

Cognitive capabilities for social cognition and language and communication are underpin by dynamic managerial capability of asset reconfiguration, heterogeneity in these cognitive capabilities contribute to heterogeneity in the associate reconfiguration capabilities. Top executives are more likely to differ individual capacity to facilitate strategic change through communication, inducing cooperation, and reducing resistance to change (Teece, 2007). Dynamic capabilities have a significant influence on the strategic direction of an organization and to better understand the emergence of the organization's dynamic-managerial capabilities or high-order capabilities, the underlying

factor that drives this formation needs to be distinguished more explicitly (Beck & Wiersema, 2013; Teece, 2007). Adner and Helfat (2003) insightfully identfiy the three attriburtes underpinning dynamic-managerial or high-order ones as those of human and social capital, as well as cognition: both being managerial types. Included in a system that incorporates resources and strategy are those of dynamic capabilities, which are part of a structure made up of resources and policy, which control an organization's competive advantage over its rivals (Teece, 2018).

Complex systems consist of a combination of substantial components that combine with difficulty. "In such systems…it is not a trivial matter to infer the properties of the whole" (Simon, 1962). To assist in limiting the detail, a 'systems approach' was used however, it did not have the ability to develop important features that induced some organisations to be more effective and succesful than their competitors. It has also not provided clear guidance for senior managers to identify the cause and effect relationships in order to identify the critical gaps and linkages (Teece, 2018).

A structure refered to as "systems theory" developed to allow for a holistic approach, which looks into phenomena that span a variety of fields, while viewing organizations as a social order which are part of sub-units intertwining in a coordinated way. With this approach the organization can be more effective and efficient (Johnson, Kast, & Rosenzweig,1963; Churchman, 1968). Disciplined generalizations which contain limited deduction derive from a systems-theory approach. Furthermore, a dynamic capabilities-framework sympolizes an adaption of this method to a market that is competitive globally. It does this by incorporating more details about the system's as well as about those the human elements.The key is an integrated approach (Teece, 2018).

Skills for Disruptive Digital Business Managers

Due to digital transformation becoming a strategic imperative on the agenda for leadership (Fitzgerald, Kruschwitz, Bonnet, & Welch, 2014; Hess et al., 2016; Singh & Hess, 2017), there is a need to understand how organizations plans on upskilling their managers and leadership for the digital transformation. Sousa, M. J., & Rocha, Á. (2019), states that the identification and development of skills is a challenging task for organizations. The role of Information Technology (IT) are key drivers for creating a new disruptive business with specific competencies developed. (Wagner & Wäger, 2018).

(Fitzgerald et al. 2014) define digital transformation as, "the use of new digital technologies (social media, mobile, analytics or embedded devices) to enable sustainable improvements within organizations , some of which are enhancing customer experience, streamlining operations, and creating new business models." Liu et al. (2011: 1730) argue that digital transformation is "as an organizational transformation that integrates digital technologies and business processes in a digital economy." Supported by Singh and Hess (2017:124), they suggest the term transformation" rather than "change" elaborates that an organization's digital transformation goes beyond functional thinking and inclusively considers the "comprehensiveness of actions" that needs to be taken to explore opportunities and prevent threats that stem from digital technologies. Hess et al. (2016) stated that organizations face significant challenges even if senior leadership and managemenet teams are internally motivated to support the digital transformation of business models, structures, and processes.

Based on the above there is a clear need for the development of the right skills for the growth and sustainability of an organization. According to Acemoglu & Autor,

(2011), skills are regarded as a resource, a combination of an individual and organizational nature, which allows for competitiveness, productivity and sustainable competitive advantages for firms. Skills has been perceived as a strategic management tool to improve the current business environment (Nyhan, 1998). The current business environment has brought new challenges for organizations; market volatility, higher customer expectations, cultural diversity in a global marketplace, the impact of digital transformation on the organizations core business and new and emerging consumers (Akerman, Gaarder, & Mogstad, 2015; Markowitsch et al., 2001).

There is a demand for managers with the right skills to help organizations overcome the appearing challenges (Vasconcelos, Kimble, Rocha, 2016).

As per the study of (Sousa & Rocha Alvaro, 2019), a model proposal for disruptive skills development that fits dimensions: innovation, leadership and management. A table has been developed of the identified skills and can be viewed in table 1 below.

Proposed model for the development of skills in order to manage disruptive business.

Category of skills	Skills
Innovation skills	– Innovation and creativity – New business opportunities – Project management – Risk management – Efficiency and efficacy – Networking
Leadership skills	– High-performance teams management – Talent management – Motivation and satisfaction – Communication – Careers management – Leadership of multi-cultural employees
Management skills	– New models of work organization – Emergent technologies – Decision making tools – Big data analysis – Organizational change – Strategic management – Social and relational knowledge

Table 1

Proposed model for the development of skills in order to manage disruptive business Sousa, M. J., & Rocha, Á. (2019).

The implementation of this model will promote the prefered acquision of skills for business growth and sustainability.

(Wagner & Wäger, 2018; Laudien & Daxböck, 2016) states that to reduce complexity, managers or leadership tends to revert to prior experience, of familiar strategic choices. Here, “managing the mismatch” between the current and future economic reality and managers' existing cognitive perceptions of old established business models is often a challenge (Velu, 2017: 605). For example, Weill and Woerner (2013: 71–72) stresses that digital business models challenges a physical model in three main areas: 1) internal power, where the “owner” of the customer's experience

often changes, needing a divison of an organization to manage multiproduct customer experiences, 2) business processes, which require seamless integration across channels, and 3) customer data, which become an enterprise-wide resource. Weill and Woerner (2015), therefore argue that management and leadership are less likely to adopt a digital business model compared with smaller, younger enterprises because of the economic and cognitive path dependencies brought about by legacy systems, global operations, work silos, and organizational politics.

Building dynamic capabilities for digital transformation: a process model

A process model that explains how incumbents build dynamic capabilities for digital transformation is presented by Wagner and Wäger (2018). This model specifies three core enablers—cross-functional teams, fast decision making, and executive support—along with three core barriers—rigid strategic planning, change resistances, and a high level of hierarchy, which influence the building of dynamic capabilities for digital transformation.

Building digital sensing capabilities. To build digital sensing capabilities, there is a need to develop new capabilities in digital scenario planning and digital scouting to pinpoint new technological, customer, and competitor-based trends. The use of informal and formal networks in the world's technology hubs leads to identifying technological trends. The importance of big data analytics and artificial intelligence sense new customer-centric trends that are hard for strategic planners to predict (Wagner & Wäger, 2018).

Digital context must be based on crafting a strong digitally oriented culture. They talked about the importance of establishing a long-term digital vision while promoting an entrepreneurial and digital mindset within large established companies.
Crafting a digital mindset and culture throughout the entire organization is essential for building sensing capabilities that will allow management and leadership to seize on the latest unexpected trends (Wagner & Wäger, 2018).

Building digital seizing capabilities. A prominent theme is that strategic agility is the critical dynamic capability for incumbents to seize on the latest trends and avoid potential existential threats according to Wagner and Wäger,2018. Incumbent firms must learn to specialize in pacing strategic actions, and constant redirection is likely to become commonplace for even the most traditional firms. Dynamic capabilities in rapid prototyping provide the opportunity to accelerate a manager's digital transformation, through decentralized-innovation labs or new subsidiaries with a blank canvas to ensure ongoing digital mindset crafting.

Balancing digital portfolios provide management with the capability to up or down scale on business model innovations that have the potential to enhance existing customer needs and demands. This system of capabilities represents the industries current view on what is required to seize on the latest digitalization opportunities (Wagner & Wäger, 2018).

Building digital transforming capabilities. The findings highlight that management must work toward redesigning internal structures through the decentralization of business units and the establishment of independent subsidiaries. In addition, navigating innovation ecosystems can radically address customer needs

compared with firms that maintain traditional product-based business models. These strategic activities help with *improving the digital maturity* of the workforce and support management's ongoing digital transformation initiatives (Wagner & Wäger, 2018).

Cognitive Capabilities of Managers

Skills and knowledge obtained by managers are called, 'managerial-human capital', and are shaped by personal as well as professional experience, including their level of education. The manager's capability in accesssing assets because of relationships and networks is referred to as managerial-social capital. The term "managerial cogninition", points to the opinions and learning models used by managers when making decisions (also referred to as "knowledge structures") (Eggers & Kaplan, 2013; Walsh, 1995), managerial cognitive capabilites, specific ways of thinking (Helfat & Peteraf, 2014), as well as his/her sensibilities (Hodgkinson & Healey, 2011). All three are interlinked (Kor & Mesko 2013). In the last decade the competencies of managers have morfed into the sub-field of "dynamic-managerial cognitive capabilities", where the creation and implementation of new models of business is very important (Helfat & Martin, 2015). Today's fast-moving world of technology, may even be its most important feature. Most managers base their decisions on their capabilities, therefore, moving from the dynamic-organizational capabilities, (Eggers & Kaplan, 2013; Helfat & Peteraf, 2014), and focusing on the dynamic-managerial capabilities. These in turn are bedded in the managerial cognitive capability. Thus sensing, seizing and reconfiguring exists at both the organizational and individual level.

In order to make an obvious connection between the two terms, "managerial capabilities" and "mental activities", the idea of "managerial cognitive capability" is

used, which is the capacity of an single manager to be able to implement at least one (sometimes more) of the mind's cognitive activities (Helfat & Peter, 2014). The human brain performs various mental activities. These include, awareness, observation, and the ability to solve problems (Helfat & Peter, 2014). That the brain's shape depends on experience is revealed through neuroimaging studies (Posner, DiGirolamo and FernandezDuque 1997). An example of this is: "…practice may change the size or number of brain areas involved and alter pathways used in the performance of 'cognitive skills', (e.g., reading) requiring attention" (Helfat & Peter, 2014).

If a mental activity is practiced repetedly by some people (e.g., as when waiters use their short-term memory), they will almost certainly develop better memorization skills, since constant practice builds a better memory. Therefore, path dependence, when developing cognitive capabilities, could perhaps contribute to a diversity of possible and applied performances of the brain's activity (Helfat & Martin, 2015). Environmental scanning is a critical way to assess opportunities for uncertain and complex environments. It is very critical to recognize the chances when they come up and aticipate competitive The recognition of opportunities as they emerge and the anticipation of threats that are competitive, before they appear is very important (Denrell, Fang, & Winter, 2003; Kaplan et al., 2003; Peteraf & Bergen, 2003). Because of dynamic capabilities' component of sensing, which involves the state of being alert and the discovery of process, it essentially includes the creation of, and reaction to, change (Eisenhardt & Martin, 2000; Kirzner, 1997; Gaglio & Katz, 2001).

The framework that Helfat and Peteraf (2014) refer to addressd the following:

- Perception and attention: While observation identifies with design acknowledgment (channel data) and understanding of information, consideration alludes to the mindfulness on the perceptual data accessible. Both are heterogeneous crosswire over supervisors and along these lines impact the capacity to detect. This abilities enables variety in circumstance acknowledgment and creation:
- Problem-solving and reasoning: These two abilities underlie planning and vital speculation choices. Thinking is the assessment of data to reach determinations, which is proposed to be a judicious demonstration. Critical thinking is a greater amount of a programmed 'heuristic process', which is valuable when managing perplexing and indeterminate circumstances that can't promptly be managed.
- Language and communication and social cognition: To reconfigure hierarchical resources, directors need to facilitate the procedure of adjustment. Dialect and correspondence is utilized to encourage arrangement among groups in the association (essentially influence). Social comprehension incorporates seeing, going to, recollecting, contemplating and comprehending the social world. These psychological exercises impact the relations and cooperations of individuals.

Managerial Attention and Initiatives

The question is why do some companies thrive more than others, when they recognize and react to the introduction of revolutionalry core technology (Khanagha, Volberda, & Oshri, 2015)? Organizations have to engage in solutions oriented to efficiency and behaviour which explore by using experiments and variations, as well as, probing further for innovation.(Benner & Tushman, 2003). Exploratory behaviour

through enactment and intepretation focuses on discovering new commodities, services, and businesses to interact with, instead of predetermined chaanges and performance improvement. Therefore exploratory behaviour can be crucial in developing organizations working through technological changes that make their existing bed of knowledge less relevant (McGrath, 2001).

Senior managers play an crucial role when when trying to empower their companies to respond constructively to outside pressures (Eggers & Kaplan, 2009). Existing research has focused largely on the conditions of change which infer a certain gradation of predictibility within the drivers of exploration, rather than unpredictable revolutionary transformation, following the emergance of essential technology that is innovative.(Lavie et al., 2010). Previous discussions and analyses concerning the microfoundations of the capablitlies elaborate on roles played by senior managers' cognitive capabilities, as well as their attention (Eggers & Kaplan, 2013; Walsh, 1995).

Most companies' involvment with innovative technology is not entirely tied to the duties of a senior manager, however the perception and alertness of managers with seniority are significant to the timing and the way engagement occurs during major changes in technology (Eggers & Kaplan, 2009). In order for senior managers in emerging technologies to succesfully drive revolutionary technological changes, attention and a large scope of resourcefulness is required to be taken by the manager throughout various aspects of the company. The attentiveness of a manager is necessary to ensure resource allocation thougout all divisions. This also includes having the skills to use new technology and to develop a work experience which enables the employees to experiment and gain more knowledge in an area that is still relatively unknown.

Managerial initiatives are required to drive a procedure that looks outward and uses an experimental learning process without impacting continuing efficiency-orientated activities of the corporation (Hambrick and Quigley,2014; Adner and Helfat, 2003). To achieve the above, there needs to be a focus on the tactics that help managers increase the quality of their resolves, when they are faced with high unpredictability in the environment of their business (Helfat & Peteraf, 2014).

Network Management

The initializing phase of launching and growing a new venture requires entrepreneurs to use their networks to organize and position resources for opportunities (Ebbers, 2014; Fand, Chi, Chen, & Baron, 2015; McGrath, Medlin, & O'Toole, 2017; Newbert, Tornikoski & Quigley, 2013). Social network capabilities refer to an entrepreneur's ability to mobilize resources available within social networks (Fang et al., 2014). Social networking can boost the boundaries of reasonableness that an entrepreneur can see when making decisions on opportunities (Adomako, Danso, Boso, & Narteh, 2018).

Networking with social peers creates an opportunity for entrepreneurs to explore new and diverse business opportunities (Alrich & Zimmer, 1986). The capability of a network is basically evolutionary as opposed to it being inherent (Moller & Svahn, 2003), as organizations are forced to build these capacities internally (Teece, Pisano, & Shuen, 1997). A critical component of any organization is the strategic-network capability that managers and their partners build for access, activation and co-shaping the company's assets with those of other companies so as to improve or alter a network, or both. (McGrath, Medlin & O'Toole 2017).

Advancement was referred to by Pettigrew (1997) as a “sequence of individual and collective events, actions, and activities unfolding over time and context.” Furthermore, a detailed comprehension of unique patterns of development is offered by the process of “temporal mapping of events and activities” (Aaboen, Dubois, & Lind, 2012; Ancona, Okhuysen, & Perlow, 2001; Gersick, 1994) which includes “grasping a shift” under specific circumstances (Anderson & Medlin, 2016; Medlin & Tornroos, 2015). The evolvement of network capability does not take place through coercion or development through mechanical ways, but instead by changing the comprehension of managers, and the mutual growth between organizations. Over time, revision, as well as most managers’ inclination to decrease the way they rely on their ties to a network, can take place. (McGrath, Medlin, & O'Toole, 2017; Nordin, Ravald, Moller, & Mohr, 2017).

The development of a clear comprehension of network capability can be an ongoing process, from a network-approach perspective, and this is based on maintaining an awareness and an openness toward understanding the way other people are aware of, and recognize, the perception of their network. Another key aspect is being alert, while understanding the multiple temporal horizons and profiles of activities and happenings within an organization with reference to specific problems; and the relevant actors required to drive that opportunity (McGrath, Medlin, & O'Toole, 2017; Lowe & Rod, 2017). Nordin, Ravald, Moller, and Mohr (2017) state that organizations, which introduce innovative improvements into the company should behave as if the part they play in a particular network is perceived as that of a leader; from the perspective of technology and marketing.

Since uncertainty and unpredictability would be navigated by the shareholders this would require of them to continuously learn, and incorporate knowledge, flexibly. (Moller & Svahn, 2009). Network management can solidify its growth by merging the capabilities and initiatives of a diversity of stakeholders, while making sure they maintain an important place as entrepreneurs in their market. Managing a network in new high-tech environment is made up of three capabilities that are related to each other and have network-positioning potentials. These are the following: to make sense of the developing business market, while influencing the way it grows, assessing opportunities and threats continuously and being able to forecast the potentials of diverse futures, and finally, employing new people in the networks, leading to the consolidation of how all employees interact in order to come up with feasible results (Nordin, Ravald, Moller, & Mohr, 2017)

Managerial Creativity and Foresight Capability

For organizations to sustain a competitive advantage, continuity in capability development is essential (Balarman & Sundarraj 2017). One such capability is foresight that helps foresee, envisage, and make plans for different types of futures (Teece, 2007), while aiming to reach that goal. Tsoukas and Shepherd, 2004 state that foresight capability means to have the capacity to view a variety of futures, seeing beyond confusion that seems superficial, acknowledging what is developing before it becomes a trend, visualizing patterns before they come to the forefront, and understanding the landscapes that have a relationship to social, entrepreneurial, and technological trends; all which will mould the direction of events in the future, and will assist organizations with handling the constant changes that modern times have brought on.

Creativity is regarded as a very important skill, which is needed for managers when they make decisions of strategy consequently companies must comprehend how managers use behaviour that is creative in order to discover the best solutions to their problems (Somsing & Belbaly 2017). Problems and tasks in general vary from being basic and then becoming complicated or ambivalent, or both (Campbell, 1988). This requires managers to find new solutions to problems, methods to incorporate risk preferences, and dynamic capabilities that will change problems that exist, into innovative results (Somsing & Belbaly 2017).

The assessment of risk preferences may be evaluated through the consideration of individual factors as well as contextual ones. Past performance and factors of context like supervision influence managers' risk preference and are considered individual factors of influence. (Wiseman & Gomez-Mejia, 1998; Barraza- Kintinna et al., 2007). The Integration, the combination, and the configuration of various origins of understanding and information need to be implemented by managers; dynamic capability is the result. (Teece et al., 1997; Teece, 2007).

Somsing and Belbaly (2017) recommend a model that will provide direction to managers for creativity, stating that organizations must develop the ability to take more risks in order for this creativity to be sustained. Secondly, companies could come up with various chores and projects that would lead to stimulating managers to develop a diversity of new explanations and concepts. Thirdly, because of their performance, managers' high reference points should be supported by organizations as an expression of their confidence, and belief in these leaders' capacity of being creative in a successful way. Tasks should be complex, challenging, and highly rewarded. Finally, organizations

should be cognizant of when managers are not able to deliver due to a high amount of risk or lack of adequate dynamic capabilities, in order to be able to offer them the correct assistance and coaching.

Building Digital Transformation in Large Organizations

Organizations and society are influenced and exposed to digital technology. The rise of addictive, real time, and customized solutions is becoming a necessity instead of a luxury. The only certain thing is that the rate of change will continue to accelerate, and all organizations have to focus on exponential technology or face the danger of falling behind or becoming obsolete. Many organizational executives spend more time on, "doing" at the expense of, "thinking", according to Simester (2016).

The purpose of strategic thinking is to find strategic insights. Strategy is about choice, which markets to compete in, and which markets to avoid, therefore strategic insight focuses on the boundaries separating attractive markets from unattractive markets (Simester 2016). Due to the increasing speed of changing technology and the inconsistency of quite a few of sectors, the need for transformation is increasing, while the opportunity to successfully achieve it is decreasing (Reeves, Faeste, Whitaker, & Hassan, 2018). Transformation is not simply about cutting costs -- gaining investors' confidence is crucial, ensuring that the organization remains viable and resists short-term market pressure.

Research and development investment that supports transformation success and strategy, as well as the increase in profits become more significant factors for long-term success (Weill & Woerner, 2018) and long-term strategy (Weill & Woerner, 2017) Leadership changes guide the way toward the odds of transformation becoming more

successful, as does a formalized transformation program with sufficient scope and scale. (Reeves, Faeste, Whitaker, & Hassan, 2018; Weill & Woerner, 2018). Scholars suggest that organizations preparing for a digital future need to align their people, processes, customer relations, and culture for long-term digital success (Bughin, Catlin, Hall, & Zeebroeck, 2017; Kane, Palmer, Phillips, Kiron, & Buckley, 2016; Reeves, Faeste, Whitaker, & Hassan, 2018; Weill & Woerner, 2017; Weill & Woerner, 2018).

Organizations need to start by focussing on their strategy, which typically involves a sequence of intense sessions among the main shareholders of these companies to identify potencial areas of digital disruption, (Bughin, et al., 2017). Culture, on the other hand, requires organizations to actively engage in efforts to bolster risk taking, agility, and collaboration, and constantly innovate to improve customer experiences while reducing cost (Weill & Woerner, 2018; Kane et al., 2016). Customers are, increasingly, expecting new features, service, value, and personilization, based on new digital experiences across various industries (Bughin, et al., 2017; Kane, et al., 2016).

Organizations that provide their management and leadership with the correct initiatives and the chance to evolve their digital acumen in a technological work setting will probably be able to hold on to their expertise. The attributes of being a transformation-visionary, a progressive thinker, having a mindset open to change, as well as possessing other skills used in leadership enables leaders to transform in a digital environment. (Kane et al., 2016). Additionally, Reeveset al. (2018) discuss that when CEOs transformed companies, the effects in the long-term were positive, leading to the likelyhood of successful results that become transformational.

Organizational Innovation

Organizational innovation is the succesful implementation of new organizational methods within a firms practices, workplace and external stakeholder relations (Mohnen & Hall, 2013). It is a prerequisite to embracing and adopting product, market and process innovation (Haddud, McAllen & DeSouza 2018). The integration of "digital" into the organization's structures, processes, systems and incentives is known as digital business according to Wolfram (2015). A digital organization or business uses technology as a competitive advantage for its operations (Rakesh & Kannan, 2017, p.1). The impact of new digital technologies within organizations (current and future), which creates significant improvements are defined as digital transformation (Fitzgerald et al., 2014; Warg, Weiß, Engel, & Zolnowski, 2016). Digital transformation is an ongoing and complex task that can significantly shape the future of an organizatopn and the way it operates (Matt, Hess, & Benlian, 2015).

For the full alignment of these relationships, which are corprate strategy, operational strategy and functional strategy, four main dimensions of digital transformation needs to be integrated, i.e. use of technologies, changes in value creation, structural changes, and financial aspects (Matt, Hess, & Benlian, 2015).

According to Weill and Woerner (2015), digital disruption is a process that creates high impact changes for businesses withing idunstries on the following attributes: 1. Rapid digitazation, 2. Elimanating industry barriers, 3. Creating new business opportunities and 4. Making long-successful business models redundant. There are two main areas that contribute to the digital disruption, first is people's ability to produce, store, process, and transmit digitally coded information and secondly the emergence of

new technology enablers e.g. cloud computing, Internet of Things, additive manufacturing, social media, big data analytics, artificial intelligence (Pajarinen et al., 2015).

To achieve that we need to have an integration of end-to-end business processes and operations for the sharing and transferring of information across the entire business to enhance aspects of traceability, transparency, trust and security. That is known as digital integration (Pal & Sandberg, 2017). Digital strategies focus area will be on the co-creation and collaboration concept, where humanization of business, interactivity and engagement will help in delivering value (Javeen, 2014). Pettey (2015) states digital humanism seeks to enable employees to achieve tasks that they never thought was possible or redefine the way their goals can be achieved.

Globalisation has forced organizations to embrace strategies that address globalized marks which include individuals from different business communities. A variety of digital technologies forms part of a significant element of the growth and success of global business endeavours (Haddud, McAllen, & DeSouza, 2018). The digital revolution will continue to have enormous influence on which business models are succesful and which are not (Kadar, Moise, & Colomba, 2014).

Due to organizations becoming more digitized, digital innovation requires dynamic set of leaders within the organization and across the entire global business environment with diverse golas and capabilities, to produce a new calabre of innovative processes, and, more broadly, tramsform there entire industry inits wake (Nambisan et al., 2017). Organizations are now faced with the need for effective and efficient management or leadership for digital innovation. Effective management fordigital

innovation requires organizations to focus on systemic processes used to develop new and improved business processes, services, products and solutions. The development of creative ideas are also needed to enable organizations to sustain growth in the digital age (Kadar, Moise, & Colomba, 2014)

Managers within organizations require a set of leadership skills that will enable them to deal with the ongoing adoption of digital technologies and the need to build, and effectively m,anage, succesful innovation plans (Ramilo and Embi, 2014). The complex relationships amoung technological and managerial knowledge resources, as firms internal resources, may lead to introductions of different types of innovations that bring required capabilities and distinctive competencies to the organization and provide a competitive edge or advantage (Camison & Villar - Lopez, 2014).

Building the Digital Enterprise in South Africa

Different smart technologies are speeding up the digital transformation of manufacturing and enabling a decisive move towards what is referred to as "industry 4.0". The expression "industry 4.0" is used when referring to the next step in the growth in an organization's value-chain process on the manufacturing industry, also known as the, "fourth industrial revolution" (Pillay, Ori & Merkofer 2016). Digital transformation is now a priority for most CEOs in South Africa. According to a survey completed, more than 27% of industrial organizations have rated their level of digitization as high, and this figure is expected to increase to 64% within the next five years according to Theron and Botha (2016). The sector of state-of-the-art materials and manufacturing processes are the most important smart technologies for digital transformation, which requires advanced computing and data capabilities, as well as connectivity. Suppliers, business partners, and

customers (e.g., crowdsourcing, gamification, mass customization, and collaborative consumption), will have the opportunity to be effortlessly introduced to new interaction and cooperation models, because of smart technologies (Pillay, Ori, & Merkofer 2016).

To prepare for this change at an exponential speed, South African organizations need to align their infrastructure, up-skill their workforce, expand their product portfolio with digital offerings, and focus on driving both revenue growth and operational efficiencies (Pillay, Ori, & Merkofer, 2016; Theron & Botha , 2016). Many of South Africa's large corporations, not within the banking, high tech or telecommunication, which are currently ahead, are still in the early stages of their digitization journey. According to Sibanda (2019), there are four key steps South African businesses can align too from global to economic performers. The first step is the need to increase agile practices to accelerate digitization. What that would require is how fast and adaptable organizations are setting, executing and adjusting their digital strategies.

The second step is taking advantage of the ecosystems. In 2025 McKinsey expects 12 distinctive ecosystems to emerge with regards to fundamental human and organizational needs and these ecosystems will account for approximately 30 percent of the global revenue. A clear example of that is a South African insurer Discovery who is currently at the forefront of ecosystem thinking with its Vitality platform. Currently there are millions of users tracking their health using Vitality and earn loyalty points for participating in various activities. They have penetrated the global market.

The third step is using mergers and acquisitions to build new digital business capabilities. (Sibanda 2019), says that not only are leading organizations spending on mergers and acquisitions (M&A), however they investing in a variety of different M&A

activities. South African organizations would do great if they step up their level of M&A activity. The one constraint, however, is the lack of a vibrant start-up landscape.

Lastly, is the investment of digital talent. There is a huge constraint in South Africa, when it comes to digital talent. Rapid advances in the three-dimensional (3D) printing, big data, cloud technologies artificial intelligence and robotics have huge potential to impact the world of work (Frey & Berger, 2015). Simultaneously, organizations are struggling to find the right talent in areas that cannot be automated (Kane et al., 2016). Skills like problem solving, intuition, creativity and persuasion abilities have proven difficult to automate (Autor, 2015).

According to Pillay, Ori, and Merkofer (2016) and Theron and Botha (2016), other challenges facing organizations, centres around soft skills such as culture, organizational leadership, training and talent. For organizations to respond to these radical new approaches of business, in a sustainable and succinct way, a shift in the learning needs to take place. A culture of 'continuous learning' needs to be embedded in today's learners. Continuous learning is, "structuring resources, expectations, and learning culture in such a way as to encourage employees to learn continuously throughout their tenure with the organization" (Mallon & Johnson 2014). A culture of 'demand learning' needs to be established within organizations, where employees access learning in unconventional ways and a 'problem-solving culture needs to be inbred into the learning culture and any learning activity that derives from it (Pillay, Ori & Merkofer 2016).

As automation, cognitive technologies, and artificial intelligence gain traction, South African organizations have been challenged with the reinvention of employee's

roles, needing to assign some tasks to humans, other tasks to machines and others to hybrid model in which technology augments human performance. Managing both humans and machines, while simultaneously retraining virtual workers and pioneering new HR processes for the management of virtual workers, cognitive agents, bots and the all other AI-driven capabilities creating the "no collar" workforce (Abbatiello, et al. 2018).

In Africa, the no-collar workforce presents complex challenges within the developing markets due to the high unemployment rates. The highly regulated labour environment presents obstacles, however with technological readiness and availability of cloud platforms, this could make it possible for organizations in South Africa and the rest of Africa to gear up for this much needed transformation (Abbatiello, et al. 2018). What is required for the development of a no-collar workforce is deliberate planning. Machines and humans can work well together if challenges are anticipated well in advance and the appropriate resources and governance structures are in place. Some of the steps recommended by Abbatiello, Boehm, Schwartz, and Chand, (2018) are assessing your needs which would require management and leadership to identify all areas in the organization where mission-critical activities that donot contain uniquely human work elements donot occur. Its important to let needs, not technology drive the organizational strategy.

Understanding how the work currently gets done is another step. Every individual task within a defined process, needs to be analysed and who is performing the task needs to be identified. The skills/ competencies that is required to complete the task, and the technologies enabling not only that specific task but adjacent or dependent tasks within

the larger process need to be identified as well. The findings will help you challenge the organizations assumptions about existing processes, and then explore different talent options and technologies that can be used in concert to improve overall process Categorise skills and tasks, investigate tools and tactics are some of the other steps recommended by Abbatiello, Boehm, Schwartz and Chand (2018).

Competitiveness in Digital Economy for Large Organizations in South Africa

Innovation is a significant force of change in a lot of organizations, yet, innovation still relates to industrial processes and artefacts in the minds of many people. In many organizations, the ability to administer and take advantage of how much knowledge they can obtain is where real economic worth lies, further, it must be used with for the purpose of achieving the goals of the company and what it has to offer. (Craffert, Ungerer, Visser, Morrison, & Claassen, 2014). When it comes to innovation and technology for businesses, they lean toward acquiring digital and disruptive types, thus creating the possibility for renewed market competition.

A product or service used by an existing business that first establishes itself through simple applications at the bottom of a market and then aggressively moves up eventually displacing established competitors is described as the process of digital disruption. (Wladawsky-Berger, 2014). With the new way of thing and working, key issues relating to digital transformation are not the onus of the CIO or Information and Communication Technology (ICT) practitioner, they are the responsibility of all business functions, as understanding the nature of the changes that are present will impact all levels and functions of the organization.

Information and Communications Technologies (ICTs) is regarded as significant sector for job creation and economic development, especially in developing countries with growth challenges and unemployment problem. The Organisation for Economic Co-operation and Development (OECD) defines ICTs as a "combination of manufacturing and service industries, whose products electronically capture, transmit or display data and information. The production (goods and services) of a candidate industry must primarily be intended to fulfil or enable the function of information processing and communication by electronic means, including transmission and display" (OECD, 2009).

Since the 1990s, the world is witnessing major advances and innovations in ICTs sector accompanied with a tremendous growth of global networks connections. The new wave of what so-called "digital revolution" has introduced new technologies that have shifted governments, organizations and markets focuses towards a new globally digitalized economy. Digital transformation process would deigned a complete new development strategy that encompasses different pillars such as: Competitive ICTs sector, free market mechanisms, competitive business sector, highly qualified human capital, and an independent regulatory authority (Adam, 2019).

For the sustainability of digital transformation, inclusive, coherent and well-coordinated policies, reflecting all the involved stakeholders: government, organizations, and development partners needs to be a prerequisite. Expanding network coverage to deprived rural areas, guaranteeing universal access to affordable internet online services, and developing e-government online services are vital policies that African countries must speedily take serious steps to undertake in order to catch fully the benefits of the digital revolution (Adam, 2019). Unlocking the value of an organization will require a

more comprehensive set of digital skills. Moving forward, the concept of e-leadership becomes increasingly significant — this alludes to the mixture of expertise that uses ICT structures in organizations that are in the lead (Wladawsky-Berger, 2014).

The 2016-2017 Global Competitiveness Report by the World Economic Forum (WEF) ranks South Africa 47th globally in terms of competitiveness (Schwab, 2017:25). South Africa's ranking was accredited to the country being a leader in the region in financial markets and infrastructure among other factors (Schwab, 2017:25). Moreover, South Africa ranked in the top five, out of 138 countries, for financial services meeting business needs, financing through local equity markets, soundness of banks and regulation of securities exchanges (Schwab, 2017:25). While the financial sector is thus a significant contributor to the South African real economy, the World Economic Forum (WEF) notes that in order to increase competitiveness, there has to be a rise in productivity as well as a focus on creating an economic environment in which emerging business models and technologies can foster economic growth (Schwab, 2017:9).The success of South Africa's financial sector is attributed to its meeting the needs of businesses and its efficient functionality in terms of providing finances without adversely affecting financial stability. An important factor impacting on the stability and profitability of banks is their ability to manage the information of their clients (Mungai & Bayat, 2018).

In South Africa, the development of e-competency ability, in all functional roles such as e-leadership, is necessary for expansion, and important for becoming competitive. In order for companies to lead in the digital economy, three specific priorities need to be taken into consideration, namely: an internal organizational emphasis for e-users and e-

leaders to the develop digital skills, advanced skills for users and leadership to assist with identifying opportunities that are novel, plus encouraging leadership that drives digital competences to an above average level thus unlocking new opportunities within the digital economy (Craffert, et al. 2014).

Summary

For the success of large organizations in South Africa to implement cognitive capabilities required at management level for the agile transformation towards digitization, a few important concepts had been highlighted throughout the review of this literature. The first few concepts focuses on knowing when and how much agility is needed for an organization to be effective and efficient. Dynamic capability characterized by organizational routines, highly effective cognitive-managerial skills, robust organizational designs, and the company's capacity to unite, establish, and restructure the expertise within it where some of the key concepts that had been identified to achieve that's state of agility (Teece, Peteraf & Leih 2016).

In the literature Teece (2007) states that dynamic capabilities can be divided into: "Microfoundations", which include adjusting and improving an organizations existing potential, while creating new ones. "High order dynamic capabilities", where the heads of the company with strong competencies that are sustained by certain administrative procedures, decide what is important in order to sense, seize, and transform what is needed to create and execute a business model. Based on the above, there is an urgent need for organizations to assess the level of skills and competencies within their organizations, revisit their business models, and develop the right skills for digital transformation.

The next few concepts focusses on digital transformation in large organizations. Customers in general are looking for real time, and customized solutions for long-term sustainability and profitability. Many organizational executives spend more time on, "doing" at the expense of, "thinking", according to Simester (2016). Strategic thinking is crucial in understanding which markets to compete in, and with transformation increasing, opportunity to successfully achieve it is decreasing (Reeves, et al., 2018). Another key concept is organizational innovation focussing on digital organizations or businesses using technology as a competitive advantage for its operations (Rakesh & Kannan, 2017, p.1). What is evidet from this literature is that for organizations to transform digitally, they need to look at new digital technologies that will impact their organizations (current and future) to creates significant improvements (Fitzgerald et al., 2014; Warg et al., 2016). There are two main areas that contribute to the digital disruption, first is people's ability to produce, store, process, and transmit digitally coded information and secondly the emergence of new technology enablers e.g. cloud computing, Internet of Things, additive manufacturing, social media, big data analytics, artificial intelligence (Pajarinen et al., 2015).

The last concepts of the literature focusses on building large digital enterprises on South Africa and the competitiveness thereof. For South African organizations to be sustainable and profitable, it need to adapt and support the digital journey of transformation, by aligning their infrastructure, up-skilling their workforce, expand their product portfolio with digital offerings, and focus on driving both revenue growth and operational efficiencies (Pillay, Ori, & Merkofer, 2016; Theron & Botha , 2016).

According to Sibanda, (2019), there are four key steps South African businesses can align too from global to economic performers. 1. Increase agile practices to accelerate digitization. What that would require is how fast and adaptable organizations are setting, executing and adjusting their digital strategies. 2. Taking advantage of the ecosystems. In 2025 McKinsey expects 12 distinctive ecosystems to emerge with regards to fundamental human and organizational needs and these ecosystems will account for approximately 30 percent of the global revenue. 3. Using mergers and acquisitions to build new digital business capabilities. (Sibanda, 2019), says that not only are leading organizations spending on mergers and acquisitions (M&A), however they investing in a variety of different M&A activities. South African organizations would do great if they step up their level of M&A activity. 4. The investment of digital talent. There is a huge constraint in South Africa, when it comes to digital talent.

A culture of 'continuous learning' needs to be embedded in today's learners. Continuous learning is, "structuring resources, expectations, and learning culture in such a way as to encourage employees to learn continuously throughout their tenure with the organization" (Mallon & Johnson 2014) is another crucial component for the success of digital transformation. From a competitive advantage viewpoint in large organizations in South Africa, the development of e-competency ability, in all functional roles such as e-leadership, is necessary. In order for organizations to lead in the digital economy, three specific priorities need to be taken into consideration, namely: an internal organizational emphasis for e-users and e-leaders to the develop digital skills, advanced skills for users and leadership to assist with identifying opportunities that are novel, plus encouraging

leadership that drives digital competences to an above average level thus unlocking new opportunities within the digital economy, (Craffert et al., 2014).

Chapter 3: Research Method

The problem is there has been a lack of understanding among many managers in large organizations on how to develop cognitive capabilities used for building organizational agility and dynamic capabilities for digital transformation (Albort-Morant et al., 2018; Verma Bharadwaj & Nanda, 2017; Teece, 2017). Researchers have noted that significant and positive influence of dynamic capabilities confirmed the importance of organizational agility in contributing to the organizational performance (Teece; 2007; Teece & Linden, 2017). Today's large organizations has embraced digitalization strategies to expand or enhance their organizations. In the past decade, research has identified the cognitive capabilities of team leaders as being the 'micro-foundation' for building the literature of dynamic capabilities (Bendig et al., 2018; Helfat & Martin, 2015). Consideration of temporal contexts of dynamic capabilities has led to recommendations for qualitative studies that has provided an in-depth understanding of how managers from large organizations attempting digital transformation leveraged their competence factors to build organizational agility and support the dynamic capabilities needed in a highly dynamic business environment (Teece & Linden, 2017; Shepherd, McMullen, & Ocasio, (2017).

The purpose of this qualitative, multiple-case study was to describe and document insights from SMEs on how managers from large-sized organizations in South Africa can leverage their cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation. South Africa was an appropriate choice as the local context of this study, given that in this nation 48% of all organizations had initiated transformations that are digital and by 2019, 44% will do the same (IT News

Africa, 2017). The research design that was used had been the multiple-case study type, satisfying the aim of this descriptive-case research study in the best manner Yin, (2017) which focused on the following managerial-cognitive capabilities: attention to emerging technology, initiative and exploratory behavior; network management, and foresight capability.

The requirement to ask the right research questions has been highlighted by Browne and Keeley (2007). As such, it was important to identify suitable questions for the research. The following questions were used, and had been generated, in order to discuss the purpose and problem of the research.

RQ1: What are the perceptions of SMEs, regarding how managers from large-sized organizations in South Africa attempting digital transformation can leverage attention to emerging technology to build organizational agility, and support dynamic capabilities?

RQ2: What are the perceptions of SMEs, regarding how managers from large-sized organizations in South Africa attempting digital transformation can leverage initiative and exploratory behavior to build organizational agility, and support dynamic capabilities?

RQ3: What are the perceptions of SMEs, regarding how managers from large-sized organizations in South Africa attempting digital transformation can leverage *network management* to build organizational agility, and support dynamic capabilities?

RQ4: What are the perceptions of SMEs, regarding how managers from large-sized organizations in South Africa attempting digital transformation can leverage foresight capability to build organizational agility, and support dynamic capabilities?

Research Methodology and Design

The customary ways for dealing with social-science research has been positivism and post-positivism. (Noor, 2008). Positivism echoes the approach taken in the natural sciences, where the researcher endeavours to reveal actualities about the social world, which has been incorporated with a “chain of causality” (Noor, 2008). Post-positivism addresses a reality, which isn't equitably chosen, however is socially developed.

The contextual analysis technique which was characterized by Robson (2002) is “a procedure for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real-life context”. Defining the research questions was probably the most important step that had been taken in a research study, so patience and sufficient time was allowed for this task. The key was to understand that research questions have both substance (for example: What is my study about?) and form (for example: Am I asking who, what, where, why, or how question?).

Generally, the “what” questions was either be exploratory (in which case any of the strategies could be used) or about prevalence (in which surveys or the analysis of archival records would be favored). “How” and “why” questions were probably favourable for the use of case studies, experiments, or histories (Yin, 2017).Case-study design was the preferred research method when researchers lacked control over behavioral events, specifically when the events of interest were contemporary ones.

It allowed direct observation of these events, and the involvement of the person being interviewed (Yin, 2017). It had been, likewise, proper for the investigation of, “contemporary phenomena”, where the limits between the specific situation and the case

may have not been clear (Rosenberg and Yates, 2007; Yin, 2017. The case itself might have been an individual, an event, entity, or other unit of examination (Noor, 2008).

When focused on an individual, a single case concerns one individual, although the investigation of more than one individual had constituted a multiple-case study (Yin, 2017). The multiple-case study approach attempted to replicate the same findings across multiple cases by exploring the differences and similarities between and within cases. They had distinct advantages and disadvantages in comparison to single case-study design. Evidence of multiple-case design has often been more compelling and therefore the overall study has been regarded as more robust (Herriott & Firestone, 1983).

On the other hand, when conducting a multiple-case study extensive resources were required and excessive time beyond the means of a single student or independent researcher were needed, therefore, when undertaking multiple-case studies, every case had to serve a specific purpose within the overall scope of inquiry (Yin, 2017). Any utilization of multiple-case designs had to follow replication, not a sampling logic, and cases where be chosen carefully by the researcher or investigator. The cases shad to serve in a similar manner to multiple tests, with comparative outcomes (a literal replication) or differentiating results (a theoretical replication) had been anticipated expressly at the outset of the investigation. The replication design did not really imply that each case study needed to be either holistic or embedded. Individual cases, inside a multi-case study design, might have been either. When an embedded design was used, an individual-case study may in fact have included the collection and analysis of highly quantitative data, as well as the use of surveys within each case (Yin, 2017; Stake, 1995).

Triangulation was for the most part thought about as a procedure of utilizing various recognitions to clear up importance, checking the repeatability of a perception, or elucidation. It additionally served to elucidate importance by recognizing the diverse ways that the phenomenon had being seen (Stake, 1995). Notwithstanding the above, the utilization of the different-case approach was especially helpful here since it permitted the researcher the adaptability required to emphasize and broaden a surviving theoretical model (Stake, 1995). Advancement of hypothesis from contextual investigation utilized the observational proof gathered to inductively create theoretical constructs. The theory emerged from the recognition of patterns in the collected data, and the logical arguments that underpin them (Eisenhardt & Graebner, 2007).

A case-study strategy was a very worthwhile way of exploring an existing theory while a well-constructed case-study design enabled the researcher to challenge it and provide a source of new research questions (Saunders et al., 2009). The development of theory from a case study used the empirical evidence to inductively develop theoretical constructs. The theory emerged from the recognition of patterns in the specified data and the logical arguments that underpinned these patterns (Eisenhardt & Graebner, 2007). The case-study design, despite its favourable circumstances, was scrutinized for its relative weakness as a technique for testing hypothesis and difficulty in generalizing from a specific case (Flyvbjerg, 2006). Contextual investigation did not try to find hard guidelines or certainties, or test hypotheses. This was a concern since the researcher's goal was to make a unique contribution to the field of institutional theory. Be that as it may, the current scholarly literature focused on how this might be accomplished. In place

of hypotheses, the researcher created hypothetical propositions, which was utilized to guide the design and ultimate analysis of the case (Yin, 2017).

Propositions were derived from the scholarly literature, theories, analysis of empirical data, and the researcher's personal contributions. Propositions were equivalent to the hypothesis of quantitative research methods (Baxter & Jack, 2008). They had been refined through the pilot test period of the research (Yin, 2017). Instead of a hypothesis to be tried, they were tools to guide the exploration. Hypothesis testing required the isolation of a phenomenon from its unique context, while case research assessed propositions in their appropriate setting (Eisenhardt & Graebner, 2007).

Unit of Analysis and Case Selection

The unit of analysis in this study was the SME or domain expert who had been an authority in a specific area or topic required to facilitate the development of innovation at initiation. Specialists of this specific study in the academic literature were selected based on a theoretical sampling model (Eisenhardt & Graebner, 2007). Multiple cases were sampled for their ability to illuminate theory and explore constructs and alternative explanations. Theory building from case studies was a relevant research method that formed the basis of many influential studies (Stake, 2013).

Legitimate challenges to case-study research were mitigated through accurate language and rigorous research design: careful validation of theory building, theoretical sampling of cases, interviews that limit informant bias, rich presentation of evidence, and clear statement of theoretical arguments, resulting in renewed theory that had bridged well from rich qualitative evidence to mainstream deductive research (Eisenhardt & Graebner, 2007). When the researcher began to see the same things repeatedly, with

minimal or limited new data found from the interviews, a point of data saturation had been reached (Merriam & Tisdell, 2015). For this reason, the subjects chosen in the sampling process were widely cited in the literature, and a snowball sampling technique (Hatch, 2002) had allowed them to propose similar expertise to others.

Population

The population for this study comprised of a set of individuals, places, and/or documents, (Yin, 2017). The sample of this study was derived from a population of academics of peer-reviewed papers published in scientific journals and indexed on Google Scholar between 2017, 2018 and 2019 when undergoing a word search under the term: "Managerial Cognitive Capabilities on Digital Transformation." The total number of SMEs' interviewed completed were ten. In addition, a sample was also obtained from the LinkedIn online professional network by participants meeting the inclusion criteria assigned for the study's sample.

Selected scholars who are authors among this population of published documents have terminal degrees from accredited institutions and have conducted empirical and theoretical studies in the area of cognitive capabilities, dynamic capabilities for digital transformation, as well as being academics and researchers in the area of strategy and technology. Lastly a sample was also attained from SME's of large South African organizations with years of experience in management and that were knowledgeable in the field of digital transformation. The inclusion criteria of the sample for this study were as follows: 1) adults over the age of 18, 2) practitioners or academics or both with at least five years' experience in management, 3) professionals with peer-reviewed publications on this topic.

Sample

Sampling strategy. Quantitative studies involve large random samples, however, this research focused on 10 SME's in various industries at an executive level. This approach is in line with the purpose of the research, which is to generate qualitative insights based on "information rich cases for in-depth study" (Patton, 2014, p.264). This research design focused on a purposive and stratified sampling method, as the required information is held by only a small fraction of the digital transformation community. This validated approach, used in qualitative research for instance for sourcing informants consists of grouping the target population into strati and then randomly selecting some from each stratum (Robinson, 2014). Interviewing experts from different states of the digital transformation in large organizations industry, was intended to limit bias by ensuring contrasting points of views (Baxter & Jack, 2008).

Sample criteria. Criteria based on knowledge and skills are commonly used in purposive sampling, for instance to source informants (Robinson, 2014). The inclusion criteria of the sample for this study were as follows: 1) adults over the age of 18, 2) practitioners with at least five years' experience in management and, 3) academics with peer-reviewed publications on this topic. Exclusion criteria included those who did not fit the inclusion criteria and those are not listed on the Johannesburg Stock Exchange (JSE). These vendors had been excluded as their views of the market could present a biased view, however their viewpoint does remain an important source of "peripheral participant" data (Fusch & Ness, 2015, p.1412) and was reviewed as preliminary material for the literature review.

A total often SMEs were selected for this exploratory study as case studies can be relevant with very few participants (Tracy, 2010). For a multiple-case study approach, about seven-10 SMEs was found to be an adequate number (Mason, 2010; Yin, 2017). Consensus had been obtained on the fact that 10 SMEs might be enough quorum to generate valuable insights with limited complexity (Schram, 2006). Studies have shown that saturation of the data is achieved once additional samples findings, do not result in any additional or contrasting information (Merriam & Tisdell, 2015). Information saturation and repetition are a measure of sample adequacy (Morse, Barrett, Mayan, Olson, & Spiers, 2002).

Sample selection. The ten SMEs were selected based on the listed criteria (Yin, 2017), but also on their years of experience and knowledge of the topic. The fact the first SMEs were already known by the researcher facilitated the development of a trust relationship, which allowed for a detailed exploration of their views on the studied topic (Rowley, 2012). This approach, widely used in purposive sampling, is adequate provided diversity in the SME's profiles is maintained in the selection and validation process (Merriam & Tisdell, 2015). The remaining four SMEs were found through snowball sampling (Patton, 2014). The ten SMEs were invited to join the study (Appendix A) and, upon acceptance, were sent an Informed Consent Form (Appendix B). On completion of the forms, one-on-one interviews were completed.

` SME's were informed at the beginning of the interviews about the purpose of the study and were given the opportunity to review the transcripts of the video recording and findings before submission of the paper as per the code of ethics. The neutrality of the interview questions was designed to avoid bias responses (Roulston, 2010). The depth of

sampling guided by the inclusion and exclusion criteria allowed for prompt saturation while ensuring quality of data. Continuous analysis of the collected interview data provided more feedback so that the researcher was able to refine the semi-structured questions and ask the first SMEs for additional information if needed (Morse et al., 2002; Yin, 2017). There was variance in the sampling selection of the case studies so that the trustworthiness of data could be strengthened (Elo et al., 2014). Rather than a collection of representative cases, the studies objective was to identify and share "extraordinary" cases that stood out for several reasons and made an impression on the SMEs (Seawright & Gerring, 2008). The SMEs came from Large South African Organizations and based in different industries to limit the bias. The sample variance allowed a cross-case analysis by triangulation, for better transferability of the study (Stake, 2005).

Materials/Instrumentation

A research design can be exploratory, descriptive, or causal. For this present exploratory research, data was collected in an unstructured format (Zikmund, Babin, Carr, & Griffin, 2012). The semi-structured interviews consisted of four open-ended questions to leave enough room for the SMEs to fully express their views. The initial questions were regarded as topics to elaborate on and subject to being refined along the interview process (Yin, 2017).

The interview questions were grounded in Teece's (2007), sensing-seizing-reconfiguring framework and the dynamic capabilities framework and, originally designed for this study given the limited prior research in the field of managerial cognitive capabilities for digital transformation and dynamic capabilities needed (Adner & Helfat, 2003; Helfat & Peteraf, 2015). For the validity of the study, effort was put into

designing relevant questions that would make it possible to answer the research questions (Kvale, 1995). In such a qualitative research study the purpose of questions is to facilitate observation of the considered phenomenon (Cronbach, 1971). Therefore, the four formulated questions mirror the research questions listed in the purpose of the study.

In qualitative research "transferability" must be considered: how valuable can the findings be in a different context? (Merriam & Tisdell, 2015). The aim of exploratory research is to have a study that "resonates" with the reader (Tracy, 2010). The open-ended and limited number of questions allows the SME to share in depth details and contextual information as possible so that readers can interpret and project the collected data by themselves (Shenton, 2004).

Interview Question Development Process

Based on the above, the four questions developed for this study were as follows:

Question 1

The focus of this study is to provide an understanding of digital transformation and cognitive capabilities required to build large organizations in South Africa. Teece (2007) states the importance of focusing on the micro foundation of individual managers to facilitate factors for strategic change and introduce the concept of managerial cognitive capability to elaborate the importance of capacity to perform both physical and mental activities. Based on the above, "in a large organization attempting digital transformation, how can a manager leverage attention to emerging technology to build organizational agility, and support dynamic capabilities? Can you give me one or two examples?" This question was used to assess the relevance of the research question and to collect the SMEs' hypotheses on whether cognitive capability, performing both physical and mental

activities for digital transformation in large organizations will contribute to organizational agility.

Question 2

Finkelstein, Hambrick, and Canella, (2009), form part of management research that has long regarded cognition as a crucial attribute for senior managers, or leadership of organizations, however more recently, advanced research on senior management or leadership cognition, more specifically to strategic change and sustainability has enhanced. “In a large organization attempting digital transformation, how can managers leverage initiative and perception to build organizational agility, and support dynamic capabilities? Can you give me one or two examples?” This question proposed to measure the expert’s evaluation of senior manager’s performance when it comes to recognizing emerging patterns in the environment, interpreting these data correctly, and creation of new opportunities for digital transformation in large organizations.

Question 3

Organizations need to be in a constant state of transformation, however, to change on an ongoing basis becomes costly, and to be agile often compromises efficiency (Teece , Peteraf, & Leih, 2016). Nordin, Ravald, Moller, and Mohr (2017) state that organizations, which introduce innovative improvements into the company should behave as if the part they play in a particular network is perceived as that of a leader; from the perspective of technology and marketing. “From your understanding of large organizations attempting digital transformation, how can managers leverage network management to build organizational agility, and support dynamic capabilities? Can you give me one or two examples?” This question proposed to explore the experts’ views on

networking management to build dynamic capabilities for the growth and long-term sustainability of an agile organizations

Question 4

South Africa can leverage their cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation. South Africa was an appropriate choice as the local context of this study, given that in this nation 48% of all organizations had initiated transformations that are digital and by 2019, 44% will do the same (IT News Africa, 2017). The research design that was used had been the multiple-case study type, satisfying the aim of this descriptive-case research study in the best manner Yin, (2017) which focused on the following managerial-cognitive capabilities: attention to emerging technology, initiative and exploratory behavior; network management, and foresight capability. “In a large organization attempting digital transformation, how can managers leverage foresight capability to build organizational agility, and support dynamic capabilities? Can you give me one or two examples?” Based on the knowledge and experience of the expert, this question provided us with their views of foresight capability and whether it helps foresee, envisage, and make plans for different types of futures (Teece, 2007).

Data Collection

The Institutional Review Board (IRB) reviewed and approved the interview protocol that had been submitted. All participants were notified about the rationale for the study. The participants were informed this was a multiple-case study research and diverging opinions were therefore encouraged (Yin, 2017). All interviews were recorded digitally with the Atlas.ti application for Android phone, with the interviewees’ approval,

and converted into a transcript presented to the SMEs for validation and further reflection (Tracy, 2010). To avoid any misunderstanding or confusion during the interviews, there was a considerable increase in the reliability and validity of the research (Stake, 1995). The interviewer recorded her own handwritten notes as a back-up and led the interviews with the planned questions, being open to digressions and examining with follow-up questions to get an in-depth understanding (Hatch, 2002). For traceability purposes, all the field data which formed part of the research (SMEs' contact information, interview schedules, audio recordings, pictures, comments, and reflections) were recorded in the Atlas.ti application and then transferred to the Atlas.ti 8 software for further analysis.

Data processing. For quality and transparency of the study to be ensured, all data collected were transferred and processed into a qualitative data analysis software Atlas.ti (Yin, 2017). All interview transcripts and associated data were scrutinized in detail and compared within and in between the stratified samples and cross-checked with the current literature. Even though the access to the software was password protected, the family names of the interviewees were not recorded and stored.

Data was incrementally tagged during the analysis according to their related themes. For example, understanding SME needs from a dynamic capability perspective and comparing the common points and differences between SMEs and between existing and new data to maintain the integrity of the database. All data analyzed were from the field data, the interviews, and the findings incorporated the literature review input (Patton, 2014).

Data Analysis

Real, empirical and detailed investigation of data were transparently assembled throughout the phases of this study to achieve reasonable and practicable data analysis that had been framed by the conceptual proposition and had been consistent with the research phenomenon (Ravitch & Carl, 2016). Related "how" and "why" research questions had evolved around the research phenomenon which delivered further insights into the phenomenon of study (Yin, 2017). Semi-structured interviews with open ended questions had been deployed to gather data for this research towards achieving the purpose of this study with stored and organized data, applying suitable techniques. The data collection process that span across a period of six weeks has seen an average of four to five interviews completed per week. Cross-case synthesis was further conducted to acquire emerging themes (Cooper & White 2012) while data triangulation with related literature and evidence from research findings had enhanced the dependability and reliability of the findings (Ravitch & Carl, 2016).

The data analysis process, which entailed triangulating interview data was conducted. For the unveiling of emerging ideas and themes, similar words and common thoughts grounded in defining words and established opinion, were documented. (Merriam & Tisdell, 2015; Yin, 2017). In-depth analysis of the organized ideas/concept were coded into identifying patterns (Saldana, 2015). The data collection method, the collected data, the reviewed data and process of data review underwent a quality audit and triangulation, which enhanced the reliability and validity of the research findings (Yin, 2017). Thematic analysis which entailed searching for patterns or themes in the codes across different interviews had been largely dependent on identifying, examining,

and pinpointing of similarities, relationship, and differences in the data (Ravitch & Carl, 2016).

The themes that were identified represented recognized patterns, practical and feasible agenda of the researcher, similarities, and the research questions. These core elements determined whether repetitive and nonrepetitive insights had been examined for both within-case and cross-case analysis (Yin, 2017). Various themes were classified using this advanced coding analysis that recognized similarity in relationships within several cases with codes that connected data collections and combined themes across a few methods such as journals, interviews, and discussions (Ravitch & Carl, 2016; Saldana, 2014). With the triangulation of the, data collection sources, improvements of the study quality and assurance provided thorough evaluation of the data collected (Yin, 2017). The mindset of the interviewees had been passed across by means of signs that are conveyed verbally and with body language and so on (Stake, 2013). These signs had been recorded in a few ways to enhance the development of context-based reports of unspoken character which allowed for a more comprehensive memory (Ravitch & Carl, 2016). Recordings of the electronically transcribed research that participants responded to, had been shared individually with the interviewees for examination and verification on the accuracy of interpretation and assessment of the researcher's reflexivity and perspective (Berger, 2015; Merriam & Tisdell, 2015).

The data evaluation approach was entered around a cross-case synthesis analysis method to integrate the refined outcomes of within-case analysis and further developed themes for multiple case analysis (Yin, 2017). Meta-analysis is often used for studies involving many cases to identify cross-case sequence, however this study used Microsoft

Excel because of the limited number of cases involved in this study (Yin, 2017). With regards to complexity and difficulty when identifying associations and patterns during the investigation of real-life experiences, cross-case correlation which enhanced the validity and generalization of the study had to be carried out (Yin, 2017). Added to that, with the use of the cross-case technique, it helped to acheive a structured analysis of the logic connecting the research data to the study's concept. The trustworthiness of data was strengthened by using a fact-based logical reasoning, which was based on data homogenization, reduction, and clarification (Cooper & White, 2012; Yin, 2017)

Issues of Trustworthiness

For research objectivity and reliability, it was important to establish an appropriate and a compacted methodology that had been based on the research purpose due to its important when establishing a thorough research design and procedure (Korstjens & Moser, 2018). Trustworthiness in qualitative research outlines the credibility, transferability, confirmability, and dependability of qualitative research findings as, qualitative research does not use instruments with established metrics (Merriam & Tidsell, 2015).

Credibility. Data credibility describes the degree to which the researcher is confident in the research findings (Merriam & Tisdell, 2015) and often interpreted as a valuation of whether or not the findings of a research represent a conceptual explanation of the data (Korstjens & Moser, 2018). For the achievement of credibility of this study, a multitude of approaches assisting data trustworthiness had been deployed not limited to data triangulation, multiple analyst triangulation, and member checks. Even though interviewees and readers were the best judge of data credibility (Ravitch & Carl, 2016),

delayed observation, saturation, consistency, cross-case synthesis, participatory research, digital recording, and audit trail had been completed by the researcher to assist data deduction credibility (Cooper & White, 2012; Yin, 2017)

Applying a research design that aligned with the research question and research aim, also aided the research credibility (Stake, 2013). Using a multiple-case study for this research helped merge multiple respondents' opinions and extractions of combined themes and diverging views from the in-depth understanding of an extensive population has aided the credibility of this study (Morse, 2015). Using a multiple-case study with significant fitting samples, met the inclusion and exclusion criteria for the study and persuasively represented members of larger population had also improved the credibility of this study (Flick, 2009)

Transferability. Transferability explores the degree to which the research had been transferred or replicated to other frameworks (Yin, 2017). Defined by the readers, specific details of the research method and phenomenon are associated to familiarity of the readers and with comparable specifics the said research is deemed to be credible and transferable. To support the transferability of this study, a comprehensive and thorough explanation of the research and methods had been provided. Detailed circumstantial description of fieldwork and all-inclusive submission of findings has also been provided by the research design to guide the research transferability (Morse, 2015). All-inclusive and detailed respondent's data explanation with detailed record of their experiences, thoughts, and opinion along with conscious selection of interviewee meeting the inclusion criteria had driven the transferability process (Yin, 2017).

Dependability. Dependability in qualitative research can be defined as the stability of data over time and over conditions, ensuring that the findings within the study are consistent and can be repeated, and often measured by the standard with which the study is administered, scrutinized, and presented (Yin, 2017). For the enhancement of the dependability of this study, in depth detail of the research design and the data collection process and strategies were documented to allow for ease of study replication. Data collection processes, strategies, and methodologies including filed notes, semi structured interview questions, journals, and cross-case comparison combined with multiple sources used to triangulate themes had been systematically and comprehensively documented. Finally, coded analyses based on observations and bolstering the phenomenon of study has strengthened the dependability of this study (Morse, 2015).

Confirmability. During the study, confirmability in qualitative research, questions the relationship between data and the research findings, which is often judged by external researchers (Ravitch & Carl, 2016) and it establishes the researcher's biases during the study (Stake, 2013). Adequate demonstration has been provided to verify that the research findings are informed by the interviewee's opinion and not due to the researcher's bias. To augment the confirmability of this study, audit trail was deployed throughout the study inclusive of the study proposal, field journal, research design procedure, raw data, and instrumentation among others to specify how each finding was made (Ravitch & Carl, 2016). Positioning design instruments that were not manipulated by the researcher, triangulation of data source and theoretical views to validate the effectiveness of the study concept has helped enhance the confirmability of the study (Morse, 2015). Overall, any researcher's disposition and opinions underpinning decision

as well as any negative instances, which challenge the initial findings was documented (Flick, 2009).

Assumptions

The primary assumption of this research was that new business models emphasizing dynamic capabilities were cited as the most promising strategy of larger organizations to thrive in the era of transformational digital ecosystems (Weill & Woerner, 2018). The researcher's experience in leading ethnographic research, in-depth interviews and the honesty and openness of SME's to have an informal discussion as part taking in a in a lengthy survey suggested that it was the preferred method to answer the research questions (Spradley, 1979). Triangulation was used to validate the gathered insights via desktop research and field observations.

The next assumption related to the suitability of the strata and selection criteria. Dependent on availability, the strata could have been done with the Forbes South African top firms instead of firms known by the researcher. Then there were the assumptions made regarding the ability of the researcher to accurately record and transcribe the views expressed, without any force of pre-existing opinions or ideas. Finally, Atlas.ti as a leading qualitative data analysis software provided a toolbox to assist with the analysis.

Limitations

One of the limitations was confidentiality of projects. The study mitigated this by focusing on the trust relationship between the SMEs and the interviewer and by completing and signing a confidentiality contract. Both interviewees and researchers, with knowledge and experience in the field involved in the study, could have introduced some inevitable bias (Patton, 2014). The stratified sampling, triangulation, and recordings

confirmed a variety in the presented views even though the replicability of multiple case studies had always been difficult. The different strata were an attempt to identify patterns by drawing responses from diverse SME profiles (Zikmund et al., 2012). It was difficult given the size of the sample to talk with SMEs from all large organizations that are digitally transforming, however each SME had a wide and diverse knowledge base and experience to share so that, indirectly, the researcher interviewed not just ten SMEs but also picked on each SME's intellectual capital.

Ethical Assurances

This exploratory multiple-case study required ethical assurances (Yin, 2017). None of the sampling criteria were related to gender, race, ethnicity, religion, or political affiliations. The framework used was adapted from the "Ethical Issues Checklist" for qualitative research (Patton, 2014). The researcher kept an open mind on the probable findings and outcomes, meticulously scrutinized under the guidance of expert matter advisors, who had access to all transcripts, source documents and interviews. The SME's who shared their knowledge, experience and perceptions gave their informed consent before publication. Observations within organizations or on social media respected privacy and no nominative data was collected or kept for this study. Only non-invasive measurement tools were used, and SME's were fully informed.

Informed consent. The international review board (IRB) guidelines were followed, and SME's were requested to sign the Informed Consent Form (Appendix B). As the research involved human subjects and interaction, the researcher was obliged to explain the purpose and method of the study, as well as the possible risks and benefits.

The research design had been approved by the IRB prior to any data been collected. The consent form was presented orally before each interview (Hatch, 2002).

Privacy and data protection. As privacy, data protection and confidentially is of utmost importance, all data had been stored safely with a strong password. The researcher chooses not to store identifiable information such as surnames or phone numbers to add an extra layer of privacy protection and comply with GDPR (Kolah, 2018).

Promises and reciprocity. SMEs were given the opportunity to review their interview transcripts and to receive the final study. No compensation had been given to any SME's to avoid a biases (Yin, 2017).

Anonymity. SME's were given the option of acknowledgement or concealment in the Informed Consent Form. The data was stored without surnames to limit possible privacy issues.

Explaining purpose. An invitation letter had been sent to the SME's**,** detailing the purpose of the study (Appendix A). The content of the invitation covered the objectives of the research and the initial questions. What the researcher would have liked to achieve at the end of the study had been included in the invitation.

Risk assessment. No harm, whether physical or emotional harm had been exposed to the SME's. No undue risk of physical harm was or had been posed by the study. Due to the possible stressed induced by the research, SME's were given the option to participate at any time. Data were only collected once the Informed Consent Form had been signed and the SMEs were fully aware of the conditions (Patton, 2014).

Summary

This research study contributes to literature concentrating on cognitive capabilities to support dynamic capabilities in large organizations. The purpose of this qualitative, multiple-case study was to describe and document insights from SME's on how managers from large-sized organizations in South Africa can leverage their cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation.

The multi-case study strategy was worthwhile when exploring existing theory while a well-constructed case-study design had enabled the researcher to challenge it and provide a source of new research questions. It also helped in the exploration of an occurrence in its own setting and used a plethora of data sources, making sure that concepts are not looked at in one way, but in a variety of ways. The unit of analysis in this study was the SME or domain expert who had been an authority in a specific area or topic required to facilitate the development of innovation at initiation. Multiple cases were sampled for their ability to illuminate theory and explore constructs and alternative explanations. The sample of this study was derived from a population of academics of peer-reviewed papers published in scientific journals and indexed on Google Scholar between 2017, 2018 and 2019 when undergoing a word search under the term "Managerial Cognitive Capabilities on Digital Transformation." The total number of SMEs' interviewed completed were ten.

The semi-structured nature of the interview process enabled the participants to not only feel more comfortable with the researcher, however increasing the probability of more relevant sharing of information and improved insights. The semi-structured

interviews consisted of four open-ended questions to leave enough room for the SMEs to fully express their views. The initial questions had been regarded as topics to elaborate on and subject to being refined along the interview process. There were certain assumptions made in relation to this multiple-case research study, however the primary assumption of this research was that new business models emphasizing dynamic capabilities were cited as the most promising strategy of larger organizations to thrive in the era of transformational digital ecosystems, plus they are able to articulate their experience in a way that the data could be captured using the thematic and cross-case study approach and articulation of their experiences must be in an honest and accurate manner. Triangulation was used to validate the gathered insights via desktop research and field observations.

Notwithstanding the valuable findings, this study was not without limitations. One of the limitations was confidentiality of projects. The study mitigated this by focusing on the trust relationship between the SMEs and the interviewer and by completing and signing a confidentiality contract. For the achievement of credibility of this study, a multitude of approaches assisting data trustworthiness had been deployed not limited to data triangulation, multiple analyst triangulation, and member checks.

The dataset, while being robust in number, was cross-sectional, which allowed understanding only the current experience and knowledge of respondents. It was difficult given the size of the sample to talk with SMEs from all large organizations that are digitally transforming, however each SME had a wide and diverse knowledge base and experience to share so that, indirectly, the researcher interviewed not just ten SMEs but also picked on each SME's intellectual capital.

Chapter 4: Findings of the Study

The purpose of this qualitative, multiple-case study was to describe and document insights from SMEs on how managers from large-sized organizations in South Africa can leverage their cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation**.** . The research design that was was the multiple-case study type, satisfying the aim of this descriptive-case research study in the best manner Yin, (2017) focused on the following managerial-cognitive capabilities: attention to emerging technology, initiative and exploratory behavior; network management, and foresight capability. The units of analysis were the SMEs meeting the exclusion and inclusion criteria for participants in the study Yin, (2017).

An element of analysis was based on SMEs. Qualitative data was applied based on collected data from comprehensive interviews with identified participants (Appendix C). Further, qualitative data was based on insights derived from in-depth interviews (Patton, 2014) from the identified participants. Since the study had concentrated on innovative approaches to exploring managerial behaviors from large-sized organizations in South Africa, data collection was achieved with a purposeful sample using criteria and snowball sampling (Gentles, et al, 2015). A semi-structured interview process was used to elicit the SMEs' expertise and insights regarding the issues raised for this researches' objective Yin, (2017)

Moreover a well-defined but open-ended interview protocol was implemented in order to obtain 10 identified participants' (Appendix C) viewpoints in regards to the topic raised in the purpose of the study (Yin, 2017). The method, range, and number of interviews for this empirical study were similar to other studies dependent on

comprehensive interviews (Bohlmann, Spanjol, Qualls, & Rosa, 2013; Strauss, Griffin, & Rafferty, 2009). Evaluation of data sources had been completed in order to determine the credibility of the evidence on the phenomena of the study and assurance of the study's results. The data was analyzed by implementing a cross-case synthesis method (Yin, 2017). Developing outlines from the analysis were organized into various categories and titles in order to address the purpose of the study.

The study's need was directed towards fact-driven and comprehensive answers to the research question, therefore the case-study method was a preferred choice due to various strategies the method offered, provided sufficient variability as the researcher conducted research on the selected subject, and broadened the theoretical model (Norlyk & Harder, 2010). The purpose of this study was to describe and document insights from SMEs on how managers from large-sized organizations in South Africa can leverage their cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation. To meet a proposal's need, Yin (2017) recommends the case study method as appropriate when research addresses either a descriptive question (what happened?) or an explanatory question (how or why did something happen?).

The range, method, and number of interviews that have been conducted for this multiple case study are comparable to other studies depending on the interviews (Bohlmann et al., 2013; Strauss, Griffin, & Rafferty, 2009; Jassawalla & Sashittal, 1998). The research statistics and data that have been collected, systematized, and assessed were gathered from the Interview Protocol (Appendix D) that helped to realize the key perceptions of 10

SMEs regarding the challenges faced by the autonomous vehicle industry in relation to human factors engineering of market acceptance, public perceptions, and safety issues.

Implementing various sources of data has been suggested in order to examine numerous individual views and plausible perceptions acquired from participants (Yin, 2017). Furthermore, the interview questions that have been presented in the Interview Protocol assessed and evaluated the context of the participants' knowledge and experiences linking professional viewpoints, opinions, and outlooks (Patton, 2002). Also, the use of individual notes as an instrument assisted with the accurate recording of the various answers to distinct interview questions (Rowley, 2012).

Experts on the study topic also analyzed, evaluated, and reflected on the results of the study. This additional source of data impacted and reinforced the authenticity and consistency of the research by means of investigator triangulation (Guion, Diehl, & McDonald, 2011) investigator triangulation and within-method triangulation provided a strategy for strengthening the trustworthiness of the research. The data was obtained from each of the SMEs who assisted in establishing and authenticating the value and strength of the researcher's accuracy (Baker & Nelson, 2006). Furthermore, foundational analysis from the SMEs aided in guiding the evaluation of the study and helped to ensure that the study would be impartial and unprejudiced (Rowley, 2012).

Handwritten notes were taken during the interviews to capture the main points, key responses, and actions (Stake, 1996). A Microsoft Excel software database was created and used to enhance reliability (Yin, 2017). The content was analyzed to describe the phenomena and the context being investigated (Hatch, 2002; Yin, 2017). This study did not screen potential participants based on gender, race, religion, or cultural background so

as to encourage diversity. All 10 individuals interviewed met the inclusion criteria of being a practitioner or academic scholar who has conducted and published in-depth research. Data were collected from the 10 participants by recording each individual's response during the semi-structured interviews, with a digital recording device during the interviews and on Skype. The recordings were then transcribed for review to capture themes that emerged from the responses.

The summary of results and findings for each participant are provided in this chapter, along with the themes and key outcomes from the interviews on how managers from large-sized organizations in South Africa can leverage their cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation. Individual responses to the interview questions and the resulting summary were compared to theoretical/conceptual frameworks, and any variations were indicated to highlight the differences of this study (Yin, 2017).

The research questions for this study were:

RQ1: What are the perceptions of SMEs, regarding how managers from large-sized organizations in South Africa attempting digital transformation can leverage attention to emerging technology to build organizational agility, and support dynamic capabilities?

RQ2: What are the perceptions of SMEs, regarding how managers from large-sized organizations in South Africa attempting digital transformation can leverage initiative and exploratory behavior to build organizational agility, and support dynamic capabilities?

RQ3: What are the perceptions of SMEs, regarding how managers from large-sized organizations in South Africa attempting digital transformation can leverage network management to build organizational agility, and support dynamic capabilities?

RQ4: What are the perceptions of SMEs, regarding how managers from large-sized organizations in South Africa attempting digital transformation can leverage foresight capability to build organizational agility, and support dynamic capabilities?

The findings were evaluated based on the individual responses to the following semi-structured, open-ended interview questions, which had been used for this study to allow for new ideas to be discovered and discussed during the process. Where applicable, follow-up clarification interview questions were asked to ensure complete understanding of the individual's responses.

1. What do you believe management within your organization does differently to understand leading practice technology?
2. Research tells us that exploring and discovering plays a crucial role in taking initiative to drive agility in the organization, your thoughts?
3. From a skills perspective, what do you believe are some of the skills that will be required for digital transformation and how do you believe these skills can be obtained?
4. Do you believe that is crucial to network globally, and locally as often as possible?
5. What is your organization doing differently to develop skills for digital transformation?
6. From a futuristic perspective, what percentage of organizations in South African organizations do you think, would have digitally transformed completely by 2050?

7. What competences do you believe would be critical in the future?

Participants

The participants for this study comprised of a set of individuals, places, or documents, or both (Yin, 2017). The sample of this study was derived from a population of academics of peer-reviewed papers published in scientific journals and indexed on Google Scholar between 2017, 2018 and 2019 when undergoing a word search under the term "Managerial Cognitive Capabilities on Digital Transformation." The total number of SMEs' interviewed completed were 10. In addition, a sample was also obtained from the LinkedIn online professional network by participants meeting the inclusion criteria assigned for the study's sample.

Selected scholars who are authors among this population of published documents have terminal degrees from accredited institutions and have conducted empirical and theoretical studies in the area of cognitive capabilities, dynamic capabilities for digital transformation, as well as being academics and researchers in the area of strategy and technology. Lastly a sample was also attained from SMEs of large South African organizations with years of experience in management and that were knowledgeable in the field of digital transformation. The inclusion criteria of the sample for this study were as follows: 1) adults over the age of 18, 2) practitioners or academics or both with at least five years' experience in management and, 3) professionals with peer-reviewed publications on this topic. For detailed information on study participants' expertise on the study topics, please refer to Appendix E.

Results of the Main Study

The interviews were semi-structured as per the Interview Protocol consisting of eight open-ended questions designed specifically for this study, which are exhibited in Appendix D. The eight interview questions were created to obtain the participants' views regarding the four research questions that had been designed at the commencement of the study. Triangulation among data sources was implemented to ensure the validity of the research. Data has been triangulated among individual cases as well as with the explanations designed in the literature review and sphere of work, the participant's and interviewers consequential indications, and the quality assessment (Patton, 2015).

Thematic evaluation supported by the six phases proposed by Braun and Clarke (2006) were performed: familiarization with the data (containing transcription as interpretation), generating initial codes, searching for themes, reviewing and grouping of themes, defining and assigning of themes, and devising the evaluation. This development is consistent with the view that "the researcher is positioned as active in the research process; themes do not just ‘emerge’" (Braun & Clarke, 2006, p. 96). Developed themes are presented here in relation to the research questions to which the SMEs responded. After unpacking the themes, they were used to hypothesize answers to the relevant research questions.

RQ1: What are the perceptions of SMEs, regarding how managers from large-sized organizations in South Africa attempting digital transformation can leverage attention to emerging technology to build organizational agility, and support dynamic capabilities?

Five applicable themes emerged from the responses of the participants in the semi-structured interviews. These five elements collectively provided data for answering RQ1 and highlighting SME insights on digital transformation that can leverage attention to emerging technology. The five themes are: 1) Mindset Change & Communication 2) Culture & Leadership 3); Understanding your Customer, 4) Reverse Mentoring, and 5) Cognitive Capabilities and Dynamic Capabilities

RQ1a. Mindset Change & Communication

The research reveals that mindset change and communication is crucial for leveraging attention to emerging technology. Participants were asked how managers from large-sized organizations in South Africa attempting digital transformation can leverage attention to emerging technology to build organizational agility, and support dynamic capabilities. Most participants agreed that mindset change and communication play a vital role to leverage attention to emerging technology.

Participant 1 stated that the first thing, “obviously for me, is that inquisitiveness, curiosity, and passion for what you do.” He believes that the problem is many people tend to want to use emerging technologies to enhance, or scale, their existing technology and spend too much money and time partnering with Fintechs to make the current, existing systems very efficient; they don’t see the need for the new emerging technologies. People need to change their mindset.

Participant 2 stated there needs to be a lot more communication, and a lot more human interaction, before we can go digital. She said that: “I don’t know how relevant, but what we’re going to do is basically tap into students to look at the problems, and then get the students to actually brainstorm and come up with new solutions.” She believes

that if we communicate more frequently, bring onboard more millennials and students that think out of the box with fresh new ideas, it will fast track some innovation.

Participant 4 said that the first part of it is the mindset change, and as humans, we are creatures of habit, we do what we are used to doing, and we are resistant to change. She believes that a mindset change is needed to get there, and with that mindset change comes risk taking. He says that we need the ability to paint a different outcome than what would have been there under the traditional scenarios.

RQ1b. Culture and Leadership

Participants were asked their views on people that show resistance to digital transformation, as they believe that robots will take over and the unemployment rate will increase.

Participant 5 mentioned:

> We as leadership can paint the picture of what the future means for them, that's where the difference will come. I think it's about just embracing the technology and getting them to embrace the technology. Whether we are going to be irrelevant or not. It's about teaching them that they need to remain relevant.

Participant 5 also stated that by encouraging employees and letting them know that they can do it to help define the future of the organization. Participant 6 stated that "…digital transformation enables better strategic engagements through pulling people off mundane stuff, to enable them to think, and to think in a way that's reflective of the future."

Participant 7 commented that: “Sure, so I think it has a lot to do with culture. In my view, it's it has to be a multifaceted approach. It’s got to be a top down and a bottom up approach”. He talks about a need for secondary means of innovation which not only comes from the top, however involves all employees. He states that one of the ways of getting employees involved is to enable an innovation campaign for all staff to participate, which will eventually feed into this R&D, which is linked to one of the ExCo members to develop the idea further and maybe commercialize it. He also mentioned symbolism, whereby they have renovated a particular section of their offices to make it a full innovation zone. Participant 8 continued to say:

> So the one thing you have to do if you want managers to actually leverage digital transformation with what they do, you need to expose them to it, and make them understand what the art of possibility is and almost tailor it so that it’s – they can see the opportunity in what you are putting in front of them..

What was evident with discussions from this participant, was the need for leadership to have a different approach to assess how do they you use their capability that they have to do something a lot more value adding that helps with decision making in the organization. Their focus has been on sustainability and sustainability meant, leadership need to look at people, process, technology and focus on how these three elements will be impacted to solve the problem that they are trying to solve and make sure they do all them.

Participant 10 mentions that it is crucial to have an open culture that allows for failure. He states that:

> IT things that have this ambidexterity, exploration, and exploitation and that you have certain capabilities and the mindset, and culture, and the necessary skills to do this exploration work. So you need to simply try new things out and really work with technology in order to find out whether things work.

RQ1c. Understanding your customer

Participant 1 commented that:

> What people must understand is the ability to remove friction for customers. A lot of companies don't have the ability to understand why do they exist? And what I learnt at Oxford University was, if you're strategy still has something that says digitization or customer, you're one of the companies that's lagging behind. Because a customer is an intricate part of your business.

Participant 4 went on to state:

> I think the first step, and the first skill that you have to have, is you have got to understand your customers' viewpoint, and that is a major cognitive change that you have to go through – is to start looking at it from the customer's point of view – and you've got to start looking at it from a I understand the problem point of view, not I've got the answer already.

It is crucial to understand the customers need first, what problem is the customer wanting to solve and how can it be solved.

RQ1d. Reverse Mentoring

The researcher was very interested in this aspect of the interview with participant 10. who stated that:

> A manager can leverage attention to emerging technology by using reverse mentoring with the help of the millennials, since the youngest generations have the technological knowledge to boost the digital transformation of organizations.

She believes that managers need to find a balance to accomplish this goal, by creating mixed teams which, will encourage people from different generations to work together and to reach a common sense about the future strategies of the organizations.

RQ1e. Cognitive capabilities and dynamic capabilities

Participant 10 referred to dynamic capabilities that are crucial for the success of digital transformation, she stated that:

> The main dynamic capabilities of workers need to be: ability to be creative; problem-solving; communication; teamwork; ability to take initiative; cooperation. So, the leadership of the process need to be participative and use techniques as distributive mentoring and distributive coaching, putting the learning process as the most important goal of that moment.

Participant 1 compliment that by saying:

> So I think the cognitive capabilities, its curiosity; it's the ability to question; it's the ability to experiment. And I think what's very, very rare these days, because information is so abundant, you don't

> have that ability that people want to learn from other anymore, you can re-educate yourself through online learning.

RQ2: What are the perceptions of SMEs, regarding how managers from large-sized organizations in South Africa attempting digital transformation can leverage initiative and exploratory behavior to build organizational agility, and support dynamic capabilities?

Four themes emerged from the responses of the participants in the semi-structured interviews in regards to RQ2. These themes focused on how managers from large organizations can leverage initiative and exploratory behavior to build organizational agility and support dynamic capabilities. These themes included: 1) Silo's, 2) Design Thinking Principles, 3) Dynamic Capabilities, and 4) South African Economy

RQ2a. Silos

Participants were asked what their thoughts were with regards to research that tells us exploring and discovering plays a crucial role in taking initiative to drive agility in the organization. Participant 1 mentioned: "My thoughts around this is that firstly, the way big organization are built is in silos' people are not used to work across IT, business, and front office. What we did was, we put a small atomic team together."

On this issue Participant 9 stated:

> The challenges and opportunities of the Fourth Industrial Revolution are global in scope, have cross-industry impact and require multi stakeholder cooperation. Understanding that the world must act now to ensure that emerging technologies will help and not

> harm humankind in the future. Managers should work alongside fellows from government, business, civil society and academia to build creative policy frameworks and protocols for governing the most important emerging technologies that are driving transformation today.

Research has shown that leaders need to play a critical role in building an environment where trust, respect and inclusion prevail, which I believe are the foundations for establishing a knowledge sharing organization.

RQ2b. Design Thinking Principles

Participants where asked, what do you believe are some of the skills that will be required for digital transformation and how do you believe these skills can be obtained? Participant 1 responded by saying:

> So there's a passion and the new ways of working. So we consistently apply agile methodology real agile methodology. 80% of your people want to maintain the status quo, and you will identify that very, very quickly. If you give people an opportunity to redefine themselves, and they don't grab it, that shows you the caliber of the people. So the physical activities are the ability to do the stuff, but the mental stuff – is there any specific mental activities that you would say needs to be trained so that they can be more agile.

Participant 7 stated that: "…it's important to understand the vision, mission and values of the organization, as if we initiate a project and do not deliver or implement as per the vision, we are not delivering on our vision."

Participant 7 also spoke about celebrating the small wins, so that employees can see how the work they are doing adds value. He says; "success breeds success.". Participant 3 spoke about big picture thinking and the importance of problem solving. Lastly Participant 2 mentioned being at the forefront of technology, and stated that emotional intelligence is crucial.

RQ2c. Dynamic Capabilities

Participant 4 spoke about building the right capabilities, he states that:

> If you take it on and you don't have those capabilities, you've either got to learn very quickly at the customer expense, potentially, or miss the opportunity. You can't come with cutting, leading edge stuff – or bleeding edge approaches – because you could break a bank, literally.

Participant 6 added: "We need to get to the enablers and the shapeshifters. Bringing agility and energy around digital transformation." Participant 8 echoed the same sentiment by saying; "…we need to understand that everyone is not digitally inclined, it is imperative that we find the right people, build the right capabilities with energy and credibility. Participant 10 mentioned technical and leadership skills, proactive exploratory mindset, management fostering an exploratory culture of open-mindedness, and decision making.

RQ2d. South African Economy

Participant 5 stated that:

> …the economy is flat. There's been all sorts of issues in the education space. There is, one almost wants to say, a lack of high-level skills that we need to do stuff, resulting in those limited skills and talents that are available are being sucked into the of detail of

> doing the work, so – and what that has, it's got a repercussion on work-life balance, right.

On this topic Participant 9 commented:

> The challenges and opportunities of the Fourth Industrial Revolution are global in scope, have cross-industry impact and require multi stakeholder cooperation. Understanding that the world must act now to ensure that emerging technologies will help – and not harm – humankind in the future. Managers should work alongside fellows from government, business, civil society and academia to build creative policy frameworks and protocols for governing the most important emerging technologies that are driving transformation today.

RQ3: What are the perceptions of SMEs, regarding how managers from large-sized organizations in South Africa attempting digital transformation can leverage initiative and exploratory behavior to build organizational agility, and support dynamic capabilities?

Four themes emerged from the responses of the participants in the semi-structured interviews in regards to RQ3. These themes focused on how managers from large organizations can leverage network management to build organizational agility and support dynamic capabilities. These themes included: 1) Collaboration is the future, 2) Network Management 3) Business models and Policies, and 4) Global Market and Partnering. Participants were asked how managers from their organizations, leverage

network management to build agility and support dynamic capabilities. They were also asked, if they believe that is crucial to network globally, and locally as often as possible?

RQ3a. Collaboration is the Future

Participant 1 commented that:

> We are exactly at that stage with the Fourth Industrial Revolution: What's been built until today doesn't really work, but we believe it does. Collaboration is the future. So the thing is for me that helped me a lot, I connected – in the last year, the thing that helped me the most was I'm now connected you can look at my LinkedIn profile. It was more about the relationships. Knowledge sharing is becoming free. This is a world where people collaboration, like you helping me, the people that now are becoming the future leaders are the people that want to see other people succeed. And for me, what the guy said, from Bitcoin: Information is not scarce anymore. Google is there. The skill today that's rare, is the willingness to learn. And even rarer, is the collaboration, that peer, where you are not an expert like you come and ask me for info now. So I give you stuff. You can use it or lose it, but I give it to you for free.

Further, Participant 2 iterated the importance of integration and collaboration:

> …previously every department had their own data base, had their own source of formation, now with everything being in one data lake, everybody has to work together. So there is one vision. So

> what we enforce, there is only one source of truth. So if it's your financial data, there is only one system.

Participant 7 went on to ask:

> Why compete on everything, let's collaborate, right? And that resulted in, so you've got an iPhone here, if you look at the iPhone, you've now got Windows' products, Office products, now that's resulting in value. So look at, this is the share price of Microsoft and Apple. Yes, they increased by 200 per cent, when they started collaborating.

RQ3b. Network Management

On this topic Participant 3 stated:

> …the network management side of it. From managers or executives or leadership from a network side, we gave students the problems, and giving them the freedom to find solutions or recommendations. We started a Cyber Academy now. So our aim is to have different courses, some on-line as well. And just to get to a bigger market in the country. I do it especially with like the EY Winning Women. I attended a session in Vietnam where my objective was to find a partner that can represent us in Australia. And it was very successful, so we're actually getting going so that is how we do networking. There's definitely new ways.

Moreover, Participant 8 stated:

So I've got, at my level, extensive networks, I mean it's with all the consulting companies, with lots of companies directly as well, where we engage on a continuous basis to understand: What are the options? What are the possibilities, et cetera? And I've got a person on my team that does ecosystem management – so that's her job. Her job is to monitor what's going on in the external environment and then tell us what we need to do. The one thing I found because I've gone to Silicon Valley, and I've done lots of stuff is that the big thing that companies have not taken into account in their digital journeys, and why people have not managed to advance, is that people focus more on just finding a solution and putting the technology in place. So we've kind of started what we call a Digital Academy, and the Digital Academy has lots of things in it.So it has very hard skills like Data Scientist, Data Engineer skills, but then it also has things like, you know: How do you identify trends? How do you do problem solving? The second big thing that we do is, we issue news data telling people that these are the trends and et cetera. Third thing is, we have a website, and WhatsApp groups, and all of those things, where we are continually sharing stuff that's happening in industry; sharing stuff from real life examples from the company where we actually just video the person and put it on the floor. And then the last big thing which we do, and this is maybe a little bit more of a targeted audience, is that if we want to take a

> concept through, we do pop ups and learning experiences. So we kind of partner with some of the consulting houses like Accenture and McKinsey, we set up a half-day session where, you know, we invite some people.

Participant 11 also commented on this topic that:

> Today´s organizations work mainly in digital chains and in network contexts in order to create new products and services faster, with distributed costs and risks, and also to access to knowledge they don´t have internally. Open and collaborative innovation is a new paradigm and the main idea is to develop new technology and products as members of large and multiple networks. For instance the iPad was created through this methodology, being Apple the leader, but working together with several other companies, even competitors, to put in the market an innovative product that has revolutionized the markets. On another perspective organizations learn better and faster when they are included in innovation and knowledge networks, not only through good practices, but also failures and the lessons learnt are very important to evolve and become more competitive.

RQ3c. Business Models and Policies

On the above subject Participant 4 had the following to say:

> It depends on the business model that you have.So if you are a true solution provider and you engage in bespoke development, then you

> would behave like that. Because then you want that kind of network to find out things and see if you can solve it. We want the governance side to it because it structures things in a large enterprise. So the second you are enterprise focused, then there's a different set of rules that are coming in. But that's almost an internal thing and when we're happy with that we'll into our product and the customers will benefit from that. There are things that break, so you've got to have engineers that can go and fix it. So before we can rush into something, we need to plan this quite carefully because our market is. But what makes more business sense is, once you've figured something out around a customer problem which was a 60 percent match to our capabilities, then try and do it again another hundred times.

Further**,** Participant 9 stated:

> As data is increasingly generated and collected globally, businesses require clearer and more practical data policies, while policy-makers need better tools to develop future-oriented and agile frameworks for data regulation that will allow for innovation but protect individual privacy. The Data Policies portfolio focuses on maximizing the humanitarian and beneficial uses of data while seeking to develop practical solutions using a multi stakeholder approach to policy-making. Projects should include:
>
> • Model AI Governance Framework

- Ethical Development, Deployment and Use of Technology
- Healthcare and Data Policy
- Trustworthy Data for the Common Good
- Designing Interoperable Frameworks for Data Flows
- Thinking outside the Box: Fit for Purpose Consent
- Chief Data Officer Community

RQ3d. Global Marketing and Partnering

On the topic of global marketing and partnering Participant 5 commented:

> I think that we are certainly tapping into the networks that we do have. I think that there's a growing network of, certainly South Africans that do it within our markets. But we are finding that we need to go international. We need to look global. And I think that's something else. South Africa, traditionally we are conservative, we are inwardly focused, and if you're going to do that we're going to get left behind. We have to look outside. We have to get what the globe is holding for us. So, networks across the board, local, international, global. And we're not confined just to our profession anymore. We've got to look outside. We have got to get different ideas. We've got bounce things off people. And you would actually be amazed how many people are prepared to share their knowledge. And as long as you are prepared to share knowledge, and tap into those knowledge networks, you'll grow.

Participant 6 had the following to say:

> …there are people who have been there faster than we are, and yet we have assessed that we are not a slow follower. There might be areas that we probably have been thinking and moving faster than others. And it's a point that I'm learning not always just out of your peers. There might also be some adjacent industries, things to be figured out. I mean Digital Catalyst, we started it off here with global strategic support, taking it right through to the likes of Hamburg and other and what have you. So you can't do this sitting in your own corner. The world has long been a global village. But you've got to be equally reflective of the spaces you are in.

Participant 10 further mentioned:

> Yeah, I think this is a topic with increasing importance. Maybe it's not networking; maybe "partnering" might better term. I think in the past most managers were, and companies were, acting within their own boundaries. It's becoming more and more obvious that those companies who basically open their boundaries, and are working boundaries spanning in networks, and are partnering with other companies, maybe even with competitors in terms they need to become digital and they don't have the necessary skills and/or resources. Only if we partner with some other players in our industry, we will be able to succeed. And I think this is some kind of new management style which becomes more and more important".

RQ4: From your understanding of large organizations attempting digital transformation, how can managers leverage foresight capabilities to build organizational agility and support dynamic capabilities? Can you give me one or two examples? Four themes emerged from the responses of the participants in the semi-structured interviews in regards to RQ4. These themes focused on how managers from large organizations can leverage foresight capabilities to build organizational agility and support dynamic capabilities. These themes included: 1) Creativity, 2) Risk Management, 3) Entrepreneurship and Global Partnerships, and 4) Visionary, Incentives and Coaching.

Participants were asked how managers, and what percentage of South African organizations did they think, would have digitally transformed completely by 2050, and what competences they believed would be critical in the future.

RQ4a. Creativity

Participant 1 mentioned:

> The other thing is the ability to recognize the potential. And you can only recognize the potential, and have foresight, if you get creative and physically get your hands dirty and see what the technology can do. I've got so much foresight now, but I'm lonely. Because a lot of people haven't worked with this. Then you've got to be able, vitally, to tell a story. And if you can tell stories, and you know how it works, you can take people with you in a collaborative fashion.

Participant 6 said:

> So you're going to be having a lot of the people who can think, and in some ways you're going to have more – needing more – skills around,

> for want of a better word, dreamers and creators. Because there's a space where you should not fear an element of failure, you know? Fail fast, learn fast". "The kind of people who want to think solutions, think them simply, think them quickly. Because they equally get too bored doing the same thing. So you've got to start drawing in more of that capacity. The creative side. So I think it presents a lot of changes, of shifts, but create opportunity, great opportunity.

Finally Participant 7 stated:

> I think what typically happens, right, when talking about foresight, people start here, you know? This is my reality. This is what it means. And then they kind of say: How do I get from here to here? So start with the big picture.With the end in mind, and get creative. And then come back to where you are now. And then say, how do we get there?

RQ4b. Risk Management

Participant 5 stated that:

> Things need to change and holding them accountable to make it happen. And trust me when I tell that it's going to happen. We need to be more risk seeking, however, manage that risk with us it's not a choice. People need to do it – it's just the way .It just changes the way people think. And it's a mindset change. So it's small steps. Its baby steps, but we'll get there". "If we look at the audit profession at large, it is probably the one profession that is very much at risk with the

> disruption happening. If one just takes blockchain – blockchain is an open ledger, right, that is transparent for the world to see.

Finally Participant 6 said that:

> Because there's a space where you should not fear an element of failure, you know? Fail fast, learn fast. Taking risks may lead to fear of failure, you're going to be slow in that space. And it's going to be a space where also you've got to disabuse excessive complexity in finding solutions. You know, we can always be too complex.

RQ4c. Entrepreneurship and global partnerships

Participant 1 mentioned that:

> My first filter – I'm thinking now on the fly here – you've got to be able, firstly to identify the difference between collaborative and non-collaborative people. I've never done something for long. But a lot of other people work for a lot of different companies, and that's the thing. And you know when you're an entrepreneur, the future of work's going to be entrepreneurial. We rely on every single person in this bank to have the ability to want to take the bank forward. That comes from passion. Not doing a job.

On this same topic, Participant 2 stated that:

> So we partner with a lot of global organizations where we do a lot of seminars, a lot of workshops, and all that kind of thing. So, for instance, we've got a partnership with Telefonica in Spain. So we send people there for a six-month rotation. The organization works with

> Telefonica to see what the European people are doing.They are always ahead of us in Africa, so they look at the products, services, and so forth.

Further Participant 3 mentioned: "So at the beginning of the year there is normally like RSA Security Conference in San Francisco. Last year I think there was 40,000 delegates, and that's where new things are being discussed and released and they sandbox and stuff". Participant 4 went on to say:

> Work with governments and companies around the world to develop a better understanding of emerging technologies and their implications, and to pilot new frameworks for enabling faster adoption of technological innovations. Increase their visibility as global leaders committed to using new technologies to benefit Society. Connect with leading innovators in the technology world. Participate in meetings and workshops throughout the global network of foresight centers.

RQ4d. Visionary, Incentives and Coaching

On this topic Participant 4 said:

> But we've also created it as an incentive – is to say: If you are doing well, you will attend the partner conferences, for example.You know, so we don't have just the Sales guy going to the partner conference, but there might be something highly innovative, technical, that's discussed, but they don't get it and they don't bring it back because they didn't understand what it was. So we'd rather say, you know: If you've excelled, you'll get an opportunity to learn, and, again, instead of giving

somebody a holiday in Hawaii which is meaningless for the business – it's a nice motivator for the person.

Participant 7 further commented:

Because remember we've done scenarios before and scenario thinking is futuristic thinking. It's about looking at 2050 and saying: This is where we'll be in 2050. I mean I even ran – when I ran strategy – I ran some of those processes, so it's all about future thinking. You'd look at your macros and the way macros are going, and then understand, you know, what type of company you would like to be.

Participant 8 also mentioned:

And I think that 4IR has put in place now I mean, I've only heard about it. I haven't been to any in schools. Because if you - if we're going to be the youngest workforce, we want people to have the right skills to be able to do the work. I mean, that's supposed to look at it. But if I listen to the feedback, we are talking about the wrong things. You also need to start talking about: How are jobs going to be changing? What are the industries that are going to be existing? How are you laying down foundational elements like You know, in that day you should be talking about skills development….But that team seems to be talking about. But that's where you need to look at it, because that needs to be - you need to have a strategy for the country into which you then call the different people to participate in.

Participant 10 added:

> But now, let's say with faster innovation cycles and everything, we are in a world of constant change. And I think this makes it more difficult to foresee the future. And it requires maybe actually to have understood that we are in a world of constant change, and that the probability is actually pretty high that we, I don't know, in a period of five to 10 years, we will do totally different - our business will totally look totally different. And this - I think managers should be aware of this and therefore they should even spend more time, as we discussed already, in understanding: What are technological developments? What do other players in my market do? What are potentially new entrants in our field? What do start-ups do? What's happening also in academia? And constantly, based on the information that I get, constantly rethink what your own organization currently does, and also actively think about how to disrupt yourself.

Evaluation of Findings

The results from this study provide outcomes that are supported by the literature and present answers to the research questions that inspired the study. The study that was implemented, describes and document insights from SMEs on how managers from large-sized organizations in South Africa can leverage their cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation**.** These related to seventeen themes that were based on the participants' viewpoints, as well as their own experience with reference to the subject matter.

Moreover they provided comparable responses that explored how managers from large-sized organizations in South Africa can leverage their cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation. The outcome of the seventeen themes in the study results are in close relation to one another.

This study's themes demonstrate the reaction of the public to digital transformation, and how managers can leverage their cognitive capabilities for organizational agility and support dynamic capabilities. All 10 participants had conducted in-depth scholarly and policy-oriented research on digital transformation and cognitive capabilities, were teaching subjects in higher education related to the research questions, or had been involved in complex industrial projects. The outcome of the seventeen themes in this study sustains the view of most participants that digital transformation impact, organizational agility, and sustainability will alter our daily lives in ways that require constant change and creativity. As a result, this study presents an understanding of the importance to develop cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation**.**

When analyzing the outcome from this study, it is evident that large organizations in South African are in their early stage of digital transformation, due to change on an ongoing basis being costly, and to be agile often compromises efficiency (Teece, Peteraf and Leih 2016). For these organizations to be efficient and effective, it is crucial to know when and how much agility is needed for an organization. Based on the data collected from this study, most of the participants agreed that strategic change and employees being able to perform both physical and mental activities, is off utmost importance, Teece

(2007). Some of the data collected showed that culture and leadership needs are crucial for large organizations in South Africa to become more agile. Some of the participants believed that people need to change their mindsets. They need to be more passionate with what they do.

Other participants mention the importance of clear communication and strategic direction. The importance of an open culture also featured as crucial to organizational sustainability. According to the SMEs, cognitive capabilities and dynamic capabilities are crucial for digital transformation. These capabilities have become the link between capabilities and mental activities, which can be clearly define the capacity of an individual manager to perform one or more of the mental activities that comprise cognition (Helfat, 2014).

Mindset change and communication. In this study participants responded by stating that managers need to be more inquisitive, curious and passionate about what they do. Mindset change is needed, and employees need to be innovative by thinking out of the box. There needs to be more clear communication before organizations can go digital, (Helfat et al. 2007).

Culture and leadership. Leadership needs to paint a picture of the future, teaching employees to be relevant. Enabling employees to think differently. The approach to digital transformations should come from the top down and the bottom up. Open culture to allow for failure looked at allowing employees to experiment or explore without being afraid of defeat, (Zott & Huy, 2018).

Understanding your customer. Removing friction from customers is imperative, according to the participants. Understanding the customer's needs, what problems they

trying to resolve and assisting them to resolve it, is where focus needs to be shifted too, (Wagner & Wäger, 2018).

Reverse mentoring. Mixed teams were suggested by participants to incorporate the different generational ways of thinking, and to reach common senses for the growth and sustainability of the organization.

Cognitive capabilities. Participants stated that cognitive capabilities play a crucial role in digital transformation. Findings from the interviews showed that curiosity, the ability to question, the ability to experiment, the ability to think differently thinking, and the ability to learn from each other is given for digital transformation (Helfat & Peteraf, 2014),

Dynamic capabilities. Findings from this study support that employees need to have the ability to be creative, and innovative. Buidling specific skills based on what the future of the organization is, was of high importance for the paticipants. Looking at what was need and identifying the skills at the early stages of planning was also started by the participants (Wagner & Wäger, 2018).

Silos. Many organizations are built on silos, employees are not used to working across various divisions or an organization, creating small autonomous teams, and this has a negative impact on digital transformation, according to participants. With the Fourth Industrial global scope, organizations need to work together to create cross-industry impact and help humankind together for the future (Weill & Woerner, 2015).

Design thinking principles. Based on the gathered information, the importance was emphasized on the new way of working, by using agile methodology. Being able to do mental and physical activities is what is needed to drive digital transformation. The

importance of celebrating the small wins, problem solving, and emotional intelligence is crucial (Teece, 2007).

South African economy. Based on the information gathered, participants felt that the South African economy is flat, due to the lack of high-level skills. Interrelationships between the public and the private sector is crucial for the South African economy to be sustainable (Pillay, Ori, & Merkofer, 2016).

Collaboration is the future. Many participants stated that collaboration is crucial for the success of organizations. Saying that relationships and knowledge sharing in various organizations to deliver end to end solutions is beneficial for the end user or client, (Weill & Woerner, 2018; Kane et al., 2016).

Network management. According to some of the participants, they found networking and value adding beneficial to the growth of their organization. They attend various networking events to establish new ways of doing things and to identify possible opportunities. Engaging with other organizations globally in different industries provides them with options. With organizations working in digital chains and network contexts, participants felt solutions are created faster, with distributed costs and risks, and access to global knowledge, (Fang et al., 2016).

Business models and policies. Based on feedback from the participants, many felt that identifying the right business model for their organizations with the right governance structures, the right solutions, with the right teams can be implemented. As data is increasingly generated and collected globally, businesses require clearer and more practical data policies, while policy-makers need better tools to develop future-oriented

and agile frameworks for data regulation that will allow for innovation but protect individual privacy, (Pajarinen et al., 2015).

Global marketing and partnering. Participants stated the importance of going international, they said that South Africans tend to be too conservative and traditional, focusing inwards instead of globally. Networks across the local and international stages are of high importance. Participants spoke about digital catalysts, starting with global strategic support. The world is a global village. Opening country boundaries and partnering with other organizations globally, will limit reinventing something that has already been done, and will assist in long tern sustainable organizations, (Akerman, Gaarder, & Mogstad, 2015; Markowitsch et al., 2002).

Creativity. Participants mentioned the importance to have the ability to recognize potential and that they believe it is only possible if you get creative, and physically try different ways of doing things. There is a need for more creative thinking and skills for the dreamers and the creators; the kind of individuals who think of solutions, quicker and simpler. Foresight, is crucial, it's about the big picture, the end in mind and the creativity needed to see that, (Somsing & Belbaly, 2017).

Risk management. Participants spoke about accountability and risk-taking. With risk comes responsibility. It's a mindset change. Individuals should not be afraid to try new things that they passionate about. "Fail fast and learn fast" was said by the participants (Weill & Woerner, 2018; Kane et al., 2016).

Entrepreneurship and global partnerships. Participants commented on the importance of thinking like an entrepreneur, as they believe that the future of work is going to be entrepreneurial. Global partnerships with organizations that are ahead of

Africa with solutions. They state that working worth government and organizations around the world will help develop a better understanding of emerging technologies and their implications, and have an opportunity to pilot new frameworks, enabling faster adoption of technological innovation, (Denrell, Fang, & Winter, 2003).

Visionary, Incentives and Coaching. Participants agreed scenario thinking is futuristic thinking. Incentives for innovative ideas, is what participants recommended. Coaching of the younger workforce is pertinent, teaching them the right skills to lay the foundation for the future. Looking at what skills are needed for the changing roles in organizations and constantly thinking of how to disrupt, (Kane et al., 2016).

Summary

The purpose of this qualitative, multiple-case study was to describe and document insights from SMEs on how managers from large-sized organizations in South Africa can leverage their cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation. Qualitative data was based on insights derived from in-depth interviews with the identified participants. Since the study concentrated on innovative approaches to exploring managerial behaviors from large-sized organizations in South Africa, data collection was achieved with a purposeful sample using criteria and snowball sampling. A semi-structured interview process was used to elicit the SMEs' expertise and insights regarding the issues raised for this researches' objective.

The entities of evaluation were SMEs who have been studying and Information that was gathered through in-depth interviews in order to develop the qualitative perceptiveness

of the point of views of selected experts on the research subject so as to provide answers to the research questions through interview questions.

In order to conduct an efficient research study, SMEs were selected according to a certain criteria and through the sampling strategy. According to Schram (2006), absolute numbers should not be selected; thus, it was advised to select up to 10 participants for a qualitative study, as a higher number of participants might obstruct further research. Triangulation of information resources was performed in order to determine the reliability of the researcher's deliberations on the topic under study. Participants were selected through LinkedIn as well as the reference page of identified research papers. The framework of this research entailed conducting 10 in-depth interviews via Skype, face to face, or having participants provide answers in written form. The requirement to ask the right research questions has been highlighted by Browne and Keeley (2007). As such, it was important to identify suitable questions for the research. A list of questions were used, and had been generated , in order to discuss the purpose and problem of the research.

The analysis involved 10 individual in-depth, open-ended interviews with SME participants thereby collecting primary data. Cross-case synthesis using analytical techniques was employed to aggregate findings of the case studies. Yin, (2017). The evolution of recommendations for management practices that help steer complicated digital transformations taking place in large companies across the country of South Africa is what made this study important. This study has offered recommendations to practitioners on how to support managers in developing their cognitive capabilities to build organizational agility and support the dynamic capabilities of large organizations

undergoing digital transformation in the highly dynamic business environment of today's South Africa.

All participants agreed that cognitive and dynamic capabilities are crucial to the success of digital transformation. All participants found that fostering partnerships and networking globally, provides integrated knowledge, minimal reinventions, and great insight for organizational; growth and sustainability. Participant concurred that development of cognitive skills, coaching, and incentivizing employees contributes extensively to the growth and sustainability of organizations.

Chapter 5: Implications, Recommendations, and Conclusions

The problem addressed in this research study has been a lack of understanding among many managers in large organizations on how to develop cognitive capabilities used for building organizational agility and dynamic capabilities for digital transformation (Albort-Morant et al.., 2018; Verma Bharadwaj & Nanda, 2017; Teece, 2017). Researchers have noted that significant and positive influence of dynamic capabilities confirmed the importance of organizational agility in contributing to the organizational performance (Teece; 2007; Teece & Linden, 2017). Further research was also needed into how dynamic capabilities' effects on performance and innovation outcomes differ throughout all the capability levels. (Pervan, Curak & Kramaric 2017).

Today's large organizations have embraced digitalization strategies to expand or enhance their organizations. Modifying rivals' threats while encouraging cultural awareness, plus creating a patent strategy, as well as developing a dynamic capabilities' portfolio was critical to the sustainability of large organizations looking to survive and thrive in a digital future (Kiron et al., 2016). Recent research considers the temporal context, within which social-psychological processes has been embedded as features of business processes, surrounding the building of dynamic capabilities in large-sized organizations through organizational agility (Alves et al., 2016). In the past decade, research has identified the cognitive capabilities of team leaders as being the "micro-foundation" for building the literature of dynamic capabilities (Bendig et al., 2018; Helfat & Martin, 2015).

The purpose of this qualitative, multiple-case study was to describe and document insights from SMEs on how managers from large-sized organizations in South Africa can leverage their cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation. South Africa was an appropriate choice as the local context of this study, given that in this nation 48% of all organizations had initiated digital tranformations (IT News Africa, 2017). The research design that was used had been the multiple-case study type, satisfying the aim of this descriptive-case research study in the best manner (Yin, 2017) which focused on the following managerial-cognitive capabilities: attention to emerging technology, initiative and exploratory behavior; network management, and foresight capability. The unit of analysis has been SMEs meeting the exclusion and inclusion criteria for participants in the study (Yin, 2017).

Qualitative data was based on insights derived from in-depth interviews (Patton, 2014) from the identified participants. Since the study concentrated on innovative approaches to exploring managerial behaviours from large-sized organizations in South Africa, data collection was achieved with a purposeful sample using criteria and snowball sampling (Gentles et al., 2015). A semi-structured interview process was used to elicit the SMEs' expertise and insights regarding the issues raised for this researches' objective (Yin, 2017). Since the goal was to gain the views of these experts, a random sample was deemed inappropriate. Instead, a purposeful sample was created following a detailed review of the literature. Snowball sampling was further used to increase the sample size (Patton, 2014). A structured, but open-ended interview process was used to elicit the ten identified participants' (Appendix B) perceptions regarding the issues raised in the

purpose of the study (Yin, 2017). The method, scope, and number of interviews for this exploratory study were similar to other studies relying on in-depth interviews (Bohlmann, Qualls, & Rosa, 2013; Strauss, Griffin, & Rafferty, (2009).

The theoretical/conceptual framework grounded on Teece (2007), which states that the importance of focusing on the micro foundation of individual managers to facilitate factors for strategic change, will introduce the concept of managerial cognitive capability to elaborate the importance of capacity to perform both physical and mental activities. For the analyses of the cognitive foundation of managerial dynamic capabilities, micro foundations of dynamic capabilities needs to be built on. A role for cognition in the "sensing", "seizing", and "reconfiguration" components of dynamic capabilities are suggested by Teece (2007). Extensive research has been completed across varies fields of cognition, from cognitive psychology, cognitive science, social psychology, cognitive neuroscience, and behavioral decision theory, and we rely upon these definitions in well-regarded dictionaries of psychology and textbooks, as well as in empirical findings documented in scholarly articles and books (Helfat, 2014). Mental activities and maps from utilizing and altering information structures among managers also plays an important part in cognition as stated by Amit and Schoemaker,(1993), Helfat and Peteraf, (2003), and Gary and Wood (2011).

Limitations

One of the limitations was confidentiality of projects. The study mitigated this by focusing on the trust relationship between the SMEs and the interviewer and by completing and signing a confidentiality contract. Both interviewees and researchers, with knowledge and experience in the field involved in the study, could have introduced

some inevitable bias (Patton, 2014). The stratified sampling, triangulation, and recordings confirmed a variety in the presented views even though the replicability of multiple-case studies had always been difficult. The different strata were an attempt to identify patterns by drawing responses from diverse SME profiles (Zikmund et al., 2012). It was difficult given the size of the sample, to talk with SMEs from all large organizations that are digitally transforming, however each SME had a wide and diverse knowledge base and experience to share so that, indirectly, the researcher interviewed not just 10 SMEs but also extracted information from each SME's intellectual capital.

Ethical Assurances

This exploratory multiple-case study required ethical assurances (Yin, 2017). None of the sampling criteria were related to gender, race, ethnicity, religion, or political affiliations. The framework used was adapted from the "Ethical Issues Checklist" for qualitative research (Patton, 2014). The researcher kept an open mind on the probable findings and outcomes, meticulously scrutinized under the guidance of expert matter advisors, who had access to all transcripts, source documents, and interviews. The SME's who shared their knowledge, experience, and perceptions gave their informed consent before publication. Observations within organizations or on social media respected privacy and no nominative data was collected or kept for this study. Only non-invasive measurement tools were used, and SME's were fully informed. The challenge of interview data is best mitigated by data collection and analysis approaches that limit bias (Arvanitis, Gkypali, & Tsekouras, 2014; Rowley, 2012).

The participants were informed this was a multiple-case study research and diverging opinions were therefore encouraged (Yin, 2017). All interviews were recorded

digitally with the Atlas.ti application for Android phone, with the interviewees' approval, and converted into a transcript presented to the SMEs for validation and further reflection (Tracy, 2010). To avoid any misunderstanding or confusion during the interviews, there was a considerable increase in the reliability and validity of the research (Stake, 1995). The interviewer recorded her own handwritten notes as a back-up and led the interviews with the planned questions, being open to digressions and examining with follow-up questions to get an in-depth understanding (Hatch, 2002). For traceability purposes, all the field data, which formed part of the research (SMEs' contact information, interview schedules, audio recordings, pictures, comments, and reflections) were recorded in the Atlas.ti application and then transferred to the Atlas.ti 8 software for further analysis.

Towards the completion of this chapter, the implications, recommendations, and conclusions of the study are presented. Implications have been established and aligned to provide answers to the study's research questions, and grounded in the extant literature on the subject, as well as the articulated views of the participants. Recommendations for practitioners are set out, as are recommendations for relevant policymakers. This study has identified several areas of future research for academic scholars, and those recommendations are also presented. The key points of Chapter 5 and the study are presented in the Conclusion section.

Implications of the Study

On becoming President of South Africa Cyril Ramaphosa put the Fourth Industrial Revolution (4IR) into his national economic strategy, generating criticism for its neoliberal rhetoric echoing the World Economic Forum (WEF) and concern it would not create jobs. 4IR is an umbrella term for 3D-printing, artificial intelligence (AI), big

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data, industrial Internet of things (IIoT) and robotics. For corporations it means rethinking strategies and auto-cannibalisation of business models. For policy-makers in manufacturing nations it is supposed to raise national competitiveness and bring manufacturing home, potentially blocking developing nations from creating jobs through attracting labour-intensive manufacturing.

The 4IR's effects on work and employment are forecast to be complex, potentially heightening inequality by reducing demand for low levels of skills. South Africa has a significant skills shortage, due to failings in its education system, limiting the supply of managers, researchers and workers needed for 4IR. There are also problems of poor quality infrastructure, reflecting weak governance and state capture. It has a poor record in policy formulation and implementation, especially across departments, with notable delays in cybersecurity and data protection. There is only a small domestic market and, despite aspirations, it is not an easy gateway to the rest of Africa, which has strong demographic growth but limited spending power and poor physical distribution systems. Moreover, South African firms have to compete with a strong Chinese presence.

The 4IR has been described as the fourth major industrial era since the initial Industrial Revolution of the 18th century, in which new technologies are fusing the physical, digital and biological worlds, impacting all disciplines, economies and industries.1 Key technology platforms include AI, robotics, the internet of things, autonomous vehicles, additive manufacturing (also known as 3D printing), quantum computing and nanotechnology. The 4IR is viewed as significant, imminent and global. South Africa's development challenges, particularly those of inequality and uneven development, require 4IRrelated strategies that are contextually specific yet informed by

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global developments. Being prepared for the 4IR means to position institutions in such a way that the 4IR is harnessed for the benefit of human wellbeing and in support of national and international social and economic objectives. It is therefore critical that South African institutions put in place strategic measures to prepare us for building innovation capacity, developing policy, writing legislation and regulations, joining multilateral and international agreements, and debating the emerging ethics of its advent. The velocity of the 4IR suggests that by the time the policy cycle has turned, the 4IR may already have had an enormous impact – hence the urgency and significance of initiating policy cycles at all levels.

The participants' input during the interview questions process, provided insights into the study's four research questions and were analysed thematically for both consistency and divergent views. This thematic analysis was synthesized with data from the existing literature, the triangulation process, and the researcher's observational field notes, which provided answers to the four research questions. The aim of this study, in addition to seeking the answers posed by the research questions and how they apply to the profession, was also to contribute knowledge to the interconnected theories that adequately explain the phenomenon of interest. The conceptual/theoretical framework has applied based on Teece (2007), which states the importance of focusing on the micro foundation of individual managers to facilitate factors for strategic change and introduces the concept of managerial cognitive capability to elaborate the importance of capacity to perform both physical and mental activities. For the analyses of the cognitive foundation of managerial dynamic capabilities, micro foundations of dynamic capabilities need to be built on. A role for cognition in the “sensing, seizing”, and “reconfiguration”

components of dynamic capabilities are suggested by Teece (2007). This question was used to assess the relevance of the research question and to collect the 10 SMEs' hypotheses on whether cognitive capability, performing both physical and mental activities for digital transformation in large organizations will contribute to organizational agility.

The findings outlined in Chapter 4 presented five themes that correspond to Research Question 1 a) Mind-set Change & Communication; b) Culture & Leadership; c); Understanding your Customer; d) Reverse Mentoring; and (e) Cognitive Capabilities), four themes corresponding to Research Question 2 a) Silo's; b) Design Thinking Principles; c) Dynamic Capabilities; and d South African Econom, four themes corresponding to Research Question 3 a) Collaboration is the future; b) Network Management; c) Business models and Policies; d) Global Market and Partnering; and four themes corresponding to Research Question 4 a) Creativity; b) Risk Management; c) Entrepreneurship and Global Partnerships and) Visionary, Incentives and Coaching. Accordingly, the following discussion of implications addresses each of these in turn.

RQ1: What are the perceptions of SMEs, regarding how managers from large-sized organizations in South Africa attempting digital transformation can leverage attention to emerging technology to build organizational agility, and support dynamic capabilities?

Mindset change and communication. Participants responded in this study by stating that managers need to be more inquisitive, curious and passionate about what they do. Mindset change is needed, employees need to be innovative by thinking out of the box. There needs to be more clear communication, before organizations can go digital,

(Helfat et al., 2007) and for companies that have the talent and mindset, digital transformation will be possible. Across both the current business and the digitally transformed business, the most important levers in this respect are retraining and hiring, according to Frankenberger, Mayer, Reiter, and Schmidt, 2019.

Culture and leadership. Leadership needs to paint a picture of the future, teaching employees to be relevant; enabling employees to think differently. The approach to a digital transformations should come from the top down and the bottom up. Open culture to allow for failure looks at allowing employees to experiment or explore without being afraid of failure, (Zott & Huy, 2018). Leaders need to understand that there is a pressing need to pursue a dual business (current and digitally transformed) approach. Leaders need to first establish why their organizations need to transform, in order to develop a strategy for how to act, (Frankenberger, Mayer, Reiter, & Schmidt, 2019).

Understanding your customer by removing friction from customers is imperative, according to the participants. Understanding the customer's needs, what problems they trying to resolve, and assisting them to resolve it, is where focus needs to be shifted too, (Wagner & Wäger, 2018). Frankenberger et al. 2019 were concerned that companies would need to respond to newly emerging competition or changing customer preferences. This would require a need to play catch-up as they see their market share dwindling, or they may seek to proactively create novel value propositions for new customer profiles.

Reverse mentoring. Mixed teams were suggested by participants to incorporate the different generational ways of thinking, to reach common senses for the growth and sustainability of the organization. Kaše, Saksida, and Mihelič (2019), mention the

importance of how extrinsic motivation may be used to explain variation in younger mentors' and older learners' skill development. Younger mentors pursue opportunities to develop their skills, in reverse-mentoring initiatives to enhance their career opportunities. This proactive approach to managing external circumstances is indicative of the crucial role that extrinsic outcomes play during this stage of their lives.

Cognitive capabilities Participants stated that cognitive capabilities play a crucial role in digital transformation. Findings from the interviews showed that curiosity, ability to question, the ability to experiment, ability to think differently (Helfat & Peteraf, 2014), and the ability to learn from each other is given for digital transformation. According to Tarka, (2019), "…companies above all, need managers who can not only work smart and with dexterity, but also who can easily undertake cognitive efforts which will enhance their processes of thinking and consequently lead to an improvement of business effectiveness as well as the efficiency of the entire organization."

RQ2: What are the perceptions of SMEs, regarding how managers from large-sized organizations in South Africa attempting digital transformation can leverage initiative and exploratory behavior to build organizational agility, and support dynamic capabilities?

Silos. Many organizations are built on silos, employees are not used to working across various divisions or an organization, creating small autonomous teams, which has a negative impact on digital transformation, according to participants. With the fourth industrial global scope, organizations need to work together to create cross-industry impact and help humankind together for the future, (Weill & Woerner, 2015).

Design thinking principles Based on the gathered information, the importance emphasized on the importance on the new way of working, using agile methodology. Being able to do mental and physical activities is what is needed to drive digital transformation. The importance of celebrating the small wins, problem solving, and emotional intelligence is crucial mentioned (Teece, 2007). Tackling possible disruptors, requires an internal transformation to change the inner core of the organizations' DNA with its norms and values. True change needs true authenticity, not just a new makeup (Vey, Fandel-Meyer, Zipp, & Schneider, 2017).

Dynamic capabilities Findings from this study support that employees need to have the ability to be creative, and innovative. Buidling specific skills based on what the future of the organization is, was of high importance from the paticipants. Looking at what were the needs and identifying the skills at the early stages of planning was also started by the participants, (Wagner & Wäger, 2018). The link between innovation and skills was essential. These skills are identified and distributed in three dimensions: Dynamic Skills, Innovation Skills, and Digital Skills (Sousa, 2019).

South African economy Based on the information gathered, participants felt that the South African economy is flat, due to the lack of high-level skills. Interrelationships between public and private sector is crucial for the South African economy to be sustainable (Pillay, Ori, & Merkofer, 2016).

> Africa lags behind the other regions in networks coverage and in its use of core digital platforms and services. Expanding network coverage to deprived rural areas, guaranteeing universal access to affordable internet online services, and developing e-government

> online services are vital policies that African countries have to speedily take serious steps to undertake in order to catch fully the benefits of the digital revolution" (Adam, 2019).

RQ3: What are the perceptions of SMEs, regarding how managers from large-sized organizations in South Africa attempting digital transformation can leverage initiative and exploratory behavior to build organizational agility, and support dynamic capabilities?

Collaboration is the future. Many participants stated that collaboration is crucial for the success of organizations. Saying that relationships and knowledge sharing various organizations to deliver end to end solutions is beneficial for the end user, or client, (Weill & Woerner, 2018; Kane et al., 2016). Digital tranformation often starts with the strategic renewal of the incumbent's business model and changes in business models, tending to lead to wider changes in the firm's collaborative approach, which, if executed correctly, will eventually lead to deeper changes in organizational culture (Warner, & Wäger, 2019).

Network management. According to some of the participants, they found networking beneficial and value adding to the growth of their organization. They attended various networking events to establish new ways of doing things and to identify possible opportunities. Engaging with other organizations globally, in different industries provides them with options. With organizations working in digital chains and network contexts, participants felt solutions are created faster, with distributed costs and risks, and access to global knowledge, (Fang et al., 2014).

Business models and policies. Based on feedback from the participants, many felt that identifying the right business model for their organizations with the right governance structures, the right solutions, with the right teams can be implemented. As data is increasingly generated and collected globally, businesses require clearer and more practical data policies, while policy-makers need better tools to develop future-oriented and agile frameworks for data regulation that will allow for innovation but protect individual privacy, (Pajarinen, Rouvinen, & Ekeland, 2015).

> Digitization transforms, and disrupts, businesses on various levels, be it in terms of new products, new services, or completely new business models that redefine and dissolve boundaries of existing industries. The challenge for companies is how fast and how far to go on the path to digital transformation" (Vey, Fandel-Meyer, Zipp, & Schneider, 2017).

Global marketing and partnering. Participants stated the importance of going international, they said that South Africans tend to be too conservative and traditional, focusing inwards instead of globally. Networks across local and international is of high importance. Participants spoke about digital catalysts, starting with global strategic support. The world is a global village. Opening country boundaries and partnering with other organizations globally, will limit reinventing something that has already been done, and will assisting in long tern sustainable organizations, (Akerman, Gaarder, & Mogstad, 2015; Markowitsch et al., 2001).

RQ4: From your understanding of large organizations attempting digital transformation, how can managers leverage foresight capabilities to build organizational agility and support dynamic capabilities?

Creativity. Participants mentioned the importance to have the ability to recognize potential and that they believe is only possible if you get creative, and physically try different ways of doing things. There is a need for more creative thinking, skills for the dreamers and the creators. The kind of individuals who think of solutions, quicker and simpler. Foresight, is crucial, it's about the big picture, the end in mind and the creativity needed to see that, (Somsing & Belbaly, 2017).

Risk Management. Participants spoke about accountability and risk taking. With risk comes responsibility. It's a mind-set change. Individuals should not be afraid to try new things that they are passionate about. Fail fast and learn fast was something mentioned by the participants. (Weill & Woerner, 2018; Kane et al., 2016)

Entrepreneurship and global partnerships. Participants commented on the importance of thinking like an entrepreneur, as they believe that the future of work is going to be entrepreneurial. Global partnerships with organizations that are ahead of Africa with solutions. They state that working worth governments and organizations around the world will help develop a better understanding of emerging technologies and their implications, and have an opportunity to pilot new frameworks, enabling faster adoption of technological innovation, (Denrell, Fang, & Winter, 2003).

Visionary, incentives. and coaching. Participants agreed scenario-thinking is futuristic-thinking. Incentives for innovative ideas, is what participants recommended. Coaching of the younger workforce is pertinent, while teaching them the right skills to lay the foundation for the future and looking at what skills are needed for the changing roles in organizations and constantly thinking of how to disrupt, (Kane, et al,. 2016).

Future predictions of SMEs for digital transformation towards 2030. The main finding from the research questions is that digital transformation is inevitable for the long-term sustainability of organizations. This will involve the ongoing strategic renewal of the organizations' integration and collaboration approach, improving the digital maturity of the workforce, developing the dynamic capabilities and cognitive skills, navigating an innovative ecosystem, and lastly building the organizational culture (Warner & Wäger, 2019). Participants also stated the importance of creativity, networking, reducing the silo mentality, and partnering or networking locally and globally. The literature review showed that for the success of large organizations in South Africa to implement cognitive capabilities required, at management level, the agile transformation towards digitization; a few important concepts were highlighted throughout the review of this literature.

The first few concepts focus on knowing when and how much agility is needed for an organization to be effective and efficient. Dynamic capability characterized by organizational routines, highly effective cognitive-managerial skills, robust organizational designs, and the company's capacity to unite, establish, and restructure the expertise within it were some of the key concepts that were identified to achieve that state of agility (Teece, Peteraf & Leih 2016). Based on the above, there is an urgent need for organizations to assess the level of skills and competencies within them, revisit their business models, and develop the right skills for digital transformation. Customers in general are looking for real time, and customized solutions for long-term sustainability and profitability. Strategic-thinking is crucial in understanding which markets to compete

in, with transformation increasing and the opportunity to successfully achieve it decreasing. (Reeves, et al. 2018).

What is evident from this literature is that for organizations to transform digitally, they need to look at new digital technologies that will impact their organizations (current and future) to creates significant improvements (Fitzgerald et al., 2014; Warg et al., 2016). For South African organizations to be sustainable and profitable, it need to adapt and support the digital journey of transformation, by aligning their infrastructure, up-skilling their workforce, expand their product portfolio with digital offerings, and focus on driving both revenue growth and operational efficiencies (Pillay, Ori, & Merkofer, 2016; Theron & Botha , 2016).

Recommendations for Practice

The world has experienced a massive transformation since the establishment of the first industrial revolution which seemed as a breakthrough for humankind. The first industrial revolution transformed from an agrarian and handcraft world to the use of machines that were powered by water and steam. This was followed by what is called the second and subsequently the third industrial revolution the two led to an establishment of electric power to create mass production and the use of electronics and information technology to automate production. In a short while technology evolved rapidly birthing what is so called the current fourth industrial revolution. Unlike the past three evolutions, the fourth industrial revolution has rapidly transformed the way of life to a sophisticated digitalized world where everything is made instant.

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In the current study, we examined how managers from large-sized organizations in South Africa can leverage their cognitive capabilities to build organizational agility

and support dynamic capabilities during a period of digital transformation. Therefore, we contribute to Teece , Peteraf, and Leih's, (2016) call for organizations to achieve dynamic capabilities characterized by organizational routines, highly effective cognitive-managerial skills, robust organizational designs, and the company's capacity to unite, establish, and restructure the expertise within it, which leads to eventually dealing with, and altering the atmosphere of the said business. However, as with all exploratory research, the current study is not without its limitations. Recommendations to advance the work can be made for future research in the exploration of how ordinary capabilities interact with dynamic capabilities for digital transformation over time (Teece, 2014).

One undeniable factor of the current study is that it is too early to conclude how the impact of the implementation of dynamic capabilities and highly effective cognitive skills in South African large organizations will be embraced. One limitation of the current study is that it was dependent on the SMEs understanding the subject under study. This study could be supported by further analyzing additional case studies from which insights can be gathered towards the successful implementation of dynamic capabilities and highly effective cognitive skills for digital transformation.

All participants stated that digital transformation will impact their organizations for a sustainable and profitable future. The stated gaps provide sufficient purpose to continue pursuing in-depth qualitative research, particularly with samples of end-user customers. With ongoing research and organizations implementing digital transformation, there will be an opportunity to conduct in-depth studies that will contribute to the current study and studies to come. The qualitative method that had been used for this research was a way to gain an understanding of the present phenomenon. In the future, a broader

number of participants who are SMEs on the current topic of discussion, should be considered for studies as this will create an opportunity to generalize participants' responses as well as form new themes. A larger population of participants will generate more defined outcomes in similar research and contribute to the reliability and credibility of future studies.

Four broad cross-cutting strategies have emerged from the policy discourse and research in South Africa ( ). The first is the need to strengthen adaptive capabilities. Across all institutions (including government, business, education and research), increased capacity to make sense of technological change and adapt accordingly is becoming increasingly significant. The second is the generalised imperative to leverage the technological changes that characterise the 4IR. Technological change in most instances presents both opportunities and threats, and the role of policy must be to harness new technologies for the maximisation of opportunity and the mitigation of threats. The third broad domain is that of building capabilities, since capabilities underpin efforts to leverage technological change. These include technological capabilities, research and development capabilities, and education and skills development capabilities. The fourth and final strategy is to ensure that all policy is oriented towards the achievement of developmental outcomes, including economic growth, human development and human freedoms.

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URI: http://hdl.handle.net/20.500.11910/15119

Recommendations for Future Research

Further studies are needed to assess the impact of the building of dynamic capabilities for digitalization to use in new ventures (Autio, Nambisan, Thomas, & Wright, 2018; Huang et al, 2017), which would contribute to the discussion of their role

and intended purpose (Barreto, 2010). Further research could also compare whether there is a difference in building dynamic capabilities guided by consultants versus an internal change process without consultancy. Finally, in a world of disruptive competition, prevalent digital technologies, and changing end-user behaviours, the sources of a competitive advantage are increasingly unknown (McGrath, 2013). Hence, more research needs to explore the progressive role that digital transformation plays in the maintenance of transitory competitive advantage.

Conclusions

To provide answers to the research questions presented in this study, a qualitative multiple-case study method was implemented to present how managers from large-sized organizations in South Africa can leverage their cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation. The results from this study provided outcomes that were supported by the literature and presented answers to the research questions that inspired the study. The study that was implemented, described and documented insights from SMEs on the stated topic. Recommendations were made that were based on the above, for organizations to assess the level of skills and competencies within their organizations, revisit their business models, and develop the right skills for digital transformation. Management should understand customer needs, as customers in general are looking for real time, and customized solutions for long-term sustainability and profitability. From a strategic thinking point of view, it is crucial for management to understand, which markets to compete in.

Problems such as collaboration and networking can be sufficiently addressed at this time, and potential partnerships can be implemented for the future. A lack of knowledge about this new technology plays an important role in market acceptance and trust, therefore change and culture leadership is of high importance. Future research is needed to explore the progressive role that digital transformation plays in the maintenance of transitory competitive advantage, as well as the impact of building dynamic capabilities and highly skilled cognitive capabilities for the digitalization of new ventures.

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Appendices

Appendix A: Introduction Letter

Re: Introduction and request for participation in doctoral study

Attn: Name

Dear Sir/Madam

My name is Sharlett Naidu and I am a doctoral student at the International School of Management (Paris, France). I am writing a dissertation involving in-depth interviews to explore the perceptions of Subject Matter Experts (SMEs) with regards to how managers from large-sized organizations in South Africa can leverage their cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation. The interview has an approximate timeframe of 1.5 hours to complete and you have an option for your input to either be completely confidential or attributed to you. You will be asked questions in a semi-structured format during the interview. The study is in partial fulfilment of the requirements for the Degree of Doctor of Philosophy and the results will be published.

The purpose of this qualitative case study is to document and describe the insights of SMEs on how managers from large-sized organizations in South Africa can leverage their cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation. Once this study is approved by the International School of Management, you will be provided an electronic copy of the dissertation manuscript.

If you are available for an interview, please reply via email to snaidu@moyo.com or reach me at my cell phone at +27 (011) 827779435. On receipt of the authorized form, I will be in contact with you to arrange an interview.
Kind Regards,

US Naidu, PhD Candidate
International School of Management
Daphne Halkias, PhD., Dissertation Committee Chair

Appendix B: Informed Consent Form

Introduction

My name is Sharlotte Naidu. I am a doctoral student at ISM. I am completing this research as part of my doctoral degree. I am conducting a research study on the perceptions of Subject Matter Experts (SMEs) regarding how managers from large-sized organizations in South Africa can leverage their cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation. I invite you to participate in this research study for a dissertation at International School of Management (ISM) based in Paris France.

Activities:

As a participant in this research, you will be asked to:

- Provide in-depth verbal responses to interview questions asked by the researcher,
- The researcher will schedule the interview based on your convenience and will conduct the interview session with you by Skype or Zoom or face-to-face meeting,
- The Interview session will be recorded and will last approximately an hour and half.

Eligibility

You are eligible to participate in this research if you:

- Are a subject matter expert in the field of digital transformation in South Africa
- Have practitioner experience related to leveraging cognitive capabilities to build organizational agility and support dynamic capabilities in South Africa

Risks

There are minimal risks in this study. Some possible risks include: Some information may be personal in nature. The interview process includes semi-structured questions that are intended to encourage in-depth responses, perceptions and comments. You will not be asked to divulge proprietary or confidential information. To decrease the impact of these risks, you can: skip any question, and/or, stop participation at any time.

Benefits

If you decide to participate, there are no direct benefits to you for taking part in this research. The benefit for your participation in this study includes access to the final

dissertation manuscript that was sent to you after the study is completed and approved by ISM. The potential benefits to others include findings on how managers from large-sized organizations in South Africa can leverage their cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation.

Confidentiality

Unless you have elected to have your comments attributed to you in the final study, the information you provide will be kept confidential to the extent allowable by law. Some steps I will take to keep your identity confidential including the of a number to identify you. Individuals who have access to your information are: myself, and/or my dissertation chair, and/or my dissertation committee. The Institutional Review Board may also review my research and view your information. I will secure your information with these steps: locking the computer file with a password, locking physical documents in a file cabinet. I will keep your data for 7 years, subsequently I will delete electronic data and destroy paper data.

Please sign here if you would like your remarks to be attributed to you in the final study:

_____

Contact Information

In you have any questions for me, you can contact me at: snaidu@moyo.com or by phone at +27(011)827779435. My dissertation chair's name is Dr. Daphne Halkias. She works at ISM and is supervising me in this research. You can contact her at daphne.halkias@ism.edu. If you have questions about your rights in the research, or if a problem had occurred, or if you are injured during your participation, please contact the Institutional Review Board at ISM at +33 (0) 1 45 51 09 09.

Voluntary Participation

Your participation is voluntary. If you decide not to participate, or if you stop participation after you start, there is no penalty to you. You will not lose any benefit to which you are otherwise entitled.

Recording

I would like to use a cell phone to record voice notes of your responses is the interview is done in person and record the audio is the interview is performed using Skype or Zoom. You can still participate if you do not want to be recorded.

Please sign here if you consent to be recorded:

_____

Signature

A signature indicates your understanding of this consent form. You will also be given a copy of this form.

_____

___

Participant Signature Printed Name Date

Appendix C: Interview Protocol

Name of Participant: _____

Participant Number Identifier _____

Date of Interview: _____

Years of Professional/Academic Experience_____ Country: _____

Thank you for affording me with your time and consent to participate in my research. The Informed Consent letter that had been provided to you, has been read, acknowledged, and signed, which explained the purpose and characteristics of the study. With your permission, I would like to record your responses using an audio recorder; will that be in order? The extent of the interview will be approximately 30 minutes. A variety of open-ended questions will be asked by myself and there may be additional probes to explore your professional insights on the research study topic asked by myself as well.

Later, the transcribed interview will be made available to you, to provide you with an opportunity to review the transcribed interview for clarity and possible elaboration. All information discussed in this interview will be strictly confidential, and your participation in this study is completely voluntary. Feel free to skip any questions or withdraw from the study at any time. Please feel secure to disclose as much or as little about your knowledge and experience on the study topic as you wish. References will be coded to all study responses, reporting will be done in aggregate, and all recognizable markers will be removed.

Are we ready to start?

In a large organization attempting digital transformation;

1. How can a manager leverage attention to emerging technology to build organizational agility, and support dynamic capabilities? Can you give me one or two examples?
2. How can managers leverage initiative and perception to build organizational agility, and support dynamic capabilities? Can you give me one or two examples?
3. How can managers leverage network management to build organizational agility, and support dynamic capabilities? Can you give me one or two examples?
4. How can managers leverage foresight capability to build organizational agility, and support dynamic capabilities? Can you give me one or two examples?

Are there any final thoughts you wish to share with me on the topic of how managers from large-sized organizations in South Africa can leverage their cognitive capabilities to build organizational agility and support dynamic capabilities during a period of digital transformation.

Appendix D Professional Background of Subject Matter Experts

P1 – Executive DLT/Blockchain & CA **(SA) training**

Responsible for block chain strategy across the universal financial services organisation currently working payments/letters of credit accounting in distributed ledgers across protocols and uses cases delivering live chains with real impact across the group. focusing on end to end value chains and integrating between smart contracts and functionality delivering brand new customer experiences across AFRICA, china and SA with global partnerships co-creating and collaborating across architecture, developers as well as business in the most resilient and adaptive manner. Focusing on the future. 24 years' experience. Chartered Accountant

P2 – Global Group CTO Telecommunications organization

Responsible for telecommunication networks across Sub-Saharan Africa, for the largest telecommunications organisations in South Africa. With over 30 years of experience, he is at the forefront of telecommunications technology. He presents at all many international conference on the future of telecommunications and technology. Master's degree

P3 – CEO of Cyber Security Organisation

This individual is a transformational leader and visionary entrepreneur with a proven track record. She has won both local and international awards and is recognised as a technology industry leader. Her passion for building a business that makes a significant contribution not only financially, but also to the wellbeing and security of the country, led her to found LAWtrust in 2006 and grow it from a start-up, to the dominant player in the South African identity and integrity security sector. With more than 20 years' experience in the cyber security sector, she regularly talks at local and international events. Master's degree

P4 – CEO Auditing and Consulting Firm

One of the founders and CEO of a South African Auditing firm that has been providing accounting, audit and consulting services since the birth of South Africa's democracy in 1994. SAB&T became one of the first black firms in South Africa to join an international association. His network now has more than 230 member firms in over 110 countries. Over 25 years of experience. Chartered Accountant.

P5 – Executive Vice-President and Company Secretary Petroleum Organization

BA; LLB. 1996-2003, with South African Gov't: Assistant Legal Adviser to President Nelson Mandela; Special Adviser to Nat'l Director of Public Prosecutions; Chief Legal Adviser to Minister of Finance and National Treasury; Director, Corporate Strategy and Transformation, Department of Justice and Constitutional Development. With Transnet: 2004-06, Group Executive, Legal and Risk; 2007-10, Group Executive, Office of the Group Chief Executive. Since January 2011, Executive Vice President, Advisory & Assurance, and Company Secretary, Sasol. Chairman, Rhodes University Council. Member, Board of Governors, Rhodes University Foundation. Former Chairman, Council of St John's College, Houghton, Johannesburg. Over 15 years' experience

P6 – Principal Officer at Medical Scheme Organization

Navigating and protecting our members through their healthcare journey.
An accomplished, multi-skilled leader with over 15 years' experience working in the financial and healthcare sector, with a passion for unlocking and driving new opportunities. Master's Degree.

P7 – Chief Digital Officer for chemical division of a Petroleum Organization

In her career of over 20 years, she has gained a deep understanding of the Petrochemical Chemical Industry, having held roles in Operations, Business and Strategy. She is passionate about the development of people and mentors talented individuals to help them reach their true potential. Degreed in Chemical Engineering.

P8 – Senior Futurist and Presidential Commissioner for the South African Fourth Industrial Revolution (4IR)

Professor, with over 25 years of experience. Future Studies, Research, lecturing and consulting in the fields of Entrepreneurship, Future Studies, Social Entrepreneurship, Research methodology, Family Business ,Culture, Turnaround Strategies, Governance Structures and Planning, Strategic Planning, Outside Advice, Risk Control, Internal Regulatory Environment, Stakeholders Interest, Needs Alignment, Cultural Values Alignment, Trust, Ethics and Profitability.

P9 – Professor of Information Systems and Strategic IT Management at University of Bayreuth, Germany

As well as Director at the FIM Research Centre and the Fraunhofer Project Group Information Systems. Before, he held the position of an Assistant Professor at EBS Business School in Wiesbaden where he was head of the Strategic IT Management Competence centre at the Institute of Research on Information Systems (IRIS). He also received his doctorate from EBS. Furthermore, he holds a diploma in information systems from the University of Paderborn. In 2008, he stayed at the University of Pittsburgh as Visiting Scholar at the Katz Graduate School of Business, in 2012 at the the École des Hautes Etudes Commerciales (HEC) of the University of Lausanne. Complementary to his academic work, he was Managing Consultant with Horváth & Partners in Stuttgart. Earlier, he worked as Consultant with Accenture in Frankfurt. Nils Urbach has been working in the fields of strategic information management and collaborative information systems for several years. In his current research, he focuses on digital transformation, future IT workplace, and blockchain, among others. His work has been published in several academic journals such as the Journal of Strategic Information Systems (JSIS), Journal of Information Technology (JIT), IEEE Transactions on Engineering Management (IEEE TEM), Information and Management (I&M), Journal of Information Technology Theory and Application (JITTA), Business Process

Management Journal (BPMJ), and Business & Information Systems Engineering (BISE) as well as in the proceedings of key international conferences such as the International Conference on Information Systems (ICIS), the European Conference on Information Systems (ECIS), the Hawaii International Conference on System Sciences (HICSS), and the Americas Conference on Information Systems (AMCIS).

P10 – (Ph.D. in Management) is a University Professor and a research fellow at ISCTE/IUL.

Her research interests currently are public policies, information science, and innovation. She is a best seller author in Research Methods, ICT and People Management fields and has co-authored over 80 articles and book chapters and published in several scientific journals (e.g. Journal of Business Research, Journal of Medical Systems, Information Systems Frontiers, European Planning Studies, Systems Research and Behavioral Science, Computational and Mathematical Organization Theory, Future Generation Computer Systems, and others), she has also organized and peer-reviewed international conferences, and is the guest-editor of several Special Issues from Springer and Elsevier.