Gordon Institute of Business Science
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Leveraging a digital business strategy for a sustained competitive advantage

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Abstract

The advances and the exponential change in technology impact the business strategy of all organisations, from established enterprises to newly formed digital start-ups. These digital technologies are reforming, shaping, and changing the way in which organisations think about their business strategy and IT strategy as they converge. This convergence increases the need for the organisation to understand the relationship between a Digital Business Strategy (DBS) across the elements of scope, scale, speed and value creation and the Dynamic Capabilities (DC) of sensing changes in the environment, seizing any identified opportunities, and transforming resources and the organisation.

A quantitative research study was employed, and a multivariate analysis was conducted on 121 respondents. This study investigated the relationship between the elements of a DBS and the DC that leads to a sustained competitive advantage (SCA).

The findings in this research indicated a statistically significant positive correlation between the components of a DBS and a SCA. A regression analysis indicated that the activities an organisation should focus on and pursue namely: firstly, the scope of a DBS, which predicts the DC of seizing, indicating that focusing on seizing the opportunities that emerged from digital technologies will lead to a SCA; secondly, the three dimensions of speed in a DBS, the speed at which products are launched, the speed of management decision making, and the speed of network formation and adaptation. These findings provide organisations with insights on how to successfully leverage a DBS for a SCA.

Keywords

Digital business strategy, dynamic capabilities, sustained competitive advantage, strategy

Declaration

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

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Table of contents

List of figures

List of tables

Chapter 1 : Introduction to research problem

"New digital technologies present both game-changing opportunities for – and existential threats to – companies whose success was built in the pre-digital economy" (Sebastian et al., 2017, p. 1).

1.1. Introduction

Organisations globally are evolving and exploring opportunities to leverage digital technologies to gain productivity improvements by utilising resources more effectively and efficiently, reducing costs and innovating to ensure their relevance in the future (Hess, Benlian, Matt, & Wiesböck, 2016). The exponential growth and potential of digital technologies has, and still is transforming strategy and organisations (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013; Leischnig, Woelfl, & Ivens, 2016; Sebastian et al., 2017; Sia, Soh, & Weill, 2016; Singh, Gaur, & Agarwal, 2017). This improvement in technology, infrastructure, information, communication, and connectivity led to the creation of lower priced easy-to-use hardware and software that is accessible worldwide through the connectiveness of the internet causing organisations to change their technology infrastructures to fit into the digital age and economy (Bharadwaj, El Sawy, et al., 2013; Fichman, Dos Santos, Brian, & Zheng, 2014). The emergence of multisided platform organisations, the increase in information available to organisations, the ability through technology to interact with users, suppliers and customers, and the ability to form relationships with organisations to create a sustained competitive advantage through the use of digital technologies are just some of the challenges facing organisations (Bharadwaj, El Sawy, et al., 2013; Hansen & Sia, 2015; Luo, Zhang, Bose, Li, & Chung, 2018; Schoemaker, Heaton, & Teece, 2018; Sebastian et al., 2017; Sia et al., 2016; van Alstyne, Parker, & Choudary, 2016). This highlights the influence of Information Technology (IT) in an organisation and more specifically the impact on the organisations strategy and structure (Bharadwaj, El Sawy, et al., 2013; Leischnig et al., 2016; Pagani, 2013; Yeow, Soh, & Hansen, 2018).

1.2. Research aim and problem

The research aims to identify the relationship between an organisation's Digital Business Strategy (DBS) and Sustained Competitive Advantage (SCA) as part of

Dynamic Capabilities (DC). It is proposed that a dynamic approach towards creating a SCA is important through examining the processes, procedures and strategies by which digital technologies and IT can add value to the organisation and the strategy (Bharadwaj, El Sawy, et al., 2013; Grover & Kohli, 2013; Mikalef & Pateli, 2017; Schoemaker et al., 2018; Sebastian et al., 2017; Sia et al., 2016).

This study will analyse the individual relationship between the dimensions of a DBS namely: scope, scale, speed and value creation (Bharadwaj, El Sawy, et al., 2013) and the Dynamic Capabilities of sensing change, seizing opportunities and transforming resources and organisations (Schoemaker et al., 2018).

The value to academia from this research is that it could possibly contribute to the current insights on sustained competitive advantage through investigating the broad themes proposed by Bharadwaj et al. (2013) of scope, scale, speed and sources of value creation. In conducting a quantitative study, the researcher aimed to contribute empirical evidence to the literature and understand the components of a DBS that may significantly predict a SCA.

The value of this research study to business, is that it may provide managers and organisations with a better understanding of the relationship between a digital strategy and how a sustained competitive advantage could be achieved. The focus will be on the key components of a digital strategy that would enable it. Managers can direct their limited resources to the components that would make the biggest impact in formulating their digital business strategy.

1.3. Scope of the research

The scope of the research is confined to the following definitions: Digital Business Strategy, Dynamic Capabilities, sensing, seizing, transforming, and sustained competitive advantage.

A DBS is actions taken by an organisation to leverage digital technology capabilities (Woodard & Tschang, 2013; Yoo, Henfridsson, & Lyytinen, 2010), through the investment in IT to respond to all current and future threats (Mithas, Agarwal, & Courtney, 2012; Mithas, Tafti, & Mitchell, 2013; Mithas & Lucas, 2010) by enabling

strategy that can impact performance, identify opportunities, and create value for the organisation and the ecosystem (Drnevich & Croson, 2013). Summarised in the work by Bharadwaj et al. (2013): A strategy that is implemented through the use of digital resources that creates strategic value in this competitive environment (Bharadwaj, El Sawy, et al., 2013). The definition proposed above (1) highlights the importance of digital resources' horizontal integration in multiple functional areas within an organisation, (2) emphasises the shift from traditional IT strategy as only technologies and systems to recognise digital resources, (3) links DBS to the value creation within an organisation that can lead to a SCA (Bharadwaj, El Sawy, et al., 2013). The key components of a digital strategy are the scope, scale, speed and the sources of value creation and capture (Bharadwaj, El Sawy, et al., 2013).

Core to a DBS is digital resources that include all digital technologies and capabilities within an organisation. Multiple authors attempted to explain how digital resources could create a SCA through the Resource Based View (RBV) of strategy (Bharadwaj, El Sawy, et al., 2013; Drnevich & Croson, 2013; Sebastian et al., 2017; Sia et al., 2016). The RBV of an organisation assumes that organisation resources are heterogenous and immobile (Barney, 1991; Eisenhardt & Martin, 2000; Wernerfelt, 1984). It is theorised that if organisations have resources that have the following attributes it will lead to a competitive advantage: these resource needs to be valuable, the resource can grab any opportunities and also neutralise any threat to the organisation's environment; this resource must be rare amongst the organisations competitors; this resource must be imperfectly imitable; and there can be no other resources that can substitute this resource. Although this view of resources within an organisation, and the possible competitive advantage that they create is critical to understanding the importance of resources and especially those resources with the VRIN attributes: Valuable; Rare; imperfectly Imitable; Non-substitutable (Barney, 1991; Eisenhardt & Martin, 2000; Wernerfelt, 1984). Barney (1991) defined organisational resources as "all the assets, capabilities, processes, attributes, information and knowledge controlled by a firm" (p. 101) that can be utilised in the strategies that will increase the organisations efficiency and effectiveness, including the capabilities in the definition that refers to an organisations capacity to redeploy resources (Drnevich & Croson, 2013).

Building on the RBV, Teece et al. (1997) theorised that just having resources that have VRIN qualities and valuable technology assets that are often protected by intellectual property law is not adequate to ensure a SCA. Organisations that can respond to a changing market, have management capabilities that can react to, orchestrate, and position internal and external competences to stay competitive (Teece et al., 1997). The global business environment with organisations dispersed across multiple geographies need to have more than difficult-to-replicate and difficult to imitate assets. It requires these attributes with dynamic capabilities (DC) to drive the organisations strategic agenda (Teece, 2007). These dynamic capabilities require higher level activities where ordinary capabilities can be directed towards higher pay-off projects by managing and orchestrating the resources of an organisation in such a manner as to be part of the rapidly changing business environment (Teece, 2014). The analysis of DC can be disaggregated into three parts: sensing, seizing, transforming. Sensing describes how an organisation should constantly scan the market both locally and internationally in search of new technologies and markets, this implies that an investment in research needs to be prioritised by an organisation. As soon as new technologies and markets have been sensed it must be developed and seized through new products, processes, or services to capture the value for an organisation. This also could include an investment for the development and commercialisation of the identified product, service, or process. Finally managing the threats or the transformation of the business environment, as the organisation evolves, through the development of new products and services. It becomes increasingly important to be aware of the creation of unfavourable path dependencies (Teece, 2007).

In a study conducted by Sebastian et al. (2017) it was identified that big old companies believed that their competitive positions can be retained in the market if they can use their existing abilities and leverage the capabilities that digital technologies offer. As mentioned, to implement a DBS the organisation needs to move through a process of digital transformation. According to Sebastian et al. (2017) there are three essential elements that need to be present for a successful digital transformation. Firstly, the organisation needs to define its DBS that is inspired by social, mobile, analytics, cloud, and Internet of Things (SMACIT) value propositions (Sebastian et al., 2017). These and other powerful technologies that can deliver unique capabilities, that can respond to a changing market. Secondly, the

organisation should have or develop an operational backbone that ensures operational excellence (Sebastian et al., 2017). The last element is for the organisation to create a digital services platform that enables the organisation to innovate and respond to emerging opportunities in the environment (Sebastian et al., 2017). According to the study conducted by Sebastian et al. (2017) there are five recommendations for ensuring a successful digital transformation journey. (1) Define a digital business strategy to focus the organisation to build difficult to imitate and difficult to replicate capabilities; (2) Invest in an operational backbone that can provide service excellence, it is suggested to look to technology resources such as cloud computing; (3) Design and architect a digital services platform to create an environment that can focus on business critical digital innovations; (4) Design the digital services platform with other businesses in mind to create a platform where other parties can develop and build on; (5) Adopt a service culture where both IT and business individuals are working together to define all the elements of a product from price to priority and which services will be enhanced or discarded (Sebastian et al., 2017). Creating a DBS, enabling resources through technology and transforming the organisation requires substantial technological investments and it requires the organisation to change the way it is structured and the way it functions (Bharadwaj, El Sawy, et al., 2013; Drnevich & Croson, 2013; Sebastian et al., 2017; Sia et al., 2016).

In the next section the academic theory underpinning the study will be discussed and a literature review undertaken of the other work that has been done in this field of research. The proposed research methodology and an overview of the research design will follow.

Chapter 2 : Literature review

2.1. Introduction

The earlier chapter introduced Digital Business Strategy (DBS) for Sustained Competitive Advantage (SCA) through leveraging the Resource-based View (RBV) as part of Dynamic Capabilities (DC). It further identified the aim and the need of the research study. This chapter endeavours to gain an understanding of the available literature about the different concept mentioned in Chapter 1. DBS is defined and the different themes identified and discussed. The concepts of RBV and DC will be discussed and examined. Leading to the interplay between SCA and the combination of resources and capabilities, and how this can lead to an organisation to achieving SCA. Finally, the relationship between performance and sustained competitive advantage will be investigated through the theoretical lens of RBV and DC.

Rumelt (2011) defines strategy as the application of strengths against weaknesses, or how an organisation applies its innate strengths to new opportunities. A good strategy needs to be coherent in driving the organisation in a single direction through coordinating policies, procedures, and actions. In doing this an organisation will create new strengths through coordination. It is suggested that new strengths can also be created by reframing the competitive situation and drawing new and different insights which can create new advantages or identify weaknesses (Rumelt, 2011). The research will show how through the creation of a DBS and leveraging the resources and capabilities within an organisation, new opportunity will be identified, and resources will be combined and reconfigured to create a sustained competitive advantage.

2.2. Digital Business Strategy

The current academic literature offered multiple definitions for a DBS in the context of a digital economy and the prevalence of new technology (Bharadwaj, El Sawy, et al., 2013; Leischnig et al., 2016; Mithas et al., 2013; Sebastian et al., 2017; Woodard & Tschang, 2013). The first definition described DBS as multiple deliberate actions taken by an organisation, through harnessing digital technology capabilities, and

offering digitally enabled products and services to consumers to gain a competitive advantage (Woodard & Tschang, 2013; Yoo et al., 2010). The second definition by Mithas et al. (2013) suggested that DBS does not merely focus on making an organisation's operations more effective or focusing on a few competitors in the environment, it is an awareness and ability to respond to all current and new competitors in the digital environment through the investment in information technology (IT). The investment in IT could be in the form of suitably outsourcing some of the technology functions to a vendor to gain an advantage from their knowledge by increasing the speed, scale or scope of digital deployments (Hansen & Sia, 2015; Mithas et al., 2012, 2013; Mithas & Lucas, 2010). The third definition of DBS described it as an important strategy enabler that can impact performance, identify opportunities, and create value in the environment as it effects the structures of the industry where the organisation competes (Drnevich & Croson, 2013). Through investing in IT and technologies the organisation's ordinary capabilities could be enhanced to create new dynamic capabilities that can be leveraged to build a sustained competitive advantage (Drnevich & Croson, 2013).

The definition suggested by Bharadwaj et al. (2013) that digital business strategy is a business strategy that is created and implemented through the use of digital resources to create strategic value encapsulates the essence of a DBS and is the definition used in this research study. This definition proposed that digital technology does not merely impact the functional IT level, but that it is critical on the strategic level of the organisation including all the different functional areas (Bharadwaj, El Sawy, et al., 2013; Sia et al., 2016). Digital resources are broadly defined as all the digital elements including technological infrastructure consisting of practices, processes, data and information that together provide increasing power of digital technology to organisations (Bharadwaj, El Sawy, et al., 2013). The argument is that the organisation's IT strategy could evolve to become an overarching business strategy where digital resources and capabilities can be leveraged to create value for the organisation that can differentiates it in the market (Bharadwaj, El Sawy, et al., 2013; Hess et al., 2016). The view is that organisational IT strategy focuses on the efficient and effective management of the myriad of IT application systems and different infrastructures. Mostly, what these IT strategies lack is an overarching business centric focus that is needed to transform the organisation and develop business models, products and services that can leverage new digital technologies

(Hess et al., 2016). This view supports the argument proposed by Bharadwaj et al. (2013) that the coordination of digital transformation and alignment of all the organisation's strategies lead to the need for an overarching digital business strategy.

A study conducted on the alignment of an organisations business and IT strategies indicated that in a dynamic, changing environment the investment in IT has a positive effect on organisational performance. It was further found that senior executives and Chief Information Officers (CIO's) consistently sited strategic business IT alignment as one of the top three IT management issues (Sabherwal, Sabherwal, Havakhor, & Steelman, 2019). Thus, considering the importance of IT in the organisation and the alignment to business strategy, the need for a DBS is crucial for organisations in dynamic, complex and changing environments (Sabherwal et al., 2019; Sia et al., 2016). As defined in the introduction of the research problem, DBS is divided into four distinct attributes or themes and this broadly holds all the definitions of DBS in them.

2.2.1. Scope of Digital Business Strategy

Corporate scope and how it is determined is a critical part of strategy research (Kaul, 2012). Corporate scope is an equilibrium between the different resources in an organisation, both financial and managerial, and how these are allocated to different opportunities identified by the organisation. These resources are distributed in order of value to ensure that the rents received from the scarce resources are realised (Amit & Schoemaker, 1993; Barney, 1991; Kaul, 2012; Levinthal & Wu, 2010). The diversification of these resources impacts the corporate scope of an organisation and subsequently the performance of an organisation (Bharadwaj, El Sawy, et al., 2013; Kaul, 2012; Levinthal & Wu, 2010; Wade & Hulland, 2004).

The scope of a DBS builds on corporate scope as defined above, as it refers to the level of integration and alignment between IT and business strategies. How this strategy uses the existing ecosystem to create a competitive advantage and how products and services are impacted by digital technologies (Bharadwaj, El Sawy, et al., 2013; Singh et al., 2017). It is critical to understand the relationship between the external environment and the organisation, and internally within the organisation and

the interaction with technology. The implementation of a DBS in different environments will impact the scope of the DBS for different organisations (Bharadwaj, El Sawy, et al., 2013).

Bharadwaj et al. (2013) proposed that the DBS will eventually become the business strategy of the organisation in a digital era. DBS reaches across all the traditional functional areas and the processes in the organisation that are connected by digital resources (Bharadwaj, El Sawy, et al., 2013). The more organisations become reliant on digital connectivity, information and communication the more important it becomes to consider the digital elements in the organisations strategy and potentially a digital strategy (Bharadwaj, El Sawy, et al., 2013; Sia et al., 2016). Organisations and their products and services are becoming more digital, thus the development of these products and services need to consider usability with other platforms through the use of digital resources (Bharadwaj, El Sawy, et al., 2013). The DBS extends the scope of the organisation beyond traditional markets and physical boundaries towards dynamic ecosystems (Ross, Sebastian, & Beath, 2017). These ecosystems could change rapidly, but if designed correctly the digital platforms can enable resources to respond and keep their competitive advantage within the industry (Bharadwaj, El Sawy, et al., 2013; Sebastian et al., 2017). Considering how the scope of the organisation will change in the future through creating new business models that can leverage technology it is critical for organisations to ensure that they can still create value. This is especially prevalent in industries where digitally enabled platform businesses operate. For instance the media industry that is competing with social media platforms and other “born digital” pioneers such as Amazon, Google and the like (Hess et al., 2016; Sebastian et al., 2017). Where the organisation will compete in the future and how the business scope changes is driven by the ability of the organisation to recognise some of these digital opportunities and shift the resources to take advantage of these (Hess et al., 2016).

The scope of an organisations DBS creates focus on which activities they should pursue and how the organisation structures and uses its resources to gain a competitive advantage (Bharadwaj, El Sawy, et al., 2013). This can be done by extending the range of its products or services into the market or by recombining the resources to create new opportunities within the existing market to create a competitive advantage (Schoemaker et al., 2018). Sensing new opportunities in the

market created by digital technologies and adapting the strategy of the business creates a SCA (Schoemaker et al., 2018). An example of an organisation that adapted the scope of its business is Amazon. Adapting their business from just being an online retailer to creating Amazon Web Services that provides a host of cloud based solutions to customers the organisation was able to sense an opportunity in the market, seize it by adapting the scope of its business and transforming the resources to be able to deliver the new services (Bharadwaj, El Sawy, et al., 2013).

2.2.2. Scale of Digital Business Strategy

Traditionally scale drives profitability by pushing down the per unit cost of products through efficiency gains from repeated use of processes in producing products (Bercovitz & Mitchell, 2007; Bharadwaj, El Sawy, et al., 2013). Scale is also the accumulation of organisational specific assets (Bercovitz & Mitchell, 2007). Considering scale not only in physical terms, but also in digital terms, Bharadwaj et al. (2013) identified four distinct ways scale is different within DBS.

Firstly, cloud computing enables rapid scalability which creates a dynamic capability that can adapt to the environment in line with market pressures. Cloud computing allows an organisation to have access to technology infrastructure that is available almost immediately (Bharadwaj, El Sawy, et al., 2013). This infrastructure can be in the form of computing capacity, databases to store information, software services, or some or all of these in combination. Thus, scaling through the use of cloud computing means not being constrained by a long process of procurement and setting up infrastructure when additional capacity is required (Luo et al., 2018). Moving from a capital expense to an operational expense and only paying for what is being used and needed at a specific moment in time (Luo et al., 2018). It is proposed by Luo et al. (2018) that cloud computing is a driver of Dynamic Capabilities by enabling sensing of opportunities in the environment and partnerships within and across the boundaries of the organisation. Although cloud computing is available to all organisations making it a commoditised resource, the value is derived in the way it is implemented in an organisation. This creates a platform for organisations to develop DC to allow an organisation to renew and reconfigure resources to create a SCA. The ability to constantly change and pursue opportunities through the deployment and development of applications and other digital resources on a

dynamic technology platform (Luo et al., 2018). Two critical factors will increase the effectiveness of enabling DC: Business readiness as the ability of the organisation to reconfigure itself to adopt cloud computing quickly through changing its current business processes to cloud based business processes (Luo et al., 2018); coordination readiness to collaborate internally and externally, and coordinate resources as is needed to adopt cloud computing effectively (Li, Wang, Wu, Li, & Wang, 2011; Luo et al., 2018)

Multisided platforms create the potential for rapid scaling through network effects (Bharadwaj, El Sawy, et al., 2013). Platforms has existed for a long time, where certain organisations connect suppliers and the consumer. An example of this is how newspapers connect subscribers with advertisers. The increase in technology and the ability of IT makes it simpler and cheaper to build and scale platforms. This allows for lower friction engagements that increases the network effect (van Alstyne et al., 2016). Network effects are the demand-side economies of scale which causes increased consumption of products or services as more consumers adopt the product or service (Bharadwaj, El Sawy, et al., 2013; van Alstyne et al., 2016). Network effects can come from the direct network such as sharing digital assets and it can come from an indirect network such as complimentary goods, economies of scale and different learning by doing experiences (Fichman et al., 2014). The value creation comes through increased adoption by users, complimentary products and services, and new synergies that is being created between different organisations (Bharadwaj, El Sawy, et al., 2013; Fichman et al., 2014; Grover & Kohli, 2013; Sia et al., 2016; van Alstyne et al., 2016). The scale of the network creates more value, which in turn attracts more participants to the platform which creates more value. This can create a virtuous cycle that can produce monopolistic organisations such as Alibaba, Google and Facebook that dominate their respective environments (van Alstyne et al., 2016). This forces organisations to change their strategy and move the focus from controlling resources to orchestrating resources both internally and externally (van Alstyne et al., 2016). RBV emphasised controlling valuable, rare, inimitable resources to gain a competitive advantage and these resources are normally tangible (Barney, 1991, 2001; van Alstyne et al., 2016). In the world of platforms these resources are the communities that contribute to create a competitive advantage which requires managers with DC to orchestrate these resources (Grover & Kohli, 2013; Schoemaker et al., 2018; Sebastian et al., 2017;

van Alstyne et al., 2016). In different business models scale can be a value driver for organisations through loosely coupled coalitions and in multisided platforms (Pagani, 2013). These loosely coupled coalitions and partnerships can come in the form of organisations using other organisations capabilities to enhance their business processes (Bharadwaj, El Sawy, et al., 2013). An example of these are the digital linkages used through Application Programming Interfaces (API's) that connects one organisation digitally to another through a process of specific requests being sent or received via these linkages (Bharadwaj, El Sawy, et al., 2013).

Further scaling through DBS will require the understanding of vast amounts of data and how the organisation can develop capabilities to harness the information continuously. The organisations DBS need to focus on scaling through partnerships and the utilisation of shared digital assets (Bharadwaj, El Sawy, et al., 2013; Drnevich & Croson, 2013; Pagani, 2013; Sebastian et al., 2017; Sia et al., 2016). Big data is defined as large amounts of data in various forms which, for instance assists organisations and managers to make decisions (Akter, Wamba, Gunasekaran, Dubey, & Childe, 2016). Thus, big data can enhance a firm's performance if the resources are VRIN and the management team can redeploy and these resources in a way that creates a competitive advantage (Akter et al., 2016). Big data can include social media feeds, crowdsourced ideas, machine generated sensor data and all other digital communication but are not limited to only these (Bharadwaj, El Sawy, et al., 2013). Being able to scale the organisation with a DBS will require the ability to use all the data available to create capabilities that can harness the information to create products and services that can create a competitive advantage (Bharadwaj, El Sawy, et al., 2013). The availability of more information will provide suppliers and customers with more information that will identify better partnerships between suppliers and customers (van Alstyne et al., 2016).

2.2.3. Speed of Digital Business Strategy

In the digitally competitive landscape speed has become even more important for organisations as it relates to delivering products and services, and how quickly decisions are made (Bharadwaj, El Sawy, et al., 2013). The competitors are constantly adapting and launching new products faster and faster. Some of these "born digital" or pure-play digital organisations, have built their businesses in the

digital era on digital platforms that have the ability to launch products more rapidly (Ross et al., 2017; Sebastian et al., 2017). This has forced all other organisations to focus on how quickly new or adapted products could be launched to satisfy customer needs or to complement other products (Bharadwaj, El Sawy, et al., 2013; Sebastian et al., 2017). But this does not mean that the only organisations that pose a threat or offers an opportunity is “born digital” organisations. Apple’s iPhone was launched in 2007 and by 2015 it generated 92% of the industries global profits. The organisation not only produces mobile handsets, but also created a platform business, the iStore, that allows the community to develop products and services (Schoemaker et al., 2018; van Alstyne et al., 2016). This serves as an example of how an organisation adapted its strategy to move with the changing digital environment by enabling the community to quickly develop and deploy solutions onto their platform (Bharadwaj, El Sawy, et al., 2013; Schoemaker et al., 2018; van Alstyne et al., 2016).

The dimensions that need to be considered in an organisation’s DBS as it relates to speed are: The Speed of product launches; The speed of decision making; The speed of supply chain orchestration; The speed of network adaptation and formation (Bharadwaj, El Sawy, et al., 2013). The launching of new products are accelerated through a DBS because of the new benchmark that are set by the purely digital organisations that launch products continuously at intervals in alignment to the improvement of technology (Bharadwaj, El Sawy, et al., 2013). This creates opportunities for other organisations, as they add digital capabilities to their business, to also accelerate the launches of products to align with these businesses (Bharadwaj, El Sawy, et al., 2013). An organisation’s ability to identify and respond to new developments in the market in this fast moving digitally enabled world (Bharadwaj, El Sawy, et al., 2013; Junfeng & Wei-ping, 2017). It was found that there is a positive relationship between the launch of new products and the DC of sensing, seizing and transforming in the environment of rapid innovation and technology (Junfeng & Wei-ping, 2017).

Information has always been critical to management decision making, but with the increased speed and volume of information received from the market and customers it enables organisations to sense and respond quicker to changes in the environment (Bharadwaj, El Sawy, et al., 2013). The speed to which an organisation can adapt to the changing environment through their dynamic capabilities to ensure they keep

their SCA is critical. Organisations need to respond rapidly to digital threats and opportunities as they arise to ensure future prosperity (Sia et al., 2016). Organisations that value speed and experimentation in their product or service development cycles also foster collaboration and the use of data for decision making prosper in this digitally competitive environment. Driving speed, nimbleness and agility within the organisation will be advantageous in retaining and gaining a sustained competitive advantage (Kane, Palmer, Phillips, Kiron, & Buckley, 2016).

Key to a DBS is the ability of an organisation to create, manage and maintain networks that provide capabilities that can complement the organisation's internal capabilities (Bharadwaj, El Sawy, et al., 2013). As stated previously the power of network effects for organisations in scaling their respective businesses is also important in the speed at which organisations can build these networks (Bharadwaj, El Sawy, et al., 2013; van Alstyne et al., 2016). In a study conducted by Junfeng & Wei-ping (2017) it is proposed that if an organisation can leverage the external resources in their network it would be able to benefit from information alignment and control over scarce resources not internally controlled. Thus, this external business network may offer an organisation a more efficient way to adapt to change or develop quickly to ensure competitiveness (Junfeng & Wei-ping, 2017). However, this can only be leveraged through the development of DC's of sensing and seizing to create new products or services by the internal resources or the use of the external resources in the network (Junfeng & Wei-ping, 2017).

2.2.4. Sources of Value Creation

Value creation is defined as the contribution to products or services in its production for the end user (Pagani, 2013). This is done through the multiple value adding stages in the process of creating an overall value proposition (Pagani, 2013). It is further proposed by Pagani (2013) that customers can create their own value from the activity-based offerings organisations provide, highlighting the organisation's strategic task of reconfiguring and integrating its abilities with their customers. Sources of value creation and capture in conventional business models have been researched extensively and focused on using tangible, physical resources (Bharadwaj, El Sawy, et al., 2013).The additional dimensions explored by the introduction of a DBS was: Increased value from information; Multisided business

models; Coordination of business models in networks; Capture of value through the control of the digital architecture in the industry (Bharadwaj, El Sawy, et al., 2013).

Investment in IT and other enabling digital technologies will change the organisation's capabilities and create new business level strategic value opportunities (Bharadwaj, El Sawy, et al., 2013; Pagani, 2013). Value creation through a DBS focuses on the increased importance of information with new unique sources of value that is created through, for instance the curation of content from subscriptions and advertising (Bharadwaj, El Sawy, et al., 2013). DBS has also made information and content more accessible to everyone which leads to the use of data through sharing, analysing, remixing and redistribution which creates new sources that can be utilised to deliver specialised unique products and services to customers that disintermediates the traditional sources of value whilst creating new sources of value (Bharadwaj, El Sawy, et al., 2013; Sebastian et al., 2017).

Value creation through the use of multisided business models has gained rising importance because of the importance of multisided revenue generation models (Bharadwaj, El Sawy, et al., 2013; van Alstyne et al., 2016). These business models connect multi customers and users and for example in the case of Facebook provides free services to users and derives its revenue from customers looking to advertise to those users (Bharadwaj, El Sawy, et al., 2013; van Alstyne et al., 2016). Organisations have increasingly implemented multilayer business models where they would give away one product or service in a certain layer to create value in another layer (Bharadwaj, El Sawy, et al., 2013). DBS changes the way organisations create and capture value by considering all the different facets in an interaction (Bharadwaj, El Sawy, et al., 2013). Value creation through coordinated Business models in different networks recognises the importance of new dynamic environments where multiple organisations interact together to deliver complimentary products and services (Bharadwaj, El Sawy, et al., 2013). Business models are not independent anymore, they interact with each other and intersect at different times to create value in more rapidly changing environments (Bharadwaj, El Sawy, et al., 2013).

Some organisations capture and create value by controlling the architecture in the ecosystem, the key value driver in this case is the utilisation of the platform and the

platform's capacity to be utilised by other sources. This in turn enables an organisation to share in the profit of other organisations that use the platforms (Bharadwaj, El Sawy, et al., 2013; Pagani, 2013). Value from coordinated multisided business models, enhanced current non-digital capabilities and the development of new digital capabilities through leveraging IT resources, create value that will lead to a competitive advantage as this will differentiate an organisation from others in the environment (Bharadwaj, El Sawy, et al., 2013; Coltman, Tallon, Sharma, & Queiroz, 2015; Drnevich & Croson, 2013; Sebastian et al., 2017). Dynamic capabilities plays a pivotal role in creating value for an organisation as organisations need to reconfigure the resources to deliver value to the customer (Pagani, 2013; Teece, 2007, 2014)

DBS is cross-functional and supports more than functional IT experimentation, it requires the reconfiguration, development and creation of IT and business resources across the organisation's processes (Sia et al., 2016). Digital resources and the enablement of resources through digital platforms can contribute to an organisation's sustained competitive advantage. Through the enabling of dynamic capabilities and the combination of digital and other resources can create valuable, unique, inimitable, and non-substitutable characteristics (Bharadwaj, El Sawy, et al., 2013; Lin & Wu, 2014). Similarly, the digitisation of products and services, and the use of digital resources leads to delivering unique products and services beyond the traditional organisational environment to a dynamic ecosystem. This can give an organisation a competitive advantage through the delivery of superior products and services to the customer (Bharadwaj, El Sawy, et al., 2013; Coltman et al., 2015; Mithas et al., 2013; Sebastian et al., 2017; Sia et al., 2016).

As organisations create digital capabilities to take advantage of future opportunities the processes to execute strategy is becoming more dependent on technology (Bharadwaj, El Sawy, et al., 2013; Coltman et al., 2015). The ability to create an advantage in an technologically enhanced environment, organisations need to leverage their IT capabilities through the use of business processes to execute their Digital Business Strategy (Coltman et al., 2015). Just having these IT capabilities is not sufficient to derive an advantage, these capabilities need to be utilised fully, reconfigured or combined with each other or other capabilities to derive a sustained competitive advantage as discussed in the section on DC (Coltman et al., 2015;

Schoemaker et al., 2018). These capabilities can be utilised incorrectly through poor management decisions by not aligning the IT to the organisational goals through for instance purchasing commodity software or systems that can be easily replicated by competitors and provides no competitive advantage to the organisation. These systems need to be utilised in conjunction with the organisation's resources to give it a competitive advantage (Coltman et al., 2015). This will be discussed in the subsequent sections on RBV and DC.

2.3. The RBV of the organisation

Executives in organisations are constantly searching for the reason why certain organisations perform better than others (Amit & Schoemaker, 1993). A reason for this advantage is management's belief that organisation specific resources and capabilities are critical (Amit & Schoemaker, 1993; Barney, 1991, 2001; Junfeng & Wei-ping, 2017; Peteraf, 1993). The resource based view of the organisation was developed to address an organisation's increasing need to understand the sources of sustained competitive advantage, and how it could be exploited to gain economic rents or profit (Amit & Schoemaker, 1993; Barney, 1991; Peteraf, 1993). The framework proposed by Barney (1991) made two assumptions that are critical for the framework to be used in the analysis of sources of SCA. The first assumption was that strategic resources controlled by organisations are heterogeneously distributed across all the organisations within an industry or group (Amit & Schoemaker, 1993; Barney, 1991, 2001; Peteraf, 1993). The second assumption was that the strategic resources, that an organisation controls, is not perfectly mobile across organisations and this leads to possible long term diversity among organisations (Amit & Schoemaker, 1993; Barney, 1991, 2001; Peteraf, 1993). These assumptions were fundamentally different from the strategic management literature of the time, which focused on identifying an organisation's opportunities and the threats within an environment, then analysing the internal dynamics of an organisation by identifying its strengths and weaknesses, and finally matching these to choose the best suited strategies (Barney, 1991; Barney, Ketchen, & Wright, 2011). At the time it was assumed that organisations within an industry or strategic group had identical strategic resources that they control and that they pursue similar strategies (Barney, 1991; Barney et al., 2011). The second assumption at the time was that even if diverse strategic resources were to develop, it would be short lived due to the mobility

of resources between organisations, thus these resources could be bought and sold in a factor market (Barney, 1991; Barney et al., 2011).The basis for all other literature related to the resource based view of the organisation finds its roots in the characteristics identified by Barney that could identify possible resources of sustained competitive advantage (Barney et al., 2011). Barney (1991) proposed the following framework “firms obtain a sustained competitive advantage by implementing strategies that exploit their internal strengths, through responding to environmental opportunities, while neutralizing external threats and avoiding internal weaknesses” (p. 99).

It is important to define some of the key terms used in resource-based theory to ensure that there is a common understanding. Organisational resources are defined as all the assets, organisational attributes and processes, capabilities, information, and knowledge controlled by the organisation that enables the organisation to conceive of or improve the efficiencies and its effectiveness (Barney, 1991). These identified strengths can be used to create or implement the organisations strategies that will lead to the creation of value for the organisation (Barney, 1991). The different types of resources as defined in the original framework are: physical capital resources, which include technology, geography, access to raw materials, and plant and equipment; human capital resources, such as training, experience, judgement, intellect, relationships, and insights of managers and workers; organisational capital resources, which include formal reporting structures, formal and informal planning, controlling and coordinating systems, and informal relationship groups within the organisation (Barney, 1991). It is important to note that not all resources are strategic and adds value to the strategy (Barney, 1991). Building on the initial work by Barney, other authors identified the need for capabilities to create a SCA. Capabilities are defined as an organisation’s ability to exploit resources in combination with using organisational processes to reach a desired outcome (Amit & Schoemaker, 1993; Makadok, 2001; Newbert, 2008). The main purpose of a capability is to enhance the productivity of resources that a specific organisation possesses (Makadok, 2001; Newbert, 2008). These capabilities are embedded in an organisation’s non-transferrable, specific resources whose main purpose is to improve productivity of other resources within the organisation (Makadok, 2001).

Understanding the resources and capabilities available in an organisation is only part of the value posed by the creation of a strategy focusing on the RBV (Barney, 1991, 2001). The competitive advantage an organisation holds, or tries to create, is defined by how the organisation is implementing a value creating strategy that is not being implemented by current or potential competitors in the industry (Barney, 1991, 2001).This does not create a situation where an organisation will have an advantage that cannot be duplicated by competitors or potential competitors in the market (Barney, 1991). It creates a SCA which cannot be competed away through the duplication of the advantage by others. “Sustained” does not necessarily refer to a specific period, but rather that the advantage created by the organisation cannot be nullified by other competitors through duplication (Barney, 1991). According to Amit & Schoemaker (1993) and (Newbert, 2008) a sustained competitive advantage can only be attained if an organisation can achieve a level of cost that exploits a market opportunity and/or neutralise a threat their competitors cannot. Sustained competitive advantage is further defined through the performance of the organisation as it achieves and accrues economic rents as a result of implementing the value creating strategy (Newbert, 2008). This is in line with the definition proposed by Barney in his 1991 work “Firm resources and sustained competitive advantage”.

The characteristics of these resources are Valuable, Rare, Imperfectly Imitable, and non-Substitutable (VRIN) (Barney, 1991; Lin & Wu, 2014). A valuable resource will exploit any opportunities for the organisation and/ or neutralise any threats in the organisation’s environment (Barney, 1991). Newbert (2008) further proposed that a resource’s value can only be realised if it is combined with a very specific capability or other resource, this highlights the importance of the exploitation of the resource-capability combination for the organisation (Newbert, 2008).

Rare resources are the second characteristic identified in the framework. These resources or bundles of resources are valuable, as per the first characteristic, and can exist in a single organisation or multiple organisation at the same time. The qualifier for being rare is that these resources do not exist in enough organisations to create perfect competition within the industry or the environment the organisation operates in, amongst the current and potential competitors (Barney, 1991). Value and rareness need to be present for resources to be considered as adding to the organisation’s sustained competitive advantage. It is suggested in later studies that

it is important for resources to be valuable and rare, but it is critical that these resources are exploited in a way that is value adding to the organisation either through improving efficiency or effectiveness (Newbert, 2008). Value and rareness were found to be significantly related to sustained competitive advantage, but not necessarily causally related to the performance of the organisation (Newbert, 2008). Of the first two characteristics value has been found to be correlated to an organisation's performance, but rareness is fully mediated by competitive advantage. This means that for an organisation to obtain increased performance it should first obtain a SCA through the exploitation of these resources and capabilities available to the organisation (Newbert, 2008). Interestingly, it is proposed that resources can be made rare through their combination with other resources and capabilities in the organisation (Newbert, 2008).

Valuable and rare resources are important in having a sustained competitive advantage in an organisation, but if these resources could be freely obtained or imitated by competitors it will nullify the competitive advantage. Resources need to be imperfectly imitable, and these resources can be imperfectly imitable for three reasons or a combination of these. The ability of the organisation to obtain these resources is dependent on the unique history of the organisation. Certain resources were obtained at a specific time or within a situation and then exploited over time to create value. These resources are almost impossible to imitate by competitors that have not required them under the same conditions as the organisation. The organisation follows a path or journey through history to obtain these valuable and rare resources (Barney, 1991). The organisation's history is created by the decisions the managers make to identify, develop, train, and deploy resources in a way that gives the organisation a sustained competitive advantage. Decisions by managers are made in uncertain economic, industrial, regulatory, social on technological environments with in its own context which creates resources that are imperfectly imitable (Amit & Schoemaker, 1993). Considering that competitors cannot duplicate an organisation's value creating strategies through imitating the resources because of the ambiguity of which resources are causing the sustained competitive advantage. Competitors can describe the resources but are not able to identify if the described resources are creating a sustained competitive advantage. It is proposed that if organisations can identify the link between the resources and the organisation's ability to implement value creating strategies, then it will be possible

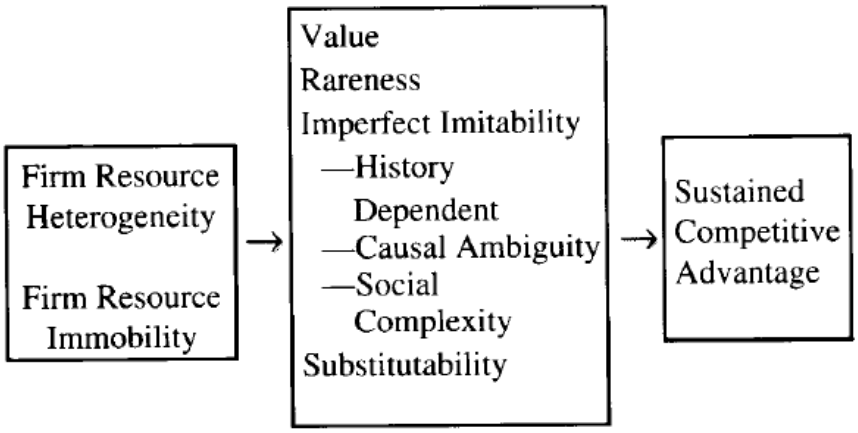
for other organisations to do the same. An organisation can only have a SCA if it is unclear about the link the resources have to implementing the strategy of the organisation (Barney, 1991, 2001). The third reason why resources can be imperfectly imitable is caused by the social complexity in the organisation and the environment they operate in. The complexity in organisations are created through the different relationships among managers with themselves and among managers and their employees. Other complexities include the reputation of the organisation with suppliers and its customers. Managers and other decision makers have certain behavioural biases such as over reliance on previously successful strategic decisions or implementations, these feed into the processes of the organisation and into different organisational implementations. Resources in this situation are less likely to be transferable or easy to imitate (Amit & Schoemaker, 1993). Although technology is included as a physical capital resource in the definition by Barney (1991), it is not included in the definition of an imperfectly imitable resource. Only in combination with other organisational resources or capabilities can technology create a sustained competitive advantage. The reason the combination leads technology to be an imperfectly imitable resource is because of the use of socially complex organisational resources. Only some organisations possess the relationships, culture or traditions to exploit technology to implement its value creating strategy (Barney, 1991).

The final characteristic identified in Barney's 1991 framework is that of substitutability and more specifically the non-substitutability of resources. The existence of other strategically equivalent resources or bundles of resources that are rare, valuable, and imperfectly imitable provides the opportunity for competitors to exploit those resources to implement the same strategy with different resources (Barney, 1991). There are two forms of substitutability, a competitor cannot imitate the organisation's resources, but those resources can be substituted with other resources to drive the organisation towards implementing the same strategy. Secondly, diverse organisational resources can be substitutes in an organisation to implement the same strategy as proposed previously (Barney, 1991).

Figure 1 depicts the RBV framework, reading from the left, the assumptions of resource heterogeneity and resource immobility that required when using RBV as a set of tools to analyse the resource that creates a SCA (Barney, 1991, 2001). The

evolving literature about the RBV makes similar assumptions about the heterogeneity and immobility of resources (Amit & Schoemaker, 1993; Barney, 2001; Barney et al., 2011; Makadok, 2001; Newbert, 2008; Peteraf, 1993; Teece et al., 1997). In the model developed by Peteraf (1993) it indicates the importance of heterogeneity in creating economic rents for the organisation as resources are in limited supply creating possible product differentiation. Further, resources are tailored to specific organisations which make them imperfectly mobile, but this normally only occurs when resources are in combination with other resources (Peteraf, 1993). Teece et al. (1997) referred to resources as being sticky, thus organisations are stuck with them for the short term. The reason for this is that business development is very complex and it is not easy for organisations to develop new skills quickly and easily (Teece et al., 1997). There is tacit knowledge in an organisation that is not easily tradeable thus resources are heterogeneous between organisations. In purchasing assets organisations stand little chance to gain much, unless they have superior knowledge beforehand, but normally the price will be fully capitalised in a competitive market (Teece et al., 1997). According to Barney (1991, 2001), Amit & Schoemaker (1993) and Peteraf (1993) resources must be valuable and rare for it to create a SCA in the organisation. The focus of other research shifts from just having rare valuable resources to how these resources are combined with capabilities and the combination of these could create rare resources from common resources (Makadok, 2001; Newbert, 2008). Creating resources and capabilities that are non-imitable and non-substitutable is critical to have a sustained competitive advantage and it can happen in different ways with a focus in more recent times on how capabilities can be used in conjunction with resources to deliver a value creating strategy (Amit & Schoemaker, 1993; Makadok, 2001). The focus is on the interaction of the managers with the resources and how they exploit these resources to create economic rent (Amit & Schoemaker, 1993; Makadok, 2001). Using one of two mechanism, either resource picking or capability building (Makadok, 2001). Resource picking happens in the decision phase that effects economic profit before the acquisition of the resource. Capability building happens after a resource has been acquired and economic profit occurs then, but the resource needs to be acquired for this to occur in the implementation phase (Makadok, 2001).

Figure 1: The relationship between Resource Heterogeneity and Immobility, Value, Rareness, Imperfect Imitability, and Sustained Competitive Advantage



Reprinted from “Firm resources and sustained competitive advantage”, J. Barney, 1991, *Journal of Management, 17,* p. 112.

Resources are central to creating a competitive advantage within an organisation and the characteristics of those resources, valuable, rare Inimitable, non-Substitutable, as discussed in the preceding section, lends itself to laying the foundations of understanding the advantage of resources to a sustained competitive advantage (Amit & Schoemaker, 1993; Barney, 2001; Makadok, 2001; Peteraf, 1993). In the current business environment that are knowledge intensive, abundance of information, highly unpredictable and rapidly changing it is almost impossible for organisations to have a sustained competitive advantage (Bharadwaj, 2000; Mikalef & Pateli, 2017; Sebastian et al., 2017; Sia et al., 2016). This leads to further investigation in the next section on how capabilities are utilised with resources in changing environments. Uncertainty and change can impact the VRIN characteristics of resources and nullify its effect.

2.4. Dynamic Capabilities

DC evolved from the RBV of an organisation and is focused on the way in which resources, routines, products and services are changed to survive and prosper in a changing business environment (Eisenhardt & Martin, 2000; Teece et al., 1997; Yeow et al., 2018). Building on the RBV, the DC framework delves deeper into the role of capabilities in creating a SCA for organisations. The work of (Amit &

Schoemaker, 1993; Makadok, 2001; Newbert, 2008) referred to this as capabilities, that in combination with resources creates a competitive advantage. Dynamic capabilities are referred to as a set of activities that uses the organisation's resources to create or deliver products or services to clients (Teece, 2014). These activities enable an organisation to direct, through manager orchestration, its ordinary activities towards higher pay-off activities (Teece, 2014). The orchestration capabilities of managers are crucial in managing the different resources and capabilities that can be exploited by deploying a DBS as defined by through the network effects that can be capitalised on in platform businesses and in the ecosystem (Bharadwaj, El Sawy, et al., 2013; van Alstyne et al., 2016). As stated by Teece et al. (1997) 'dynamic' is ability to renew competencies to align with the shifting environment, emphasising innovative responses when time and speed becomes critical and technology is causing rapid change. Teece et al. (1997) further notes "the term 'capabilities' emphasizes the key role of strategic management in appropriately adapting, integrating, and reconfiguring internal and external organizational skills, resources, and functional competences to match the requirements of a changing environment" (p. 515). The emergence of dynamic capabilities in the literature was due to the inability of the RBV to explain and describe why certain organisations had a competitive advantage in a rapidly changing uncertain environment. Change and uncertainty was mainly caused by shifts in the dynamics of the market due to the rapid change of technology (Eisenhardt & Martin, 2000; Teece, 2014; Teece et al., 1997). Similarly Eisenhardt & Martin (2000) defines dynamic capabilities as the specific processes in an organisation that integrates, readjust, finds and releases resources to adjust to the changes in the market, or in some circumstances create market changes. Thus, dynamic capabilities are different organisational and strategic routines that organisations deploy to change the resources and react to market shifts and changes. A DBS focuses on increasing the speed of adoption and adaptation of products or services to enable an organisation to continue to add value in the rapidly changing environment (Bharadwaj, El Sawy, et al., 2013; Sebastian et al., 2017).

The organisational and strategic routines or processes that dynamic capabilities consist of includes: new product development, creation of alliances, innovation, and strategic decision making that addresses changes in new and existing markets through value creating strategies (Eisenhardt & Martin, 2000; Teece, 2014). Considering this, dynamic capabilities have commonalities across different

organisations, termed “best practices”, this is in contrast with the resource based view of heterogeneity and non-substitutability of resources and capabilities across organisations (Eisenhardt & Martin, 2000). The impact of markets on the structure of dynamic capabilities is considerable. If markets are moderately dynamic and change occurs in a stable industry environment, the processes and routines are characterised by complexity with a lot of detail that rely heavily on internal knowledge to produce expected outcomes (Eisenhardt & Martin, 2000). In contrast in high velocity markets where change occurs rapidly and the structure of the market is unclear and shifting, these routines are simple, experiential and unstable, they are built on newly obtained knowledge through iterative processes that creates unpredictable outcomes (Eisenhardt & Martin, 2000). Next generation competition, hyper competition or dynamic competition describes markets that are fluid, comprising amalgamations of knowledge and technology that is dispersed across the globe. In this environment the competitive advantage is quickly eroded with ecosystems competing with each other across boundaries with rules constantly broken and new ones set in its place (D’Aveni, 1994; Teece, 2012, 2014). Dynamic capabilities in an organisation evolves by way of learning mechanisms built through historical experiences and these are path dependant (Eisenhardt & Martin, 2000). It is further stated that dynamic capabilities are necessary to create a competitive advantage but not sufficient on its own. DC can be used to create short term advantages by creating new resource combinations and it can be used to create long term advantages by enhancing the organisations existing resources (Eisenhardt & Martin, 2000). These dynamic capabilities through the combination with resources shape the business environment, this ensures that organisations that evolve constantly survive and thrive (Teece, 2010). Although long-term performance of an organisation is determined, to some extent, by the external environment and the organisation’s position and history in this environment. The development of internal dynamic capabilities is becoming vital for future success or else inevitable failure in the changing environment (Teece, 2007).

Dynamic capabilities can be divided into three clusters of highest or higher order capabilities: (1) sensing which is the identification, development, creating or scanning of any opportunities, technological or non-technological in relationship to the market and customer needs. (2) seizing the opportunities identified by the earlier step through the development of new products, processes, or services through using and

combining the resources to address the needs. (3) Transforming or reconfiguring assets and structures as the organisation grows. It is critical that this is a continuous process of sensing, seizing and reconfiguring because of the dynamic changing environment and the introduction of new technologies and markets (Helfat & Peteraf, 2015; Schoemaker et al., 2018; Teece, 2007, 2014, 2018). The importance of managers in the organisation, for both the RBV and dynamic capabilities are crucial for organisational performance and sustained competitive advantage. It was indicated by Amit & Schoemaker (1993) in the RBV that the role of managers were to identify, develop, protect and deploy resources and capabilities in a manner that will create a SCA for the organisation. According to Helfat & Peteraf (2015) managers possess, what they refer to as dynamic managerial capabilities, and link this to the cognitive ability of managers as it relates to the higher order capabilities presented above. The first managerial capability are managers that possess the ability to sense opportunities within the changing environment before it has fully materialised is critical. The ability to sense opportunities is rooted in a manager's cognitive capability of perception and attention (Helfat & Peteraf, 2015). The second managerial dynamic capability is being able to seize an opportunity that may arise in the market or protect the organisation against certain threats. In many instances managers will make substantial strategic investments into opportunities that can lead to increased organisational performance by using their ability to problem solve and reason to select the best strategic investment (Helfat & Peteraf, 2015). The third dynamic managerial characteristic is the managers ability to reconfigure and orchestrate the assets of the organisation to grow and perform. The role of the manager is to use the organisation's assets, resources, and capabilities to adjust or reconfigure the organisation to sustain the growth and the competitive advantage. Cognitive abilities of language, communication and social cognition are important to gain trust and induce cooperation between the different resources in the organisation (Helfat & Peteraf, 2015). The organisation's DC and managerial capabilities in combination leads to SCA and performance of the organisation (Helfat & Peteraf, 2015; Teece, 2018). Dynamic capabilities at an organisational level is multifaceted and organisations are not as strong across all the different elements. The strength of organisational dynamic capabilities determines the speed at which the resources and capabilities can be mobilised to meet the end user or customer's needs (Teece, 2018).

In the section on the RBV of an organisation it was concluded that VRIN resources contribute to an organisation's ability to sustain a competitive advantage. In the research conducted by Lin & Wu (2014) they propose that the RBV and DC should be used in conjunction to understand the sustained competitive advantage of the organisation. It is suggested that dynamic capabilities act as a partial mediator between an organisation's VRIN resources and the dynamic capabilities in the organisation (Lin & Wu, 2014). Thus, DC mediate the VRIN resources to improve the organisations competitive advantage and in turn this improves the organisation's performance (Lin & Wu, 2014). Further the combination of these two elements and good strategy will enable the organisation to achieve long term sustained performance (Eisenhardt & Martin, 2000; Lin & Wu, 2014; Teece, 2014).

In conclusion dynamic capabilities has certain characteristics that identify them and should be considered when analysing resources and capabilities within the organisation. The ability of managers and the organisation to: sense opportunities by scanning the environment, exploring opportunities to use technology for improvement and investigating customer needs requires management insight and vision or some analytical process that can mimic this by identifying trends and patters to enable management to make decisions which is further enabled by a DBS through the speed of decision making and the abundance of information available to managers to interrogate to make decisions (Bharadwaj, El Sawy, et al., 2013; Helfat & Peteraf, 2015; Schoemaker et al., 2018; Sia et al., 2016; Teece, 2007, 2014, 2018; Vijaya Sunder, Ganesh, & Marathe, 2019); implement investment strategies, different business models to satisfy customer needs, change and shape their markets and capture value for the organisation which is enabled by a DBS that allows for rapid scaling through multisided platforms which is easier as more information is available from customers and users (Bharadwaj, El Sawy, et al., 2013; Grover & Kohli, 2013; van Alstyne et al., 2016). It is important that employees are motivated and aligned and strong relationships with the business ecosystem of the different suppliers, customers and complimentary productor service providers (Helfat & Peteraf, 2015; Schoemaker et al., 2018; Teece, 2007, 2014, 2017, 2018; Vijaya Sunder et al., 2019); to transform or reconfigure the organisation through the leadership skills of the management team by realigning the organisation's resources when rapid change occurs due to opportunities or threats that were sensed and seized. Other important factors to consider is the organisations alignment with its

ecosystem and ensuring that it transforms to keep the benefits it had from being part of the ecosystem (Helfat & Peteraf, 2015; Schoemaker et al., 2018; Teece, 2007, 2014, 2017, 2018; Vijaya Sunder et al., 2019). Some of these characteristics have also been identified under the RBV such as heterogeneity of the organisation, this is due to the different resources and skills in the organisation and how these are combined and reconfigured to create dynamic capabilities.

Idiosyncrasy is another important element and it refers to the different path dependencies that create difficult to replicate or reproduce capabilities in an organisation (Amit & Schoemaker, 1993; Eisenhardt & Martin, 2000; Helfat & Peteraf, 2015; Lin & Wu, 2014; Peteraf, 1993; Teece, 2017; Teece et al., 1997; Vijaya Sunder et al., 2019). Dynamic capabilities exhibit all of these characteristics in certain degrees or strengths and the strengths of these characteristics determine the sustainable competitive advantage created by the organisation (Vijaya Sunder et al., 2019). But it is important to note that although the strength of these DC enable the effective and efficient selection of resources and deployment of them, the push for efficiency can undermine the DC by making the organisation rigid through its processes and procedures and thus the importance of managers to skilfully navigate the balance is critical. DBS will enable an organisation through dynamic capabilities to possibly acquire a SCA by reconfiguring the resources and capabilities to adapt to the changing environment (Bharadwaj, El Sawy, et al., 2013; Mikalef & Pateli, 2017; Sebastian et al., 2017; Teece et al., 1997). Cloud computing is a DC in its own right as it allows for rapid scaling of infrastructure as it is needed by the organisation to enable the organisation to the customer's needs (Bharadwaj, El Sawy, et al., 2013; van Alstyne et al., 2016).

Chapter 3 : Research questions

This research aims to answer the following broad overarching question:

Is there a relationship between digital business strategy and an organisation's sustained competitive advantage?

3.1. Research Question 1: What is the relationship between the scope of digital business strategy and sustained competitive advantage?

In chapter two, the literature review, the scope of DBS has been described as the products and services under an organisation's control that is impacted by digital technologies. Digitising of products and services and using digital resources to deliver unique products and services beyond the traditional organisation environment to a dynamic ecosystem. These give an organisation a competitive advantage through delivering superior products and services to an increasing demanding customer (Bharadwaj, El Sawy, et al., 2013; Coltman et al., 2015; Mithas et al., 2013; Sebastian et al., 2017; Sia et al., 2016).

3.2. Research Question 2: What is the relationship between scale of digital business strategy and sustained competitive advantage?

In chapter two, the literature review, the scale of DBS is focused on the increase efficiency and effectiveness through the use of digital technology. The growth of systems and spread of information through the network effect has increased exponentially in the digital era, connecting organisations through strategic partnerships and alliances, use of information to make decisions and gain insights will lead to a competitive advantage in the same way that the industrial revolution made products cheaper and increased profitability (Bharadwaj, El Sawy, et al., 2013; Drnevich & Croson, 2013; Sebastian et al., 2017; Sia et al., 2016)

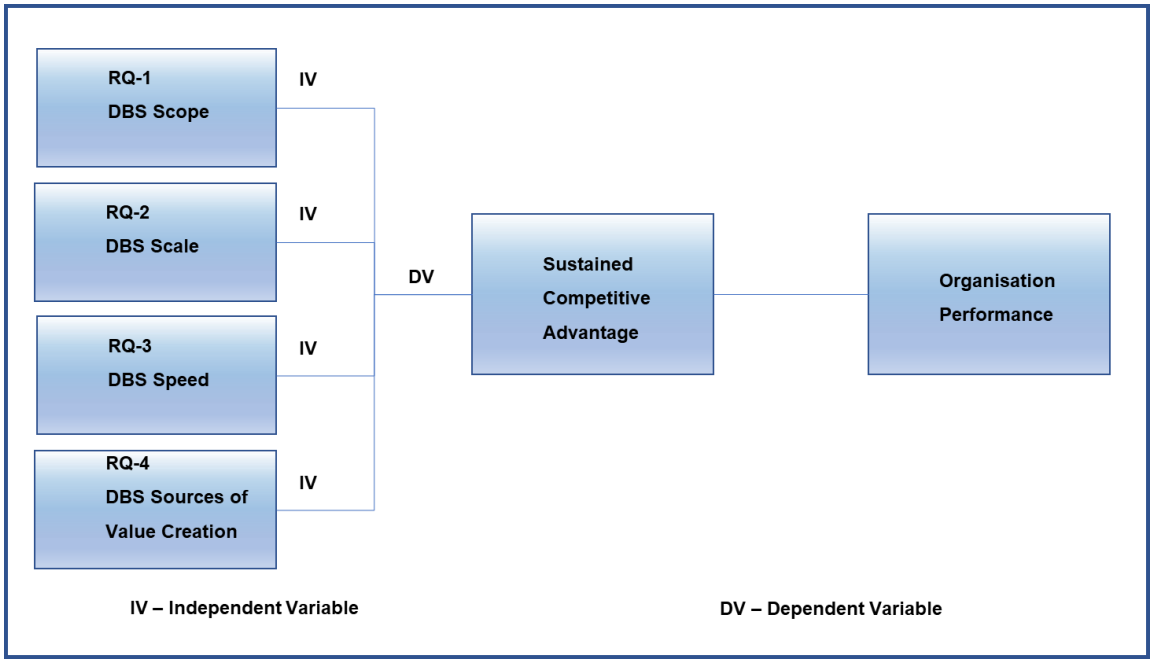
3.3. Research Question 3: What is the relationship between speed of digital business strategy and sustained competitive advantage?

In chapter two, the literature review, the importance of time or more specifically the speed of product launches to meet customer needs, increased need for faster strategic decision making, through leveraging technology in developing agile and scalable digital platform or the use of outsourced services can lead to a competitive advantage as the organisation will be able to meet customer needs faster and also meet the specific requirement of a connected customer base (Bharadwaj, El Sawy, et al., 2013; Sebastian et al., 2017; Sia et al., 2016).

3.4. Research Question 4: What is the relationship between digital business strategy sources of value creation and sustained competitive advantage?

In chapter two, the literature review, the sources of value creation and capture in DBS is discussed focussing on the increased value from the abundance of information. The value from coordinated multisided business models, enhanced current non-digital capabilities and the development of new digital capabilities through leveraging IT resources to create value. This will lead to a competitive advantage as it will differentiate an organisation from others in the environment (Bharadwaj, El Sawy, et al., 2013; Coltman et al., 2015; Drnevich & Croson, 2013; Sebastian et al., 2017).

Figure 2: Diagram depicting dependent and independent variable



Chapter 4 : Research methodology and design

4.1. Introduction

This research aims to identify the link between Digital Business Strategy and sustained competitive advantage. Further, to understanding the relationship between the four elements scope, scale, speed, and sources of value creation identified in DBS with SCA (Bharadwaj, El Sawy, et al., 2013). The researcher collected primary data through the use of a survey, that is a research technique that gathers information from respondents on a certain topic, as part of this study (Zikmund, Babin, Carr, & Griffin, 2009)

This chapter discusses the methodology used in this research study. Starting with the research methodology and the design that describes the philosophy used, the approach towards the research, and the type of research which in this case was descripto-explanatory (Saunders & Lewis, 2018). Next the population from which the data was gathered and the unit of analysis ,which refers to the level of aggregation of the data and who provided the data, will be discussed (Saunders & Lewis, 2018; Zikmund et al., 2009). In the following section the sampling method and size will be discussed as it was not possible the measure the whole population. The following two sections deals with the data gathering instrument and process. After which, the data analysis will be explained and the different ways in which the analysis was done. Finally, a brief discussion on the different limitations of the research will be described.

4.2. Research Methodology and Design

Positivism as a research philosophy was selected for this study. A positivistic approach is designed to be unambiguous and to deliver data that has not been influenced by bias of the researcher (Saunders & Lewis, 2018). The aim is to create law-like generalisations that can be reproduced and used in predicting behaviour and events within an organisation. A highly structured methodology was followed through the use of a questionnaire to enable the researcher to replicate the study. The focus was on quantitative data which can be utilised in statistical analysis to identify causal relationships (Saunders & Lewis, 2018). This type of research philosophy is

appropriate for the study as the data is collected through an online questionnaire that is set, meaning the researcher cannot change the manner in which questions are asked per respondent (Saunders, Lewis, & Thornhill, 2012). Further a highly structured methodology was followed and the data was statistically analysed to be able to identify causal relationships between the data (Saunders et al., 2012).

A deductive approach was selected to conduct this study (Saunders et al., 2012). As it attempts to explain the relationship between the constructs of DBS scope, DBS scale, DBS speed and the DBS SVC on the DC that lead to a SCA of sensing, seizing and transforming (Bharadwaj, El Sawy, et al., 2013; Schoemaker et al., 2018). A vast amount of literature was available, as discussed in chapter 2, on digital business strategy and established theories of dynamic capabilities and sustained competitive advantage, thus the research followed a deductive approach (Saunders et al., 2012). The researcher tested the relationship between the multiple variables mentioned above of DBS, and DC that leads to a SCA. This study was a mono method quantitative study which utilised a single data collection technique through the use of an online questionnaire (Saunders & Lewis, 2018). This method was appropriate as the researcher had limited time to complete the research project (Saunders & Lewis, 2018).

The objective of the research is descripto-explanatory, using descriptive research to create a clear and accurate view of the situation or event. Descriptive research should serve the purpose of being a precursor to explaining certain relationships as set out by the research, thus it is a starting point towards drawing conclusions from these relationships (Saunders et al., 2012). This research used descriptive research as part of proposing an explanation of an event or situation. In this research the relationship between two variables is explained, DBS and sustained competitive advantage (Saunders et al., 2012). A questionnaire was used as the research strategy which is normally associated with deductive research. This research strategy is used for descriptive and exploratory research and in the case of this study descripto-explanatory research. The questionnaire was used because it allowed for highly standardised data collection, this allowed the collection and analysis of quantitative data using descriptive and inferential statistics, it was used to suggest relationships between the variables. These were identified through the measuring and testing of the data in a manner that is structured (Saunders et al., 2012; Zikmund

et al., 2009). Quantitative studies allow for the replication of the results in other studies, which in turn leads to different studies following the same procedure producing the same results. Quantitative research is objective as the researcher is merely an observer creating research independence (Zikmund et al., 2009).

An online questionnaire was used to conduct the research through the survey method. The advantage of using the survey method is that it is inexpensive, quick, accurate and efficient, considering the time constraints of this study the online survey method was the best option (Zikmund et al., 2009). The drawback of using the survey method is that the data it collects is not as detailed and further questions for clarity cannot be posed to the respondents, but considering the timelines the advantage was that it can be easily distributed and collated (Zikmund et al., 2009).

A major constraint in the research is time as it needs to be completed in the academic year of 2019, thus this will be a cross-sectional research study. The data will be collected at a point in time and provide a current view of the relationship between the variables that were evaluated at that specific time (Saunders & Lewis, 2018). The impact of this is that the organisations in the study are at different stages in their digital journey which could influence the relationship between the DBS and the performance of the organisation (Ross et al., 2017; Sebastian et al., 2017; Sia et al., 2016).

4.3. Population

The population that was targeted for this study includes all organisations. The targeted audience for this study was all managers and executives within the organisations that are involved in the formulation or execution of strategy. This population allowed the researcher deeper insights into strategy formulation in the organisation and the capabilities and resources available to the organisation to execute the different strategies. The selection of this population group is appropriate as it was proposed by Bharadwaj et al. (2013) that all organisations from well-established to new pure digital start-up organisations will be impacted by digital business strategy and the impacts of technology. Further, the selection of both executives and senior managers that set strategy, and the middle and junior

managers that execute the strategy will provide a holistic view of the extent of a DBS in an organisation.

4.4. Unit of Analysis

This study investigated DBS which is a digital strategy at the organisational level and not at the level of the functional business units or at an individual level (Bharadwaj, El Sawy, et al., 2013). The information about the strategy and the components of a DBS will be provided by all managers that are involved in setting and executing strategy. The unit of analysis is who or what will provide the information for this study, and at what level of aggregation, either at the individual level or as is the case with this study at the organisational level (Zikmund et al., 2009).

4.5. Sampling size and method

The population size is considerable and there is no consolidated list available to the researcher that will identify all these organisations, thus the total size of the population is not fully known as organisations do not clearly state if they have a DBS or elements of a DBS. Measuring the entire population is expensive and time consuming, thus a subset was used. This subset of a population is known as the sample (Saunders & Lewis, 2018; Zikmund et al., 2009). The limited information available about the population and the probability of any specific member of the organisation being selected led to the use of non-probability sampling. Non-probability selects the member of the population to be surveyed based on convenience or personal judgement of the researcher (Zikmund et al., 2009).

In this study the following sampling techniques were utilised: purposive sampling and snowball sampling. Purposive sampling is hinged on the researcher's judgement to select the sample, considering certain criteria that are aligned to the purpose of the research and the needed population (Saunders & Lewis, 2018). A second method of sampling that was employed was snowball sampling, snowball sampling is when the first member of the sample nominate or volunteer other members to participate in the study (Saunders & Lewis, 2018; Zikmund et al., 2009). These methods were utilised for sampling because of the researcher's limited network of business professionals that fit the criteria for the required population. The disadvantage of using the snowball

sampling method is that the sample could have similar biases or views. The reason for this is that the initial respondent could refer someone with similar views. The advantage is that there was a substantial cost saving associated with using this method to acquire more respondents (Zikmund et al., 2009). The researcher made use of his networks to contact the initial respondents through the use of email, business platforms (such as LinkedIn) and Whatsapp.

When identifying the required sample size for the research it is argued that the bigger the sample size the better and more accurate the results (Field, 2009; Zikmund et al., 2009). An important consideration in selecting the sample size is the power of a test. Power is the probability of finding an effect or put differently power is the probability of rejecting the null hypothesis (Tabachnick & Fidell, 2012). If a lack of power exists non-significant results could be achieved and small samples could result in less reliable correlation coefficients (Pallant, 2011). There are multiple methods and suggestions available in the literature to estimate sample size. The simplest of these rules estimate that fifteen participants are required per independent variable or predictor. In the case of this study the required sample size would have been 15(4) = 60 as the study has four independent variables namely: DBS Scope, DBS Scale, DBS Speed, DBS Value creation (Field, 2009; Pallant, 2011). A more accurate formula was proposed to predict the number of responses required based on the independent variables in the study. The minimum recommended sample size for testing the overall fit of the regression model is $N \geq 50 + 8k$ (where k is the independent variables or predictors). Secondly to test the individual dependent variables or predictors in the model is $N \geq 104 + k$. The recommendation is to select the bigger of the two sample sizes (Field, 2009; Pallant, 2011; Tabachnick & Fidell, 2012). In the case of this study with four independent variables or predictors the minimum sample size is either 50 + 8(4) = 82 or 104 + 4 = 108. the recommended sample for this study will be 108. This is aligned to the recommendation that for an expected large effect a sample size of 80 will suffice and for a medium effect a sample size of a 100 will suffice with less than six independent variables (Field, 2009).

Saunders et al. (2012) reported response rates in a multinational organisation from individual sites between 41 percent to 100 percent with an overall response rate of 52 percent. Considering response rates and possible data issues or incomplete

responses the researcher aimed to target 208 respondents. It was impossible to report the response rate because of the sampling technique utilised, which in this case was snowball sampling (Saunders & Lewis, 2018).

4.6. Data Gathering Instrument

The data collection method that was used was an online self-completed questionnaires where all respondents were asked the same set of closed-ended questions in the same order (Saunders & Lewis, 2018). The use of a survey that can be distributed digitally on the internet had a few advantages as it relates to low cost of administering the survey, it was quick to collect the data, the geographic location of the respondents was not of concern, confidentiality and anonymity could be provided which led to more openness from respondents (Zikmund et al., 2009). The questionnaire was based on adaptations of the key themes of DBS, digital transformation and competitive advantage (Bharadwaj, El Sawy, et al., 2013; Junfeng & Wei-ping, 2017; Makkonen, Pohjola, Olkkonen, & Koponen, 2014; Pagani, 2013; Sebastian et al., 2017).

4.7. Data Gathering Process

A pilot test of the questionnaire was distributed to a small group of respondents. This was done to ensure that any issues could be found and fixed by the prior to further distribution (Zikmund et al., 2009). The study used a pilot test of ten managers to send the questionnaire to and they were required to provide feedback on the flow, aesthetics, and readability of the questionnaire. The researcher also consulted their supervisor for feedback on the research instrument. Feedback on the questionnaire highlighted that the researcher needed to explain some of the terms utilised in the questionnaire to clarify the questions. This was done and the average duration time by this group to answer the questionnaire was fifteen minutes, this was deemed acceptable.

The researcher utilised a standardised 1 – 7 Likert scale, as per the questionnaire in Appendix 1, to measure attitudes and it allowed respondents to rate on a sliding scale how much they agree or disagree with the stated question (Zikmund et al.,

2009). The design of the questionnaire was based on the themes and questions identified in the research and chapter 2, the literature review.

The first six questions obtained descriptive information of the respondents and covered current employment, biographic information, tenure in the organisation, and information about the respondent's current organisation.

The first section in the questionnaire measured the levels of digital maturity (DM) within the organisation. These questions were adapted from the study done by Sebastian et al. (2017) which identified two technology enabled assets that are prerequisites for digital transformation that is aligned with the organisations digital maturity (Sebastian et al., 2017).

The second section focused on the DBS as proposed by Bharadwaj et al. (2013) and the questions were derived from the four themes that were identified in the literature. The themes that were measured were DBS Scope, DBS Scale, DBS Speed, DBS Value creation. This section aimed to identify if the respondent's organisation has some of the elements of a DBS and to what extent.

The third section measured the dynamic capabilities in the organisation as this indicates if the organisation has a sustained competitive advantage as per the questions in Junfeng & Wei-ping (2017) and Makkonen et al. (2014). These studies utilised the 7-point Likert scale to measure the level of dynamic capabilities and the researcher used the same scale.

4.8. Data Analysis

The data was analysed using the IBM SPSS statistical software after the data had been downloaded, cleaned, and readied for statistical testing. Data preparation happens in three stages before analysis can occur namely editing, coding, and creating the data file (Zikmund et al., 2009). Google Forms, an online instrument, was used to conduct the questionnaire for this study. 121 responses were received through this tool. The data was extracted into Microsoft Excel, after which it was checked to ensure completeness. All responses were adequately completed thus

there was a 100% response rate. The Likert-scale data was imported into IBM SPSS 25 and coded into numeric values to enable quantitative analysis.

4.8.1. Validity and Reliability

According to Saunders & Lewis (2018) the research will be reliable if the data collection method and the analysis produced congruent results. Cronbach's Alpha is most commonly used as a measurement of reliability (Pallant, 2011; Saunders et al., 2012). A measure of reliability that can be assessed by Cronbach's alpha is internal consistency, which is how the items that make up the scale measure the same underlying attribute (Pallant, 2011). A high level at 0.7 or more indicates that it is measuring what was expected, a low Cronbach Alpha at 0.3, could indicate that it is not measuring what it should or something completely different (Field, 2009; Pallant, 2011; Saunders et al., 2012). Internal validity refers to the extent that an independent variable is responsible for any variance in the dependent variable (Zikmund et al., 2009).

Table 1: Calculated Cronbach's Alpha values for constructs

Construct	Cronbach's Alpha	No. of items
Sustained competitive advantage	0.884	11
DBS – Scope	0.775	5
DBS – Scale	0.824	5
DBS - Speed	0.864	6
DBS – Value creation	0.631	2

All the Cronbach alpha values were above the optimal (0.7) except for the construct DBS - Value creation (Appendix 2). Cronbach's alpha are dependent on the number of items in the scale, thus with only two items in this specific scale it is recommended to calculate the mean inter-item correlation which should range between 0.2 and 0.4 (Pallant, 2011). The mean interim-item correlation value as per the summary items statistics table is 0.461 which places it outside the optimal value and must be removed from the analysis in this study (Pallant, 2011).

4.8.2. Principal Component Analysis

Principal Component Analysis (PCA), is a method that reduces larger sets of variables into fewer variables that is easier to analyse. The aim is to identify which variables correlate with each other and cluster together (Field, 2009; Pallant, 2011). In PCA the original variables are changed into smaller sets of linear combinations with all the variances being used. The outputs of the PCA are components which is the combinations of the correlated variables (Pallant, 2011; Tabachnick & Fidell, 2012).

Before PCA could be conducted, it needed to be confirmed that the data is factorizable. The suitability of the data for using PCA is firstly conducted through the inspection of the correlation matrix to establish if there are coefficients greater than 0.3. If only a few correlations above this level is found PCA is not appropriate (Pallant, 2011; Tabachnick & Fidell, 2012). Next two additional measures were generated: Keyser-Meyer-Olkin (KMO) and Bartlett's test of sphericity (Appendix 3). Bartlett's test of sphericity must be significant ($p < 0.05$) to consider PCA. KMO index range between 0 and 1, and it is suggested that 0.6 is the minimum value to do a good PCA (Pallant, 2011; Tabachnick & Fidell, 2012).

Table 2: KMO and Bartlett's test of sphericity

Constructs	KMO	Bartlett's Test
Sustained competitive advantage	0.839	0.000
DBS – Scope	0.775	0.000
DBS – Scale	0.824	0.000
DBS - Speed	0.854	0.000
DBS – Value creation	0.500	0.000

The PCA was conducted on the 11 questions measuring the Sustained Competitive Advantage construct, 5 questions measuring the DBS – Scope construct, 5 questions measuring DBS – Scale construct, 6 questions measuring DBS Speed and 2 questions measuring DBS – Value Creation construct.

For the sustained competitive advantage construct the PCA revealed three components that had eigenvalues greater than one, this is known as Kaiser's criterion (Field, 2009). These components explained 48.29%, 17.77% and 10.77%

of the total variance respectively as indicated in Appendix 4.1. 76.82% of the total variance was explained by these three components. The items loading to the 3 components of the Sustained Competitive Advantage (SCA) construct had a strong loading on: Seizing questions for component 1; Sensing questions for component 2; Transforming Capabilities questions for component 3 as indicated in Appendix 4.1. To facilitate interpretation by simplifying the rows and columns a VARIMAX orthogonal rotation was used (Hair, Black, Babin, & Anderson, 2014).

For the DBS – Scope construct the PCA identified only one component with eigenvalues above one and the one component explained 52.86% of the total variance as indicated in Appendix 4.2. This component was named DBS – Scope.

For the DBS – Scale construct the PCA identified only one component with eigenvalues above one and the one component explained 58.9% of the total variance as indicated in Appendix 4.3. This component was named DBS – Scale.

For the DBS – Speed construct the PCA identified only one component with eigenvalues above one and the one component explained 59.7% of the total variance as indicated in Appendix 4.4. This component was named DBS – Speed.

For the final DBS – Value Creation construct the PCA identified only one component with eigenvalues above one and the one component explained 73.05% of the total variance as indicated in Appendix 4.5. This component was named DBS – Value Creation.

Through the use of the IBM SPSS Statistics software version 25 the calculated average of all the questions per component were utilised to create a new variable. These new variables could then be used to simplify the analysis process.

4.8.3. Descriptive Analysis

The descriptive statistics were utilised to provide information about the basic features of the data used by the researcher. Some of these statistics are the mean, standard deviation, demographic, and organisational data. The estimation of central tendency, through the use of the mean or average, can be a number not actually observed in

the data but calculated from all the other numbers using an average across the dataset (Field, 2009). The standard deviation is a measure of dispersion across different samples of the same population. The higher the standard deviation the further the different data points are from the mean. Conversely, the lower the standard deviation the closer the data points are to the mean (Wegner, 2016). These measures describe the attributes of the data that has been analysed by the researcher.

4.8.4. Correlation Analysis

The research aimed to understand how the various constructs are related. How the elements of a DBS: scope; scale; speed; value creation (Bharadwaj, El Sawy, et al., 2013) are related to dynamic capabilities that give an organisation a sustained competitive advantage. The use of correlation analysis enables the researcher to explore the association between different variables and describe the strength and direction between two variables (Pallant, 2011). This approach would address the research question posed in Figure 2. Although it is debated in academic literature whether Likert scale data can be used for parametric analysis as this is an ordinal scale. The use of parametric tests requires the data to be interval data but converting the Likert scale data to numbers can address this issue. It was found that parametric tests can be used with Likert scale data and that parametric tests are more robust that nonparametric tests. Thus parametric tests are robust enough to deliver largely unbiased outcomes that are acceptably close to the “real value” when the researcher analyse Likert scale responses (Sullivan & Artino, 2013). Havlicek & Peterson (1976) showed that due to the robustness of the Pearson’s correlation test, data that is non-interval, not normally distributed or skewed or any combination of these can be used and the probability that is obtained can be assumed to be fairly accurate.

The strength of the relationship between the variables was evaluated based on the suggestion by Field (2009):

Table 3: Correlation coefficient measure

Correlation coefficient value	Classification
0	No linear correlation
0.10 – 0.29	Small
0.30 – 0.49	Medium
0.50 – 0.99	Large
1	Perfect correlation

The correlation coefficient lies between -1 and +1 and the sign indicates if the relationship is positive or negative with -1 being a perfect negative relationship and +1 a perfect positive relationship (Field, 2009).

A correlation analysis was performed amongst the independent variables of DBS scope, DBS scale, DBS speed and DBS value creation with the dependent variable SCA. As stated above interval data is required and normality was assumed to test significance (Field, 2009; Pallant, 2011). It is important to note that the correlation analysis has certain assumptions which were tested in chapter 5. The assumptions are as follows:

- The two variables that are tested against each other need to have a linear relationship, thus when reviewing a scatterplot, the data should be close to a straight line and not curved (Pallant, 2011).
- There should not be many outliers, and this can be checked on the same scatterplot (Pallant, 2011).
- The data should be normally distributed and can be checked by reviewing the histograms which should show the distribution similar on both sides. In the instances where this was found not to be true the researcher still ran a Pearson's correlation based on the robustness of the test (Havlicek & Peterson, 1976).

4.8.5. Regression Analysis

Regression analysis is when a model is fit to data to predict the value of the dependant variable by one independent variable, known as simple regression, or multiple independent variables which is known as multiple regression (Field, 2009). In regression analysis the β indicates the strength and the direction of the relationship

between the two variables which are the dependent and independent variables. The standardised regression coefficient (β) provides a way for regression results to be compared no matter what the underlying scale was. The higher the absolute β value the stronger the relationship is, the range is between -1 and +1 (Zikmund et al., 2009). The slope of the line indicates how much the Y rises or falls with a change on the X-axis. The slope coefficient is significant if the p-value is smaller than 0.05 and can be utilised in the interpretation of the regression model (Zikmund et al., 2009).

During the analysis phase multiple regression tests were performed using statistical software mentioned earlier and the subsequent outputs were analysed. As stated, the DV was SCA and DBS scope, DBS scale, DBS speed and DBS value creation were the independent variables. All the multiple regression results can be found in chapter 5 of this research report.

In doing multiple regression testing certain assumptions needed to be tested:

- Sample size: The importance of the sample size is to ensure that the study is generalisable across other samples. According to Tabachnick & Fidell (2012, p.123) an adequate sample size can be calculated using the formula $N \geq 50 + 8m$, where m denotes the number of independent variables in the study. Thus, for this research study the minimum required responses are $50 + 8(4) = 82$. This research study had 121 responses so the sample size is sufficient to meet generalisation criteria for this sample (Pallant, 2011).
- Independence of residuals as assessed by the Durbin-Watson statistic, with a value between 1 and 3 is acceptable and 2 is optimal. Thus, the closer the value is to 2 the better (Field, 2009).
- Multicollinearity: This is the relationship between the independent variables, if these variables are highly correlated ($r \geq 0.9$) it does not contribute to a good regression model (Pallant, 2011). Two other values can be investigated as a check for multicollinearity, these are the Tolerance and the Variance Inflation Factor (VIF) as depicted in the Coefficients table when doing multiple regression in IBM SPSS. The limit for Tolerance is if it is smaller than 0.1 and the limit for VIF is above 10. If these limits are breached there is a high possibility of multicollinearity and the model needs to be reconsidered (Pallant, 2011).

- Outliers: These are extremely high or exceptionally low values that are different from all the other variables. Outliers are those variables with standardised residual values above 3.3 or less than -3.3 (Pallant, 2011; Tabachnick & Fidell, 2012). These outliers can be identified by scrutinising the scatterplot and identifying standardised residuals as described above (Pallant, 2011).
- Normality: According to Pallant (2011) “The residuals should be normally distributed about the predicted DV scores” (p.151). Scrutinising the Normal Probability Plot (P-P) of the regression standardised residual, as per the multiple regression ran in the IBM SPSS software, should indicate that all the points lie close to the line running from bottom left to top right. This would indicate that there are no major deviations from normality (Pallant, 2011).
- Linearity: If the relationship between the predicted dependent variable scores and the errors of prediction does not have a straight line relationship, but rather it is shaped as a curve on the scatterplot it indicates non-linearity (Tabachnick & Fidell, 2012).
- Homoscedasticity: The variance around the regression line is the same for all values (Tabachnick & Fidell, 2012).

4.9. Research Limitations

The first limitation of this study is that the sample size is relatively small and thus it could be that it is not representative of the whole population. Further this study will only focus on organisations within South Africa and this could have a limiting effect on being able to generalise it across geographic regions. Snowball sampling is used which could lead to respondents in the study having low levels of variance in their responses.

Chapter 5 : Results

5.1. Introduction

This chapter discusses the research results from the questionnaire. The descriptive statistics provides information about the respondent population and the analysis described in Chapter 4, is also given. All the results are discussed based on the RQ's from Chapter 3. The number of respondents for this study is n = 121.

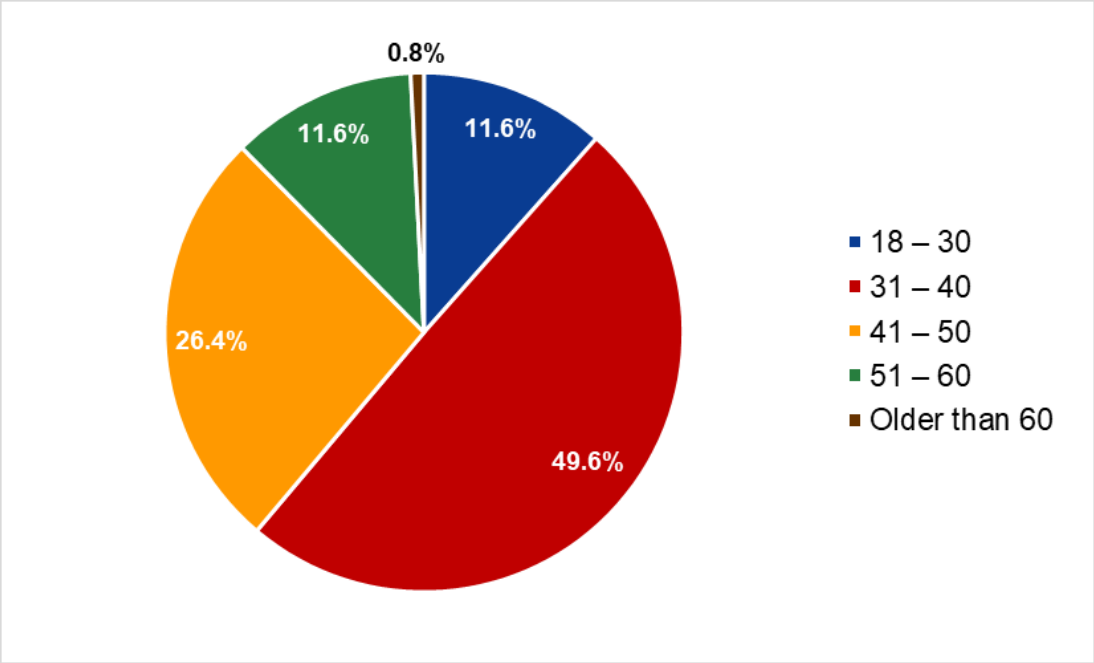
5.2. Description of the sample

5.2.1. Respondent Demographics

5.2.1.1. Age of the respondents

In Figure 3 the division between respondents by age group is shown. Most of the respondents fall between 31 – 40 years (49.6%). The second age category is respondents between the age of 41- 50 (26.4%). The remainder of the respondents are either over 50 or between the age of 18 – 30 (24%).

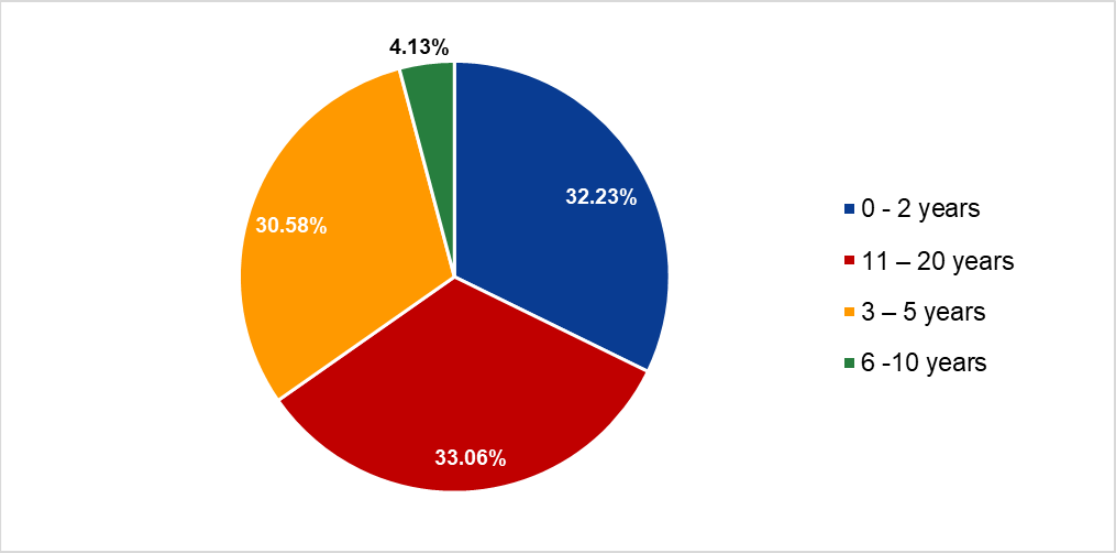
Figure 3: Average age of respondents



5.2.1.2. Tenure within the organisation

The majority of the respondents has been with their organisation for more than three years when the study was conducted. The largest group have been with the organisation between 3-5 years (29.8%), followed by the group of between 6-10 years (27.3%).

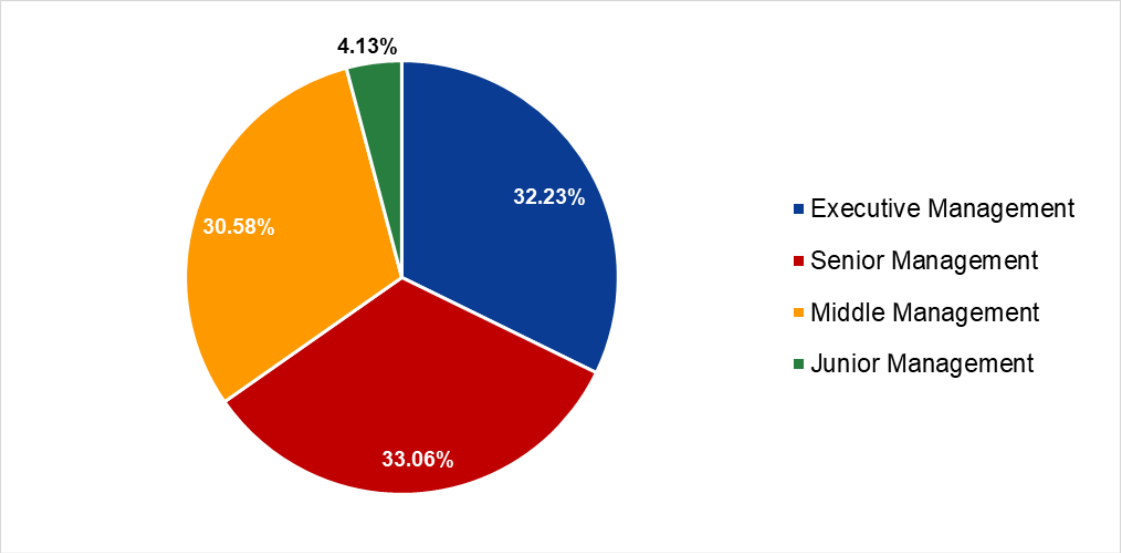
Figure 4: Tenure of the respondents



5.2.1.3. Seniority of the respondent's role

The job level of the different respondents was fairly evenly distributed across the more senior levels. More than 65% of the respondents were at a senior or executive level within the organisation. It can be assumed that both executives and senior managers are intricately involved in shaping the organisation's strategy and should have a lot of knowledge about their organisation's different strategies.

Figure 5: Seniority within the organisation



5.2.2. Demographics of the organisations

5.2.2.1. Industry

The questionnaire established the different industries the respondents were working in. Finance and financial institutions are the largest industry (25.6%), followed by Telecommunications, Technology, Internet, and Electronics (17.4%) and the Healthcare and Pharmaceuticals, and Retail and Consumer Durables both at 9.1%.

Table 4: Industry

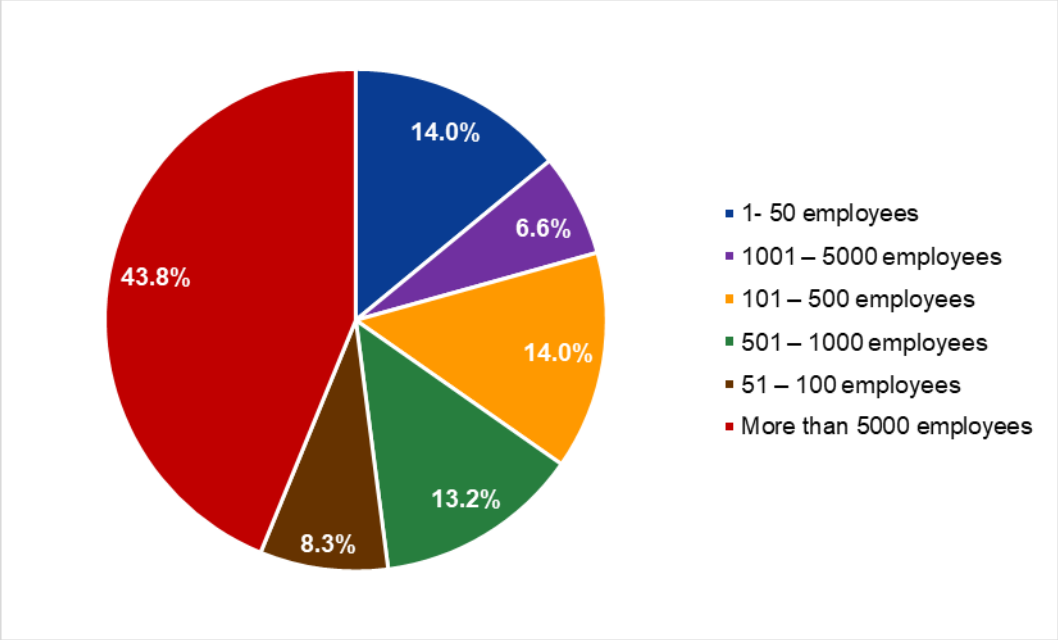
Industry	Percentage
Finance and Financial Services	25.6%
Telecommunications, Technology, Internet, and Electronics	17.4%
Healthcare and Pharmaceuticals	9.1%
Retail and Consumer Durables	9.1%
Advertising and Marketing	7.4%
Business Support and Logistics	5.8%
Food and Beverages	5.0%
Manufacturing	4.1%
Education	4.1%
Utilities, Energy and Extraction	3.3%
Construction Machinery and Homes	2.5%
Agriculture	1.7%
Government	1.7%
Transportation and Delivery	0.8%
Non-Profit	0.8%

Professional Services	0.8%
Mining	0.8%

5.2.2.2. Number of Employees

As indicated by Figure 6. 43.8% of the respondents are in organisations with more than 5000 employees. More than 27% of the respondents were in organisations with between 100 – 1000 employees. Another 22.3% were in organisations with less than 100 employees and 6.6% in an organisation with between 1001 – 5000 employees.

Figure 6: Approximate number of employees in organisation



5.3. Descriptive statistics for the SCA construct

The sustained competitive advantage construct is made up of three variables as per the PCA (Appendix 4.1). These variables are (1) Sensing which is the identification, development, creating or scanning of any opportunities in relationship to the market and customer needs. (2) Seizing is the opportunities identified by the earlier step through the development of new products, processes, or services. (3) Transforming or reconfiguring assets and structures as the organisation grows (Helfat & Peteraf, 2015; Schoemaker et al., 2018; Teece, 2007, 2014, 2018).

Table 5: Sustained Competitive Advantage – Mean and Standard Deviation

Descriptive Statistics		
	Mean	Std. Deviation
SCA - Sensing	5.335	1.028
SCA - Seizing	4.533	1.247
SCA - Transforming	4.303	1.372

The sustained competitive advantage constructs have an average mean of about 4.7, lying close to “somewhat agree”, suggesting that most believe their organisations have some capabilities already that contribute to a sustained competitive advantage.

5.4. Results for Research Question 1

Question 1 tried to understand the relationship between the DBS attribute scope with sustained competitive advantage through dynamic capabilities.

The research question involves digital business strategy scope as the independent variable and sustained competitive advantage as the dependent variable.

5.4.1. Descriptive Analysis for Research Question 1

The mean and the standard deviation are depicted below for the construct DBS – Scope. The mean score of 4.8, indicates that most responses tended towards “somewhat agree” on the 7-point Likert scale.

Interpreting this most of the respondents believed their organisations have some of the elements of DBS as it pertains to the scope.

Table 6: DBS Scope - Mean and Standard Deviation

Descriptive Statistics		
	Mean	Std. Deviation
DBS - Scope	4.759	1.182

5.4.2. Correlation Analysis

The researcher used a Pearson's correlation to understand the relationship between DBS – Scope and sustained competitive advantage. The summarised correlation results are depicted in Table 7 as per the correlation results in Appendix 5.

Table 7: Correlation results – DBS Scope and SCA components

Correlations		**DBS - Scope**	**Variability**
SCA - Sensing	Pearson Correlation	**0.436**	19%
	Sig. (2-tailed)	0.000	
	N	121	
SCA - Seizing	Pearson Correlation	**0.522**	27%
	Sig. (2-tailed)	0.000	
	N	121	
SCA - Transforming	Pearson Correlation	**0.42**	18%
	Sig. (2-tailed)	0.000	
	N	121	

The analysis indicated that the relationship was linear, and all the variables were normally distributed as indicated in Appendix 5 with Shapiro-Wilk's test ($p < 0.05$). This led the researcher to run a Pearson's correlation.

The correlation was moderately positive between DBS – Scope and SCA – Sensing, $r = 0.436$. DBS – Scope explained 19% of the variability in the SCA – Sensing component (Table 7) and statistically significant $p < 0.01$.

The correlation was strong positive between DBS – Scope and SCA – Seizing, r = 0.522. DBS – Scope explained 27% of the variability in the SCA – Seizing component (Table 7) and statistically significant $p < 0.01$.

There was a moderate positive correlation between DBS – Scope and SCA – Transforming, r = 0.42. DBS – Scope explained 18% of the variability in the SCA – Transforming component (Table 7) and statistically significant $p < 0.01$.

5.5. Results for Research Question 2

This question attempts to understand the relationship between the digital business strategy attribute scale with sustained competitive advantage through dynamic capabilities.

The research question involves digital business strategy scale as the independent variable and sustained competitive advantage as the dependent variable.

5.5.1. Descriptive Analysis for Research Question 2

The mean and the standard deviation are depicted below for the construct DBS – Scale. The mean score of 4.6, indicates that most responses tended towards “somewhat agree” on the 7-point Likert scale.

Interpreting this most of the respondents believed their organisations have some of the elements of DBS as it pertains to the scope.

Table 8: DBS Scale - Mean and Standard Deviation

Descriptive Statistics		
	Mean Statistic	Std. Deviation Statistic
DBS - Scale	4.620	1.346

5.5.2. Correlation Analysis

The researcher used a Pearson's correlation to understand the relationship between DBS – Scale and sustained competitive advantage. The summarised correlation results are depicted in Table 9 as per the correlation results in Appendix 8.

Table 9: Correlation results – DBS Scale and SCA components

Correlations		DBS - Scale	Variability
SCA - Sensing	Pearson Correlation	**0.434**	19%
	Sig. (2-tailed)	0.000	
	N	121	
SCA - Seizing	Pearson Correlation	**0.465**	22%
	Sig. (2-tailed)	0.000	
	N	121	
SCA - Transforming	Pearson Correlation	**0.435**	19%
	Sig. (2-tailed)	0.000	
	N	121	

The analysis indicated that the relationship was linear, and all the variables were normally distributed as indicated in Appendix 8 with Shapiro-Wilk's test ($p < 0.05$). This led the researcher to run a Pearson's correlation.

The correlation was moderately positive between DBS – Scale and SCA – Sensing, $r = 0.434$. DBS – Scale explained 19% of the variability in the SCA – Sensing component (Table 9) and statistically significant $p < 0.01$.

The correlation was moderately positive between DBS – Scale and SCA – Seizing, $r = 0.465$. DBS – Scale explained 22% of the variability in the SCA – Seizing component (Table 9) and statistically significant $p < 0.01$.

The correlation was moderately positive between DBS – Scale and SCA – Transforming, $r = 0.435$. DBS – Scale explained 19% of the variability in the SCA – Transforming component (Table 9) and statistically significant $p < 0.01$.

5.6. Results for Research Question 3

This question attempts to understand the relationship between the digital business strategy attribute speed with sustained competitive advantage through dynamic capabilities.

The research question involves digital business strategy speed as the independent variable and sustained competitive advantage as the dependent variable.

5.6.1. Descriptive Analysis for Research Question 3

The mean and the standard deviation are depicted below for the construct DBS – Speed. The mean score of 4.7, indicates that most responses tended towards "somewhat agree" on the 7-point Likert scale.

Interpreting this most of the respondents believed their organisations have some of the elements of DBS as it pertains to the scope.

Table 10: DBS Speed - Mean and Standard Deviation

Descriptive Statistics		
	Mean Statistic	Std. Deviation Statistic
DBS - Speed	4.664	1.247

5.6.2. Correlation Analysis

The researcher used a Pearson's correlation to understand the relationship between DBS – Speed and sustained competitive advantage. The summarised correlation results are depicted in Table 11 as per the correlation results in Appendix 9.

Table 11: Correlation results – DBS Speed and SCA components

Correlations		DBS - Speed	Variability
SCA - Sensing	Pearson Correlation	**0.550**	30%
	Sig. (2-tailed)	0.000	
	N	121	
SCA - Seizing	Pearson Correlation	**0.587**	34%
	Sig. (2-tailed)	0.000	
	N	121	
SCA - Transforming	Pearson Correlation	**0.439**	19%
	Sig. (2-tailed)	0.000	
	N	121	

The analysis indicated that the relationship was linear, and all the variables were normally distributed as indicated in Appendix 9 with Shapiro-Wilk's test ($p < 0.05$). This led the researcher to use a Pearson's correlation.

There was a strong positive correlation between DBS – Speed and SCA – Sensing, $r = 0.550$. DBS – Speed explained 30% of the variability in the SCA – Sensing component (Table 11). This correlation was shown to be statistically significant $p < 0.01$.

There was a strong positive correlation between DBS – Speed and SCA – Seizing, $r = 0.587$. DBS – Speed explained 34% of the variability in the SCA – Seizing component (Table 11). This correlation was shown to be statistically significant $p < 0.01$.

The correlation was moderately positive between DBS – Speed and SCA – Transforming, $r = 0.439$. DBS – Speed explained 19% of the variability in the SCA – Transforming component (Table 11). This correlation was shown to be statistically significant $p < 0.01$.

5.7. Results for Research Question 4

This question attempts to understand the relationship between the digital business strategy attribute sources of value creation (SVC) with SCA through dynamic capabilities.

The research question involves digital business strategy sources of value creation as the independent variable and sustained competitive advantage as the dependent variable.

5.7.1. Descriptive Analysis for Research Question 4

The mean and the standard deviation are depicted below for the construct DBS – SVC. The mean score of 4.0, indicates that most responses tended towards “somewhat agree” on the 7-point Likert scale.

Interpreting this most of the respondents believed their organisations have some of the elements of DBS as it pertains to the scope.

Table 12: DBS SVC - Mean and Standard Deviation

Descriptive Statistics		
	Mean	Std. Deviation
DBS - SVC	4.062	1.485

5.7.2. Correlation Analysis

The researcher used a Pearson’s correlation to understand the relationship between DBS – SVC and sustained competitive advantage. The summarised correlation results are depicted in Table 13 as per the correlation results in Appendix 10.

Table 13: Correlation results – DBS SVC and SCA components

Correlations		DBS - SVC	Variability
SCA - Sensing	Pearson Correlation	**0.389**	15%
	Sig. (2-tailed)	0.000	
	N	121	
SCA - Seizing	Pearson Correlation	**0.373**	14%
	Sig. (2-tailed)	0.000	
	N	121	
SCA - Transforming	Pearson Correlation	**0.256**	7%
	Sig. (2-tailed)	0.005	
	N	121	

The analysis indicated that the relationship was linear, and all the variables were normally distributed as indicated in Appendix 10 with Shapiro-Wilk's test ($p < 0.05$). This led the researcher to run a Pearson's correlation.

The correlation was moderately positive between DBS – SVC and SCA – Sensing, $r = 0.389$. DBS – SVC explained 15% of the variability in the SCA – Sensing component (Table 13). This correlation was shown to be statistically significant $p < 0.01$.

The correlation was moderately positive between DBS – SVC and SCA – Seizing, $r = 0.373$. DBS – SVC explained 34% of the variability in the SCA – Seizing component (Table 11). This correlation was shown to be statistically significant $p < 0.01$.

There was a weak positive correlation between DBS – SVC and SCA – Transforming, $r = 0.256$. DBS – SVC explained 7% of the variability in the SCA – Transforming component (Table 11). This correlation was shown to be statistically significant $p < 0.01$.

5.8. Multiple Regression Analysis

In this section the relationship between a single dependent variable and multiple independent variables will be analysed to be able to predict the dependent variable.

The weights assigned to each independent variable denote the relative contribution it makes to the overall prediction (Hair et al., 2014).

During the Principal Component Analysis, it was identified that the dependent variable (Sustained Competitive Advantage) had three components (Appendix 4) to which separate regression tests will be administered against. These components are: SCA - Sensing; SCA – Seizing; SCA – Transformation. The independent variables that these will be administered against are the attributes of a DBS: DBS – Scope; DBS – Scale; DBS – Speed; DBS – Sources of Value Creation (SVC) as per Figure 2.

5.8.1. Multiple regression results: SCA – Sensing as DV

Multiple regression (MR) was used to predict SCA – Sensing from the four independent variables of DBS. There was normality and linearity as assessed by the Normal P-P Plot of Regression Standardised Residuals and the partial scatterplots (Appendix 11). There was one outlier as indicated by the line on the scatterplot (below -3.3) in Appendix 11, after investigation the researcher decided not to exclude this value. The residuals were independent as indicated by the Durbin-Watson statistic 1.996.

Table 14: Model Summary of Regression with SCA – Sensing as the DV

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.567[a]	0.322	0.298	0.86126	1.996
a. Predictors: (Constant), DBS - SVC, DBS - Scope, DBS - Speed, DBS - Scale					
b. Dependent Variable: SCA - Sensing					

There was no multicollinearity as per the coefficients table in Appendix 11, because all the tolerances were bigger than 0.1 as per the limit of tolerance and the Variance Inflation Factors were below 10. Homoscedasticity existed as assessed by a visual inspection of the scatterplot.

The multiple regression results showed an adjusted R-square of 0.298 (Table 14), considered as a small size effect with 29.8% of the variability in SCA – Sensing explained by DBS according to Cohen (1988). The overall model is statistically significant $p < 0.0005$, $F(4,116) = 13.743$. Only one of the four variables statistically significantly added to the model as indicated with a $p < 0.05$ (Appendix 11).

Table 15: Summary of multiple regression coefficients table

	Standardised Coefficients		Standardised Coefficients	
Variable	**B**	**Std. Error**	**Beta**	**Sig**
Intercept	2.962	0.350		
DBS - Scope	0.107	0.125	0.123	0.392
DBS - Scale	-0.034	0.118	-0.044	0.775
DBS - Speed	0.352	0.094	0.427	0.000*
DBS - SVC	0.093	0.066	0.134	0.160

* $p < 0.05$

Predicted (SCA – Sensing) = 2.962 + (0.107 * DBS – Scope) + (-0.034 * DBS – Scale) + (0.352 * DBS – Speed) + (0.093 * DBS – SVC)

5.8.2. Multiple regression results: SCA – Seizing as DV

MR was used to predict SCA – Transforming from the four independent variables of DBS. There was normality and linearity as assessed by the Normal P-P Plot of Regression Standardised Residuals and the partial scatterplots (Appendix 12). There was one outlier as indicated by the line on the scatterplot (above 3.3) in Appendix 12, after investigation the researcher decided not to exclude this value. The residuals were independent as indicated by the Durbin-Watson statistic 2.042.

Table 16: Model Summary of Regression with SCA – Sensing as the DV

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.618[a]	0.382	0.361	0.99724	2.042
a Predictors: (Constant), DBS - SVC, DBS - Scope, DBS - Speed, DBS - Scale					
b Dependent Variable: SCA - Seizing					

There was no multicollinearity as per the coefficients table in Appendix 12, because all the tolerances were bigger than 0.1 as per the limit of tolerance and the Variance Inflation Factors were below 10. Homoscedasticity existed as assessed by a visual inspection of the scatterplot.

The multiple regression results showed an adjusted R-square of 0.361 (Table 16), considered as a medium size effect with only 36.1% of the variability in SCA – Seizing explained by DBS according to Cohen (1988). The overall model is statistically significant $p < 0.0005$, $F(4,116) = 17.913$. Two of the four variables statistically significantly added to the model as indicated with a $p < 0.05$ (Appendix 12).

Table 17: Summary of multiple regression coefficients table

	Standardised Coefficients		**Standardised Coefficients**	
Variable	**B**	**Std. Error**	**Beta**	**Sig**
Intercept	1.273	0.405		0.002
DBS - Scope	0.336	0.144	0.319	0.022*
DBS - Scale	-0.145	0.136	-0.156	0.290
DBS - Speed	0.435	0.109	0.435	0.000*

DBS - SVC	0.074	0.076	0.088	0.331

* p < 0.05

Predicted (SCA – Seizing) = 1.273 + (0.336 * DBS – Scope) + (-0.145 * DBS – Scale) + (0.435 * DBS – Speed) + (0.074 * DBS – SVC)

5.8.3. Multiple regression results with SCA – Transforming a the DV

MR was used to predict SCA – Transforming from the four independent variables of DBS. There was normality and linearity as assessed by the Normal P-P Plot of Regression Standardised Residuals and the partial scatterplots (Appendix 13). There were no outliers as indicated by the line on the scatterplot in Appendix 13. The residuals were independent as indicated by the Durbin-Watson statistic 2.205.

Table 18: Model Summary of Regression with SCA – Transforming as the DV

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.478[a]	0.228	0.202	1.22606	2.205
a. Predictors: (Constant), DBS - SVC, DBS - Scope, DBS - Speed, DBS - Scale					
b. Dependent Variable: SCA - Transforming					

There was no multicollinearity as per the coefficients table in Appendix 13, because all the tolerances were bigger than 0.1 as per the limit of tolerance and the Variance Inflation Factors were below 10. Homoscedasticity existed as assessed by a visual inspection of the scatterplot.

The MR results reported an adjusted R-square of 0.202 (Table 18), considered a small size effect with only 20.2% of the variability in SCA – Transforming explained by DBS according to Cohen (1988). The overall model is statistically significant p <

0.0005, F (4,116) = 8.586. Only one of the four variables statistically significantly added to the model as indicated with a $p < 0.05$ (Appendix 12).

Table 19: Summary of multiple regression coefficients table

	Standardised Coefficients		Standardised Coefficients	
Variable	**B**	**Std. Error**	**Beta**	**Sig**
Intercept	1.648	0.498		0.001
DBS - Scope	0.132	0.177	0.114	0.458
DBS - Scale	0.181	0.168	0.178	0.282
DBS - Speed	0.276	0.134	0.250	0.042*
DBS - SVC	-0.024	0.094	-0.026	0.799

* $p < 0.05$

Predicted (SCA – Transforming) = 1.648 + (0.132 * DBS – Scope) + (0.181 * DBS – Scale) + (0.276 * DBS – Speed) + (-0.044 * DBS – SVC)

5.9. Summary of findings

Research Question 1: What is the relationship between the scope of DBS and SCA?

The results showed a positive correlation between the scope of digital business strategy and the components of sustained competitive advantage. DBS – Scope had a moderate positive relationship with SCA- Sensing and SCA – Transforming components of sustained competitive advantage. DBS – Scope had a strong positive relationship with SCA – Seizing components of sustained competitive advantage. All these relationships were statistically significant with a $p < 0.01$. As a result, the null hypothesis can be rejected because of the statistically significant relationship between the DBS attribute scope and the SCA components.

Research Question 2: What is the relationship between the scale of DBS and SCA?

The results showed a positive correlation between the scale of digital business strategy and the components of sustained competitive advantage. DBS – Scale had a moderate positive relationship with SCA – Sensing, SCA – Seizing, and SCA – Transforming components of sustained competitive advantage. All these relationships were statistically significant with a $p < 0.01$. As a result of this the null hypothesis can be rejected as there is a positive statistically significant relationship between the DBS attribute scale and the SCA components.

Research Question 3: What is the relationship between the speed of DBS and SCA?

The results showed a positive correlation between the speed of digital business strategy and the components of sustained competitive advantage. DBS – Speed had a strong positive relationship with SCA- Sensing and SCA – Seizing components of sustained competitive advantage. DBS – Speed had a moderate positive relationship with SCA – Transforming components of sustained competitive advantage. All these relationships were statistically significant with a $p < 0.01$. As a result, the null hypothesis can be rejected because of the statistically significant relationship between the DBS attribute scope and the SCA components.

Research Question 4: What is the relationship between the SVC of DBS and SCA?

The results showed a positive correlation between the SVC of DBS and the components of sustained competitive advantage. DBS – SVC had a moderate positive relationship with SCA- Sensing and SCA – Seizing components of sustained competitive advantage. DBS – SVC had a weak positive relationship with SCA – Transforming components of sustained competitive advantage. All these relationships were statistically significant with a $p < 0.01$. As a result, the null hypothesis can be rejected because of the statistically significant relationship between the DBS attribute scope and the SCA components.

The correlation findings of the four research questions are summarised in Table 18 below.

Table 20: Summary of Pearson's Correlation results for the RQ's

Sustained Competitive Advantage Components	DBS - Scope	DBS - Scale	DBS - Speed	DBS - SVC
SCA - Sensing	Moderate +	Moderate +	Strong +	Moderate +
SCA - Seizing	Strong +	Moderate +	Strong +	Moderate +
SCA - Transforming	Moderate +	Moderate +	Moderate +	Weak +

DBS – Scope, Scale, Speed and SVC were all significant $p < 0.01$

In analysing the cumulative effect, a DBS through the different components of Scope, Scale, Speed and SVC on Sustained Competitive Advantage multivariate regression analysis was used. The models were statistically significant with $p < 0.05$, but only some variables were statistically significant in predicting the organisation in having a sustained competitive advantage.

Table 21: Summary of multiple regression results

Sustained Competitive Advantage Components	DBS - Scope	DBS - Scale	DBS - Speed	DBS - SVC
SCA - Sensing	NS	NS	0.352	NS
SCA - Seizing	0.336	NS	0.435	NS
SCA - Transforming	NS	NS	0.276	NS
Cumulative covariance	0.336	0.00	1.063	0.00

DBS Speed was significant in predicting SCA across all three the components. Whereas DBS Scope is only statistically significant in predicting the component SCA – Seizing.

Chapter 6 : Discussion of Results

6.1. Introduction

The aim of this study was to explore the relationship between a digital business strategy and a sustained competitive advantage as depicted in Figure 2 above. The researcher aimed to provide clarity on the relationship by answering the four research questions posed in chapter 3. The results reported in chapter 5 through the descriptive statistics and the statistical tests conducted, aim to answer the four RQ's and the overall question posed in chapter 3. This section discusses the results in detail through a combination of the reviewed literature and the statistical results obtained from the research.

The reviewed literature indicated that a sustained competitive advantage can be achieved through the implementation of a good strategy, and a combination of VRIN resources and dynamic capabilities. The proposed research model was shown in Figure 2 above, indicated a proposed relationship between the constructs that make up a DBS and a SCA, as measured through the higher order capabilities of DC. These components were: sensing, seizing, and transforming. These can be viewed as the core capabilities that drive a sustained competitive advantage. The processes and activities in organisations that are used to reconfigure or mould digital resources through the implementation of a DBS (Kane et al., 2016; Sebastian et al., 2017). All these processes and procedures that are used in the implementation of a DBS rely on the principles of dynamic capabilities and the RBV (Eisenhardt & Martin, 2000; Peteraf, 1993; Teece et al., 1997). The expected outcome of implementing a DBS using these processes and procedures will lead an organisation to have a sustained competitive advantage. This will, as per the literature review in chapter 2, lead to better firm performance.

Table 22: Summary of attributes

Construct	Attributes	Attribute details
Sustained Competitive Advantage (SCA)	SCA – Sensing	Identification, development, creating or scanning of any opportunities in relationship to the market and customer needs.

	SCA – Seizing	Seizing identified opportunities through the development of new products, processes, or services by using and combining resources
	SCA – Transforming	Reconfiguring assets and structures as the organisation grow and new needs arise.
Digital Business Strategy (DBS)	DBS – Scope	All the different products and services under the organisation's control and the organisation's relationship with other organisations in the environment.
	DBS – Scale	Driving economies of scale by reducing the per unit cost and focusing on scaling digitally through technology, partnerships, and networks.
	DBS – Speed	Adapting to deliver new or changed products or services quickly to customers to ensure the organisation can compete in the rapidly changing environment.
	DBS – Sources of Value Creation	Value creation is defined as the contribution to products or services in its production for the end user, through multiple value adding stages in the process of creating an overall value proposition. DBS sources of value creation focuses on the digital assets such as information that is value adding.

6.2. Discussion of Research Question 1

The first research question will be discussed in the following section. Research question one pertains to the relationship between the DBS attribute of scope and the SCA attributes as measured through the DC of sensing, seizing, and transforming.

The descriptive statistics, regression and correlation will be discussed based on the literature reviewed in Chapter 2. The descriptive results as suggested in section 5.4. that most respondents believed their organisations agree that digital technologies, complementary platforms, big data, and digital platforms are important factors in their business strategy. This indicates that some or all of these factors are considered in

formulating and executing the organisation's strategy. Table 23 below indicates the correlation between DBS – Scope and the three attributes of SCA.

Table 23: Summary of Pearson's correlation results for Scope and SCA

Sustained Competitive Advantage Components	DBS - Scope
SCA - Sensing	Moderate +
SCA - Seizing	Strong +
SCA - Transforming	Moderate +

All results were statistically significant $p < 0.01$

6.2.1. DBS – Scope and the Sensing attribute of SCA

The sensing attribute describes the organisation's ability to scan, search and explore markets and technologies for product innovations. The ability to identify customer trends and needs, and new technologies though exploring these options and opportunities can result in a SCA (Junfeng & Wei-ping, 2017). Linking this to DBS – scope that uses data to make decisions on new customer needs and trends, through using digital technologies to enable the organisation (Bharadwaj, El Sawy, et al., 2013). Table 23 indicates that there is a moderately positive relationship between DBS – scope and the sensing attribute.

The DBS extends the scope of the organisation beyond traditional markets and physical boundaries towards dynamic ecosystems by sensing new opportunities that can be exploited or leveraged (Bharadwaj, El Sawy, et al., 2013; Sebastian et al., 2017). The organisation can only adapt its scope to include technologies and adapt to changes in the environment through sensing new opportunities. These opportunities are identified by either the data that has been gathered and analysed or by the abilities of managers to intuitively sense changes in the environment (Helfat & Peteraf, 2015). This is rooted in a manager's cognitive ability of perception and attention to identify these opportunities (Helfat & Peteraf, 2015).

The literature supports the findings that there is a positive relationship between DBS scope and the organisation's ability to sense opportunities. The ability of the managers and the organisation to sense opportunities by scanning the environment, exploring opportunities to use technology for improvement and investigating customer needs, requires management insight and vision or some analytical process that can mimic this by identifying trends and patters to enable management to make decisions (Helfat & Peteraf, 2015; Schoemaker et al., 2018; Teece, 2007, 2014, 2017, 2018; Vijaya Sunder et al., 2019).

6.2.2. DBS – Scope and the Seizing attribute of SCA

The seizing attribute builds on the opportunities sensed as per the sensing attribute of DC. This is done through the development of new processes, products or services by using and combining both resources and capabilities available to an organisation (Helfat & Peteraf, 2015; Schoemaker et al., 2018; Teece, 2007, 2014, 2018). Increasingly digitally enabled industries create competitive landscapes that require organisations to take advantage of the digital capabilities and assets available (Bharadwaj, El Sawy, et al., 2013). The organisation's strategic focus will extend beyond the traditional product offerings to new digitally enabled products created by leveraging the digital resources and capabilities of the organisation (Bharadwaj, El Sawy, et al., 2013; Hess et al., 2016; Sebastian et al., 2017). Table 23 indicates that there is a strong positive relationship between DBS – scope and the seizing attribute.

A DBS enables an organisation to create value from the identified opportunities in the market through the use of technology (Bharadwaj, El Sawy, et al., 2013; Sia et al., 2016). These technologies can be in the form of digital resources that are reconfigured and combined to create new products (Bharadwaj, El Sawy, et al., 2013; Schoemaker et al., 2018; Yeow et al., 2018) or extending the industries where the organisation operates, which will provide new opportunities that would have not been considered in the traditional corporate scope (Hess et al., 2016; Sebastian et al., 2017). Thus, the literature supports a positive relationship between an expanded scope of the organisation's strategy focused on digital resources. A further relationship beyond the organisation's borders to reap the benefit of new opportunities through the use of digital resources and the ability to seize identified

opportunities through the use of these resources (Bharadwaj, El Sawy, et al., 2013; Hess et al., 2016; Schoemaker et al., 2018; Yeow et al., 2018).

6.2.3. DBS – Scope and the Transforming attribute of SCA

Transforming or reconfiguring the structures and the assets of the organisation as it grows and expands, is critical for SCA and the continuous process of sensing, seizing and reconfiguring as the competitive landscape shifts and change (Helfat & Peteraf, 2015; Schoemaker et al., 2018; Teece, 2007, 2014, 2018). The scope of an organisation changes to stay competitive in the world of platform businesses, digital resources and dynamic ecosystems (Bharadwaj, El Sawy, et al., 2013; Sebastian et al., 2017; Sia et al., 2016). Table 23 indicates that there is a moderate positive relationship between DBS – scope and the transforming or reconfiguring attribute.

The scope of the organisation's products and the markets that it competes in could change fundamentally in the future, which would require the organisation to possibly change the way in which it conducts its business (Hess et al., 2016; Sebastian et al., 2017). Through adapting or even transforming the business model, the industry, or the way in which it delivers products, organisations will be able to create a SCA by leveraging digital technologies and resources (Hess et al., 2016; Schoemaker et al., 2018; Sebastian et al., 2017). The DBS further extends the scope of the organisation beyond the traditional markets and transformation will happen to enable the organisation to compete in this new environment (Ross et al., 2017). Organisations will require the ability to recombine and transform its current resources, digital and ordinary, to enable it to thrive in its selected business world (Bharadwaj, El Sawy, et al., 2013; Schoemaker et al., 2018). The literature supports a positive relationship between the DBS scope of an organisation and the transforming or reconfiguration DC.

6.2.4. DBS – Scope and the regression analysis results

As stated in section 4.8.5, a regression analysis was conducted to determine if the different independent variables predict the components of the dependent variables namely, SCA sensing, seizing, and transforming. The scope of a DBS only predicts one of the components of SCA namely seizing as stated in Table 21. This indicates

that the organisation should focus on using technology to create value in the environment through the creation of new products and expanding into other environments (Bharadwaj, El Sawy, et al., 2013; Hess et al., 2016; Sebastian et al., 2017; Sia et al., 2016).

6.3. Discussion of Research Question 2

Research question two will be discussed in the following section. Research question two pertains to the relationship between the DBS attribute of scale and the SCA attributes as measured through the DC of sensing, seizing, and transforming.

The descriptive statistics, regression and correlation will be discussed based on the literature reviewed in Chapter 2. The descriptive results as per section 5.5. suggested that most respondents believed their organisations agree that the ability to rapidly scale up or down, network effects through platforms, and information abundance, contribute to their ability to scale their business. This indicates that some or all of these factors are considered in formulating and executing on the organisation's strategy as it relates to the scaling capability of the organisation. Table 24 below indicates the correlation between DBS – Scale and the three attributes of SCA.

Table 24: Summary of Pearson correlation results for Scale and SCA

Sustained Competitive Advantage Components	DBS - Scale
SCA - Sensing	Moderate +
SCA - Seizing	Moderate +
SCA - Transforming	Moderate +

All results were statistically significant $p < 0.01$

6.3.1. DBS – Scale and the Sensing attribute of SCA

Sensing enables an organisation to identify new opportunities in the market and different technologies that can drive growth and expansion (Helfat & Peteraf, 2015; Schoemaker et al., 2018). Digital strategies are ongoing and emergent thus organisations need the ability to sense the changes happening in the industries

(Yeow et al., 2018). Scale as it relates to DBS, explores using technologies to scale an organisation across industries and into technologies that are value creating (Bharadwaj, El Sawy, et al., 2013). Table 24 shows that there is a moderately positive relationship between DBS – scaling and the sensing attribute.

Cloud computing enables an organisation to develop dynamic capabilities by easily reconfiguring resources on a scalable environment (Luo et al., 2018). The increased creation of multisided platforms that allow users, suppliers and even competitors to interact with each other creates a network effect (Bharadwaj, El Sawy, et al., 2013; van Alstyne et al., 2016). The network effects of the increased adoption from users and suppliers will give the organisation the ability to sense new opportunities that can possibly be exploited (Bharadwaj, El Sawy, et al., 2013; Grover & Kohli, 2013; van Alstyne et al., 2016). This further leads to the availability of large amounts of data than can be analysed to give managers the advantage of being able to identify new opportunities in the market (Bharadwaj, El Sawy, et al., 2013; Pagani, 2013; Sebastian et al., 2017).

The literature supports the findings that there is a positive relationship between DBS scale and the organisation's ability to sense opportunities. The combination of having information from customers, users and suppliers available to the organisation and the connection to other organisations provides the managers with the ability to sense possible opportunities in the market (Bharadwaj, El Sawy, et al., 2013; Pagani, 2013; van Alstyne et al., 2016).

6.3.2. DBS – Scale and the Seizing attribute of SCA

Seizing as mentioned previously, relates to the organisations ability to act and capitalise on the opportunities identified in the sensing phase (Helfat & Peteraf, 2015; Schoemaker et al., 2018; Teece, 2007). Cloud computing, multisided platforms and the information available from the different actors in the environments enable an organisation to seize the opportunities as they arise (Bharadwaj, El Sawy, et al., 2013). Table 24 indicates that there is a moderately positive relationship between the DBS – scale and the seizing attribute of SCA.

In seizing opportunities to create new products or services or moving into other environments or industries can have exponential advantage for organisations that have the ability to scale through cloud computing (Bharadwaj, El Sawy, et al., 2013; Luo et al., 2018). This is due to the quick scalability of the infrastructure that leads to the availability of IT infrastructure resources, to build and deploy these new products onto the platforms (Luo et al., 2018). The creation of multisided platform enables convergence of multiple players in the environment, onto the same platform, which in turn creates the development of new products by multiple parties and the opportunity to develop complimentary products or services (Bharadwaj, El Sawy, et al., 2013; Pagani, 2013).

The literature supports the findings that there is a positive relationship between DBS scale and the organisation's ability to seize opportunities. The availability of a platform that allows for rapid development of products or services at a minimal cost gives an organisation the ability to possibly have a SCA (Bharadwaj, El Sawy, et al., 2013; Pagani, 2013; van Alstyne et al., 2016).

6.3.3. DBS – Scale and the Transforming attribute of SCA

All organisations reside in ecosystems that they interact with at different levels, transforming or reconfiguring enables these organisations to adjust and adapt to the changes that occur within the ecosystems. It is critical for organisations to adjust to these changes to keep the benefits of being part of these ecosystems (Helfat & Peteraf, 2015; Schoemaker et al., 2018; Teece, 2007, 2014, 2017, 2018). The DBS focuses on the opportunities of the environment and the platforms available to scale the business (Bharadwaj et al., 2013; Pagani, 2013; Ross et al., 2017; van Alstyne et al., 2016). Table 24 indicates that there is a moderately positive relationship between the DBS – scale and the transforming attribute of SCA.

The findings are supported by the literature that there is a positive relationship between DBS scale and the organisation's ability to transform or reconfigure assets and resources. The platforms and networks created by a DBS and the ability to scale enables managers to transform and reconfigure assets and resources to stay relevant in the ecosystem and possibly have a SCA (Bharadwaj, El Sawy, et al., 2013; Pagani, 2013; van Alstyne et al., 2016).

6.3.4. DBS – Scale and the regression analysis results

The scale of a DBS predicts not one of the components of SCA as stated in Table 19. This indicates that this researcher could not find evidence through the analysis that the scale as described in the DBS influences the components of a sustained competitive advantage as described through the DC as the results were not significant. These results indicate that when the effects of all the elements of a DBS is considered simultaneously, in relation to SCA, the DBS scale has insignificant findings. That could mean that this has an indirect or supportive role to enable these DC, as discussed in the research, rather than predict them.

6.4. Discussion of Research Question 3

The third research question will be discussed in the following section. Research question three pertains to the relationship between the DBS attribute of speed and the SCA attributes as measured through the DC of sensing, seizing, and transforming.

The descriptive statistics, regression and correlation will be discussed based on the literature reviewed in Chapter 2. The descriptive results as per section 5.6. suggested that most respondents believed their organisations agree that the speed at which products are launched, decisions are made, and the creation of networks are integral to their strategy. Table 25 below indicates the correlation between DBS – Speed and the three attributes of SCA.

Table 25: Summary of Pearson correlation results for Speed and SCA

Sustained Competitive Advantage Components	DBS - Speed
SCA - Sensing	Strong +
SCA - Seizing	Strong +
SCA - Transforming	Moderate +

All results were statistically significant $p < 0.01$

6.4.1. DBS – Speed and the Sensing attribute of SCA

The research has indicated that the ability of an organisation to sense new opportunities through the identification, development or creation of these opportunities to satisfy a customers need is a critical component of SCA (Helfat & Peteraf, 2015; Schoemaker et al., 2018; Teece, 2007). As the competitive landscape for many organisations change due to digital platforms, competitors and customers that can bring products to the market a lot quicker, speed is focal to a DBS (Bharadwaj, El Sawy, et al., 2013; Ross et al., 2017; Sebastian et al., 2017).Table 25 indicates that there is a strong positive relationship between DBS – speed and the sensing attribute.

As stated in the literature review an organisation such as Apple is a good example of where opportunities were identified in the market for the development of a platform that can enable the community and suppliers to develop applications that can be deployed on the devices (van Alstyne et al., 2016). The speed at which opportunities can be identified and created is critical, especially with the abundance of information available to players in the market (van Alstyne et al., 2016). The organisations that can act first on a potential opportunity can have a monopolistic effect on the industry as per the example of Google that accounts for more than 94% of mobile search (van Alstyne et al., 2016).

A DBS accelerate the launches of new products and the identification of these opportunities due to the pure digital competitors that have the capability to launch multiple products or at least enhancements over a shorter period of time driving the industry forward (Bharadwaj, El Sawy, et al., 2013). Thus being able to sense these changes and respond quickly could lead to a SCA (Bharadwaj, El Sawy, et al., 2013; Junfeng & Wei-ping, 2017). But to be able to identify these opportunities and customer trends, the available information from multiple resources need to be ingested quickly to give the organisation an advantage in making decisions about which direction it needs to go, as it relates to their products (Bharadwaj, El Sawy, et al., 2013; Junfeng & Wei-ping, 2017; Sia et al., 2016). The network effect has been discussed in depth in the literature review as it relates to the economies of scale and the efficiencies it can create for an organisation (Bharadwaj, El Sawy, et al., 2013;

van Alstyne et al., 2016), The speed at which these networks can be identified leads to strategic partnerships or relationships in the ecosystem that can give an organisation access to resources with DC (Bharadwaj, El Sawy, et al., 2013; Junfeng & Wei-ping, 2017; van Alstyne et al., 2016).

The literature supports the findings that there is a positive relationship between DBS speed and the organisation's ability to sense opportunities. The speed at which the identification of opportunities, partners in the network, the availability of information, and decision making, supports the DC of sensing opportunities and being faster than a competitor to market (Bharadwaj, El Sawy, et al., 2013; Junfeng & Wei-ping, 2017; van Alstyne et al., 2016).

6.4.2. DBS – speed and the Seizing attribute of SCA

In the literature review it was identified that the speed of product launches gives organisations the ability to compete and then by seizing opportunities quickly it can lead to a SCA (Bharadwaj, El Sawy, et al., 2013; Ross et al., 2017; Sebastian et al., 2017; van Alstyne et al., 2016). Table 25 indicates that there is a strong positive relationship between the DBS – speed and the seizing attribute of SCA.

Considering the dimensions discussed in the literature review, related to speed and how this impacts an organisations competitive advantage in relation to the DC of seizing the identified opportunity, the following conclusions can be drawn. The speed at which an organisation can launch a product will have a positive impact on seizing the identified opportunity of a possible new product or addition to an existing product (Bharadwaj, El Sawy, et al., 2013; Junfeng & Wei-ping, 2017). This is even more prevalent where there are full digital businesses in the ecosystem and products are launched multiple times per year (Bharadwaj, El Sawy, et al., 2013; Junfeng & Wei-ping, 2017; van Alstyne et al., 2016). The second element critical to DBS as it relates to speed is how quickly management can make a decision related to new products and the strategic direction of the organisation to ensure that the organisation stays competitive in its current ecosystem or alternatively to exit the current market (Bharadwaj, El Sawy, et al., 2013; Junfeng & Wei-ping, 2017). Because the environment is changing quickly due to the innovation of products and the launch of these products, the organisation needs to gather and consume information quickly

to seize the opportunities that will arise from these changes (Bharadwaj, El Sawy, et al., 2013; Junfeng & Wei-ping, 2017; Kane et al., 2016; Sia et al., 2016). This leads to the ecosystem that an organisation resides in, the DBS emphasises that an organisation needs to leverage their networks to identify the resources, both internally and externally, that can be used to rapidly grow and expand (Bharadwaj, El Sawy, et al., 2013; Junfeng & Wei-ping, 2017; van Alstyne et al., 2016).

The literature supports the findings that there is a positive relationship between DBS speed and the organisation's ability to seize opportunities. An organisation will achieve a SCA through launching new products quickly, leveraging and consuming information, quickly making decisions, and building networks to grow (Bharadwaj, El Sawy, et al., 2013; Junfeng & Wei-ping, 2017; Kane et al., 2016; Pagani, 2013; van Alstyne et al., 2016).

6.4.3. DBS – Speed and the Transforming attribute of SCA

Continuously reconfiguring or transforming assets in the organisation to create a SCA is the third DC capability that will be discussed in relation to the speed component of a DBS (Helfat & Peteraf, 2015; Schoemaker et al., 2018; Teece, 2007, 2014; Teece et al., 1997). Table 25 indicates that there is a moderately positive relationship between the DBS – speed and the transforming attribute of SCA.

Building on the speed at which an organisation can seize opportunities and deliver new products to the ecosystem, an organisation needs to be able to reconfigure their assets to develop these new products (Bharadwaj, El Sawy, et al., 2013; Junfeng & Wei-ping, 2017). It has been identified that these environments are changing faster due to the (1) new players in the environment, (2) the availability of usable data. Usable data has increased exponentially due to the digital interaction of all the players in the ecosystem. Thus, to compete transformation of assets needs to happen faster (Bharadwaj, El Sawy, et al., 2013; Junfeng & Wei-ping, 2017; Makkonen et al., 2014; Schoemaker et al., 2018; van Alstyne et al., 2016). Finally, there needs to be a continuous cycle of sensing, seizing and reconfiguration to ensure that the organisation keeps a SCA. Due to the rapidly changing ecosystem speed becomes more crucial (Kane et al., 2016; Schoemaker et al., 2018).

The findings are supported by the literature that there is a positive relationship between DBS speed and the organisation's ability to transform or reconfigure assets and resources. Transforming or reconfiguring assets to deliver new products does not only rely on the internal resources, but also the external resources that can be found in the same ecosystem, which if done quickly, will lead to a SCA (Bharadwaj, Sawy, Pavlou, & Venkatraman, 2013; Junfeng & Wei-ping, 2017; Makadok, 2001; Schoemaker et al., 2018; van Alstyne et al., 2016).

6.4.4. DBS – speed and the regression analysis results

The speed of a DBS predicts all the components of SCA as stated in Table 21. The researcher found evidence through the analysis that speed as described through the DBS is the main predictor of SCA of all the components tested. The dimensions of speed namely speed of product launches, speed of decision making, and the speed of network formation and adaptation should be leveraged to maximise a resulting sustained competitive advantage as encapsulated through the components of sensing, seizing, and transforming. This will then lead to firm performance as per the literature that a SCA leads to better firm performance (Schoemaker et al., 2018; Teece, 2007; Teece et al., 1997).

6.5. Discussion of Research Question 4

The concluding research question will be discussed in the following section. Research question four pertains to the relationship between the DBS attribute of sources of value creation and the SCA attributes as measured through the DC of sensing, seizing, and transforming.

The descriptive statistics, regression and correlation will be discussed based on the literature reviewed in Chapter 2. The descriptive results as per section 5.7. suggested that most respondents believed their organisation agree, that the sources of value creation relate to delivering products and services to customers based on their preferences. Table 26 below indicates the correlation between DBS – sources of value creation and the three attributes of SCA.

Table 26: Summary of Pearson's correlation results for SVC and SCA

Sustained Competitive Advantage Components	DBS - SVC
SCA - Sensing	Moderate +
SCA - Seizing	Moderate +
SCA - Transforming	Weak +

All results were statistically significant $p < 0.01$

6.5.1. DBS – SVC and the Sensing attribute of SCA

The component of DC that relates to sensing new opportunities emphasises that an organisation has the capability to identify these as per the customer's needs (Helfat & Peteraf, 2015; Teece, 2007, 2014). The additional sources of value creation that have been highlighted through a DBS is increased value through information, multisided business models, the coordination of business models in the network and the capture of value through the control of the digital architecture in the environment (Bharadwaj, Sawy, et al., 2013; Pagani, 2013). Central to value creation is the customers' needs and the contribution that the product or service makes to the end user (Pagani, 2013).

Table 26 indicates that there is a moderate positive relationship between DBS – sources of value creation and the sensing attribute of SCA.

In the literature the value of information is emphasised, not only the volume but also the sources of information (Bharadwaj, El Sawy, et al., 2013; Pagani, 2013). These new sources of information give managers in an organisation insights into the needs of customers, which in turn leads to the creation of new opportunities (Bharadwaj, El Sawy, et al., 2013; Sebastian et al., 2017). Building onto the discussion on multisided business models mentioned under the scale element, the value created through the connection of multiple customers, users and suppliers, which enable organisations to create unique value propositions for their customers (Bharadwaj, El Sawy, et al., 2013; van Alstyne et al., 2016). Organisations that can sense additional revenue

opportunities on these multisided business models could possibly create a SCA (Schoemaker et al., 2018; van Alstyne et al., 2016). Although organisations can partake in these ecosystems, it is suggested that additional value can be created if the organisation controls the digital architecture, by sharing in the profits created by other partners on the platform (Bharadwaj, El Sawy, et al., 2013; Drnevich & Croson, 2013; Pagani, 2013).

The literature supports the findings that there is a positive relationship between DBS SVC and the organisation's ability to sense value creation opportunities. Identifying these opportunities by focusing on the myriad of information available and identifying possible changes to the organisation's business model can create a SCA (Bharadwaj, El Sawy, et al., 2013; Coltman et al., 2015; Drnevich & Croson, 2013; Pagani, 2013).

6.5.2. DBS – SVC and the Seizing attribute of SCA

The opportunities identified through the use of multiple sources of information to identify customers' needs, should be brought to fruition by using the digital platforms to create products or service that will meet customers' needs (Bharadwaj, El Sawy, et al., 2013; Sebastian et al., 2017). Table 26 indicates that there is a moderately positive relationship between the DBS – sources of value creation and the seizing attribute of SCA.

Seizing opportunities to create new revenue streams through the curation of the large amounts of information for the use by advertisers, subscribers or the like can lead to a SCA (van Alstyne et al., 2016). This will stem from creating multisided business models that can act on these opportunities through the connection of all the players on a platform (Bharadwaj, El Sawy, et al., 2013). Organisations entice users and suppliers to the platforms through implementing multi-layered business models that can derive value from, for example a free service as is the case with Facebook (Bharadwaj, El Sawy, et al., 2013; van Alstyne et al., 2016). A DBS creates opportunities for organisations to seize these revenue generating possibilities through addressing the needs of customers in innovative ways (Bharadwaj, El Sawy, et al., 2013; Schoemaker et al., 2018).

The literature supports the findings that there is a positive relationship between DBS SVC and the organisation's ability to seize opportunities. The multisided business models, technology platforms that can utilise data to create value and the ownership of the digital platform can enable organisations to seize the opportunities that will arise from technology and the changing competitors (Bharadwaj, El Sawy, et al., 2013; Sebastian et al., 2017; van Alstyne et al., 2016).

6.5.3. DBS – SVC and the Transforming attribute of SCA

Transforming the assets available to the organisation both internally and externally can lead to a SCA (Helfat & Peteraf, 2015; Schoemaker et al., 2018; Teece, 2007, 2014; Teece et al., 1997). In the context of the sources of value creation as stipulated in the DBS, changing the business models of organisations is crucial for long term survival (Bharadwaj, El Sawy, et al., 2013; Pagani, 2013). Table 26 indicates that there is a weak positive relationship between the DBS – SVC and the transforming attribute of SCA.

The key to delivering value to a customer is the ability of an organisation to reconfigure the assets internally under its control, but also externally available to the organisation (Coltman et al., 2015; Drnevich & Croson, 2013; Pagani, 2013; Teece, 2007, 2014). The dynamic capability to reconfigure the assets and transform the way in which an organisation conducts business is shown to be important elements as it relates to the SVC (Bharadwaj, El Sawy, et al., 2013; Pagani, 2013). Coordinating multiple different users, assets, suppliers and customers within an ecosystem requires managerial capabilities to orchestrate all these elements to deliver value (Pagani, 2013; van Alstyne et al., 2016).

The findings are supported by the literature that there is a positive relationship, although weak, for the transforming element, between a DBS sources of value creation and SCA. The sources of value creation discussed enables an organisation to sense opportunities and act on these because of the digitally enabled platforms that are becoming more prevalent (Coltman et al., 2015; Drnevich & Croson, 2013; Pagani, 2013; Sebastian et al., 2017).

6.5.4. DBS – SVC and the regression analysis results

The sources of value creation do not predict any of the components of SCA as stated in Table 21. This indicates that this researcher could not find evidence through the analysis that the SVC as described in the DBS, influences the components of a sustained competitive advantage as described through the DC, as the results were not significant. These results indicate that when the effects of all the elements of a DBS is considered simultaneously, in relation to SCA, the DBS SVC has insignificant findings. That could mean that this has an indirect or supportive role to enable these DC, as discussed in the research, rather than predict them.

Chapter 7 : Conclusion

The findings of the research are consolidated in this chapter and these are contextualised in with the aim of the research study in mind. Further this chapter will make recommendations to management and propose areas for research in the future.

7.1. Principal Findings

The research study had the following objectives to understand how much the four components of a DBS influenced an organisations ability to create a SCA. The SCA was measured through the dynamic capabilities influenced and enabled by a DBS. The results from chapter 5 showed an understanding of the relationship between these variables, thereby meeting the objectives and contributing to the insights into a DBS and the impact on SCA.

7.1.1. The relationship between the scope of an organisation's DBS and the DC that leads to a SCA

The scope of a DBS as outlined in the research, was found to have a positive relationship with SCA. It was found that there was a moderately positive relationship with sensing and transforming and a strong positive relationship with seizing.

The integration and alignment between business and IT strategies in the configuration and combination of resources to drive towards a SCA whilst considering the impact of digital technologies, is central to the scope of a DBS (Bharadwaj, El Sawy, et al., 2013; Kaul, 2012; Singh et al., 2017). In considering the impact of digital technologies as more organisations and the world move towards digital connectivity, an abundance of information and easy communication IT strategy become more and more an integral part of the organisation (Bharadwaj, El Sawy, et al., 2013; Sia et al., 2016). Digital technologies open different and new industries to organisations and these organisations should be in a position to act on the identified opportunities and change their business to take advantage of these (Bharadwaj, El Sawy, et al., 2013; Schoemaker et al., 2018; Sebastian et al., 2017;

Sia et al., 2016). The digitisation of products and services in new dynamic ecosystems can be achieved through the reconfiguration and transformation of current resources through a combination of digital resources and managerial capabilities to empower organisations to build DC for a SCA (Bharadwaj, El Sawy, et al., 2013; Hess et al., 2016; Schoemaker et al., 2018; Sia et al., 2016). Seizing the identified opportunities by digitising products, moving towards dynamic ecosystems and moving IT from being a silo to a strategic enabler in the organisation, will have the biggest advantage as indicated by the regression analysis in Table 19 (Bharadwaj, El Sawy, et al., 2013; Hess et al., 2016; Schoemaker et al., 2018; Sebastian et al., 2017).

7.1.2. The relationship between the scale of an organisation's digital endeavours and the DC that lead to a SCA

The scale of a DBS as outlined in the research, was found to have a positive relationship with SCA. It was found that there was a moderately positive relationship with all the elements of a SCA as per the research (sensing, seizing, and transforming).

Normally scaling is associated with economies of scale where it becomes more profitable the more an organisation produces due to the decrease in a per unit price (Bercovitz & Mitchell, 2007), but scale is further considered in digital terms. Three areas of focus was identified and supported by the research to have a positive relationship on an organisation's SCA (Bharadwaj, El Sawy, et al., 2013). Cloud computing is an enabler to scaling an organisation's business by being flexible and easily adjustable dependant on the need of the business, which makes cloud computing a digital resource that is dynamic (Bharadwaj, El Sawy, et al., 2013; Luo et al., 2018). With this enabling technology the connection between multiple stakeholders and users can be utilised through the creation of multisided platforms (van Alstyne et al., 2016), which creates new opportunities for organisations to collaborate and develop new complimentary products that satisfy customer needs (Bharadwaj, El Sawy, et al., 2013; Pagani, 2013). The availability of multiple sources of information from the platforms, social media, customer trends and competitors enables organisations to understand the needs of their customers better and guide organisations into new areas of business that have the potential of growing an

organisation exponentially (Bharadwaj, El Sawy, et al., 2013; Pagani, 2013; Sebastian et al., 2017). The regression analysis revealed that the elements investigated in relation to a DBS did not have a significant influence on a SCA of an organisation, this can be an indication that scale plays an enabling or supporting role in a SCA of an organisation.

7.1.3. The relationship between the speed of an organisation's strategy elements and the DC that lead to a SCA

The speed elements of a DBS as outlined in the research, was found to have a positive relationship with SCA. It was found that there was a strong positive relationship with the elements sensing and seizing, but a moderately positive relationship with transforming.

In the frequently evolving and changing digital landscape, the pace at which organisations can launch products, create relationships, and make decisions has become more important than ever (Bharadwaj, El Sawy, et al., 2013; Ross et al., 2017; Sebastian et al., 2017). The speed at which organisations can launch new products to compete with the digitally native agile businesses has become faster than ever (van Alstyne et al., 2016). Capabilities need to be identified inside and outside of the organisation that can enable them to deliver faster (Bharadwaj, El Sawy, et al., 2013; Schoemaker et al., 2018; van Alstyne et al., 2016). Consequently sensing and seizing the opportunities identified for new product launches, will lead to an organisation having a sustained competitive advantage, but resources need to be reconfigured to deliver these new products and pivot into a different direction if it is required by the business (Bharadwaj, El Sawy, et al., 2013; Junfeng & Wei-ping, 2017; van Alstyne et al., 2016). Changing direction and orchestrating required resources from outside the organisation require an organisation to be able to quickly form networks that can adapt to changes (Bharadwaj, El Sawy, et al., 2013; van Alstyne et al., 2016). But, all of these would not be possible if the decision makers in the organisation are not equipped with the right information at the right time to make the critical decisions that will guide the organisation's future direction (Bharadwaj, El Sawy, et al., 2013; Kane et al., 2016; Sia et al., 2016). The critical elements mentioned under the speed of DBS namely: speed of product launches, speed of decision making and speed of network formation and adaptation (Bharadwaj, El

Sawy, et al., 2013) all influence a sustained competitive advantage as per the regression analysis conducted in this study.

7.1.4. The relationship between the speed of an organisation's strategy elements and the DC that leads\ to a SCA

The sources of value creation elements of a DBS as outlined in the research, was found to have a positive relationship with SCA. It was found that there was a moderately positive relationship with the elements sensing and seizing, but a weak positive relationship with transforming.

The sources of value creation that have been highlighted in a DBS are: increased value through information, multisided business models, the coordination of business models in the network, and the capture of value through the control of the digital architecture in the environment (Bharadwaj, Sawy, et al., 2013; Pagani, 2013). Throughout the four components of a DBS the value of information is highlighted and incorporated into each of the components (Bharadwaj, El Sawy, et al., 2013). Value can be created by not only using the information for decision making, but also curating information and transforming information for the use by, for instance, advertisers (van Alstyne et al., 2016). The customers' needs are central to an organisation's ability to create value and these needs can be met by utilising digital technologies to deliver it to them (Bharadwaj, El Sawy, et al., 2013; Pagani, 2013). Further to creation of platforms, networks, and multisided business models, value can be created through the interactions with the users, identify their needs, and other players on the platforms to combine resources to deliver to the customer's needs (Bharadwaj, El Sawy, et al., 2013; Drnevich & Croson, 2013; Pagani, 2013; van Alstyne et al., 2016). The regression analysis revealed that the elements investigated in relation to a DBS did not have a significant influence on a SCA of an organisation. This can be an indication that sources of value creation can be an outcome rather than an influencer of SCA in an organisation.

7.2. Implications and recommendations for management

In conducting the research, the following recommendations were identified for organisations and their management

Firstly, managers wanting to create a sustained competitive advantage for their organisations in this increasingly faster changing world, need to focus on the speed at which new or adapted products are launched, especially on digital platforms and in competition with organisations that are fully digital (Bharadwaj, El Sawy, et al., 2013).

Secondly, the speed at which an organisation can make decisions will set them apart as it relates to a SCA. Decisions can only be made quickly and accurately if the organisation utilises their internal data and the data from the ecosystem (Bharadwaj, El Sawy, et al., 2013; van Alstyne et al., 2016). The data needs to be analysed and interpreted either by skilled resources or through digital means or a combination of these two.

Thirdly, the last element of DBS speed that influences a SCA is the speed at which organisations can create and adapt networks. These networks provide the organisation with an increased resource and capabilities base, from the partners in the network, that can be utilised to create new products and grow their organisations (Bharadwaj, El Sawy, et al., 2013).

Finally, IT strategy needs to be lifted to an organisational level and the alignment between these two strategies is crucial for seizing a competitive advantage. Digitisation of products and services needs to be central to an organisation's strategic agenda as well as exploring other areas beyond a firms boundaries that can add value in the future (Bharadwaj, El Sawy, et al., 2013).

7.3. Limitations of research

7.3.1. Sampling size

The first limitation of this study is that the sample size is relatively small and thus it could be that it is not representative of the whole population. Further this study will only focus on organisations within South Africa and this could have a limiting effect on being able to generalise it across geographic regions.

7.3.2. Sampling bias

The study utilised purposive sampling and snowball sampling, because of the unknown size of the population (Saunders & Lewis, 2018). Snowball sampling is when the first member of the sample volunteer other members to participate in the study which creates a high probability that the participant could have similar views (Zikmund et al., 2009).

7.3.3. Research experience

Using the non-probability sampling techniques needed for this research, the researcher may not have had enough, and adequate experience.

7.3.4. Research theory

The theories used in this study, as it relates to digital business strategy, may require further development as there is limited research. Further, this research only considered some of the components and is by no means exhaustive.

7.4. Suggestions for future research

In this research study a positive relationship between a DBS and a sustained competitive advantage of an organisation was identified. This study did not measure if the organisations have a digital strategy in place, and what is some of the other components that can be utilised to create a sustained competitive advantage.

The respondents in the study could be at different levels in their digital journey, and by measuring digital transformation, it could identify which areas of the DBS could be focused on dependent on an organisation’s level of digital transformation.

As this was a quantitative study that measured responses through an online questionnaire, future research could be conducted through a qualitative study where other elements of a DBS can be identified that are not currently being researched.

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Appendices

Appendix 1: Questionnaire

Demographics Questions

1. **What is your age?**
   - 18 – 30
   - 31 – 40
   - 41 – 50
   - 51 – 60
   - Older than 60

2. **What is the primary industry of the business?**
   - Advertising & Marketing
   - Agriculture
   - Airlines & Aerospace
   - Automotive
   - Business Support & Logistics
   - Construction, Machinery, and Homes
   - Education
   - Entertainment & Leisure
   - Finance & Financial Services
   - Food & Beverages
   - Government
   - Healthcare & Pharmaceuticals
   - Insurance
   - Manufacturing
   - Non-profit
   - Retail & Consumer Durables
   - Real Estate
   - Telecommunications, Technology, Internet & Electronics
   - Transportation & Delivery
   - Utilities, Energy, and Extraction

3. **How long have you been with the organisation?**

   0 - 2 years

   3 – 5 years

   6 -10 years

   11 – 20 years

   More than 20 years

4. **On what level are you in the organisation?**

   Junior Management

   Middle Management

   Senior Management

   Executive Management

5. **How many employees does the organisation have?**

   1- 50 employees

   51 – 100 employees

   101 – 500 employees

   501 – 1000 employees

   1001 – 5000 employees

   More than 5000 employees

6. **What is the latest reported organizational revenue?**

   0 – R 1 000 000

   R 1 000 001 – R 5 000 000

   R 5 000 001 – R 10 000 000

   R 10 000 001 – R 50 000 000

   R 50 000 001 – R 100 000 000

   More than R 100 000 000

Digital Maturity and Transformation

Sebastian, I. M., Ross, J. W., Beath, C., Mocker, M., Moloney, K. G., & Fonstad, N. O. (2017). How big old companies navigate digital transformation. *MIS Quarterly*, *16*(3), 197–214.

7) The organisation uses Social, Mobile, Analytics, Cloud, and Internet of Things (SMACIT) technologies to create and deliver products and services to the customers
8) The organisation has a business strategy focusing on engaging with customers and providing personalised solutions
9) The organisation has a business strategy focusing on using data and technology to develop new and innovative digital solutions for the customers

Technology enabled assets: Operational Backbone

10) The organisation has a system that is a reliable source of all the critical data of the customers, orders, or transactions
11) The organisation has seamless transaction processing
12) The backend services are standardised and shared across the organisation

Technology enabled assets: Digital Services Platform

13) The organisation uses cloud technology to facilitate rapid innovation and experimentation
14) The organisation stores data from multiple sources that can be accessed and interrogated when required
15) The organisation uses analytics technology to derive insights from the disparate data
16) Data from the organisations operational systems are available to be analysed and used in decision making

Digital Business Strategy

Scope

Bharadwaj, A., El Sawy, O. A., Pavlou, P. A., & Venkatraman, N. (2013). Digital Business Strategy: Toward a next generation Of iInsights. *MIS Quarterly*, *37*(2), 471–482.

17) The business strategy is influenced and driven by digital technologies.
18) The organisations products and services are designed to interoperable on complementary platforms

19) The organisation designs products and services that take advantage of digital resources ex. cloud computing
20) The organisation uses big data to make decisions about the products and services we offer
21) The organisation partners with other organisations in the ecosystem through digital platforms

Scale

Bharadwaj, A., El Sawy, O. A., Pavlou, P. A., & Venkatraman, N. (2013). Digital Business Strategy: Toward a next generation Of iInsights. *MIS Quarterly*, *37*(2), 471–482.

22) We use cloud computing services to rapidly increase infrastructure as the market needs the digital products
23) The organisation uses platforms on which the products and services are available to a wider network of consumers (Network Effects)
24) The organisation has the capability to harness big data and create meaningful insights for scaling products and services
25) The organisation has partnerships with other organisations in the business ecosystem through shared digital assets
26) The organisation uses Application Programming Interfaces (API's) to connect to partners or they use it to connect to us in the business ecosystem

Speed

Bharadwaj, A., El Sawy, O. A., Pavlou, P. A., & Venkatraman, N. (2013). Digital Business Strategy: Toward a next generation Of iInsights. *MIS Quarterly*, *37*(2), 471–482.

27) The organisation has a multiyear sequenced roadmap for launching new products
28) The organisation has a strategy in place to make some of the products and services obsolete and replace them with new products and services
29) We consider when complimentary products launch in the business ecosystem and coordinate the launches accordingly
30) As copious amounts of data are available and big data sets are created, the organisation invests in solutions to harness the data

31) The organisation makes investments in enabling rapid decision making from the available information
32) In the organisation we have the capability to form and manage networks that provide complimentary capabilities to the own

Sources of Value creation and capture

Bharadwaj, A., El Sawy, O. A., Pavlou, P. A., & Venkatraman, N. (2013). Digital Business Strategy: Toward a next generation Of iInsights. *MIS Quarterly*, *37*(2), 471–482.

Pagani, M. (2013). Digital business strategy value creation: Framing dynamic cycle Of control points. *MIS Quarterly*, *37*(2), 617–632. https://doi.org/10.25300/MISQ/2013/37.2.13

33) The organisation personalise the products and services based on customer preferences gathered from social media platforms
34) We have products and services that connect different customers through a platform we manage

Dynamic Capabilities

1 – 7 Likert Scale

Strongly Disagree, Disagree, Somewhat Disagree, Neither Agree nor Disagree, Somewhat Agree, Agree, Strongly Agree

Sensing

Junfeng, Z., & Wei-ping, W. (2017). Leveraging internal resources and external business networks for new product success: A dynamic capabilities perspective. *Industrial Marketing Management, 61*(1) 170–181.

35) In scanning, searching, and exploring across technologies and markets for product innovation, we are capable of:
    - Exploring opportunities and options
    - Detecting new opportunities and product solution options
    - Spotting new technology possibilities

- Identifying trends in customer needs

Seizing

Junfeng, Z., & Wei-ping, W. (2017). Leveraging internal resources and external business networks for new product success: A dynamic capabilities perspective. *Industrial Marketing Management, 61*(1) 170–181.

39) On the basis of the firm's established organisation structures, procedures, design, and incentives, we are able to:
    - Seize most business opportunities when they emerge
    - Catch many new opportunities available in the market
    - Capture new R&D opportunities whenever they appear
    - Grab new product development opportunities resulting from changes in technologies

Transforming capabilities (reconfiguration)

Makkonen, H., Pohjola, M., Olkkonen, R., & Koponen, A. (2014). Dynamic capabilities and firm performance in a financial crisis. *Journal of Business Research, 67*(1), 2707-2719.

43) We have developed routines to enable employees' active participation in generating ideas for new products and services
44) We have developed routines to enable employees' active participation in generating ideas for new production processes or organisational procedures
45) The firm has routines for organising employees' experiences

Appendix 2: Cronbach's Alpha

Sustained Competitive Advantage:

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.884	0.889	11

DBS - Scope:

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.775	0.773	5

DBS- Scale

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.824	0.824	5

DBS - Speed

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.864	0.862	6

DBS - Value Creation

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.631	0.631	2

Appendix 3: KMO and Bartlett's Test of Sphericity

Sustained Competitive Advantage:

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.839
Bartlett's Test of Sphericity	Approx. Chi-Square	877.565
	df	55
	Sig.	0.000

DBS - Scope:

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.775
Bartlett's Test of Sphericity	Approx. Chi-Square	154.904
	df	10
	Sig.	0.000

DBS- Scale:

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.818
Bartlett's Test of Sphericity	Approx. Chi-Square	202.337
	df	10
	Sig.	0.000

DBS - Speed:

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.854
Bartlett's Test of Sphericity	Approx. Chi-Square	316.466
	df	15
	Sig.	0.000

DBS - Value Creation:

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.500
Bartlett's Test of Sphericity	Approx. Chi-Square	28.312
	df	1
	Sig.	0.000

Appendix 4: Principal Component Analysis

Sustained Competitive Advantage PCA results

The PCA yielded three components for Sustained Competitive Advantage

Rotated Component Matrix[a]			
	Component		
	1	2	3
35. In scanning, searching, and exploring across technologies and markets for product innovation, we are capable of: [Exploring opportunities and options]	0.227	0.850	-0.002
35. In scanning, searching, and exploring across technologies and markets for product innovation, we are capable of: [Detecting new opportunities and product solution options]	0.211	0.904	0.055
35. In scanning, searching, and exploring across technologies and markets for product innovation, we are capable of: [Spotting new technology possibilities]	0.242	0.762	0.113
35. In scanning, searching, and exploring across technologies and markets for product innovation, we are capable of: [Identifying trends in customer needs]	0.289	0.730	0.169
39. On the basis of the firm's established organisation structures, procedures, design, and incentives, we are able to: [Seize most business opportunities when they emerge]	0.828	0.260	0.166
39. On the basis of the firm's established organisation structures, procedures, design, and incentives, we are able to: [Catch many new opportunities available in the market]	0.836	0.319	0.168
39. On the basis of the firm's established organisation structures, procedures, design, and incentives, we are able to: [Capture new R&D opportunities whenever they appear]	0.842	0.251	0.189
39. On the basis of the firm's established organisation structures, procedures, design, and incentives, we are able to: [Grab new product development opportunities resulting from changes in technologies]	0.827	0.231	0.215
43. We have developed routines to enable employees' active participation in generating ideas for new products and services [.]	0.151	0.045	0.910

44. We have developed routines to enable employees' active participation in generating ideas for new production processes or organisational procedures [.]	0.248	0.032	0.868
45. The organisation has routines for organising employees' experiences [.]	0.139	0.164	0.776

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

The different questions were grouped and labelled as new variables

Component	Question no.	Question text	Percentage of construct
SCA - Seizing	39.a	On the basis of the firm's established organisation structures, procedures, design, and incentives, we are able to: [Seize most business opportunities when they emerge]	28.3%
	39.b	On the basis of the firm's established organisation structures, procedures, design, and incentives, we are able to: [Catch many new opportunities available in the market]	
	39.c	On the basis of the firm's established organisation structures, procedures, design, and incentives, we are able to: [Capture new R&D opportunities whenever they appear]	
	39.d	On the basis of the firm's established organisation structures, procedures, design, and incentives, we are able to: [Grab new product development opportunities resulting from changes in technologies]	
SCA - Sensing	35.a	In scanning, searching, and exploring across technologies and markets for product innovation, we are capable of:	27%

		[Exploring opportunities and options]	
	35.b	In scanning, searching, and exploring across technologies and markets for product innovation, we are capable of: [Detecting new opportunities and product solution options]	
	35.c	In scanning, searching, and exploring across technologies and markets for product innovation, we are capable of: [Spotting new technology possibilities]	
	35.d	In scanning, searching, and exploring across technologies and markets for product innovation, we are capable of: [Identifying trends in customer needs]	
SCA - Transforming	43	We have developed routines to enable employees' active participation in generating ideas for new products and services [.]	21.50%
	44	We have developed routines to enable employees' active participation in generating ideas for new production processes or organisational procedures [.]	
	45	The organisation has routines for organising employees' experiences [.]	

Digital Business Strategy - Scope PCA results

The analysis yielded one component.

Component Matrix[a]	
	Component 1
17. The business strategy is influenced and driven by digital technologies. [.]	0.749
18. The organisations products and services are designed to be interoperable (ability to connect to other systems) on complementary platforms [.]	0.726
19. The organisation designs products and services that take advantage of digital resources e.g. cloud computing [.]	0.839
20. The organisation uses big data to make decisions about the products and services it offers [.]	0.672
21. The organisation partners with other organisations in the ecosystem through digital platforms [.]	0.632

Extraction Method: Principal Component Analysis.

a. 1 component extracted.

The total variance explained by the single component

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.643	52.861	52.861	2.643	52.861	52.861
2	0.823	16.463	69.324			
3	0.670	13.409	82.733			
4	0.486	9.710	92.444			
5	0.378	7.556	100.000			

Extraction Method: Principal Component Analysis.

Digital Business Strategy - Scale PCA results

The analysis yielded one component.

Component Matrix[a]	
	Component 1
22. We use cloud computing services to rapidly increase infrastructure as the market needs the digital products [.]	0.806
23. The organisation uses platforms on which the products and services are available to a wider network of consumers (Network Effects) [.]	0.794
24. The organisation has the capability to harness big data and create meaningful insights for scaling products and services [.]	0.647
25. The organisation has partnerships with other organisations in the business ecosystem through shared digital assets e.g. online portals, cloud platforms, online market places [.]	0.798
26. The organisation uses Application Programming Interfaces (API's) to connect to partners or they use it to connect to the organisation in the business ecosystem [.]	0.781

Extraction Method: Principal Component Analysis.
a. 1 components extracted.

The total variance explained by the single component.

Total Variance Explained						
	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.945	58.904	58.904	2.945	58.904	58.904
2	0.711	14.221	73.125			
3	0.524	10.488	83.613			
4	0.481	9.622	93.235			
5	0.338	6.765	100.000			

Extraction Method: Principal Component Analysis.

Digital Business Strategy - Speed PCA results

The analysis yielded one component.

Component Matrix[a]	
	Component 1
27. The organisation has a multiyear sequenced roadmap for launching new products [.]	0.819
28. The organisation has a strategy in place to make some of the products and services obsolete and replace them with new products and services [.]	0.850
29. We consider when complimentary products launch in the business ecosystem and coordinate the launches accordingly [.]	0.725
30. As large amounts of data are available and big data sets are created, the organisation invests in solutions to harness the data [.]	0.823
31. The organisation makes investments in enabling rapid decision making from the available information [.]	0.759
32. In the organisation we have the capability to form and manage networks that provide complimentary capabilities [.]	0.640

Extraction Method: Principal Component Analysis.
a. 1 components extracted.

The total variance explained by the single component.

Total Variance Explained						
	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.581	59.675	59.675	3.581	59.675	59.675
2	0.698	11.636	71.311			
3	0.678	11.294	82.605			
4	0.450	7.502	90.107			
5	0.302	5.036	95.143			
6	0.291	4.857	100.000			

Extraction Method: Principal Component Analysis.

Digital Business Strategy – Sources of Value Creation PCA results

The analysis yielded one component.

Component Matrix[a]	
	Component 1
33. The organisation personalise the products and services based on customer preferences gathered from social media platforms [.]	0.855
34. We have products and services that connect different customers through a platform we manage [.]	0.855

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

The total variance explained by the single component.

Total Variance Explained						
	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.461	73.050	73.050	1.461	73.050	73.050
2	0.539	26.950	100.00			

Extraction Method: Principal Component Analysis.

Appendix 5: Research Question 1 – Normality and Correlation results

Normality test: DBS - Scope

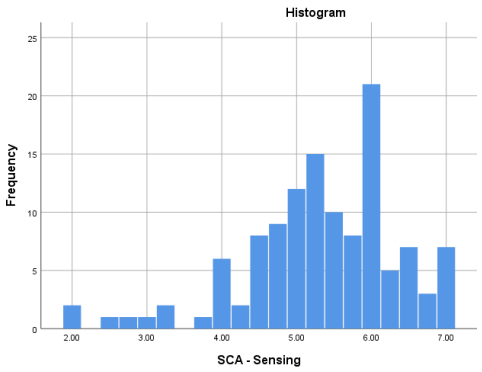
Tests of Normality							
	Kolmogorov-Smirnov[a]			Shapiro-Wilk			Normal/ Not Normal
	Statistic	df	Sig.	Statistic	df	Sig.	**<0.05**
DBS - Scope	0.093	121	0.012	0.974	121	0.018	Normal
SCA - Sensing	0.100	121	0.005	0.945	121	0.000	Normal
SCA - Seizing	0.115	121	0.001	0.970	121	0.008	Normal
SCA - Transforming	0.124	121	0.000	0.952	121	0.000	Normal

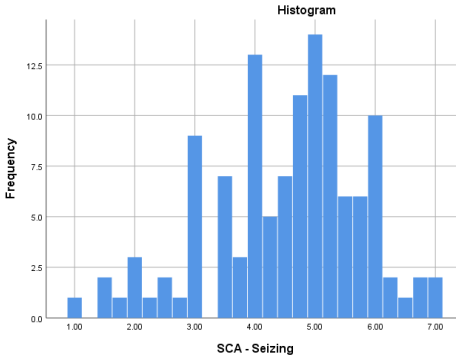
Correlation test: DBS – Scope

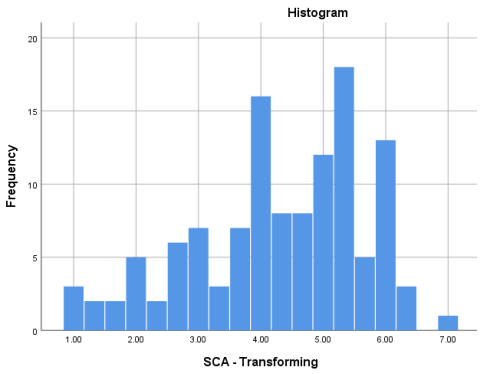
Correlations					
		DBS - Scope	SCA - Sensing	SCA - Seizing	SCA - Transforming
DBS - Scope	Pearson Correlation	1	.436**	.522**	.420**
	Sig. (2-tailed)		0.000	0.000	0.000
	N	121	121	121	121
SCA - Sensing	Pearson Correlation	**.436****	1	.566**	.243**
	Sig. (2-tailed)	0.000		0.000	0.007
	N	121	121	121	121
SCA - Seizing	Pearson Correlation	**.522****	.566**	1	.421**
	Sig. (2-tailed)	0.000	0.000		0.000
	N	121	121	121	121
SCA - Transforming	Pearson Correlation	**.420****	.243**	.421**	1
	Sig. (2-tailed)	0.000	0.007	0.000	
	N	121	121	121	121

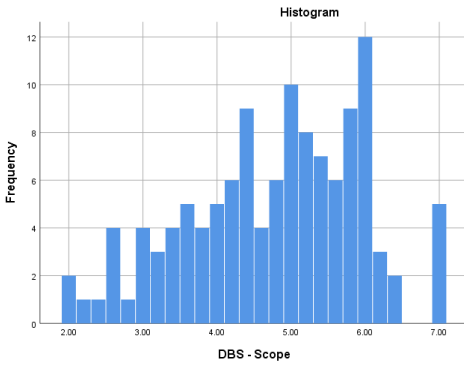
**. Correlation is significant at the 0.01 level (2-tailed).

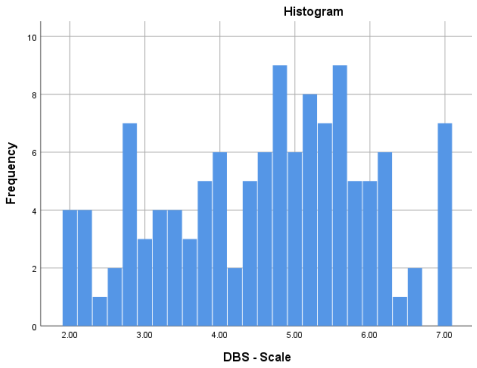
Appendix 6: Histograms – Test Normality

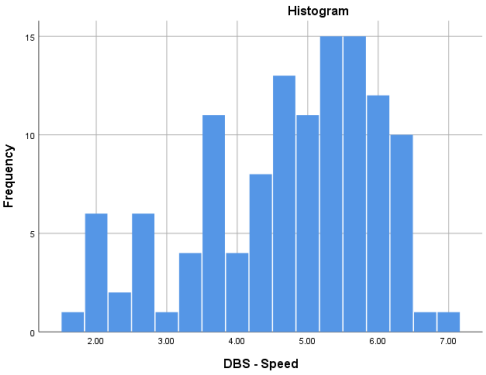


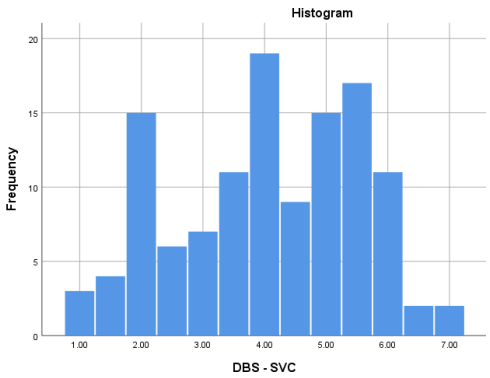




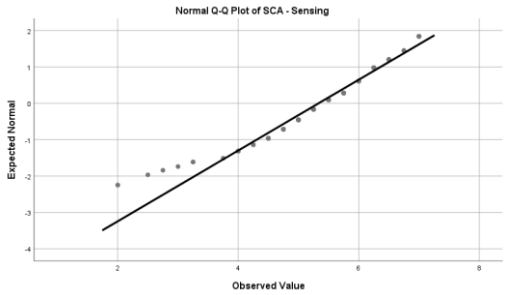


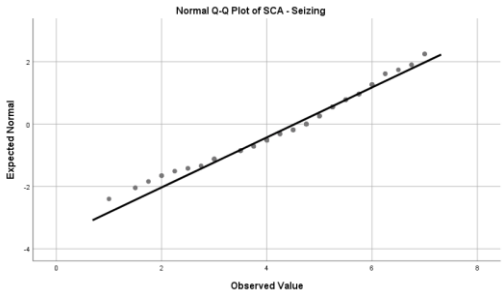


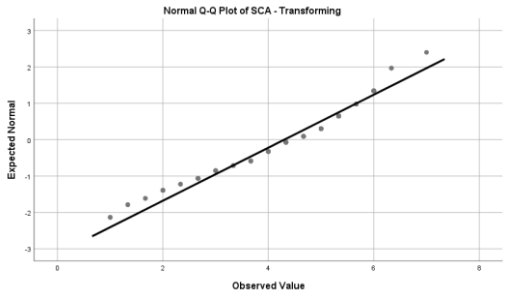


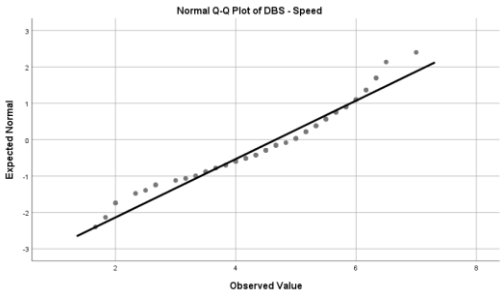


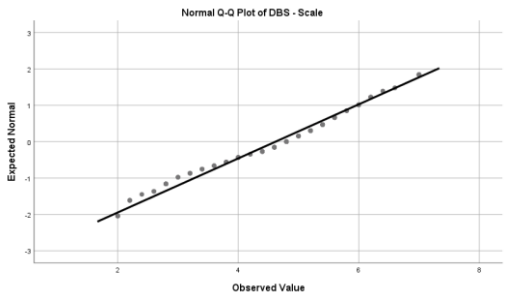
Appendix 7: Q-Q Plots – Test Normality

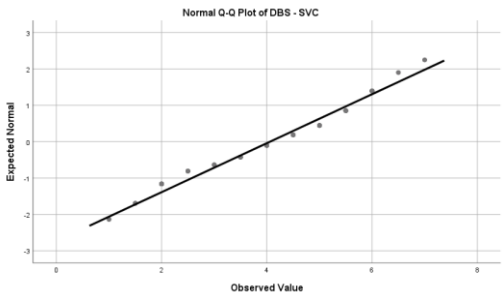


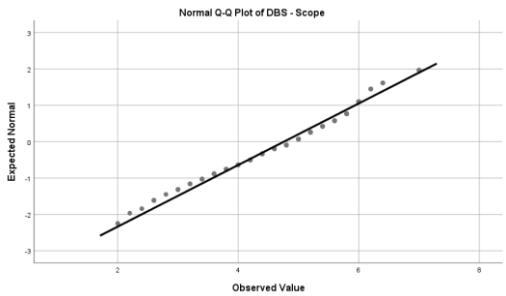












Appendix 8: Research Question 2 – Normality and Correlation results

Normality test: DBS - Scale

Tests of Normality							
	Kolmogorov-Smirnov[a]			Shapiro-Wilk			Normal/ Not Normal
	Statistic	df	Sig.	Statistic	df	Sig.	**<0.05**
DBS - Scale	0.090	121	0.017	0.967	121	0.005	Normal
SCA - Sensing	0.100	121	0.005	0.945	121	0.000	Normal
SCA - Seizing	0.115	121	0.001	0.970	121	0.008	Normal
SCA - Transforming	0.124	121	0.000	0.952	121	0.000	Normal

Correlation test: DBS – Scale

Correlations					
		DBS - Scale	SCA - Sensing	SCA - Seizing	SCA - Transforming
DBS - Scale	Pearson Correlation	1	.434**	.465**	.435**
	Sig. (2-tailed)		0.000	0.000	0.000
	N	121	121	121	121
SCA - Sensing	Pearson Correlation	**.434****	1	.566**	.243**
	Sig. (2-tailed)	0.000		0.000	0.007
	N	121	121	121	121
SCA - Seizing	Pearson Correlation	**.465****	.566**	1	.421**
	Sig. (2-tailed)	0.000	0.000		0.000
	N	121	121	121	121
SCA - Transforming	Pearson Correlation	**.435****	.243**	.421**	1
	Sig. (2-tailed)	0.000	0.007	0.000	
	N	121	121	121	121

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

Appendix 9: Research Question 3 – Normality and Correlation results

Normality test: DBS – Speed

Tests of Normality							
	Kolmogorov-Smirnov[a]			Shapiro-Wilk			Normal/ Not Normal
	Statistic	df	Sig.	Statistic	df	Sig.	**<0.05**
DBS - Speed	0.135	121	0.000	0.946	121	0.000	Normal
SCA - Sensing	0.100	121	0.005	0.945	121	0.000	Normal
SCA - Seizing	0.115	121	0.001	0.970	121	0.008	Normal
SCA - Transforming	0.124	121	0.000	0.952	121	0.000	Normal

Correlation test: DBS – Speed

Correlations					
		DBS - Speed	SCA - Sensing	SCA - Seizing	SCA - Transforming
DBS - Speed	Pearson Correlation	1	.550**	.587**	.439**
	Sig. (2-tailed)		0.000	0.000	0.000
	N	121	121	121	121
SCA - Sensing	Pearson Correlation	**.550****	1	.566**	.243**
	Sig. (2-tailed)	0.000		0.000	0.007
	N	121	121	121	121
SCA - Seizing	Pearson Correlation	**.587****	.566**	1	.421**
	Sig. (2-tailed)	0.000	0.000		0.000
	N	121	121	121	121
SCA - Transforming	Pearson Correlation	**.439****	.243**	.421**	1
	Sig. (2-tailed)	0.000	0.007	0.000	
	N	121	121	121	121

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

Appendix 10: Research Question 4 – Normality and Correlation results

Normality test: DBS – SVC

Tests of Normality							
	Kolmogorov-Smirnov[a]			Shapiro-Wilk			Normal/Not Normal
	Statistic	df	Sig.	Statistic	df	Sig.	**<0.05**
DBS - SVC	0.125	121	0.000	0.956	121	0.001	Normal
SCA - Sensing	0.100	121	0.005	0.945	121	0.000	Normal
SCA - Seizing	0.115	121	0.001	0.970	121	0.008	Normal
SCA - Transforming	0.124	121	0.000	0.952	121	0.000	Normal

Correlation test: DBS – SVC

Correlations					
		DBS - SVC	SCA - Sensing	SCA - Seizing	SCA - Transforming
DBS - SVC	Pearson Correlation	1	.389**	.373**	.256**
	Sig. (2-tailed)		0.000	0.000	0.005
	N	121	121	121	121
SCA - Sensing	Pearson Correlation	**.389****	1	.566**	.243**
	Sig. (2-tailed)	0.000		0.000	0.007
	N	121	121	121	121
SCA - Seizing	Pearson Correlation	**.373****	.566**	1	.421**
	Sig. (2-tailed)	0.000	0.000		0.000
	N	121	121	121	121
SCA - Transforming	Pearson Correlation	**.256****	.243**	.421**	1
	Sig. (2-tailed)	0.005	0.007	0.000	
	N	121	121	121	121

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

Appendix 11: SCA – Sensing regression results

Model Summary SCA – Sensing

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.567[a]	0.322	0.298	0.86126	1.996
a. Predictors: (Constant), DBS - SVC, DBS - Scope, DBS - Speed, DBS - Scale					
b. Dependent Variable: SCA - Sensing					

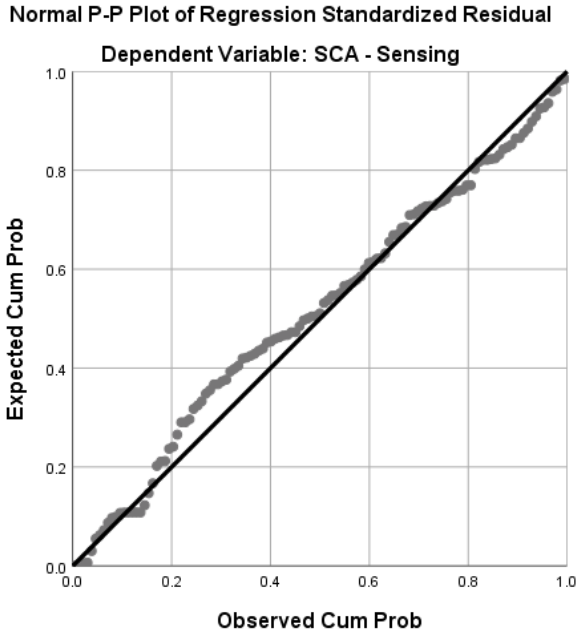
ANOVA

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	40.775	4	10.194	13.743	.000[b]
	Residual	86.044	116	0.742		
	Total	126.819	120			

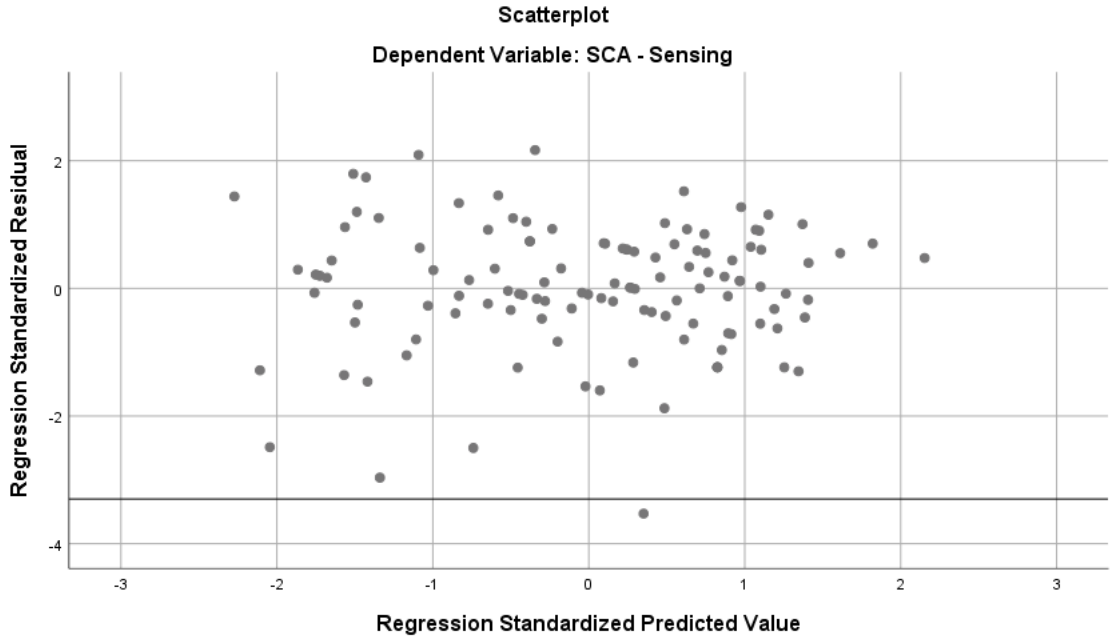
a. Dependent Variable: SCA - Sensing

b. Predictors: (Constant), DBS - SVC, DBS - Scope, DBS - Speed, DBS - Scale

Normal P-P plot of Regression Standardised Residual



Scatterplot



Coefficients Table SCA – Sensing

Coefficients[a]													
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	2.962	0.350		8.467	0.000	2.269	3.654					
	DBS - Scope	0.107	0.125	0.123	0.860	0.392	-0.140	0.354	0.436	0.080	0.066	0.285	3.509
	DBS - Scale	-0.034	0.118	-0.044	-0.287	0.775	-0.267	0.200	0.434	-0.027	-0.022	0.246	4.069
	DBS - Speed	0.352	0.094	0.427	3.740	0.000	0.166	0.539	0.550	0.328	0.286	0.449	2.228
	DBS - SVC	0.093	0.066	0.134	1.414	0.160	-0.037	0.223	0.389	0.130	0.108	0.649	1.541

a. Dependent Variable: SCA - Sensing

Appendix 12: SCA – Seizing regression results

Model Summary SCA – Seizing

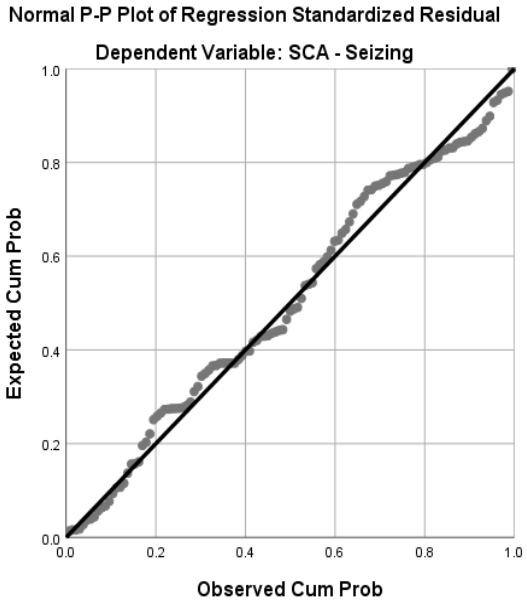
Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.618[a]	0.382	0.361	0.99724	2.042
a Predictors: (Constant), DBS - SVC, DBS - Scope, DBS - Speed, DBS - Scale					
b Dependent Variable: SCA - Seizing					

ANOVA

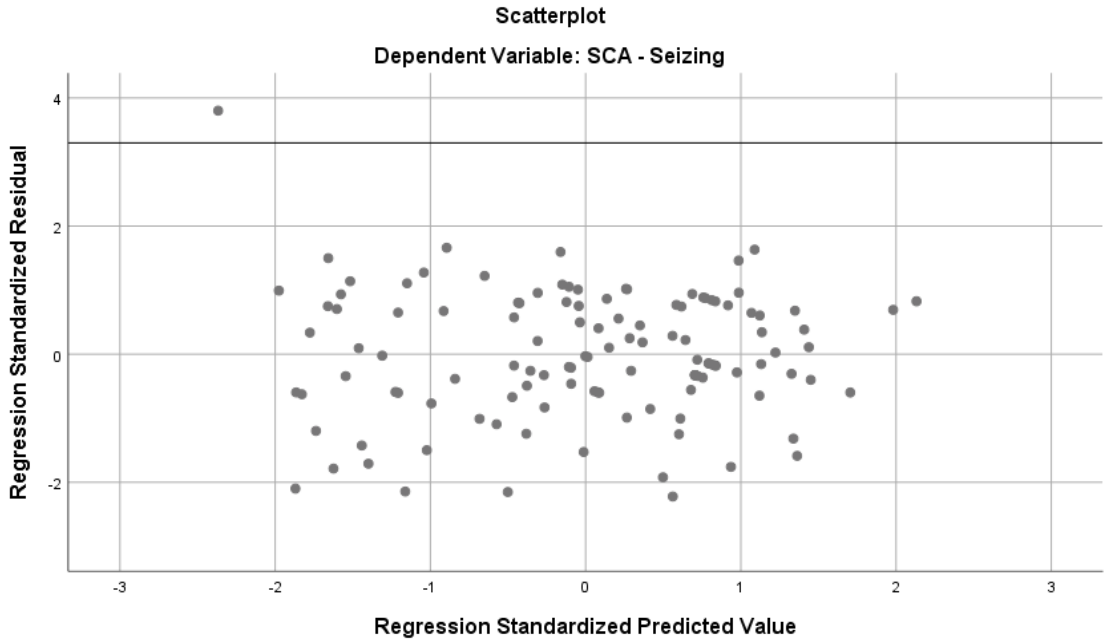
ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	71.257	4	17.814	17.913	.000[b]
	Residual	115.361	116	0.994		
	Total	186.618	120			

a Dependent Variable: SCA - Seizing
b Predictors: (Constant), DBS - SVC, DBS - Scope, DBS Speed, DBS - Scale

Normal P-P plot of Regression Standardised Residual



Scatterplot



Coefficients Table SCA – Seizing

Coefficients[a]													
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.273	0.405		3.143	0.002	0.471	2.075					
	DBS - Scope	0.336	0.144	0.319	2.330	0.022	0.050	0.622	0.522	0.211	0.170	0.285	3.509
	DBS - Scale	-0.145	0.136	-0.156	-1.062	0.290	-0.415	0.125	0.465	-0.098	-0.078	0.246	4.069
	DBS - Speed	0.435	0.109	0.435	3.988	0.000	0.219	0.651	0.587	0.347	0.291	0.449	2.228
	DBS - SVC	0.074	0.076	0.088	0.976	0.331	-0.076	0.225	0.373	0.090	0.071	0.649	1.541

a Dependent Variable: SCA - Seizing

Appendix 13: SCA – Transforming regression results

Model Summary SCA – Transforming

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.478[a]	0.228	0.202	1.22606	2.205
a. Predictors: (Constant), DBS - SVC, DBS - Scope, DBS - Speed, DBS - Scale					
b. Dependent Variable: SCA - Transforming					

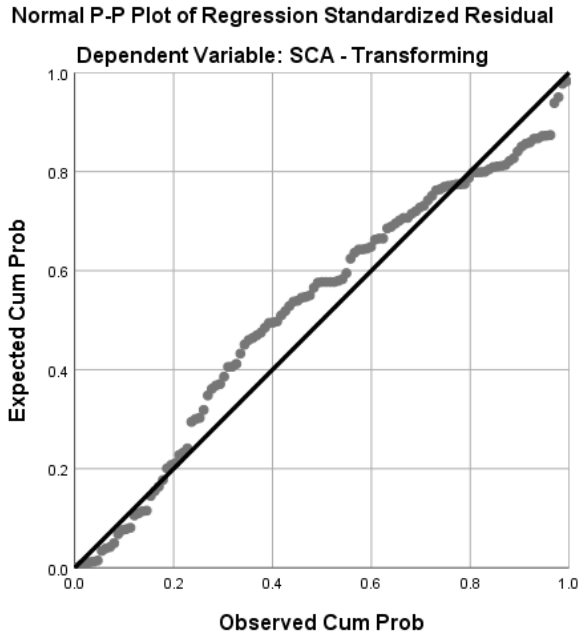
ANOVA

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	51.625	4	12.906	8.586	.000[b]
	Residual	174.375	116	1.503		
	Total	226.000	120			

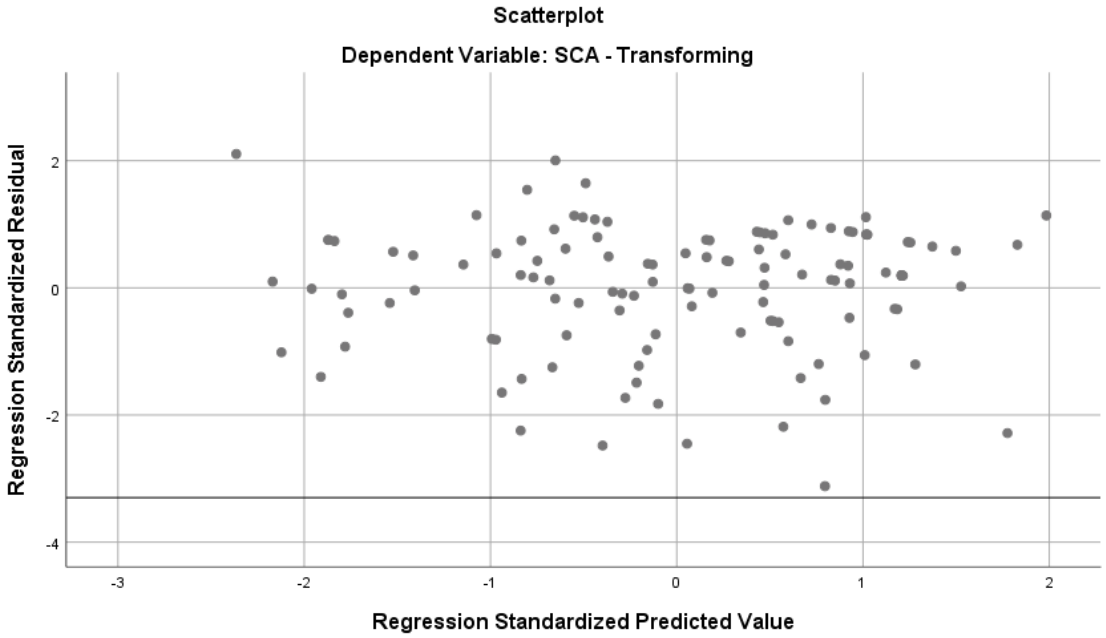
a. Dependent Variable: SCA - Transforming

b. Predictors: (Constant), DBS - SVC, DBS - Scope, DBS - Speed, DBS - Scale

Normal P-P plot of Regression Standardised Residual



Scatterplot



Coefficients Table SCA – transforming

Coefficients[a]													
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.648	0.498		3.310	0.001	0.662	2.634					
	DBS - Scope	0.132	0.177	0.114	0.745	0.458	-0.219	0.484	0.420	0.069	0.061	0.285	3.509
	DBS - Scale	0.181	0.168	0.178	1.080	0.282	-0.151	0.514	0.435	0.100	0.088	0.246	4.069
	DBS - Speed	0.276	0.134	0.250	2.056	0.042	0.010	0.541	0.439	0.188	0.168	0.449	2.228
	DBS - SVC	-0.024	0.094	-0.026	-0.255	0.799	-0.209	0.161	0.256	-0.024	-0.021	0.649	1.541

a. Dependent Variable: SCA - Transforming

Appendix 14: Ethical clearance confirmation

Gordon Institute of Business Science
University of Pretoria

06 August 2019

Marthinus Prinsloo

Dear Marthinus

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

You are therefore allowed to continue collecting your data.

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

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

Kind Regards

GIBS MBA Research Ethical Clearance Committee

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