

**Effectiveness of technology adoption for
strategy implementation**

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Abstract

The internet economy has given rise to new business models which do not require high capital costs. In this regard, technology has enabled organisations to revise their strategy to enhance organisational effectiveness. Consequently, this has resulted in the disruption of traditional business models. Therefore, the central aspect of this study was to consider the effectiveness of technology adoption for strategy implementation. Blue ocean strategy was regarded as a suitable framework to consider customer satisfaction, while technology adoption theory highlighted the importance of influencing factors in the environment and organisation when adopting technology. Exploratory, qualitative data was collected by means of semi-structured interviews from 16 research respondents who were identified through non-probability sampling across differing sectors. The data from these interviews were analysed by means of descriptive coding. Microsoft excel was used to complement the coding process. Three major findings emerged: First, the level of importance of technology, among other organisational components was established. It was understood that technology serves as an enabler of the other components. Next, a unique scoring system was designed to determine the restrictive ability of influencing factors namely, culture, structure, risk appetite, financial resources and compliance in relation to technology adoption. The ranking of the factors was established with compliance ranked as the number one factor to negatively influence the rate of technology adoption. Lastly, the relationship between technology adoption and organisational effectiveness was determined where the results indicated that there was higher organisational effectiveness in those organisations with a higher rate of technology adoption. This study contributes towards existing knowledge in literature and provided valuable insights for businesses in terms of the alignment between IT and business strategies.

Key words

Technology adoption, strategy implementation, blue ocean strategy, organisational effectiveness, IT-business strategy alignment, compliance, diffusion of innovation, customer experience.

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. A signed copy of the declaration was submitted to the university on 08 November 2019.

Jeseelan Pillay

08 November 2019

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Chapter 1: Introduction to Research problem

This chapter considered the need for the research study and highlighted potential contribution for business and academia. An isolated gap in literature which posed a theoretical problem was identified. Accordingly, research questions were put forward as an indicator of the research objective. The urgency for this study was evident given the rapid rate at which technological innovations are disrupting traditional business models. The report maintained an unbroken 'golden thread' which was consistent across all chapters.

1.1 The research problem

A recent publication in the Harvard Business Review titled, *"5 ways the best companies close the strategy-execution gap"* sparked the interest for this research study. The bold introduction to the article was captivating, as the author stated,

"Executives say that they lose 40% of their strategy's potential value to breakdowns in execution. However, this strategy-to-performance gap is rarely the result of shortcomings in implementation; it is because the plans are flawed from the start" Mankins (2017, p.2).

Other scholars were of a similar view that there was a disconnect between strategy formulation and implementation. Greer, Lusch and Hitt (2017) explained that to create value for the organisation, the 'formulated' strategy must be implemented, while Homkes and Sull (2016) reported that execution (or implementation) was always top of mind for CEOs. This was surprising since the blueprint for strategy was described in 1980 through Porter's five forces strategy framework (Porter, 1980).

Further research into the issue revealed that scholars have recently questioned the suitability of Porter's theoretical framework in the current business environment (Dälken, 2014; Hales & Mclarney, 2017). According to Hales and Mclarney (2017), changes in the external environment have resulted in strategies becoming less relevant over time (p.20). Given the rapid rate of technological innovations, the business landscape has changed, and organisations have been forced to redefine business models to enhance organisational effectiveness (Lui, Ngai & Lo, 2016).

The internet economy has given rise to new business models which do not require high capital costs (Neirotti, Raguseo & Paolucci, 2018). Consequently, technology has enabled organisations to revise their business models to improve operational efficiency (Demirkan, Bess, Spohrer, Rayes, Allen & Moghaddam, 2015). For this reason, it was reported that business and (information technology) IT strategies must be integrated to deliver on customer value (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013). However, from technology adoption theory it was understood that there was an alignment between technology, environment and organisation (Tornatzky, Fleischer & Chakrabarti, 1990). In a later model, technology was included into the organisational component and referred to as organisational readiness (Iacovou, Benbasat & Dexter, 1995).

This indicated that technology was acting together with other organisational components to deliver customer value (Cummings & Worley, 2015, p.95). It was understood that this was a highly systemic environment (Patel & Mehta, 2017). Therefore, it was imperative to understand the level of importance of technology among other organisational components. From technology adoption theory, it was understood that there were influencing factors from the environment and organisation which influenced the rate of technology adoption. Therefore, it was important to understand the factors which influenced the rate of technology adoption. According to Oliveira and Martins (2011), for technology to improve organisational effectiveness, it must be integrated into the business. For this reason, the relationship between technology adoption and organisational effectiveness was an important aspect.

This formed the foundation of the research problem. In the current global context of mega-trends, rapid technological advancements and changes in globalisation, survival of organisations was dependent on technological innovations (Lee & Trimi, 2018). It was understood that traditional strategy models were becoming obsolete in this new 'techno' era. Given the leading role of technology in transforming business models, it was important to understand the effectiveness of technology adoption in relation to strategy implementation.

The research objectives were outlined as research questions in Chapter 3. Briefly, these included: **(i)** establish the level of importance of technology among other

organisational components; **(ii)** establish the rate of technology adoption when considering influencing factors and **(iii)** establish the relationship between the rate of technology adoption and organisational effectiveness.

1.2 Significance of the research

A recent study showed a high count of ICT citations, compared to non-ICT citations, for newly submitted patents (Koutroumpis, Leiponen & Thomas, 2017). This signified the importance of this study for academia and businesses. ICT in this regard referred to the field of information, communications and technology. It was envisaged that the insight gained from this study would contribute towards existing knowledge in literature. Also, new themes arising from this study, that required deeper investigation, would serve as a basis for future research.

From a theoretical perspective, a comparative assessment between traditional business models based on Porter's five forces, and newer strategy approaches such as blue ocean strategy, will provide interesting insight into the alignment between IT and business strategies. The disconnect between IT and business strategies was reported in literature (Coltman, Tallon, Sharma, & Queiroz, 2015), and was concerning given the disruption to business models by technological innovations (Lui et al., 2016). From a business perspective, it was understood that the alignment between IT and business strategies was regarded as a key concern since Chief Information Officers (CIOs) ranked this problem as one of the main issues on a yearly basis (Kappelman, Torres, McLean, Maurer, Johnson & Kim, 2019).

From a theoretical perspective, it was also envisaged that this study would provide deeper insight into other organisational components. Establishing the level of importance of technology among other organisational components will also provide new insight into the design of the business model. These components and other factors will be further explored when establishing the rate of technology adoption in the organisation. This would prove valuable from a business perspective since it will provide insight into the key concerns regarding influencing factors when adopting technology. A detailed enquiry into this practice will provide insight for a deeper understanding into the nature of factors which influence the rate of technology adoption. This was regarded as important since technology was only effective if it were adopted into the business (Oliveira & Martins, 2011).

1.3 Scope of the research

The scope of the research focussed on the effectiveness of technology adoption in relation to strategy implementation. Technology in this regard referred to technology that was relevant to the core functioning of the business. However, it was understood that virtualisation of hardware implied digital technology was no longer cordoned-off to the domain of IT and was now applied to other parts of the business as well (Furr & Shipilov, 2019). The benefits and types of virtualised hardware environments have also been reported (Obasuyi & Sari, 2015). What this implied was that since technology hardware has becoming increasingly digital, the terminology of technology has migrated towards digital technology. Thus, referring to technology as digital technology was redundant.

When considering the comprehensive model used for analysing organisational systems, at an organisational level (Cummings & Worley, 2015), human resource systems influenced *“the mix of skills, personal characteristics, and behaviors of organization members”* (p.99). For this reason, human capital resource was included under this component for this study.

According to Luftman, Lyytinen and ben Zvi (2017) one of the reasons for the misalignment between IT and business strategies was convoluted constructs arising from scholars over the years. In their publication, it was reported that studies over the years have been *“fraught with sampling bias because of a single industry focus, company type focus, or geographic focus”* (p. 27).

For this reason, this study stretched across differing industries and concentrated on technology adoption where, the adopted technology was relevant to the core functioning of the business. The industry sectors included manufacturing, financial services, technology-companies, fast moving consumable goods (FMCG), public services, security and hospitality. However, it should be noted that since culture was considered as one of the influencing factors when determining the rate of technology adoption, the study was confined to organisations operating in the Gauteng region. The reason for this was that cultural factors differed geographically (Peet, 1998). The scope of the sample was further defined in **Section 4.5.2**.

1.4 Research purpose

Technological innovations are disrupting current business models (Lui et al., 2016). Thus, the purpose of this study was to understand how organisations could enhance organisational effectiveness through adoption of technology when considering influencing factors.

1.5 Layout of the research report

This chapter highlighted the need for this research, including the research objective. The research questions in Chapter 3, formed the basis of the research objective and were constructed to address the gap in literature, as indicated in Chapter 2. In this regard, the research questions explored the importance and the adoption rate of technology in relation to strategy implementation. The research methodology, described in Chapter 4, was underpinned by a qualitative technique and provided new insights through analyses of research findings. The patterns which emerged from the findings were traced to the research questions. This was linked 'back' to theory to draw comparisons between the literature and the analysed results. The research questions were enabled through a research instrument which was tested for reliability and validity as described in **Section 4.9**. The results emanating from semi-structured interviews were presented in Chapter 5 and discussed in Chapter 6. The main findings and concluding remarks were articulated in Chapter 7.

The prescribed guidelines regarding the format of the report were adhered to. All appendices were labelled and presented in the final section while the American Psychological Association (APA) (6th edition) method of referencing was adopted consistently for all reference. Original sources of reference were used as required. However, seminal research in this field of study was dated pre-2013. For this reason, only 50 of the 72 references used for literature research were from 2013 - 2019. All the same, current literature was considered for the research problem.

Chapter 2: Literature Review

2.1 Introduction

In business management, much attention was given to strategy formulation over the years. However, it was reported that to create value for the organisation, the 'formulated' strategy must also be implemented (Greer et al., 2017). Given the rapid rate of technological innovations, organisations have redefined their business landscape to enhance organisational effectiveness (Lui et al., 2016). For this reason, it was reported that business and IT strategies must be integrated to deliver on customer value (Bharadwaj et al., 2013). For integration to be realised, technology must be adopted into the business and factors influencing the adoption of technology must be considered (Oliveira & Martins, 2011).

In **Section 2.3**, key frameworks relating to technology adoption at an organisational level were examined to determine the effectiveness of technology adoption in relation to strategy implementation. This included the environment, organisation and technology model, (TOE) framework (Tornatzky et al., 1990), diffusion of innovation (DOI) (Rogers, 1995) and data interchange (EDI) model (Iacovou et al., 1995). The EDI model (**Figure 2.5**) which was grounded in the theories of the other two, was the key framework for this study. The TOE framework, depicted in **Figure 2.4**, showed the alignment between technology and the organisation. This was important for Research Question 1, which explored the level of importance of technology among other organisational components in strategy implementation. The comprehensive model used for analysing organisational systems, at an organisational level (Cummings & Worley, 2015, p.95) illustrated in **Figure 2.1**, showed similarities to the TOE framework and highlighted organisational components. Also, this model described the effectiveness of strategy implementation through the degree of alignment between the organisation and **(i)** its environment **(ii)** key components in the organisation (p.94). Thus, this model was used in **Section 2.2** to understand the level of importance of technology.

In **Section 2.3**, organisation readiness and external pressure (from the EDI model) were considered to gain deeper understanding of the factors which influenced technology adoption. The final section (**Section 2.4**) included other frameworks and focussed on the perceived benefits of technology adoption for the organisation.

2.2 The level of importance of technology

The primary focus of Research Question 1 (as indicated in Chapter 3) was to determine the level of importance of technology among other components which contributed to strategy implementation in the organisation. The core framework for addressing this research question was grounded in the theory relating to the comprehensive model used in analysing organisational systems, at an organisational level (Cummings & Worley, 2015, p.95). A graphical representation of the model (herein tagged organisational model) was shown in **Figure 2.1**. It was reported to be similar to other popular organisation-level diagnostic models (p.96).

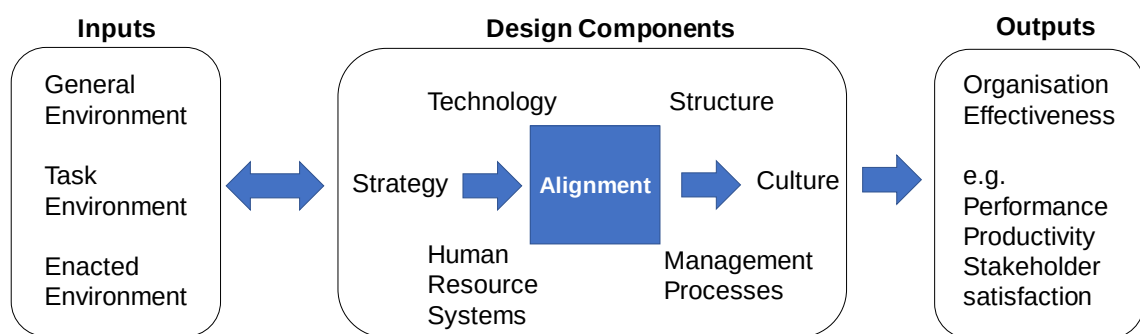


Figure 2.1: Graphical representation of the organisational model (adapted from Cummings & Worley, 2015, pp.95).

The organisational model in **Figure 2.1** illustrated the alignment between inputs derived from the environment and design components, with the aim of delivering organisational effectiveness as an output. As depicted in the model, strategy was an intermediate input and defined how an organisation positioned itself in relation to the environment. The responsibility of leading strategy fell under the domain of top executives, and it was reported that strategy must be implemented to create value for the organisation (Greer et al., 2017). However, strategy implementation was one of the most challenging concerns among top executives (p.137).

According to Mankins (2017), the strategy-performance gap was not as a result of poor execution (as claimed by 40% of executives) but instead as a result of a flawed plan. In addition, it was noted that organisational performance was dependent on great strategy formulation, and implementation (Mankins, 2017). These sentiments were echoed by Sull (2007), who described strategy as a 'strategy loop'. Through continuous revision, the process of implementation was regarded as an endless,

iterative cycle of formulation and implementation which guarded against the risk of a failed course of action (p.33). Martins and Fernandes (2015) attributed a flawed plan to the absence of customer value at the business strategy level, even though top executives knew customer value was key to achieving business success. It was argued that customer value and the factors that go with delivering customer value, must be placed at the forefront of the business strategy (p.25).

Technology and innovation were reported as ways in which businesses could create and capture value (Chatterjee, Moody, Lowry, Chakraborty & Hardin, 2015; Yang, Vladimirova, & Evans, 2017). The relationship between customer value and technology was demonstrated through a study showing how the quality of information, enabled by technological resources, allowed faster response times for meeting customer needs (Setia, Venkatesh & Joglekar, 2013). Given the enabling prowess of technology, and businesses' need to deliver on customer value, it was argued that there should be a *"fusion between IT strategy and business strategy"* (Bharadwaj et al., 2013, p.471). This amalgamation was termed 'digital business strategy' and was reported to transcend functional and process strategies (p.473). Thus, technology was regarded as the enabling constituent which was integrated into functional and process aspects of the business.

2.2.1 Technology enabling processes

Technology has enabled (start-ups and established) organisations to adapt their business models through capitalising not only on lower computing costs with higher performance levels, but also increased connectivity powered by the internet and mobile applications (Bharadwaj et al., 2013, p.472). Subsequently, this has resulted in cross-sector disruptions which has prompted the evolution of new business models such as service-based solutions (Barrett, Davidson, Prabhu & Vargo, 2015). According to Rahimi, Møller and Hvam (2016), the driving force for re-engineering organisations can be attributed to the interdependency between business process management (BPM) and information technology (IT) systems. In this instance, technologies were used to enable processes, to close the IT-business strategy gap. This approach was reported to enable **(i)** business innovation relevant to trending technologies and **(ii)** organisations to avoid wasting costs correcting misalignments (p.142).

The interdependency between BPM and IT was further considered through the organising logic between business processes and IT infrastructure. This was referred to as enterprise architecture (Lapalme, Gerber, van der Merwe, Zachman, de Vries & Hinkelmann, 2016), which accounted for integration and standardisation of IT resources in the organisation. It was reported that well-constructed enterprise architectures yielded improved operations which was a source of competitive advantage for the organisation (Bradley, Pratt, Byrd, Outlay & Wynn, 2012, p.121). Alignment between business processes and IT provided significant improvement for core activities such as customer care, operations, scheduling and reporting among others (Furr & Shipilov, 2019). It was also reported that to enable management to make better decisions, dashboards were created which provided an instant overview of key indicators (Furr & Shipilov, 2019). The interdependency between BPM and IT systems served as groundwork for 'digital business strategy'. Thus, it was not surprising that the fusion between IT and business was reported to facilitate quicker responses times, ease of use and faster decision making (Bharadwaj et al., 2013).

Historically, this 'fusion' was commonly known as IT-business alignment. Under this umbrella of IT-business alignment featured a plethora of research activities (Coltman et al., 2015). The discussion centred around whether IT played a fundamental role in business level strategy or was part of the functional-level strategy. This debate has been ongoing since Henderson and Venkatraman (1993) published their paper '*Strategic alignment: Leveraging information technology for transforming organizations*' in IBM Systems Journal.

2.2.2 Technology and business alignment

Research in the area pertaining to the alignment of IT and business has resulted in numerous frameworks being established. Drnevich and Croson (2013) described a unique model constructed from business profit frameworks, to show the role of IT when determining the profitability of the organisation under profit framework perspectives. Gerow, Thatcher and Grover (2015) proposed a framework which showed that improved financial performance was not only dependent on the alignment between business and IT strategies. Instead, there should also be consideration for the alignment between business strategies and infrastructure (p.478). Cui, Ye, Teo, and Li (2015) designed a framework which showed how IT integration enhanced innovation. The main argument behind these studies were that

an alignment between IT resources and business strategy resulted in improved organisational performance. However, according to Coltman et al. (2015, p.92), as a result of several points of contact between IT and business, numerous and (sometimes confusing) definitions and measurements have resulted in a *“family of IT alignment constructs”*.

Coltman et al. (2015) further reported, the annual Society for Information Management (SIM) survey for Chief Information Officers (CIO) in 2014 showed IT-business alignment as the third most important personal concern among CIOs. IT-business alignment from an organisation perspective was reported to be the number one concern (Kappelman et al., 2019, p.52). Interestingly, in the 2014 study, 81% of results were contradictory when respondent indicated there was an alignment between IT and business strategies (Preston, 2014; Coltman et al., 2015). This was evident since analyses of data indicated that IT-business alignment was indeed a concern among CIOs. This ‘misalignment’ between perception and the ‘actual’ measurement of IT-business alignment called for an alternate means of determining and defining this alignment. It was suggested that instead of using performance indicators, scholars should focus more on measurable goals such as business value or customer satisfaction to define IT-business alignment (Coltman et al., 2015, p.91). The 2018 SIM survey reported personal and organisational concern in fourth and second position, respectively (Kappelman et al., 2019, p. 52,53).

2.2.3 Dynamic capabilities

Following the editorial published by Coltman et al. (2015), Luftman, Lyytinen and ben Zvi (2017) addressed the concern of convoluted constructs through a strategic alignment maturity (SAM) model. In their publication, it was reported that studies over the years have been *“fraught with sampling bias because of a single industry focus, company type focus, or geographic focus”* (p. 27). The SAM model identified six dimensions for promoting alignment, and for the first time, IT-business alignment was considered through activity-based characterisations, and not through perception-based and/or fit-based measurements (p. 36). Activity-based characterisations considered the humanistic side of the alignment process and the study was grounded in the theory of dynamic capabilities, and dynamic capabilities stemmed from the people in the organisation (Teece, Pisano & Shuen, 1997). According to Di Fiore (2018), the adoption and implementation of technology harnessed dynamic

capabilities. The illustration in **Figure 2.2** was indicative of the development of dynamic capabilities from a static level to a dynamic level.

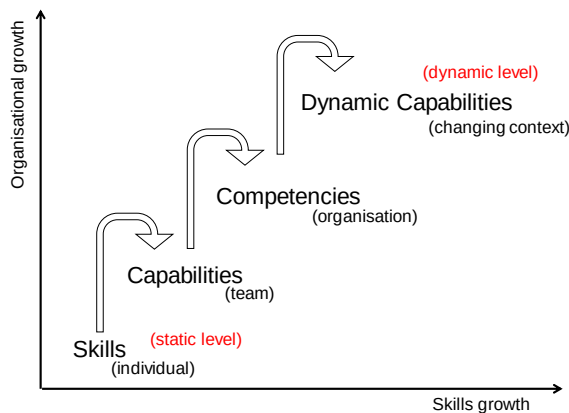


Figure 2.2: An Illustration of skills development from static to dynamic levels in an organisation (constructed by Author).

The collective capacity of individual skills at a static level gave rise to team capabilities which holistically reflected the competency of the organisation. Once these skills were developed, it allowed the organisation to pursue new frontiers referred to as dynamic capabilities. According to Teece (2018), strong dynamic capabilities were required for effective implementation of business models. Thus, it was reported, the effective deployment of human capital resources was crucial for implementation of strategy (Greer et al., 2017). However, it was also reported that design of the organisational structure influenced dynamic capabilities, hence organisational performance (Teece, 2018).

2.2.4 Organisational structure

Advances in technology and changes in the environment have forced organisations to restructure the way in which they operate. To enhance agility, flexibility and innovation, organisations have shifted from functional and matrix structures to customer centric and process type counterparts (Cummings & Worley, 2015, pp.339). Advantages and disadvantages of the differing structure designs were identified (p.341-353) and summarised in **Table A.1** of **Appendix A**. Also, it was documented that the degree to which an organisation's structure matched the environment, technology, organisation size and strategy, was an antecedent to organisational effectiveness. A higher the degree of 'matching' was associated with increased organisational effectiveness (p.340). The seminal work in this area could

be traced to the publication by Walton (1986), entitled '*A vision-led approach to management restructuring*'. Interestingly, this work was cited 51 times over the years, and even fewer (16) over the last five years. In contrast, the research conducted by Henderson and Venkatraman (1993) was cited 5155 times and 1440 times (at Oct. 2019), in the last five years. While organisational structure has been reported to influence organisational performance (Csaszar, 2012), the limited research in this field was concerning (p.611).

Frameworks to understand the rate of technology adoption were considered next. The contribution of influencing factors was also explained to understand the impact of these factors on the adoption rate.

2.3 Rate of technology adoption

In recent years, technological innovation has redefined the business landscape with improved operational efficiencies and enhanced business growth (Lui et al., 2016). Furthermore, as indicated earlier, integration of IT and business strategies contributed towards customer value (Bharadwaj et al., 2013). However, for technology to enable processes, improve organisational performance and enhance customer value, it must be adopted into the business. In this regard, it was important to understand theoretical models and factors which influenced technology adoption (Oliveira & Martins, 2011). This area of research has received much attention with the development of numerous theoretical models, grounded in sociology, psychology, and information systems (Patel & Connolly, 2007; Lai, 2017; Taherdoost, 2018). However, what was important for technology adoption for this study, were theories relating to technology adoption at an organisational level only. For this reason, three key models, including the TOE, DOI and EDI frameworks were considered.

2.3.1 Frameworks for technology adoption

According to scholars, the 'diffusion of innovation' theory proposed by Rogers (1995) was derived from a collection of 508 diffusion studies. This work formed the basis for conducting research on innovation acceptance and adoption (Lai, 2017, p.22). The DOI theory resulted in the well-known diffusion of innovation curve or technology adoption curve, shown in **Figure 2.3**.

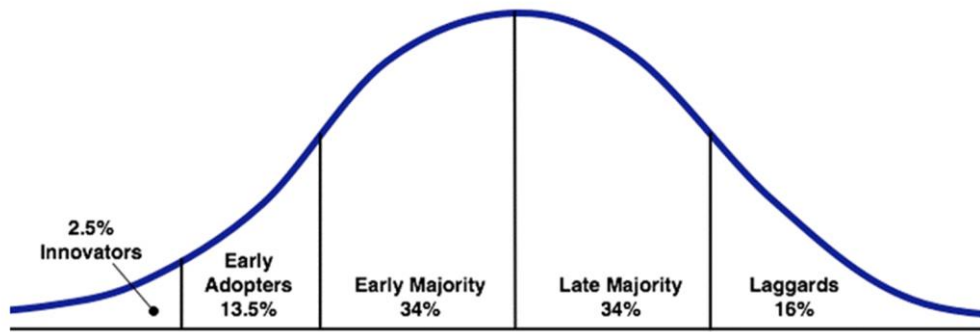


Figure 2.3: Diffusion of innovation curve (adapted from Rogers, 1995).

The DOI theory considered the rate at which innovations and technology spread through cultures, operating at the individual and organisational level. The degree of communication of the innovation and the willingness of individuals to adopt technology were important aspects. Resultantly, the theory highlighted that the ability of a portion of the population to adopt technology over a period, assumed, approximately normal distribution (Rogers, 1995; Oliveira & Martins, 2011, p.111). Categorising the normal distribution into 5 segments relating to the rate at which adoption occurred, defined the technology adoption curve. At an organisational level, the ability to innovate or adopt technology was dependent on characteristics of the leader and the organisation (both internal and external). The DOI model served as a foundation for the TOE framework.

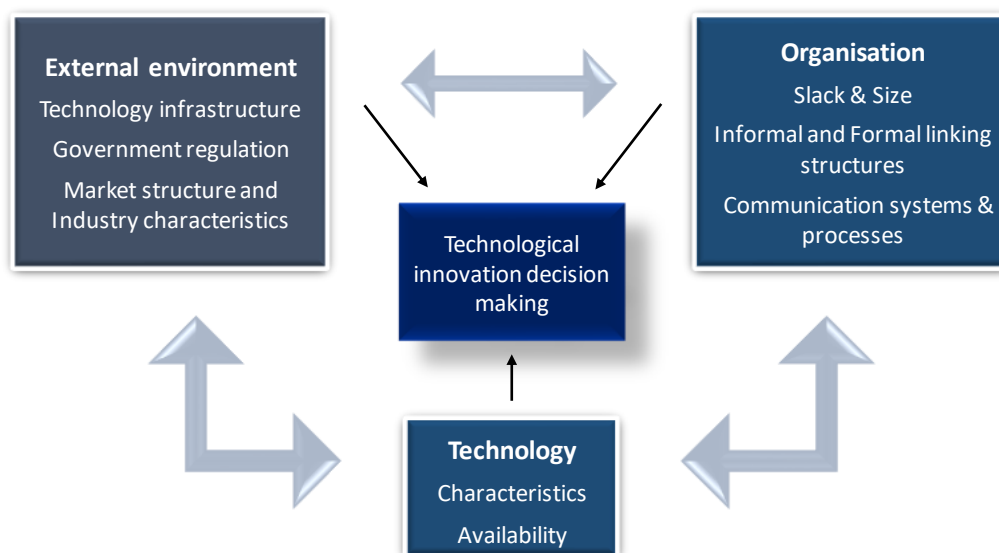


Figure 2.4: Diagrammatic representation of the TOE framework (adapted from Oliveira & Martins, 2011; Tornatzky et al., 1990).

The TOE framework depicted in **Figure 2.4** outlined three aspects which influenced an organisation's ability to adopt and implement technological innovation. This included, environmental, organisational and technological settings (Oliveira & Martins, 2011, p.112). Thus, while the model showed similarities to the DOI model from a technological and organisational viewpoint, the TOE framework also included a new dimension which was the environmental consideration. It was reported that the TOE framework enabled an improved explanation of intra-organisational innovation diffusion. Oliveira and Martins (2011) presented an excellent review (cited 957 times as of Oct 2019), of the studies which adopted the TOE framework only (p.113) and with the DOI theory (p.117, 118). A combination of frameworks has previously been used to analyse the adoption of technology across different industries. Oliveira and Martins (2010) used the TOE framework together with an electronic data interchange (EDI) model (Iacovou et al., 1995) depicted in **Figure 2.5**.

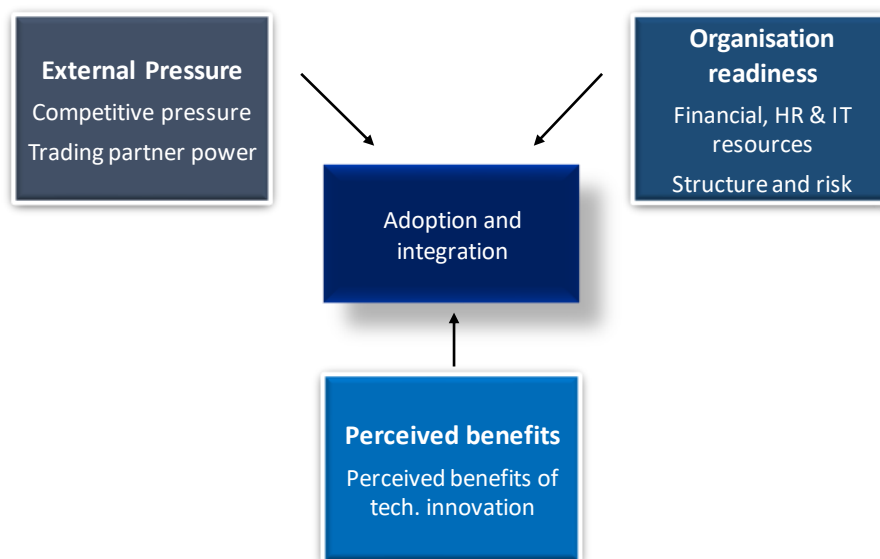


Figure 2.5: Schematic of the EDI model for technology adoption (adapted from Oliveira & Martins, 2011; Iacovou et al., 1995, p.467).

Iacovou et al. (1995) analysed characteristics relating to interorganisational systems which influenced organisations' ability to adopt technological innovations. This framework for technology adoption was underpinned by organisational readiness, external pressure and perceived benefits. Organisation and technology from the TOE framework were fused into organisation readiness (indicated through the colour coding), while external pressure included the restrictiveness of trading partner power. Perceived benefits was a newly introduced dimension. Interestingly the article

published by Iacovou, Benbasat and Dexter in 1995 received 2937 citations to date (Oct 2019). According to Oliveira and Martins (2011), this model was best suited to explain technology adoption at an interorganisational level.

For the purpose of this research, the EDI model which was grounded in the TOE and DOI frameworks were utilised to explore critical factors which influenced the rate of technology adoption. From an external perspective, governance or regulation (as per the TOE model) was considered. Under the umbrella of organisation, communication and culture were considered. Structure, financial resources and risk appetite were also interrogated.

2.3.2 Factors influencing technology adoption

In 2013, initial findings from a research study by Frey and Osborne (2013) received much criticism for reporting that approximately 47% of US workers were at risk of losing their jobs to automation. Scholars indicated that jobs comprised of tasks which may not be easily automated (Autor, 2015), and that new jobs were likely to emerge with the creation of new industries (Mokyr, Vickers & Ziebarth, 2015). Also, people were inclined to adapt and improve their skillsets in reaction to technological advancements (Hirschi, 2018). Interestingly, research by Frey and Osborne was published in *Technological Forecasting and Social Change* (H-index 93) a few years later (Frey & Osborne, 2017).

Since people were a key component during the adoption of technology, creating awareness was an important part of the process. According to Russel and Hoag (2004), user awareness and organisational culture were key reasons for the unsuccessful implementation of technology. This was concerning given earlier discussions regarding technology adoption and strategy implementation (Bharadwaj et al., 2013; Lui et al., 2016). According to the highly cited (7370 citations as of Oct. 2019) publication by Kotter (1995), ineffective communication was one of the main barriers to strategy implementation.

Cummings, Bridgman and Brown (2016) reported that some of the best-known change management frameworks, including Kotter's (1995) 8 step change model, followed the format of Kurt Lewin's change as three steps (CATS) model (Cummings, Bridgman & Brown, 2016, p.42). Interestingly, what was regarded as "*change*

management's foundational framework" was ironically never meant to be a change management tool. Instead, the theory was based on (i) group communication prior to devising a plan and (ii) understanding the interaction of people within groups (p. 36,37). Since most well-known change management theories were founded on the CATS model, the relationship between change, communication and strategy implementation should not be understated. Regarding the interaction of people within groups, this was grounded in the theory by Edgar Schein (1985; 2010) relating to culture.

Schein (2010, p.18) described culture *"as a pattern of shared assumptions learned by a group as it solved problems of external adaptation and internal integration, which worked well enough to be considered valid"*. It was further described that this way of thinking and behaving was passed on to new members as the correct way. Hence, the phrase *"(that's) the way we do things around here"* (Sun, 2008, p.137). Thus, external adaptation and internal integration was an important aspect of the operating environment as far as culture was concerned.

According to Trompenaars and Woolliams (2011) 'failure' in internally controlled cultures was managed through procedures and planning while externally controlled cultures regarded 'failure' as inevitable and necessary, to grow skills necessary to address circumstances. Internally controlled cultures created rule-centred, inflexible organisations with mountains of red tape. However, these organisations proved to be less wasteful and more cost focussed, since they did not repeat mistakes. In contrast, externally controlled organisations that were relationship-based, were more adaptable and tolerant of 'failure' which encouraged learning and innovation (p.3). It was further reported that these types of organisations encouraged higher risk taking, unlike *"when the willingness to risk failure is moderated by a fear of not achieving"* (p.5). Resultantly, innovation was dampened. In the context of technology advancements, innovation was a key contributor. As previously indicated, this was one of the main reasons why organisations shifted from functional and matrix structures to customer centric and process type structures (Cummings & Worley, 2015, pp.339). Therefore, the correct alignment between culture and organisational structure was crucial.

Trompenaars and Woolliams (2011) also documented that organisation could combine the virtues of rule-based and relationship-based operations (p.3). In doing so, it would allow organisations to maintain the status quo, while innovation flourished. Business incubators were one such way of ensuring the success of this practice, and subsequently the organisation (Mas-Verdú, Ribeiro-Soriano & Roig-Tierno, 2015). The key objective of business incubators was to assist innovation while day-to-day business activities continued (p.793). In the current era of mega-trends, rapid technological advancements and changes in globalisation, innovation was imperative for the survival of organisations (Lee & Trimi, 2018), especially when considering the impact of Moore's law. The law described the exponential growth of computing performance, where smaller units performed more powerful operations at a faster rate (Denning & Lewis, 2016) and at a lower cost (Kurzweil, 2004). However, during rapid technological innovations, regulation was an important factor.

The pace of change of technology makes it difficult for regulations to keep up. Fenwick, Kaal and Vermeulen (2017), reported that it has become more difficult to design regulatory frameworks which ensured *"safety of users and the public, whilst facilitating the commercial use and consumer enjoyment of disruptive innovation"* (p.567). For this reason, regulatory interventions have become difficult and regulators often implement unnecessary regulation or do nothing. This makes it difficult for adoption of new technologies into the market (p.561). It was proposed that the regulatory disconnect be addressed through regulation of innovation (Butenko & Larouche, 2015). This included the merger of disciplines in literature, between law and economics and law and technology. The financial status technology adoption was the last factor considered for this section.

It was previously reported that financial resources in some organisations (mostly small-medium enterprises) restricted technology adoption. Consequently, limited financial resources required a more focused approach when investing in technology. It was further reported that implementation of new IT software and hardware required long term investment. The same was documented about IT infrastructure costs (Ghobakhloo, Hong, Sabouri, & Zulkifli, 2012, p.43). However, it was argued that in recent years the costs for information, communication and technology (ICT) capabilities have been reduced which has lowered financial barriers for new entrants (Neirotti, Raguseo & Paolucci, 2018). It was mentioned above that organisations tend

to waste costs when it comes to IT-business alignment (Coltman et al., 2015; Rahimi et al., 2016) and this could be a possible reason for organisational limitations when it comes to financial resources. In the final section of this chapter, the suitability of strategic models, for organisational effectiveness during rapid technological innovations, were considered.

2.4 Strategic frameworks during technology innovation

The alignment between strategy and operations have become increasingly important to deliver on organisational effectiveness (Cummings & Worley, 2015). Traditional business tactics were grounded in Porter's five forces strategy framework (Porter, 1980), where organisations were biased towards defending their current position. According to Porter, the essence of strategy formulation was coping with competition (p.34) and the five forces model (p.36) described the elements which governed competition in an industry. This included three forces of competition on the horizontal plane namely, threat of new entrants, threat of substitute products or services and threat of established rivals, as well as two forces of competition on the vertical plane, the bargaining power of suppliers and the bargaining power of customers. However, rapid technology innovations have prompted businesses to rethink their strategic approach (Hales & Mclarney, 2017). Scholars have questioned the exclusive use of Porter's strategic framework in the internet economy (Dälken, 2014; Alam & Islam, 2017; Hales & Mclarney, 2017). In a world fuelled by continuous innovations, it was reported that most strategies become irrelevant over time because of changing environments (Hales & Mclarney, 2017, p.20).

2.4.1 Impact of technology on five forces

As previously explained, the cost of technology has been reduced over the years which has lowered financial barriers for new entrants (Neirotti et al., 2018). This enabled larger economies of scale with less capital investment. Since Uber burst onto the scene in 2009, the threat of substitute products or services has been redefined through platform technologies. Increased globalisation and interconnectivity (Lee & Trimi, 2018) sparked the growth of application-based technologies. Cramer and Krueger (2016) indicated reasons why this type of business model such as the uber application was more successful than traditional services. New rivalry has impacted business models which has redefined the

business landscape (Lui et al., 2016). With lower barriers to entry suppliers have integrated to move forward, thus creating increased competition (Hove & Masocha, 2014). Resultantly, changes in the business environment have impacted the customer, where the buyer has become spoilt for choice and instant gratification or ‘speed of delivery’ was an inherent expectation (Daugherty, Bolumole & Grawe, 2019). Therefore, understanding customer needs was essential for ensuring customer experience was. Customer experience was defined as *“every point of contact at which the customer interacts with the business”* which should result in *“a win-win value exchange between the retailer and its customers”* (Daugherty et al., 2019).

2.4.2 Blue ocean strategy

Almost two decades ago, Kim and Mauborgne (2000) explained that the customer experience when purchasing a product or service passes through six stages. This was referred to as the buyer experience cycle (p.132). Six utility levers cut across the buyer experience cycle and were available to the organisation, to unlock different utility propositions for the customer. This 6 x 6 matrix including buyer experience and utility levers was referred to as the ‘Buyer Utility Map’ and is depicted in **Figure 2.6**.

The Six Stages of the Buyer Experience Cycle						
The Six Utility Levers	1. Purchase	2. Delivery	3. Use	4. Supplements	5. Maintenance	6. Disposal
	Customer Productivity					
	Simplicity					
	Convenience					
	Risk					
	Fun and Image					
	Environmental friendliness					

Figure 2.6: Representation of the buyer utility map (adapted from Kim & Mauborgne, 2000).

It was reported that by positioning a new product in any one of the 36 spaces on the buyer utility map created customer proposition or benefit different to existing product offerings (p.130). However, organisations often delivered the same utility at the same

stage of the customer experience i.e. there was often a high concentration in the same areas within the buyer utility map. Organisations that operated in the traditional manner reduced growth and profit as a result of limited demand in the market (Mi, 2014). The competition for existing market share referred to the market in its present context and was termed 'red ocean'. In contrast, the market that was not yet defined where possibilities were endless but dependent on the organisation was coined 'blue ocean' (Kim & Mauborgne, 2004). The blue ocean strategy referred to a theoretical framework of strategy which considered creating a new demand for an uncontested market space instead of competing for existing demand within the red ocean (p.77). **Table 2.1** highlighted the differences between blue and red ocean strategies.

Table 2.1: Red ocean versus blue ocean strategy.

Red ocean strategy	Blue ocean strategy
Competition within current market environment.	Creating demand for a new uncontested market space.
Beat the competition.	Make the competition irrelevant.
Exploit the current demand.	Create new demand.
Structuralist stance	Reconstructionist approach
Make the value/cost trade-off.	Break the value/cost trade-off.
Alignment to strategic choice of differentiation or low cost.	Pursue differentiation and low cost.

(adapted from Kim & Mauborgne, 2004).

The structuralist approach from a red ocean perspective was where organisations build a distinctive position with abundant resources to outperform competitors (p.81). However, this approach has become less suitable given the reduced cost of technology has lowered barriers to entry. Interconnectivity and globalisation have demanded a new approach to strategy. The reconstructionist approach taken by blue ocean strategy has called for the creation of uncontested market spaces where customer experience was not based on value/cost trade off (p.81). Through this approach, physical structures were no longer regarded as barriers to entry. The revised approach to strategy enabled a revised approach to the costing model as indicated in **Figure A.1** of **Appendix A** (Kim, & Mauborgne, 2015). In this regard, it was documented that the right strategic sequence was required to build the blue ocean strategy (p.118).

This approach considered pricing at the beginning of the strategic approach which implied value proposition for the buyer through reduced costs of competition. This is not unlike what Martins and Fernandes (2015) prescribed, above, where customer value be placed at the start of the strategy process. As a service solution (Demirkan et al., 2015) was one the ways in which organisations adapted business models and ensured customer value was a key component formulation of the strategy. This type of business model created new opportunities and enabled revenue growth through improved innovativeness, efficiency and effectiveness within organisations (p.734).

2.5 Conclusion

Literature research showed that components acting in the organisational model contributed to the alignment between strategy implementation and organisational effectiveness. Given the rate of technological innovations, scholars considered the relationship between IT and business strategies as an important field of study for this practice. From literature, the interdependency between technology and organisational components was evident. However, the level of importance of components was not defined in literature. Therefore, in order to determine the effectiveness of technology in relation to strategy implementation, the first part was to understand the level of importance of technology among other organisational components. This was the reason for the first research question.

From literature it was understood that technology had to be adopted into the business to enable processes, improve organisational performance and enhance customer value. However, for the purposes of understanding the limitations of technology adoption the factors which influenced technology adoption had to be considered. Hence, the second research question.

To gain deeper insight into the alignment between IT and business strategies, it was suggested that scholars should focus more on measurable goals such as business value or customer satisfaction since there was limited research regarding this aspect in literature. For this reason, the last part of this research investigated the relationship between the rate of technology adoption and organisational effectiveness

Chapter 3: Research Questions

3.1 Introduction

The objective of this research was to determine the effectiveness of technology adoption in relation to strategy implementation. As indicated in Chapter 2, the formulation and implementation of strategy is an iterative process with the aim of achieving organisational effectiveness. Organisational effectiveness can be determined by measuring outputs. This study considered the role of technology in this process, where the unit of analysis was the organisation. To address the research objective, three research questions were put forward to methodically understand this situation. However, given the inductive approach of this study, the research questions were revised based on observations and patterns which emerged during data analysis. This was further explained in **Section 4.2**. Also, owing to the semi-structured design of the interview, the order of the open-ended interview questions was not determined ahead of time (Merriam & Tisdell, 2016, p.110,111). For this reason, the interview questions contained in the research instrument (**Appendix B**) were not sequentially aligned to research questions.

3.2 Research Questions

Research Question 1: What is the level of importance of technology compared to other components in strategy implementation.

The aim of Research Question 1 was to identify the **level of importance** of technology among other components in strategy implementation. From literature, it was understood that the alignment of key components influenced strategy implementation. These components included, human resource systems (HRS) which included human capital, management processes, organisational structure and technology. However, there was no indication of the level of importance among the components, in particular technology. To understand the effectiveness of technology in the implementation process, it was important to determine the level of importance and subsequently the role of technology in the organisational model (explained in Chapter 2). From the research instrument, interview questions 1, 3, 10 and 11 were used to gain a deeper understanding into Research Question 1.

Research Question 2: What is the rate of technology adoption when considering influencing factors.

The aim of Research Question 2 was to determine the rate of technology adoption in organisations when considering influencing factors. For technology to effectively enable strategy implementation, the rate at which technology was adopted at an organisational level was important. For this research, the rate was dependent on specific factors namely, financial resources, compliance, risk appetite, structure and culture. To gain a true assessment of the rate of technology adoption, the strength of a factor's ability to influence the adoption rate was taken into consideration. Interview questions 4 – 9 were put forward to gain deeper insight into this research question.

Research Question 3: What is the relationship between the rate of technology adoption and organisational effectiveness.

In the introduction to this section, the link between the rate of technology adoption and strategy implementation (organisational effectiveness) was explained. Research Questions 1 and 2 established the foundation for this study. Research Question 3 was designed to determine if there was a relationship between the rate at which technology was adopted and organisational effectiveness. Interview questions 2 and 11 were the key questions in this regard.

The research questions formed the foundation of this study and were designed to address the gap in literature. The research questions were formulated to systematically explore the importance and adoption rate of technology in a systemic environment. The reason for this was to address the concern indicated in Chapter 1. The following chapter provided a description of the research methodology undertaken for this study.

Chapter 4: Research Methodology

4.1 Introduction

This chapter provided a description of the research strategy undertaken for this study. The qualitative techniques used in the approach to the research methodology showed an alignment between the new insights, which emerged from this study, and the research questions. Data captured through open-ended questions from 16 respondents were analysed using coding techniques. The processes of ensuring reliability and validity of data was documented in detail, while ethical obligations were adhered to throughout the study. Limitations to research were also articulated, for the benefit of future studies.

4.2 Research approach and design

A qualitative strategy underpinned the research methodology for this study. In their book, Merriam and Tisdell (2016, p.14-15) reviewed a few definitions of qualitative research. The underlying concept centred around using interpretive techniques to gain deeper insight into *“the meaning, not the frequency”*, of practice. In this regard, qualitative research took into consideration the way people ‘felt’ about a situation based on their experiences and what meaning they gave to it (p.24). For this study, as described in Chapter 3, it was important to understand ‘how’ and ‘why’ factors (social actions, some of which include human behaviour), impacted strategy implementation, by negatively influencing technology adoption. This formed the basis of an interpretivism philosophy used in this work (Bell, Bryman & Harley, 2019, p.31). In interpretive research, there were no single, set realities, but rather different ways in which situations were interpreted (Merriam & Tisdell, 2016, p.9). This was not surprising since in qualitative research, words were used as data and this could be *“collected and analysed in all sorts of ways”* (Braun & Clarke, 2013, p.3).

In this study, data was collected through a research instrument which comprised open-ended questions and a Likert scale. However, it must be stressed, the number assigned to qualitative pieces of data on the scale was only a representation of the data (Luftman et al., 2017, p.33-34). The main purpose of the data collection tool was to understand the meaning of the event, and not the behaviour as in positivism philosophy, which was usually associated with quantitative research. The process of data analysis was discussed in **Section 4.8**.

What was also important, was that this study did not attempt to draw inferences from the frequency of an occurrence and write it up as a conclusion, which was indicative of quantitative research too. Furthermore, there was no attempt to confirm or disprove any concept by means of hypotheses testing as in the case of quantitative research, which was closely associated with a deductive approach (Bell, Bryman & Harley, 2019, p.24). In contrast, this study made use of an inductive process which was consistent with qualitative research. However, it was noted that inductive and deductive approaches were likely to involve elements of one another (p.23). **Figure 4.1** illustrated the deductive and inductive approaches.

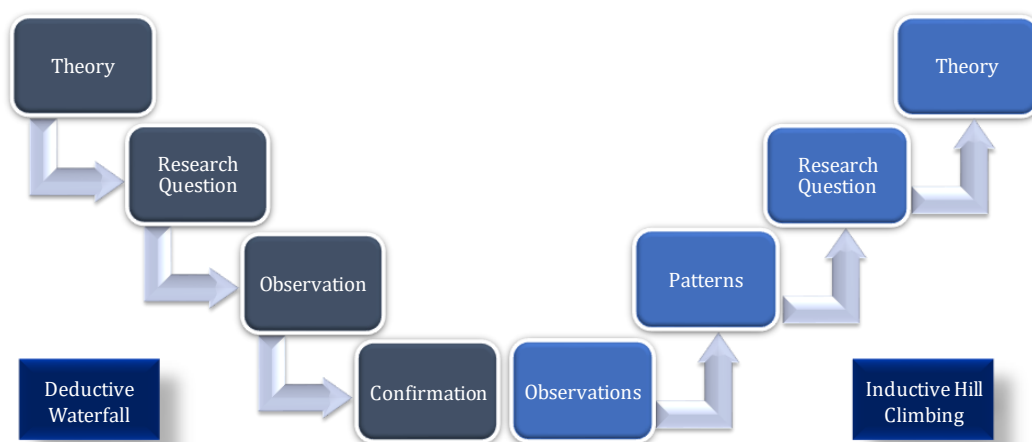


Figure 4.1: Diagrammatic representation of inductive versus deductive approach (adapted from Burney, 2008).

As illustrated in **Figure 4.1**, an inductive process began with observations from which theory could be derived. According to Saunders and Lewis (2018, p.113), the flexible design of an inductive approach “*permits changes of research emphasis as the research progresses*”. It was for this reason, that while the interview questions in the research instrument remained the same, the research questions (in Chapter 3 and the research instrument) did not. For the purpose of this research the terms ‘theory’ and ‘observation’ in **Figure 4.1** must be explained. Observation did not refer to viewing the phenomenon being investigated, instead it referred broadly to the data acquired through interviews. Observation included field notes, recordings and visual cues which were utilised in this study (Merriam & Tisdell, 2016, p.115-116). In terms of the word ‘theory’, Bell, Bryman and Harley (2019) explained that while some research resulted in new theory being developed, others ended up with new insights (p.23). In this study new insights emerged through interviews.

From **Figure 4.1**, the exploratory research was conducted as follows. First, observations (as defined above) was conducted during the interview process, second; patterns were identified from the responses of the research participants (during the analysis of data), third; the patterns were traced to the research questions (as mentioned above, this process resulted in minor changes to the research questions), lastly; this was linked 'back' to theory to draw comparisons between the literature and the analysed results. Thereafter, recommendations and conclusions were put forward to build on the exploratory study.

Exploratory research aimed to provide new insights while clarifying any ambiguous situations through open-ended questioning techniques. It was not intended to provide definite evidence for a set course of action, instead tentative answers to initial questions, which could be later followed by more detailed research (Saunders & Lewis, 2018, p.115).

Open-ended questions formed the foundation of the semi-structured interviews, and it allowed participants the opportunity to define the situation as a narrative. A narrative inquiry was not only the oldest but also the most natural form of sense making (Merriam & Tisdell, 2016, p.23). According to Daiute (2014), *"narrating is a social process occurring in everyday life and, thus, in research interactions"* (p.xviii). Semi-structured interviews also provided an allowance for parts of the interview to be structured, where specific information was required from all participants (Merriam & Tisdell, 2016, p.110). Structured parts of the interview were required when respondents were requested to rank certain factors. All data was collected from research participants once only. This cross-sectional approach considered a snapshot view of the situation, which was suitable given the research objective and the time constraints of research (Saunders & Lewis, 2018, p.130).

4.3 Population

According to Krieger (2012), members of a population individually possessed attributes which allowed them to be part of a specific group. For this study, the population included members in senior management or executive roles which comprised CEOs, managing directors, directors, and senior managers. The attributes for membership included institutional experience and knowledge as well as being technologically savvy. The criteria for sampling in **Section 4.5.2** described

attributes for membership in more detail, which presented a clearer understanding of the population.

4.4 Unit of analysis

This research study explored the effectiveness of technology adoption in relation to strategy implementation. What was critical here was to determine the improvement of strategy implementation, be it through improved functioning of technology or improved rate of technology adoption. This was noticeable in the build-up to Research Question 3, which considered the relationship between the rate of technology adoption and organisational effectiveness. However, factors influencing the rate of technology adoption had to first be investigated. Thus, in-depth interviews were carried out to gain deeper insight into this phenomenon. The captured responses enabled the design of a scoring system which was used to rank factors according to the restrictive ability in relation to adoption of technology. This provided a basis to explain variance among organisations when adopting technology (Sekaran & Bougie, 2016, p.103).

The research participants were the individuals being interviewed or observed, from whom the information was retrieved. However, this study was not about the individuals, it was about how organisations were impacted in terms of organisational effectiveness when specific factors influenced technology, and technology adoption. Thus, the unit of analysis (p.103) in this study was the organisation.

4.5 Sampling method and size

For this study, it was impractical to gain access to the entire population. Therefore, a non-probability sampling technique was used. This was suitable for qualitative analysis and often required small sample sizes (Saunders & Lewis, 2018, p.141). There are different types of non-probability sampling techniques, but for this work only non-probability, purposive sampling was used (p.145). The use of this technique called for judgment to be applied, based on specific factors, when respondents were selected. Specificity in sample selection ensured only appropriate research participants were selected for this study. This involved a fair amount of pre-screening prior to the interview (as indicated in **Section 4.5.2**).

4.5.1 Point of saturation

A total of 16 research participants were identified and interviewed. It was noted during coding of the data (discussed in **Section 4.8**) that the sample demonstrated saturation early in the process. In their book, Merriam and Tisdell (2016) reported that sampling should be carried out until no new information was forthcoming. This was referred to as a point of saturation or redundancy. At this point, the responses received from interviewing any 'new participants' sounded similar to the previous responses (p.101). Coding of data only commenced after interview 12. Therefore, even though saturation was reached earlier it was only realised later. This was similar to the findings by Guest, Bunce and Johnson (2006). The publication which was cited 10945 times (as of Oct 2019) described saturation by the absence of new codes, upon additional interviews being conducted. In this study, the coding process resulted in 68 codes from the first interview, which was followed by 8, 4 and 1 new codes from the second, third and fourth interviews respectively. Thereafter, no new codes were generated. A graphical representation of the findings was depicted in **Figure 4.2**, which showed similarities to the illustration by Guest et al. (2006, p.67).

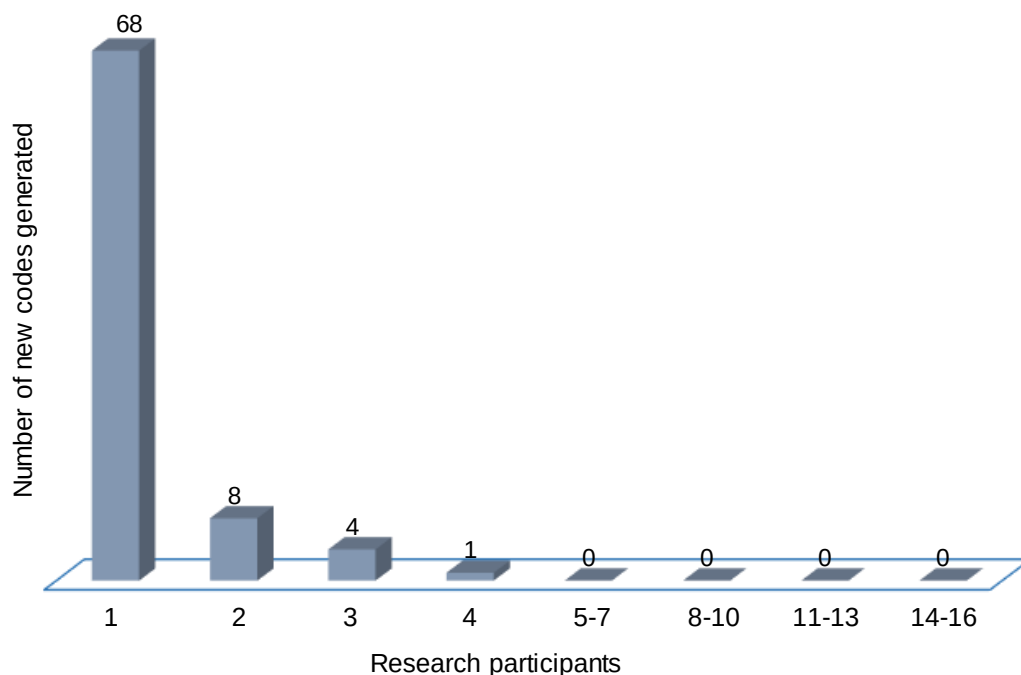


Figure 4.2: Code creation over the course of data analysis.

According to Paton (2002, p.244), there were no set rules when it came to sample size in qualitative inquiries. What was important were the insights, validity and meaningfulness generated from the sample for research. What was also important

was that the credibility of purposeful sampling was not judged on the criteria of 'probability sampling', such as logic and sample size. Instead it was based on whether it supported the purpose of the research (p.245). For this reason, the sample was carefully selected to ensure deeper insight was provided into the research topic. One of the benefits of purposive sampling was that it allowed suitable research participants to be selected, which enabled valuable contributions for this study. Sample selection was governed by guiding criteria.

4.5.2 Sample selection

Purposive or judgemental sampling was used to select suitable research participants for this study. First, the research participant was expected to provide insight into the research topic based on current or previous working environments (this referred to institutional experience and knowledge). The expectation for the working environment was that it comprised an organisational structure, where staff were employed to carry out functions within the company. This was important since organisational cohesiveness and structure were factors investigated to gain deeper understanding into the rate of technology adoption.

Further to this, since cultural factors differed geographically (Peet, 1998) the study was limited to organisations operating in the Gauteng region. It was expected that the organisation provided a service or product which required a pricing model. This was important to narrow the scope of what was referred to as organisational effectiveness, linking back to strategy implementation. The organisation should have recently adopted new technology relevant to the core functioning of the business. Next, the research participant should have at least five years of experience in a senior management or executive role, with a good understanding of the organisational strategy, and the contribution of technology towards strategy implementation in the organisation. However, it was required that this coincided with the above conditions. As mentioned, a thorough pre-screening was conducted prior to setting up an interview. **Appendix B** showed the interview schedule which contained the research instrument used for data collection.

4.6 Research instrument

The research instrument was the data collection tool which included open-ended questions, used in semi-structured interviews to obtain deep insight from respondents into the research topic. This process of verbal interaction allowed research participants to provide opinions on the topic based on experiences in their organisations.

4.6.1 Pilot testing

The interview schedule including the research instrument was revised based on recommendations which emerged from the research proposal. The interview schedule was tested through a pilot study with a work colleague. However, an oversight in this regard was that the work colleague was not a member of the population. This resulted in problems within the first few interviews. The research instrument had to be revised and resubmitted for ethical clearance. Ethical clearance was obtained again (**Appendix C**), and this mishap did not occur the second time around. Pilot testing the interview schedule ensured all the correct elements, which enhanced data collection, were considered prior to the first interview (Kallio, Pietilä, Johnson & Kangasniemi, 2016). Also, the pilot testing was conducted with a member of the identified population (Chenail, 2011). Further to this, the pilot testing not only provided an indication of how the interview should be paced, but also served as a guide of how to remain impartial during the process.

4.6.2. Scoring system

From the dataset acquired from the research instrument, a unique scoring system was designed to determine how the factors ranked in terms of most restrictive to least restrictive in terms of adopting technology. Construction of the scoring system was described in detail in **Section 5.5**. Briefly, the format used to design the unique scoring system was as follows. First, a total count (among all respondents) was taken for each box selected on the Likert scale. Next, the categories on the Likert scale were allocated points on a sliding scale basis with the most restrictive category awarded the highest points. Thereafter, the total count within each block, for each factor was multiplied by the points allocated to the specific category. The points for each of the factors was added to establish ranking. The factor with the most points was regarded as most restrictive towards technology adoption. The calculated

weighting reflected the same. The weightings were important and were also utilised to calculate the 'actual' rate of technology adoption.

4.7 Data collection

During the process of gathering data, research participants were contacted telephonically, to request an interview. The research topic was explained during the telephonic conversation and based on the availability of the participant; an appropriate meeting time was scheduled. The venue of the meeting was held at a location which was most convenient for the respondent, in all cases this was the working address of the respondent. This was important since it has been reported that a safe and comfortable environment allowed interviewees to share experiences openly (Kallio et al., 2016). Also, as previously indicated field notes, recordings and visual cues were considered as observation. In addition, data collection through face-to-face interviews allowed the researcher to clarify any misunderstanding. The research participant was given assurances regarding total confidentiality as outlined in the consent form (**Appendix D**).

The duration of the interviews was agreed to a maximum time of 60 minutes, with the longest being 63 minutes. However, permission was requested from the participant to exceed the allocated time. Owing to the flexible nature of semi-structured interviews, the order of the questions was dependent on the response received from the participant, with some questions being omitted when participants answered questions in narrative responses to a forthcoming question. Probing questions were asked when necessary, which ensured richness of the data collected.

4.8 Data analysis

Data analysis commenced during data collection. The analysis process made use of a conventional method, which included observations during the interview process and thereafter coding of data. While data analysis commenced during observation which included field notes, recordings and visual cues, potential biases were considered as indicated earlier (*permission was requested to audio record the interview, and field notes were taken to limit bias*).

As part of the analysis process, audio recordings were taken and this ensured everything was preserved (Merriam & Tisdell, 2016, p.131) for the coding process. The services of a transcriber were not utilised, instead a transcribing application as used as previously indicated. The transcripts of the audio recordings were 'played back' and the transcription was 'cleaned' where necessary, for purposes of the data coding process. Revision of the transcripts provided an advantage of intimate familiarity with the data (p.132). This iterative process ensured alignment between the recorded data and the coding.

Qualitative analysis software, Atlas.ti8 was used to code the data. According to Saldana (2013), coding was defined as a systematic approach towards sorting data obtained from interviews with the aim of making sense of the views put forward by respondents. The technique of descriptive coding, which used descriptive nouns to enable an overall grasp of the study, was used during the coding process (p.91). The coding process resulted in 68 codes from the first interview, which was followed by 8, 4 and 1 new codes from the second, third and fourth interviews respectively. Thereafter, no new codes were generated. This was indicative of saturation, since no new information emerged (in the form of codes) from the remaining interviews. The codes were then grouped into 16 categories which aligned to the research questions (Braun & Clarke, 2013, p.234). The codes were grounded in quotations from the participants. The dataset for the codes were presented in **Table E.1** and **E.2** of **Appendix E**. Unfortunately, descriptive coding alone did not allow for more complex and theoretical analyses (Saldana, 2013, p.91). For this reason, excel coding was used to complement descriptive coding. In excel coding, the data captured on the Likert scale in the research instrument (**Appendix B**) was interrogated to establish patterns consistent with the narratives (Luftman et al., 2017, p. 33). Reasons for the 5-point Likert scale used in qualitative research has been reported (p.34). What was important was that respondents were provided with an opportunity during interview discussions to elaborate on these considerations (p.34).

4.9 Quality controls

Reliability and validity formed a critical component of the research study. For this reason, the qualitative investigation had to be consistent in terms of quality and trustworthiness (Golafshani, 2003). Reliability and validity of the research instrument was verified through a pilot study of the interview schedule. The process of creating

open-ended questions and conducting semi-structured interviews was researched in greater detail (Kallio et al., 2016). Two (probing) questions were included and the supporting grid to understand customer benefit was modified post pilot interview. This ensured there was consistency in the research instrument when conducting all 16 interviews. The interview schedule was also checked by the research supervisor.

Permission to audio record interviews was requested, and field notes were taken to limit potential bias. The audio recording served a dual purpose of transcribing while recording. This was carried out using a paid version of the Otter application which transcribed the interviews with approximately 90% correctness in word recognition. Further to this, the application differentiated between speakers and included time stamps during the process. This made the process of data conversion a lot easier. The transcripts and the audio recordings have been saved in the original format, if required for authentication. The transcripts together with the audio recordings were analysed to create codes. This was previously explained in **Section 4.8**. Research participants were given assurances that the audio recording will be treated with total confidentiality.

Ethical clearance requirements of this study were explained to research participants before the start of the interview. The research participant was given assurances regarding total confidentiality as outlined in the consent form. The consent form was approved through the ethical clearance process. All participants read the consent form and having accepted the assurances outlined within, the form was signed by the research participant and the researcher. In this report, the names of the research participants have been substituted with aliases. Also, the names of organisations have not been included.

This chapter provided a detailed description of the research strategy. New insights were explored during analysis of the data, from which themes were identified through a dual coding process. Analyses of the data showed an alignment to the research questions. The research questions were enabled through a research instrument which was tested for reliability and validity. The results of the analysed data were presented in Chapter 5 and discussed in Chapter 6. However, it should be noted that there were also limitations to the research methodology, as explained below.

4.10 Limitations

Qualitative research techniques were reported to be subjective and prone to biases (Merriam & Tisdell, 2016). In an interview situation, both the interviewer and the respondent were reported to be biased in terms of physical characteristics, attitudes and a sense of disposition to the process (p.130). Field notes and transcripts from audio recordings were utilised to guard against potential biases. However, there were no guarantees that the process was flawless, which presented a possible limitation.

Also, this study constituted a cross-sectional time horizon, which presented a snapshot of the situation. Thus, a potential limitation in this regard was the inability to suggest recommendations and follow up with respondents to determine if the practice had improved or not.

In terms of theoretical constraints, according to Bell, Bryman and Harley (2019), there were limitations in deductive and inductive positions. While it was understood that exploratory research provided tentative answers to initial questions, it was understood that in terms of inductive reasoning, *“no amount of empirical data will necessarily enable theory building”* (p. 24).

There was limited expertise using the Atlas.ti8 software and for this reason descriptive coding was considered for the coding process. According to Saldana (2013), descriptive coding was an accepted form of coding for novice qualitative researchers. However, descriptive coding alone did not allow for more complex and theoretical analyses.

In terms of generalisability, it was understood that generalisation from the sample to the population happened in quantitative research if the sample was representative of the population. The goal of qualitative research was to understand the participants' views in depth, rather than to be able to generalise.

Chapter 5: Results

5.1 Introduction

This chapter documented the results collected from in-depth, one-to-one interviews. The results were discussed in line with the research questions in Chapter 3. Interview questions were used to explore the effectiveness of technology adoption in relation to strategy implementation. Given the systemic nature of this study, new insights were not always categorised as per research questions. Interpretation of emerging themes was outlined at the end of each research question.

5.2 Description of the sample

The sixteen research participants interviewed for this study were selected through judgemental sampling. This implied that suitable individuals were selected based on experience, current role within the organisation, and/or previous roles held. The research participants were considered knowledge in the area of research. The sample comprised 13 males and 3 females, with all individuals being either CEO's, managing directors, directors or senior managers (herein referred to as research participants, participants or respondents). All participants had experience in executing strategy within an organisation. Names and institutions of research participants have been omitted due to total confidentiality. The industries in this study included, manufacturing, financial services, technology, FMCG, public service, security and hospitality. This was indicated in **Table F.1** of **Appendix F**.

5.3 Presentation of results

The results were presented in line with research questions in Chapter 3. To eliminate category bias, the interview questions in the research instrument did not always fit the research question. Further explanation for this approach was outlined in **Section 4.2**. This approach allowed for deeper insight through a systemic undertaking of the effectiveness of technology adoption in relation to strategy implementation. For the purposes of this study, technology adoption was also referred to as 'adoption of new technology' or 'adoption of trending technology'. Technology was previously defined in Chapter 1. The results were presented verbatim from the narrative responses. **Table E.2** of **Appendix E** matched participants' responses to aspects covered within research questions. This provided rationale for the narrative responses.

5.4 Results of Research Question 1

5.4.1 Understanding strategy implementation

The first interview question, under Research Question 1, dealt with understanding strategy implementation, and to determine if there were any other components (other than those listed in the organisational model) which contributed to the process. Given the rapid rate of technological innovations, it was important to get an understanding of the process of strategy implementation i.e. if the process was linear or cyclic. From the findings, 11 respondents inferred strategy implementation was carried out through a linear at their organisations while 5 respondents inferred a cyclic process.

From the narratives, research participants primarily viewed implementation as a linear process, where several respondents referred to a route or path that needed to be taken to get to a destination. This was indicative of a linear process. However, as indicated some participants considered strategy implementation a journey of continuous adjustment, which was indicative of a cyclic process. One respondent stated, *“it is an implementation journey, where you measure in regular intervals to make sure your direction is still correct, and you can always adjust as you need to make sure you receive the desired outcome”*. Another respondent explained the process as a roadmap without knowing all the roads along the way, *“the implementation is the roadmap to actually get there, with a lot of the detail having to be figured out along the way”*. The process of strategy implementation was considered in relation to technology adoption in Chapter 6.

The next part of the interview question determined whether other components (other than those listed in the organisational model) also contributed to strategy implementation. Most participants had a good understanding of strategy implementation, where some provided a broad explanation, while others were narrow and focussed. One participant stated, *“it is an aligned vision that gets the company or the organisation from one place to another over a long period of time, creating value for its key stakeholders, as well as customers in every aspect”*.

Another participant indicated the necessity of key components and remarked, *“implementation talks to the who, where, how and what”*. Most of the research participants recognised the importance of processes, organisational structure,

people and technology in strategy implementation. One of the respondents commented, *“it is the process after the development of the strategy, it will take into account how to adequately and successfully implement the strategic objectives and goals that have been developed by the organisation in terms of financial processes, organisational, and technological”*. Financial processes were grouped as part of management processes. This implied there were no new elements which required further consideration in the organisational model. Thus, through the triangulated process, it was decided that the organisational model was suitable for this study.

5.4.2 Components contributing to strategy implementation

Interview question 3 required research participants to allocate points (from a total of 100), to establish importance among the four components. The results were presented in **Table 5.1**.

Table 5.1: Positional ranking of key components in strategy implementation.

Key Components	Positional Ranking			
	First	Second	Third	Fourth
Human resource systems	7	3	2	4
Management processes	4	8	4	0
Structure	4	4	3	5
Technology	3	6	6	1

Human resource systems had the highest number of first position rankings (7), followed by management processes and structure with four (4) each. Technology was ranked the lowest, with the fewest number of rankings in first position (3). A few participants allocated equivalent ranking for some components and it was for this reason that the rows in **Table 5.1** did not add up to the total number of research participants (16). A more detailed description of the results was presented in **Table G.1** of **Appendix G**.

The participants that listed technology in first position strongly emphasised that technology was nothing more than an enabler. One of the respondents commented, *“my guts says 50% towards technology, but if I could only implement one thing, it wouldn’t be technology. In reality you’re never going to only implement one thing, things have to move in tandem”*. The respondent further explained the tandem

relationship and stated, *“technology is almost sitting on a different plane from the other three (components)”*. The same respondent ranked Human resource systems in last position and explained, *“a lot of your HR things are coming out in your management and structure so if you get that right, HR has less of a role”*.

This inter-relationship between components was voiced by a few participants. One of the participants stated, *“once you have the people in place, you have the structure in place, and you have the management in place, technology is very easy to implement”* while another remarked, *“technology (as) an enabler that would go across the entire set”*. The respondent who ranked technology in last position stated,

“the reason why technology is ranked lower, is that it need not be a standalone, it needs to be integrated into every single process, into every single thing that is done”.

There was a consensus that technology served as an enabler. One of the respondents stated, *“I think you need your technology to be supportive”*. These sentiments were similar to the opinion of the third participant who ranked technology in first place. The participant awarded 35 points to technology and explained that the nature of their business was heavily reliant on technology. According to the participant, there were three viewpoints to technology, *“it's the technology, which is the equipment that (is) used, then the people that operate this technology, and the environment within which the technology is being aligned”*. The participant also allocated 30 points to Human resource systems based on **(i)** the ability to adapt human resources to respond to the changes in technology which was critical to the business, **(ii)** the ability to train and develop the human resources given the rapid pace of technology innovations.

Participants also commented on the use of technology to improve operational efficiency. One of the participants mentioned, *“strategy can be achieved through looking at things like operational efficiencies and streamlining businesses to such an extent to use technology at operational sites to enable things to be much faster pace with high efficiency and linked to a lower cost benefit”*. Another used an example to describe the phenomenon of technology enablement. The participant commented,

“if we look again at (our) trust business, when we first got involved, the industry norm was six weeks to set up a trust, over the course of about a two-year continuous drive, we got that down to 48 hours, absolutely revolutionary. I mean if you told a person it is going to take 48 hours to set up your product today, you are living in the stone age”.

From **Table 5.1**, structure was selected the most amount of times in last position. **Table 5.2** presents data for the organisational structure. The rank was indicative of the importance of structure among the four components. The concern ranking and risk appetite were taken off the Likert-scale responses. Type refers to organisational structure type. Risk appetite and strategy process were also included.

Table 5.2: Compilation of data for structure, risk appetite and strategy process.

Research Participants	Organisational structure			Risk Appetite	Strategy Process
	Rank	Concern Ranking	Type		
Participant 1	4	5	Federated	2	Cyclic
Participant 2	1	2	Divisional	1	Linear
Participant 3	1	5	Customer	5	Cyclic
Participant 4	4	4	Functional	2	Linear
Participant 5	2	5	Functional	2	Linear
Participant 6	4	1	Functional	3	Linear
Participant 7	3	4	Divisional	3	Linear
Participant 8	4	2	Divisional	3	Linear
Participant 9	2	1	Divisional	3	Linear
Participant 10	4	2	Matrix	4	Linear
Participant 11	1	5	Customer	4	Cyclic
Participant 12	3	1	Divisional	1	Linear
Participant 13	2	5	Functional	2	Cyclic
Participant 14	1	3	Functional	2	Linear
Participant 15	2	2	Divisional	3	Linear
Participant 16	3	5	Customer	4	Cyclic

The rank column indicated how respondents viewed the importance of structure in comparison to other components, where 1 = very important and (on the other end of the scale) 4 = least important. The concern ranking (for structure) and the risk

appetite were taken off the Likert-scale as indicated, where 1 = very likely to negatively influence technology and (on the other end of the scale) 5 = very unlikely to negatively influence technology adoption. All these parameters were discussed in Chapter 6.

A few of the respondents linked the set-up of the structure to the type of business as well as the people in the organisation. As indicated by one of the respondents, *“when I talk to structure, I’m talking about organisational structure, I’m talking people structure and that also talks to management processes”*. Another, stated, *“organisations should understand what type of structures allow them to be more flexible, adaptable and agile to deliver (on) the strategy”*. Another commented, *“structure always follows strategy and its very important to put your key people in the right seat, to get value out of them”*.

One of the respondents highlighted the importance of technology integration into the structure, *“structure is very much how you would implement technology, you have to be flexible enough otherwise projects as (you) implement them will become a mess”*. The respondent further explained that people were given the flexibility to fix problems and were not required to continuously to report ‘back’. Another respondent explained the situation from the opposite end of the scale. In this instance, a hierarchal structure was governed by procedures. The respondent commented, *“I work for a big company, a corporate, and it is very hierarchical, and there is a lot of governance in place, and processes”*. The respondent also explained that it admittedly challenging from time to time, for decisions to be taken quickly to implement technologies. Another respondent presented an overview of hierarchical structures. The respondent remarked,

“Under structure, the more levels the more hierarchy. The harder it is for people to adopt technology on an organisational level, they might on a functional level, a little pocket, but if you wanted to do, technology or digital transformation throughout an organisation, and get it embedded in there, the more hierarchy, the harder it's going to be”.

However, it should be noted that structure was not an inherent problem in larger organisations. One the respondents from a large organisation stated, *“we have a*

federated model, where every single product built around our customers operates as a small business... they have their semi-autonomous structure. So, it's agile and efficiency comes in form the way we are structured". However, one of the participants explained the importance of consolidation in federated models for improved customer value. The participant stated, *"for complementary products, historically, they've been run as discrete federated systems and its at a point now where we synergise our IT infrastructure, our processes to actually provide better value for our customer"*. In contrast, research participants from smaller organisations explained that while the structure was important, it was not a problem. 3 of the participants indicated that they had moved from a functional to a customer-centric structure and were concentrating on selling services as a means of improving customer value.

From **Table 5.1**, none of the respondents ranked management processes lower than third position. 12 of the research participants ranked management processes in either first or second position. It was understood that involvement of technology in management processes did not change the process itself, but served as an amplifier instead. One of the participants articulated, *"if you've got good processes technology will make them better, if you've got bad processes technology will make them worse"*.

The same participant explained that the stated-of-the-art software which their organisation implemented was a management process, enabled only through technology. The participant went on to explain that prior to the introduction of the glamorous software, there was an A0 piece of paper on the wall. This was the technology used to process information, make decisions, and assist with controlling operations in the organisation. The participant further explained, *"for the stage that those teams were in (the piece of paper on the wall) was sufficient, (and had the organisation) tried to roll this out at that point, it probably would have failed"*. It was understood that the newly implemented technological system only made things easier and quicker.

Another respondent described the relationship between structure, management processes and people at their organisation. According to the respondent the hierarchical structure in the organisation was designed for direct engagement, to prepare staff, especially for training of new technologies. The training was enabled through technology by means of an online platform. The structure allowed

management to monitor and engage staff on training which contributed to performance measurement. The respondent stated,

“tools are available to go and learn and understand. So, (for example) if I want to do training on office 365, somewhere (on the system) there will be training for office 365 that I can go and do, and it counts towards my hours of training that I must do in a year, but it's very self-driven”.

The respondent further explained that there were structured processes which forced people whether they liked it or not, to adapt, and if an individual did not adapt, they will slowly be forced out of company, which the respondent likened to *“pruning of a bonsai tree”*.

Another participant explained that the purpose of management processes was to deliver value to the business, while the aim of business was to concentrate on client relationships and people. The participant remarked, *“whether it's the tech, whether it's the management processes, it should just be there to enable the ability for you to maintain those client relationships, and keep your people motivated, empowered (and), engaged”*. The participant further explained that technology enabled management processes, structure and human resource systems. According to the participant,

“when most companies think of digital transformation, they have the wrong understanding. They think you can put it in this widget and the widget will fix all the problems, but tech only makes it easier, you still need that humanistic element. I still believe in the humanistic side, that is your value proposition for me”.

From the findings, human resource systems were viewed holistically as the most important component in strategy implementation. However, for technology to enable people, people must utilise the technology. As one respondent stated, *“you can have a bicycle, but if no one is going to ride the bicycle, then why have a bicycle”*, while another remarked, *“technology helps your human resources, when technology is in place it will make all those other channels or processes easier”*.

It was understood that technology enabled the human resource function to improve management processes. One of the respondents explained that in their organisation, technology made it possible for the human resource division to be positioned at a remote location and provide services through an online platform. The respondent mentioned, *“we view everything online such as payslips and leave days (and) if there’s some issue with maybe leave days, you pick up the phone and call them, but otherwise everything is done online”*.

Technology also enabled people to take up new responsibilities and assisted the organisation to move its strategy forward. One of the respondents explained the relationship between people and technology, *“while technology makes processes seamless and easier, it doesn’t make employees redundant, when processes become easier employees are utilised in other parts of the organisation”*. Another respondent explained how people were being enabled by technology to provide value on an organisational level. The respondent stated,

“people are upskilling themselves through training and further education and moving into other roles that take away the operational focus. Now with the understanding of processes, they are taking it to another level where they are adding value. They are not operational anymore, but there is another level forming and it’s creating a lot more value for us internally”.

The respondents were also probed on the role of the information technology (IT) unit in the organisation. Interview question (10) was put forward to respondents to gain a deeper understanding of the relationship between IT and business.

5.4.3 The role of information technology

Apart from the 3 technology companies and 1 other, the remaining respondents stated that IT has predominantly a supporting role in the business. On the side of IT companies, it was understood that there was more focus towards IT and business integration. One of the respondents explained, *“we are an IT company, we develop all the stuff”*. Another responded that IT was very involved in the decision making. Also, all the technology-based companies indicated that their organisations had CIOs in their executive committee (EXCO). This was recognised in only one of the other organisations.

On the other side of the scale, participants remarked that their business relied on IT for integration of new technologies into the business. However, the decision making of what (technology) was needed to be purchased was carried out by the individual business units, *"IT departments unfortunately doesn't always understand our business needs. So, what we would do is we would probably understand the trends in our specific areas of expertise, and look at various products, investigate costs, and also work with IT"*. What was also interesting was the same participant indicated that IT held the purchasing budget in order to avoid duplication of technology. It is therefore understood that while IT doesn't make the decision on what to purchase, IT held the purse strings. Another participant mentioned that in their organisation management was responsible for deciding on the technology, which was needed in the business, and that it was a decision taken by IT.

From the findings, it was also noted that the role of IT was to ensure integration or set-up of technology in the organisation. One participant commented, *"So it's a lot of collaboration between IT in industry specific, qualified IT professionals and your generic general IT professionals to coordinate and ensure that implementation or adoption happens as seamlessly as possible. There's no such thing as a kinetic sense of IT decides in the organisation. We look to integrate holistically not just have IT as a standalone solution"*. This collaborative effort between IT industry specific and qualified IT professionals was noted from the response of another participant too. The participant explained, *"IT plays a very small role, that will be offline processing of the instrument usage. They will set up computers trying to integrate that on the servers but software installation and setting up of the instrument, that the service provider"*. Another respondent also explained the integration of connecting the functional levels to a centralised IT system, *"we've implemented an extra layer of IT, which we call a Systems Development Group... would easily be interfaced into a centralised IT system that allows us to manage our business"*.

The relationship between IT and business was explained through a descriptive narrative by one of the respondents, *"if you sell IT products and software solutions, IT will be a very different animal, as opposed to if you selling products and services to consumers or businesses, and IT is an enabler support function. So, what I've seen is there's always the struggle between business and IT. For me, I think you've still got to look at the fundamentals of an income statement and say, who's your*

revenue generator? Understanding that you've got an entire enabling function supporting you, whether that be HR, IT in its traditional sense. I think there's always been the tail wagging the dog, who's actually leading the conversation, IT always wants to, business always wants to, and that causes a lot of conflict. I think there has been a realisation now, though, that you have to have a digital transformation strategy, what that looks like, for me, it's how does that enable business to succeed and deliver on the strategy. So, IT I think, is playing far more of a co creation role”.

From the narrative responses, it was evident there was a triangulated alignment between technology, human resource systems and management processes. Interview question 11 was put forward to determine customer benefits, p outlined the **processes** involved along the customer journey, during the life cycle of a product or service, while benefits were provided by the organisation, to support the customer journey. The processes included the coming together of human resources and management processes. Thus, if the triangulated alignment was active, it would provide benefits to the customer in one way or another. **Table 5.3** shows a collective total of the responses from all participants. All 16 participants selected at least one of the categories. This indicated that triangulated alignment was active in all organisations represented by the participants.

Table 5.3: Buyer utility map showing collective total of responses from participants.

Benefits	Customer journey along product/ service life cycle					
	Purchase	Delivery	Use	Supplements	Maintenance	Disposal
Customer productivity	8	7	9	7	5	2
Simplicity	10	8	12	5	7	5
Convenience	9	11	8	3	8	3
Risk	6	6	7	4	6	3
Fun and Image	6	2	5	5	3	1
Environmental Friendliness	5	4	4	2	3	6

The primary focus of Research Question 1 was to determine the level of importance of technology among other components in strategy implementation. Key themes were analysed and discussed in Chapter 6. However, as per the prescribed

guidelines **Section 5.4.4** lists the interpretation of the key themes emanating from this research question.

5.4.4 Interpretation of emerging themes

- Components contributing to strategy implementation. The organisational model referred to in Chapter 2 was the main framework for this research, thus it was important to ensure relevance of the components in the system. This framework is discussed across other emanating themes.
- The relationship between structure and technology. From the findings, it was inferred that technology was dependent on structure. This was an important aspect because it guided the understanding of the role of technology in the organisation.
- Technology as an enabler. From the findings, it was evident that technology improved operational efficiencies which allowed businesses to improve performance. Also, it was noted that technology enabled dynamic capabilities through improved skillsets which created additional value. Thus, while technology was not viewed as the most important component, it had arguably one of the most important functions in a business.
- Technology integration. From the response technology is integrated in different aspects of the business. This relates to the relationship between information technology and business, and the 'who' should be leading the direction of the company.

Next, Research Question 2 investigated the rate of technology adoption when considering the restrictive ability of influencing factors.

5.5 Results of Research Question 2

Under this research question, the rate of technology adoption in organisations were explored. Interview questions 4 and 5 formed the basis of this research question, while interview questions 6 – 9 provided additional insight into the factors influencing the rate of technology adoption.

5.5.1 Perceived rate of technology adoption

As per interview question 4, respondents were asked if the rate of technology adoption was high (as in excellent), medium, low or in between any of the given options, in their organisation. To eliminate confusion, the research participants were made to understand that high or excellent indicated fast adoption of trending technology and low being slow. Respondents' response was recorded and the resulted were presented in **Table 5.4**.

Table 5.4: Perceived rate of technology adoption.

	* Innovators	Early Adopters	Early Majority	Late Majority	Laggards
Respondent 1	✓				
Respondent 2					✓
Respondent 3	✓				
Respondent 4				✓	
Respondent 5					✓
Respondent 6	✓				
Respondent 7		✓			
Respondent 8			✓		
Respondent 9		✓			
Respondent 10	✓				
Respondent 11	✓				
Respondent 12	✓				
Respondent 13	✓				
Respondent 14	✓				
Respondent 15			✓		
Respondent 16			✓		
Total	8	2	3	1	2
%	50%	13%	19%	6%	13%

The segments in **Table 5.4** were partitioned into five categories which mimicked segments of the technology adoption curve. In this instance, excellent/ high = innovators; medium-high = early adopters; medium = early majority; medium-low = late majority and low = laggards. Most respondents believed their organisations innovated or actively adopted trending technologies. The results of this dataset were termed ‘perceived’ rate of technology adoption, since it captured responses without any deeper understanding of the rate, i.e. responses were opinion based only. The findings were also illustrated graphically in **Figure 5.1**, to present a visual understanding of the shape of the curve which was used for comparative purposes in **Section 5.5.3**. The curve was plotted using a polynomial trendline to fit the data.

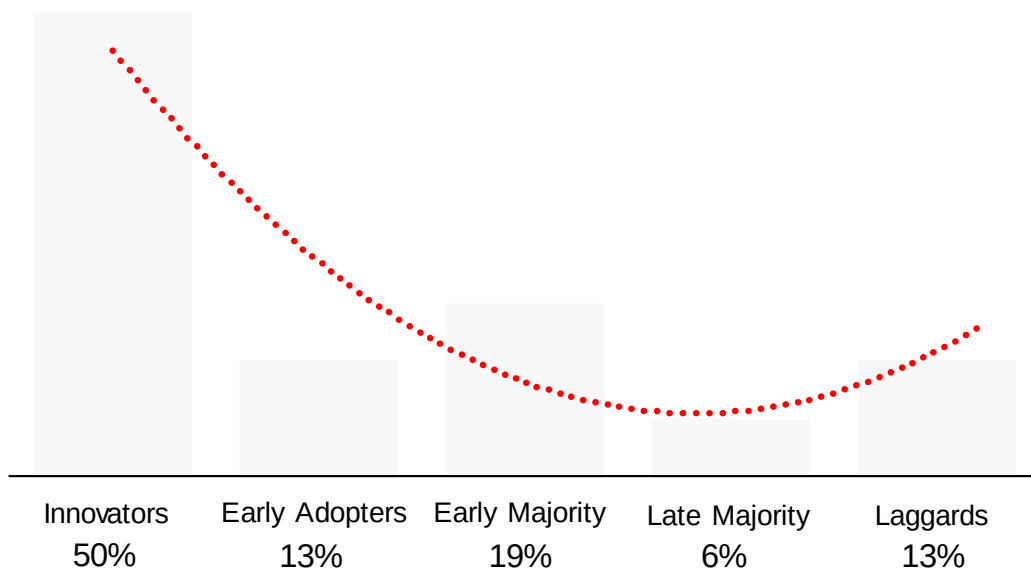


Figure 5.1: Graphical representation of the findings from the perceived rate of technology adoption.

Interview question 5 also considered the rate of technology adoption. However, this was based on influencing factors using a Likert-scale. In this question, participants were presented with options on a Likert-scale which considered the likelihood of specific factors to negatively influence the rate of technology adoption in the organisation. Participants indicated by selecting one of five options for each factor. The Likert scale formed part of the interview questionnaire and was presented in **Appendix B** under interview question 5.

5.5.2 Factors influencing technology adoption

As per question 5, the factors listed that were likely to influence the rate of technology include, financial fluidity, compliance, risk appetite, structure and culture. From the dataset, a unique scoring system was designed to determine how the factors ranked in terms of most restrictive to least restrictive in terms of adopting technology. **Table 5.5** depicted the scoring system used to determine the ranking of influencing factors.

Table 5.5: Unique scoring system showing the ranking of influencing factors.

Influencing Factors	Very likely	Some what likely	Likely	Very likely	Some what likely	Likely	Total Points Count	% weight
	Count from interviews			(x3)	(x2)	(x1)		
Finance	6	1	4	18	2	4	24	19%
Compliance	6	6	2	18	12	2	32	25%
Risk	2	6	5	6	12	5	23	18%
Structure	4	4	1	12	8	1	21	17%
Culture	8	1	1	24	2	1	27	21%
Total							127	

The format used to design the unique scoring system was as follows. First, a total count (among all respondents) was taken for each box selected on the Likert-scale. For example, 6 participants in total would have selected 'somewhat likely' for Risk while 1 participant would have selected 'likely' for Structure and 8 participants would have selected 'very likely' for Culture.

Next, the categories on the Likert-scale were allocated points, where 3 points were allocated to 'very unlikely', 2 points for 'somewhat unlikely' and 1 point for 'likely'. The points were allocated on a sliding scale basis with the most restrictive category awarded the highest points. The 'somewhat unlikely' and 'very unlikely' categories were allocated zero points, since it was more unlikely than likely to affect the rate of technology adoption. Thereafter, the total count within each block, for each factor was multiplied by the points allocated to the specific category. For example, all the blocks in the 'very likely' category were multiplied by 3 points.

The points for each of the factors was added to establish ranking. For example, Compliance = **32** = 18 + 12 + 2. The factor with the most points was regarded as most restrictive towards technology adoption. The calculated weighting reflected the same. The weightings were important and were utilised in **Section 5.5.3** to calculate the 'actual' rate of technology adoption.

For this interview question, respondents were requested to provide reasoning for their selections on the Likert-scale. This was in order to gain a deeper understanding into the factors influencing the rate of technology adoption. Further insight into specific factors was provided from through granular interview questions 6 – 9. Thus, a deeper understanding of the factors was first considered.

5.5.2.1 Compliance

From **Table 5.5**, compliance was regarded as the most restrictive factor in terms of technology adoption. The research participants explained through narrative discussions how compliance affected the rate of technology adoption. It was understood from responses that regulations played a major role in compliance. One of the participants stated, *“the regulatory landscape is very prescriptive, especially with regards to technology enablement like cloud computing or cloud computing, there are very stringent regulations around these aspects”*. Another respondent mentioned that there were too many regulations, and that compliance has become so troublesome that organisations were considering ways of working around them. The respondent further explained that their organisation needed to quadruple the size of their compliance team while the operations team remained flat (with a doubling of their client base) and stated,

“the overburdensome compliance needs are driving people to innovate around legislation. One of the biggest risks to the business is the weight of compliance, it’s just going nuts”.

The respondent also explained that companies were building business models to fit outside of licence requirements with the likes of cryptocurrency and peer-to-peer insurance. Another respondent believed that there were more regulations to come as businesses delve into more cutting-edge innovation and technology, *“we are*

doing things in a space without a lot of boundaries but when the compliance comes in, when the regulations comes in, it's going to be a problem”.

One of the respondents explained that their organisation supplied cutting-edge technology to various sectors in the country. According to the respondent, *“technology is not always adopted because the local market doesn’t do anything until they are forced to or have to comply with something”*. Interestingly, these sentiments were confirmed by another research participant that stated, *“If I wanted to meet compliance, would I adopt technology. Yes, I would adopt technology”*.

Next, the narratives relating to culture were considered. From **Table 5.5**, culture was ranked second among the influencing factors with 8 respondents indicating that culture was ‘very likely’ to negatively influence the rate of technology adoption.

5.5.2.2 *Culture, Risk Appetite and Structure*

For the purposes of this study, culture focused specifically on the behaviour of human capital towards the adoption of technology. From the selections on the Likert-scale, it was noted that there was a relationship between culture and structure. 9 participants selected the same category on the Likert-scale for culture and structure. In addition, 5 participants selected an adjacent category when selecting structure and culture. Thus, 14 out of 16 respondents indicated a close relationship between structure and culture.

A similar relationship, albeit slightly ‘milder’ was noticed between culture and risk appetite. 4 participants selected the same category on the Likert-scale for culture and risk appetite, while 5 participants selected an adjacent category. For this reason, the narratives for culture, structure and risk appetite were considered holistically. However, it should be noted that while there was a relationship between the factors, the factors remained independent in the design of the unique scoring system to avoid category bias.

From the narratives, it was understood that there was a relationship between age of the workforce and adoption of technology. One of the respondents explained that in organisations where there was typically an older workforce that had been doing things in the same way over a long time, there was going to be resistance to adopting

new technology. It was understood that the mindset of doing things in the same way was what negatively impacted the ability to adopt technology. This was unlike the behaviour in a younger workforce where there was a demand for it, and the rate of technology adoption was typically higher. The mindset in these environments was one of innovation which resulted in an innovation culture. The respondent also stated,

“Culture is critical to the adoption of technology and the more disparate your age groups and culture, the higher the risk is that you are not going to adopt technology”.

Another respondent expressed a similar concern but with reference to “*norms*” when adopting technology. The respondent explained that their organisation has an older workforce that was set in their ways of purchasing technology. It was understood that there was resistance to considering innovative alternatives that were equally capable, if not better at providing the same function. The respondent referred to this as a “*culture stereotype*” and explained that technology needed to be viewed for what it offered in terms of improvements in working systems and its ability to enhance the value offered to clients. There was a mindset of continuing with the same suppliers that had provided the organisation with technology for years on end. The respondent stated, “*based on our culture we trust certain people to give us good technology, and we can adopt it quick. But when it's others, we give them rigorous, unwarranted, technical barriers to adoption, and the barriers to that adoption now talk to the risk appetite, where risk (of not adopting) goes higher*”.

One of the respondents explained that there was a dependency of risk appetite on organisational culture where more dynamic cultures were more risk-seeking, the respondent stated, “*risk appetite is part of culture in my view, is the culture dynamic? are you prepared to learn?*”. The rhetorical question presented an interesting view on the risk to business regarding the relationship between skillset (in the organisation) and technology. Another respondent expressed concerns regarding the same, “*the risk is the people, if you have adopted new technologies and the people are not adequately trained, that affects the use of the technology*”. While it was unanimously stated that training followed the purchase of any new instrument in the organisation, one of the respondents advised that businesses needed to conduct risk assessments regarding skillsets when migrating or acquiring new technology.

Interestingly, only three of the respondents mentioned the importance of risk assessment for technology adoption. A few of the participants commented on building an innovation culture for technology adoption. According to one of the respondents, the culture of adopting technology should not create a gap in the technology continuum that it was so far behind it could not be closed. Another respondent stated, *“an innovation culture is more likely to adopt new technologies and try new things”* while another remarked, *“having the right people with the right entrepreneurial mindset, allows you to adapt to new technologies”*. One of the respondents explained that the culture of the organisation needed to be centred around how willing people were to go out and try something new.

However, according to another respondent it was also important for the organisation to create a safe space to try new things. The respondent further explained that in their organisation there was a designated team entrusted with trying new things and while it was difficult to manage, it helped the organisation to continuously learn and grow. This was important for adoption of new technologies. According to the respondent, this was only enabled through a culture of ensuring job security, *“when implementing highly automated processes, people are going to wonder if their job is secure, you have to address it right up front, and the more open communication that's going on the better, in all aspects. So, just by keeping the communication always open, allows that trust”*. One of the other participants referred to the set-up of ‘ring fencing’ a part of the business to try new things as ‘business 2.0’, having remarked,

“business 1.0 (has) a certain business model, that's what pays the bills and keeps the lights on. And then that ability to disrupt yourself, it's business 2.0 that has its own governance structure, its own incentives, its own team, then it might leverage off a few of the shared services from the original business, but it's almost like a little incubator, that is trying to disrupt itself, doing that environmental scanning, seeing what's actually out there that can be consumed”.

All respondents agreed that regular communication was of utmost importance. One of the participants that communication needed to be regular whether there was adoption of new technologies or not. Another mentioned that engagement and involvement of the people should be from the beginning of the process and not only

during implementation. One of the participants explained that apart from communication being regular, it also needed to filter to all levels in the organisation. This ensured a common understanding, which enabled alignment throughout the organisation.

Another succinctly captured the relationship between culture, communication and strategy when the respondent remarked, *“continuous active engagement which, if you are to change culture, you need that because if you don’t do that, most strategies don’t get implemented for that reason”*. The respondent further explained there was a relationship between structure, communication and technology adoption. The participant explained that their organisation changed from a functional to a matrix structure, and when adopting technology, this structure provided different channels of communicating the same message which cultivated a culture of engagement.

However, as described in Research Question 1, structure can also be a deterrent when adopting new technologies. One of the respondents explained, *“structure and culture go hand in hand. While I think there is a culture of wanting to adopt (in their organisation), the hierarchical structure is going to (present) some of the challenges in getting it through”*. Financial fluidity of the organisation to adopt new technologies was also considered.

5.5.2.3 Financial fluidity

From **Table 5.5**, it is understood that 11 participants expressed some degree of concern regarding financial fluidity in terms of technology adoption. The finance (or financial fluidity) referred to capital available for investment in technology. Other than selecting an option on the Likert-scale, most respondents did not disclose too much information regarding the financial status of their organisation. Interestingly, the technology-based companies indicated that investment in software technology was not captured as a balance sheet item but instead considered as a sunken cost. As one respondent indicated, that while they understand the technology systems had value, it also became obsolete very quickly, the respondent remarked, *“from the top level we are comfortable to throw what we’ve already built. If something better comes out tomorrow, and it’s genuinely better then we must scrap what we’ve done and move to that”*. But it should be noted that this was not the general undertaking.

Other participants explained that technology was often purchased with a multipurpose function i.e. where it could be used in other parts of the business if it became obsolete in core functions. Also, in most cases it was understood that the hardware remained the same while the software was upgraded to remain relevant. One of the respondents explained that their organisation created interfaces between older equipment and newer systems. This was similar to the comments from a different participant in Research Question 1 who stated, *we've implemented an extra layer of IT, which we call a Systems Development Group... would easily be interfaced into a centralised IT system that allows us to manage our business*".

From those respondents who commented on the financial status within their organisations, there was an understanding that while technology was becoming more efficient, it was also becoming cheaper. Incidentally, this enabled competition from new markets. This aspect was also considered in Research Question 3. One of the participants stated, *"about 20 years ago, technology was very expensive, but over the years technology has gotten cheaper because of mass adoption"*. Another respondent explained that technology was changing so rapidly that it was already outdated by the time the cost was reduced. The narratives provided by the respondents served as data to understand the rate of technology adoption in organisations. This data was captured in the form of a Likert-scale which complemented the insight provided from the narratives. Next, the 'actual' rate of technology adoption was determined.

5.5.3 Actual rate of technology adoption

In this section, the 'actual' rate of technology adoption was determined. The process considered the impact of influencing factors, which differed from the 'perceived' rate of technology adoption which was based on opinions only. It was understood that the data for factors was based on opinions as well, but the idea here was to indicate differentiation through the manner in which the data was acquired.

Since 'factor-based' methodology to determine the rate of technology adoption provided a more informative view, it was termed the 'actual' rate of technology adoption. The 'actual' rate of technology adoption was determined through a factor-based scoring structure. It was understood that this was the first time this type of scoring structure was used to determine the rate of technology adoption.

5.5.3.1 *The factor-based scoring structure*

The factor-based scoring structure operated as follows. First, the categories on the Likert-scale were allocated points where a selection in the 'very likely' category was awarded 5 points, somewhat likely = 4 points; likely = 3 points; somewhat unlikely = 2 points; very unlikely = 1 point. Based on this, when a respondent selected 'very unlikely' for all the factors – the final score was 1. This indicated that the organisation which the respondent represented was an innovator (in terms of technology adoption). Similarly, when a respondent selected 'very likely' for all the factors, the final score was 5 which indicated laggard. The factor-based scoring structure was based on the following scale,

1 = innovator; 2 = early adopter; 3 = early majority; 4 = late majority; 5 = laggard

The weightings calculated in **Table 5.5** was an important component in this scoring structure. The calculated weightings indicated the level of restiveness each factor contributed towards the rate of technology adoption. The alternative was to assign each factor an equivalent weighting of 20%. However, this would not be a true reflection because from the narratives provided and the responses collected in **Table 5.5** there was a clear differentiation in the restrictive power of each factor. Thus, the calculated weightings were used.

Table 5.6 showed descriptively, using an example, how the factor-based scoring structure determined the rate of technology adoption. The scores were calculated by multiplying the points in each category selected by the percentage weighting of the relative factor. In the example 'very likely' was selected for financial fluidity; 'somewhat likely' for compliance; 'somewhat unlikely' for risk appetite; 'somewhat unlikely' for structure and 'likely' for culture. The totals for each category was added and this example the final score was 3.28. From the scoring scale above, 3.28 was indicative of early majority. The responses from the Likert-scale were analysed for each respondent and the results were presented in **Table 5.7**. Of the 16 participants, three were categorised as early adopters, with six each for early and late majority, and one as laggard, with zero innovators.

Table 5.6: Example showing the use of factor-based scoring structure to determine the rate of technology adoption.

Influencing Factors	% weight	Very likely	Some what likely	Likely	Some what unlikely	Very unlikely	
Financial Fluidity	19%	✓ 5 points $5 \times 19\% =$ <u>0.95</u>					
Compliance	25%		✓ 4 points $4 \times 25\% =$ <u>1.00</u>				
Risk Appetite	18%				✓ 2 points $2 \times 18\% =$ <u>0.36</u>		
Structure	17%				✓ 2 points $2 \times 17\% =$ <u>0.34</u>		
Culture	21%			✓ 3 points $3 \times 21\% =$ <u>0.63</u>			
Total		0.95	1.00	0.63	0.36 + 0.34		3.28

Table 5.7: Results for the 16 research participants showing rate of technology adoption constructed through the factor-based scoring structure.

	Innovators	Early adopters	Early majority	Late majority	Laggard
Respondents	0	3	6	6	1
%	0	19%	38%	38%	6%

The findings were also illustrated graphically in **Figure 5.2**. The shape of the curve for the ‘actual’ rate of technology adoption is almost inverse to the shape of the curve for the ‘perceived’ rate of technology adoption curve in **Figure 5.1**. The ‘perceived’ vs. ‘actual’ rate of adoption for each respondent was tabulated in **Table 5.8**. Interestingly, none of the respondents showed an exact match.

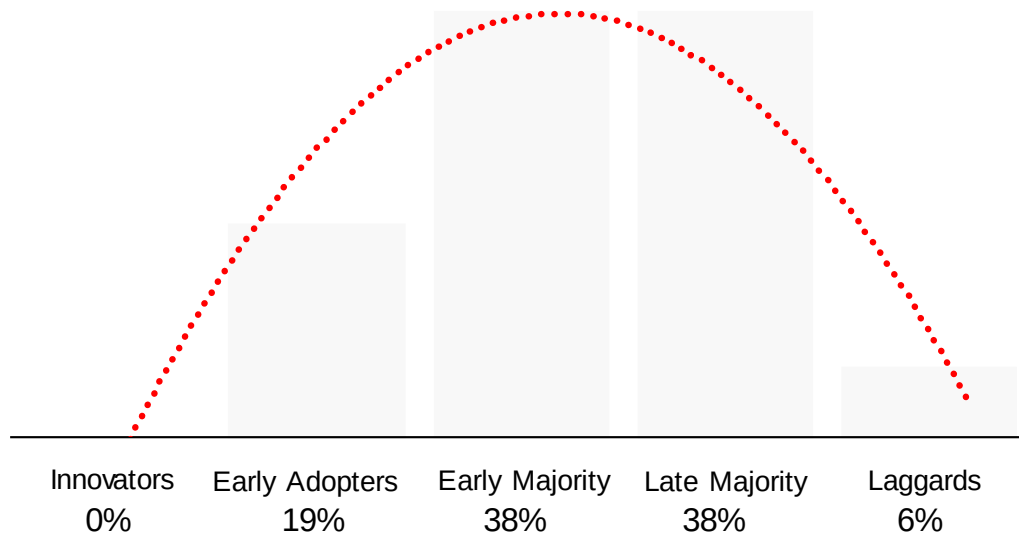


Figure 5.2: Graphical representation of the findings calculated to establish the actual rate of technology adoption among research participants.

Table 5.8: ‘Perceived’ vs. ‘actual’ rate of technology adoption among respondents.

	Perceived	Actual		Perceived	Actual
*R 1	Innovator	Early Majority	R 2	Laggard	Late Majority
R 3	Innovator	Early Adopter	R 4	Late Majority	Early Majority
R 5	Laggard	Early Majority	R 6	Innovator	Late Majority
R 7	Early Adopter	Early Majority	R 8	Early Majority	Late Majority
R 9	Early Adopter	Late Majority	R 10	Innovator	Early Majority
R 11	Innovator	Early Adopter	R 12	Innovator	Laggard
R 13	Innovator	Late Majority	R 14	Innovator	Early Majority
R 15	Early Majority	Late Majority	R 16	Early Majority	Early Adopter

*R = Respondent or research participant

The primary focus of Research Question 2 was to determine the rate of technology adoption in organisations. Key themes were analysed and discussed in Chapter 6. However, as per the prescribed guidelines **Section 5.5.4** lists the interpretation of the key themes emanating from this research question.

5.5.4 Interpretation of emerging themes

- The most distinctive theme was the misalignment between the ‘perceived’ and ‘actual’ rates of technology adoption. This was also an important aspect in relation to the theory on IT-business alignment, discussed under Research Question 1.
- Governance relating to compliance for technology adoption was a key concern among respondents, and this was further analysed while considering discussions in literature.
- The inter-relationship between structure, risk and culture was an important observation. There were several dynamics relating to this theme including, skillset, communication, change, ambidexterity, technology continuum and job security.

Costs related to technology adoption and how this affected business models.

5.6 Results of Research Question 3

Organisational effectiveness was regarded as the output achieved from delivering on the organisation's strategy, as indicated in the organisational model in **Figure 2.1**. The level of importance of technology was understood from Research Question 1 while Research Question 2 considered the rate of technology adoption. Thus, having understood that the adoption of technology promoted the process of achieving organisational effectiveness (Oliveira & Martins, 2011), it was important to determine if there was a relationship between the rate of technology adoption and organisational effectiveness. Research Question 3 was formulated as previously explained.

5.6.1 Fit for purpose

One of the important aspects regarding technology adoption was to understand if the adopted technology was fit for purpose. One of the participants commented on this practice, having stated, *"Nobody ever ties it (technology adoption) back to either a group strategy, or functional strategy. There's got to be that feedback loop of why you are actually going to choose this tool (technology). Is it fit for purpose? is it delivering on your strategy? If it's not doing that, then don't do it. And I think that's where a lot of organisations struggle"*.

Another respondent also provided an extensive narrative regarding this point. The participant stated, *"we try and have an overlap in the adoption of new technology, such that even after we have developed a new technology or adopted a new technology, we still aligned with the previous technology for a time to ensure that we have got sufficient data on the new technology, call it validation. We get to validate our technology that we adopt. But how do we manage and respond to that? The word is fit for purpose. So we try to integrate the new technology that is coming in and ask the question, is it fit for purpose? Is it worth adopting it? Because you might find that you can still provide the same level of service with the previous technology. So it doesn't make sense to necessarily move to the next technology"*. Fit for purpose was considered an important aspect when adopting new technologies. For this reason, it was important to understand if there was an alignment between the adopted technology and delivering on the strategy i.e. achieving organisational effectiveness.

5.6.2 Organisational value

To gain deeper insight into the alignment referred to above, interview question 2 requested participants to rank key threats to the business model from five available options. This included technology, innovation, customer value, competitors and pricing model. Respondents understood that the threat in this instance referred to what the organisation regarded as most valuable for sustainability of the business. In other words, which aspect (from the five options) would the organisation be most concerned about and thus guard against. This interview question was strategically positioned to eliminate participant bias. **Table 5.9** presented an overview of the collective ranking across participants. **Table 5.10** below showed individual rankings.

Table 5.9: Participants' ranking of most valuable component.

Key Components	Positional Ranking				
	First	Second	Third	Fourth	Fifth
Customer value	11	1	4	-	-
Technology	-	6	5	2	3
Innovation	2	4	2	7	1
Competitors	1	3	3	4	5
Pricing model	2	2	2	3	7

From the responses, pricing model was often linked to customer value (irrespective of where the two were positioned). The generalised comment in this regard was, *“I would link these two”*. One participant likened value for money to customer value, *“it is good value for money in terms of the product that you supply, so, it is critical that we get the right product for the right application”*.

A similar connection was made between technology and innovation. One of the respondents stated, *“How we create customer value, (is) we constantly innovate ourselves, innovation may mean the use of better technology, or it may be just doing something a lot smarter”*, while another commented, *“innovation, pricing and technology, should work together in such a way to deliver customer value”*. A few other participants also explained the relationship between technology and innovation with the aim of providing value through pricing models. However, there was little consideration of customer value from a buyer's perspective. As one of the

respondents remarked, *“the value side is what you're offering them from the business perspective”*.

5.6.2.1 *Competitor consideration*

The way in which participants communicated the importance of customer value, there was no doubt that this was regarded as a key priority for the business. However, in some instances the approach for providing customer value was indicative of guarding against competition, and the pricing model was used as the lever to accomplish this. One of the respondents claimed, *“to add customer value, you need to be innovative in your products and services, to set you aside from your competitors, it's a trade-off”*. This trade-off referred to the value-cost trade off where price was used as the competitive tool. On the other end of the scale, some respondents mentioned that competition did not dictate the business model. One of the participants claimed,

“Understanding where competitors are, and understanding where the market is globally, is very important. But, it's not the departure point of the strategy”.

Another participant explained that bench marking against competitors meant that organisations will only be doing the same thing as competitors. However, when additional value was offered as a differentiator, customers would be willing to pay a premium. In this instance customer value was used as the bargaining tool and not price.

5.6.2.2 *Customer value consideration*

Some research participants indicated a new generation of customers was changing the landscape of business, and customer value should be through off from a buyer's perspective. One of the respondents stated, *“where I see the future of the business, I see it going into the hyper-connected consumer who will scan a product to know everything about their product. People are wanting new, they're wanting different, so life cycles of product get shorter”*, while another stated, *“customers have changed to such an extent that the new generation want instant gratification. They want to know more about the products that they consume or buy, and with customers linked to technology, everything is available at the touch of a button”*. These opinions were

echoed by another who claimed, *“the demand of your customers is changing quite radically. The idea of what's worth paying for is shifting and I think (it's about) instant gratification”*.

One of the participants (ranked as an early adopter above) who selected pricing model in 'first' position explained the selection was based on the revised business model of the organisation. According to the participant, the business model was revised to move away from the traditional pricing model, which focussed on value-cost trade off. It was further understood that this type of approach was prone to competitive environments, and it 'sent' products into commodity status. Commodity status offered little or no differentiation and consumers purchased these based primarily on price. The participant continued to explain that while their organisation spent millions developing specialised technology, processors became cheaper and faster and easier to integrate over the years. Consequently, this allowed competitors to produce equivalent results at a lower price. To avoid becoming a commodity, the organisation moved away from this type of pricing model. Having selected customer value in 'second' position, the respondent explained that benefit/ value to customer was provided either through (i) pricing value or (ii) customer value. The participant remarked,

“we demonstrate value through the customer value not pricing value, we show them what value you get out of a subscription model. As a subscription model, we can give you access to the latest technology always, and you don't have to worry about paying for new licences, because you're on the subscription”.

The benefits of the subscription model were further explained, *“it allows the innovation cycles to become a lot quicker, meaning that we don't have a risk of moving away from our customers' ability to adopt, because we're not tied down to they're purchasing cycles of CAPEX (capital expenditure) spend every five or so years”*. Interestingly, all three organisations that were regarded as early adopters implemented subscription models to address customer value.

One of the other respondents (that were also early adopters) explained that their organisation implemented this type of business model because *“the future is not ownership”*. The organisation migrated from the CAPEX approach (traditional pricing

model) to a solution based OPEX (operational expenditure) model (subscription model). The respondent further stated, *“our customers are moving more into solutions as a service, not product”*. The organisation had similar concerns about becoming commodity-based owing to new entrants as a result of technology becoming cheaper. As the respondent explained, *“now equipment is rented out with service and maintenance provided and payment is based on a subscription model”*. The payment model in this regard was part of organisation’s strategy to change the business model through a means of restructuring. The participant stated that this model was not so easy for competitors to adopt because its *“experiential”*, it was about providing customer experience and not about CAPEX costs.

The findings were discussed in relation to literature in **Section 6.4**. However, as per the prescribed guidelines, interpretation of the key themes emanating from this research question were listed below.

5.6.3 Interpretation of emerging themes

- Adoption of technology which is fit for purpose when it comes to delivering on the strategy. to understand the delivery of organisational effectiveness through customer value.
- Competitive advantage arising from strengthening the organisation’s position relative to competitors. Consideration of the value cost trade-off.
- New customer approach in lieu of rapid advancements in technology. The solutions as a service model as competitive advantage. Proving customer value from a buyer’s perspective.

Table 5.10: Participants' individual ranking of organisational value component and rate of technology adoption.

	¥Organisational Value Component					²Cust. satisf.	10 – Cust. satisf.	Rate of Technology Adoption				
	C.V.	Tech.	Innov.	Pr. Model	Comp.			³Inn.	Early Adopters	Early Majority	Late Majority	Laggard
*RP 3	1	3	4	2	5	3	7		x			
RP 11	2	5	4	1	3	3	7		x			
RP 16	1	3	4	2	5	3	7		x			
RP 1	1	4	2	3	5	4	6			x		
RP 5	3	5	4	1	2	4	6			x		
RP 4	1	4	5	3	2	4	6			x		
RP 10	1	2	3	4	5	5	5			x		
RP 7	1	5	2	4	3	5	5			x		
RP 13	1	3	2	4	5	5	5				x	
RP 14	1	2	3	5	4	6	4			x		
RP 2	1	2	4	5	3	6	4				x	
RP 15	1	3	4	5	2	6	4				x	
RP 9	1	3	2	5	4	6	4				x	
RP 8	3	2	1	5	4	8	2				x	
RP 6	3	2	1	5	4	8	2				x	
RP 12	3	2	4	5	1	8	2					x

¥(C.V. = customer value, Tech. = technology, Innov. = innovation, Pr. Model = pricing model, Comp = competition);

²Cust. satisf. = customer satisfaction (combined ranking of customer value and pricing model); *RP = research participant; ³Inn. = innovators.

Chapter 6: Discussion of Results

6.1 Introduction

In this chapter, the findings presented in Chapter 5 were discussed in relation to the literature in Chapter 2. The aim was to highlight how new insights, from this study, addressed a gap in literature. This was because of the problem identified in Chapter 1, which informed the purpose of this study. Accordingly, 3 research questions were put forward, in Chapter 3, to further investigate the problem. The layout of this chapter followed the same format as previous sections, where the results in most instances were discussed according to the research questions.

6.2 Discussion of results for Research Question 1

Interview question 1 was framed to understand the level of importance of technology among other components in strategy implementation. From the findings of interview question 1, it was evident there were no other components that needed to be considered for strategy implementation in this study. Respondents were clear about the fact that the components listed were key contributors to strategy implementation. Thus, utilisation of the organisational model (Cummings & Worley, 2015, pp.95) was suitable for this part of the study. **Section 2.1** outlined the reasoning for utilising this model which merged components of the TOE framework (Tornatzky et al., 1990) namely, technology and organisation.

Respondents described the importance of the components through narrative explanations and this was complemented by interview question 3, which required respondents to rank components according to the level of importance. From the rankings in **Table 5.1**, it was evident that technology was not regarded as the most important component in the organisational model. However, from analysis of the narratives, it was understood that technology had an enabling function in relation to other components. In addition, the narratives provided insight into the inter-relationship between components and from the understanding of the inter-relationship a revised version of the organisational model was constructed. This was depicted in **Figure 6.1**. The findings for this research question were explained in relation to the revised organisational model. First, the triangulated alignment between technology, human resource systems and management processes, depicted by labels **B**, **C** and **D** was explained.

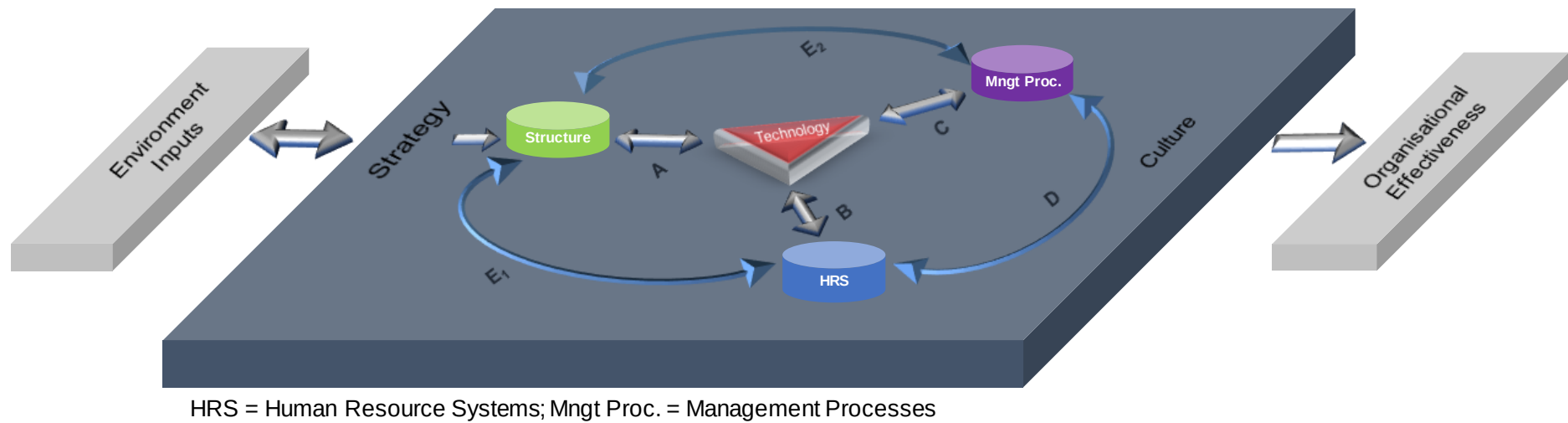


Figure 6.1: Revised organisational model depicting inter-relationship between organisational components (constructed by Author).

6.2.1 Triangulated alignment

As previously indicated, the triangulated alignment referred to the inter-relationship between technology, human resources and management processes. From literature it was understood that the integration/ 'fusion' between IT and business strategies (Bharadwaj, et al., 2013) enhanced customer value. It was further understood that the integration included three points.

First, the interdependency between technology and management processes (referred to as business process management in literature) (Rahimi et al., 2016). Second, the relationship between technology and human resource systems. This was highlighted through the ability of organisations to harness dynamic capabilities for improved organisational performance (Luftman et al., 2017; Teece, 2018). Third, the inter-connection between management processes and human resource systems. In this instance, dashboards provided an overview of key indicators which allowed management to make more informed decisions (Furr & Shipilov, 2019). The three 'points' acting together, captured the essence of the fusion between IT and business strategies, which contributed towards customer benefits.

For this research, customer benefit was probed through interview question 11, which presented respondents with a buyer utility map (Kim & Mauborgne, 2000). The map showed processes along the customer journey, together with benefits of product/ service offerings from the organisation. Any selection along the journey was an indication of customer benefit. Respondents' results from the buyer utility map were presented collectively, in **Table 5.3**. Since all respondents selected at least one of the boxes in the map, it was understood that all respondents offered customer benefit (in one form or another), following technology adoption. Thus, customer benefit resulted from the triangulated alignment between technology, human resources and management processes. Since all respondents indicated some form of customer benefit, it was understood that the process whereby all three components worked together in alignment was active in all organisations. Alignment was represented using double-sided arrows (labelled **B**, **C** and **D**) used in **Figure 6.1**. Deeper insight into this relationship was provided by the narratives which were analysed in relation to literature from Chapter 2.

6.2.1.1 *Dynamic capabilities*

It was evident from the findings that human resource systems, the component under which people featured, was the most important component in the organisational model. From the results in **Table 5.1**, human resource systems showed the highest number of first position rankings (7). Upon analysing the narratives, the interdependency between human resource systems and technology was further evident (**Figure 6.1 -B**).

The findings concurred with literature, where Greer, Lusch and Hitt (2017) indicated that human capital was the key component for strategy execution. It was also reported that the right people were required in the right positions when deploying resources for strategy implementation (p.144). Analyses of the narratives pointed to the necessity of technology being utilised by people. It was understood that while technology enabled processes to become more streamline and easy, it still required human intervention for this to be possible. Technology enabled efficiency in operations and where needed, allowed people the opportunity to perform functions remotely. From the findings, the importance of the right people in the right positions was evident and it was understood that this contributed to enhancing organisational performance. Thus, while technology provided a tool to do the job, the involvement of people was still required as a key component in actually performing the tasks.

Effective implementation of business models stemmed from the ability of the organisation to develop dynamic capabilities Teece (2018). It was understood from literature that the alignment between technology and business strategies were dependent on dynamic capabilities (Luftman et al., 2017), where technology harnessed dynamic capabilities (Di Fiore, 2018). From the findings, it was evident that technology served as a complement to humans, not a replacement. Technology permitted better decision making, especially when having to process large amounts of data. Resultantly, this enabled people to become more creative and improve their skillsets to do better. It was understood that through training and development, people started improving their abilities and performing at new levels which created value for the organisation. This was described in literature as the dynamic capabilities of an organisation (Teece, Pisano & Shuen, 1997).

Figure 2.2 illustrated that growth of the organisation was dependent on skills growth within the company. Technology provided a means of fast-tracking the process from static to dynamic level. At a static level, individuals' skills were recognised but in isolation, this resulted in low development of the organisation. From the results in Chapter 5, it was understood that technology provided training for employees which allowed growth of individual skills and a collection of these contributed to the organisation improvement. The use of technology also allowed employees to have more time available to improve their own skills. This created new competencies which allowed for new positions or new 'levels' being created in the organisation. This was the reason why scholars criticised Frey and Osborne (2013) for reporting 47% of jobs were under threat. Improved organisational competencies allowed improved organisational performance through increased creativity, learning abilities, awareness and shared values. This facilitated the dynamic capabilities. Therefore, it was evident that the humanistic element was most important for organisational growth while technology provided an enabling role to do better.

6.2.2 *Management processes*

The inter-relationship between technology and management processes was indicated by label **C** in **Figure 6.1**. The narratives in Chapter 5 provided a deeper understanding into the 'how' and 'why' of this interdependency, while the results in **Table 5.3** confirmed all respondents experienced some form of alignment between technology and management processes. From literature it was understood that technology enabled improved efficiencies in operations/ processes within businesses (Bradley et al., 2012; Bharadwaj et al., 2013, p.472). This was possible through increased connectivity and reduced computing costs (Lee & Trimi, 2018; Kurzweil, 2004). From the narratives it was understood that operational efficiencies within organisations improved owing to introduction of technology. Processes became seamless and allowed businesses to operate at a faster rate, in one instance what previously took weeks, to delivery within 48hrs. What was also evident was that the costs of technology became cheaper while the computing power improved. This was synonymous with what was reported in literature relating to Moore's law (Denning & Lewis, 2016). It was understood that while this presented an opportunity for some organisations to improve operations, it also lowered barriers to entry (for competition) which created a challenge for others.

Furr and Shipilov (2019) reported how the introduction of dashboards (which was a management process enabled by technology) provided an overview of key indicators that allowed people to make informed decisions. From the findings, respondents explained how older systems migrated into newer ones and the integration processes was key to this aspect of the business. This enabled the relationship between human resource systems and management processes (**Figure 6.1 -D**). What this allowed was for management to have a holistic view of what was happening in the organisation. As discussed, this enabled informed decisions which provided improved operations and faster delivery of services. What was clear from the responses was that while technology was important, it was only as good as the processes implemented within the organisation. It was probably for this reason, that technology was ranked fewer times in first position than management processes.

6.2.2 Organisational structure

From **Table 5.1**, structure was selected 4 times in first position. This was similar to management processes. However, structure was selected more times in last position, than any other component. Advantages and disadvantages of the differing organisational structure designs were tabulated in **Table A.1** of **Appendix A**. Structure was also considered in Research Question 2 as one of the factors which influenced the rate of technology adoption. For the purpose of this research question, what was important to understand was the relationship between structure and technology. For the purposes of understanding the positioning of structure in the revised organisational model (in **Figure 6.1**), it was also important to establish the relationship between structure and the other components.

From literature it was understood that the traditional approach to structure was a functional or divisional design, which was hierarchical in nature and presented several boundaries which restricted task coordination and decision making (Cummings & Worley, 2015, p.346). It was evident from the findings that these types of structures presented challenges to organisations. It was understood that levels of hierarchy slowed the decision-making process owing mostly to ensuring procedures were followed. Interestingly, some organisations had migrated from towards matrix and customer-centric approaches. It was understood from the narratives, matrix structures provided different channels of communication. This was regarded as an advantage of this structure type (**Table A.1**). In literature, ineffective communication

was regarded as one of the main barriers to strategy implementation Kotter (1995). This was an indicative of the relationship between structure and technology, where technology was reliant on structure for adoption or implementation. However, considering the rapid advances in technology, organisations adapt their structures to become more integrated and flexible (Cummings & Worley, 2015, p.340). This was indicative of how technology was dictating or directing to movement of structure designs in the organisation. Thus, the inter-relationship as indicated in by label **A** in **Figure 6.1**. From the findings it was understood that customer-centric structures were carefully chosen as an alternative to functional structures since it provided improved customer value. This was also highlighted in **Table A.1**. In this instance, technology can strategically deliver as per the structure since customer value was placed at the forefront of the strategy (Martins & Fernandes, 2015). It was evident that technology had a subservient role to structure. However, for technology to thrive, organisations needed to implement a structure which enabled flexibility and adaptability of the strategy.

From literature it was also understood that structure influenced dynamic capabilities (Teece, 2018), hence organisational performance (Csaszar, 2012). From the narratives it was understood that an undertaking of structure was representative of human resources and management processes as well. It was evident there was an integration between people structure, organisational structure and management processes. This integrated alignment between structure and human resource systems and, management processes was depicted by double-sided arrows in **Figure 6.1**, through labels **E₁** and **E₂**, respectively. From analyses of the narratives it was also understood that technology ‘cut across’ all three components. Thus, while the narratives in this section concurred with literature, analyses of the findings revealed new insight in the form of the alignment between the components.

To gain more insight into organisational structure, data from respondents relating to structure was captured in **Table 5.2**. What was evident, was the disparity in responses from the participants. The importance ranking of structure and the associated response to structure being a barrier to technology adoption was inconsistent. Thus, there it was perceived that structure did not restrict technology adoption. The results from this table were further analysed in **Section 6.3.1**.

6.2.3 The role of information technology

In literature, the integration of IT and business strategies was reported to enhance operational efficiencies and consequently customer value (Bharadwaj et al., 2013). From the narratives, it was understood that while technology played a central role in organisations, IT (as a business unit) played a functional role in organisations. Most respondents indicated that IT was responsible for the set-up of instruments and ensured integration with existing systems. However, this was different for technology-companies, where respondents from those companies not only ranked technology as the most important component but also indicated that IT was very much involved in the decision making too.

The discussions in this section showed a link between the narratives and what was reported in literature. However, while there were similarities, analyses of the findings provided new insight into the design and alignment of components in the organisational model. Further to this, there was also an understanding of the importance of different components. What was most important for this research question was a deeper understanding into the role, and the level of importance of technology. It was understood from the narratives that while technology played a central role in organisations, IT (as a business unit) played a functional role in organisations. Also, from the rankings in **Table 5.1**, it was further understood that while technology was not regarded largely as the most important component in the organisational model, it had an important enabling function in relation to other components. Accordingly, a revised version of the organisational model was presented in **Figure 6.1** which provided a more comprehensive understanding of the alignment between components. The inter-relationship between all the components in the organisational model was illustrated by doubled-sided arrow heads, which indicated alignment between these components. Having analysed the findings and answered Research Question 1, the results for Research Question 2 which related to the rate of technology adoption were analysed and discussed.

6.3 Discussion of results for Research Question 2

This research question explored the rate of technology adoption in organisations. For technology to enable processes, improve organisational performance and enhance customer value, it must be adopted into the business. Thus, it was important to determine the rate of technology adoption and understand the factors which influence the rate (Oliveira & Martins, 2011). Key frameworks discussed in literature provided a theoretical understanding of the research question. The data interchange (EDI) model (Iacovou et al., 1995) which was underpinned by the TOE (Tornatzky et al., 1990) and DOI (Rogers, 1995) frameworks was important for this study. It provided the framework to understand the factors influencing the rate of technology adoption in organisations. The diffusion of innovation theory provided the basis to understand the rate at which technology spread through the organisation, while considering the influence of specific factors. To determine the rate of technology adoption, a factor-based scoring structure was designed and explained in **Section 5.5.3**. The method used restrictive weightings of each factor, determined through a different unique scoring system, described in **Section 5.5.2**. While the scoring systems provided a quantifiable manner to interpret the qualitative data (Luftman et al., 2017, p. 33-34), the narratives were analysed to gain deeper insight into the ‘how’ and ‘why’ factors influenced the rate of technology adoption.

6.3.1 Factors influencing technology adoption

From **Table 5.5** it was understood that compliance was regarded as the most restrictive factor in terms of technology adoption. 14 of 16 respondents indicated that there was some degree to which compliance was likely to negatively influence technology adoption. What was evident from the findings was that while compliance was regarded as a key concern, there was some disparity surrounding regulation of technology innovation. On the one hand, it was understood that regulations were becoming overburdening, on the other it was believed that regulations were still going to come into effect as technology delves into more cutting-edge innovations. According to Fenwick et al. (2017), the pace of change of technology either resulted in ‘over’ regulations or not doing anything at all. Thus, it was not surprising that some sectors experienced one side of the scale, while others experience the other. What was also evident from the findings was that while there was perception of being innovators (**Figure 5.1**), organisations only complied with regulations when needed.

The next influencing factor was financial resources, and 11 participants indicated that finances had some degree of negatively influencing technology adoption. What was evident from the findings was that technology based- companies were prepared to take a loss in investments, if newer technology needed to be adopted. This was critical for these businesses because of the inter-relationship between IT and business strategies. Bharadwaj et al. (2013) documented the importance of this fusion for the benefit of customer value.

Given the rapid advancements of technology, systems were becoming obsolete very quickly. It was understood from the narratives that most organisations considered integration of legacy systems, where hardware did not require changing, only software. In this regard, costs in IT systems were minimised. Also, apart from technology-based companies, IT business units in organisations mostly served a functional role. It was evident that business strategy was independent of IT strategy. Thus, there was an understanding that in most instances software was upgraded or integrated into current systems. However, from literature it was noted that technology had become cost effective over the years and so too IT infrastructure (Neirotti et al., 2018). From the narratives, it was clear that some respondents understood that technology costs were becoming cheaper and recognised this through increased competition. What this implied was there was a disconnect between what organisations perceived to be the cost of technology and the actual cost. Resultantly, technology adoption was impacted. Interestingly, the perceived rate of technology adoption was also considered and discussed below in **Section 6.3.2**.

The close relationship between culture, risk appetite and structure was explained in **Section 5.5.2**. Briefly, 14 of 16 respondents indicated a close relationship between structure and culture, while 9 participants indicated a close relationship between culture and risk appetite. From the findings, it was understood that culture was a key component when considering technology adoption. 8 of 16 respondents indicated culture was very likely to negatively influence technology adoption. This was attributed to norms that evolved through the years, and age was a contributor in this regard. Older workforces were set in their ways of doing things and it was understood this proved to be a barrier for technology adoption. From literature, it was explained that culture was created through a learned way in which a group solved problems, and this became the 'norm' of how to do things (Schein, 2010; Sun, 2008)

It was evident from the narratives that there was a relationship between culture and risk appetite. From literature it was reported that risk appetite was influenced by the culture setting of the organisation (Trompenaars & Woolliams, 2011). Cultures that were internally controlled were regarded as risk averse. This was as a result of the structure of the business, which was inflexible and contained mountains of red tape. This was further understood from the narratives relating to structure in **Sections 5.4.2** and **5.5.2**. It was described earlier that organisations were migrating from functional structures to allow for more adaptability. In contrast, organisations that were relationship-based, were more adaptable and encouraged risk taking which promoted learning and innovation (p.3).

What was also evident from the findings was the link between innovation culture and technology adoption. It was understood that an innovation culture was more likely to adopt new technologies and try new things. It was reported that combining the virtues of rule-based and relationship-based operations allowed organisations to 'keep the lights on' while being innovative (Trompenaars & Woolliams, 2011). From the narratives, it was understood that a means of enabling innovative thinking was through the inclusion of business incubators in the structural design. It was understood that business incubators continuously scanned the environment looking at new ways in which to disrupt itself. This proved beneficial to the organisation. This concurred with literature where business incubators ensured the success of businesses, during an era of rapid technological advancements and changes in globalisation ((Mas-Verdú et al., 2015). However, the importance of structure cannot be understated for implementation of this practice (Teece, 2018).

The results from **Table 5.2** indicated the relationship between culture, structure and risk appetite. Participants (highlighted in blue) that implemented a customer centric structure showed less concern regarding the design of the structure for technology adoption. It was also evident that the same organisations had a higher risk appetite i.e. risk appetite did not negatively influence technology adoption. It was further evident that these organisations acknowledged the importance of structure in the organisational design, since the ranking of structure among other components was high. What was also noticeable was that these organisations adopted a cyclic approach to strategy implementation. According to Sull (2007) this approach guarded against risk of a failed course of action. Most of the linear structures were functional

and as indicated by the narratives, the hierarchical approach negatively influenced technology adoption. Consequently, this impacted risk appetite which was reported as a key ingredient for innovation. This was not favourable for organisations since innovation was regarded as imperative for the survival of organisations (Lee & Trimi, 2018). It was evident from the findings that there was an oversight regarding the impact of the influencing power of these factors in relation to technology adoption. Thus, it was not surprising that as indicated in **Table 5.4**, 8 of 16 respondents believed that the rate of technology adoption in their organisation was high, which was synonymous with being innovators.

6.3.2 Rate of technology adoption

Interview question 4 captured responses of what participants believed the rate of technology adoption was at their organisation. The responses were categorised into 5 segments which mirrored segments of the diffusion of innovation curve. **Figure 5.1** showed responses from participants, and the shape of the curve indicated that most organisations were adopting technology at quite a rapid rate i.e. innovators.

However, it was understood from earlier discussions that there was an oversight regarding the impact of influencing factors in relation to technology adoption. This was evident when the rate of technology adoption was considered inclusive of the restrictive abilities of influencing factors. To quantify the data collected from narrative responses, scoring systems were designed to convert words into numbers. **Table 5.5** and **5.6** were utilised for this process. **Figure 5.2** illustrated the 'actual' rate of technology adoption in organisations (i.e. when considering influencing factors). From the results there were no innovators among the sample, while 3 organisations were early adopters with 1 laggard. There were 6 organisations each in the early and late majority segments. The findings showed that the 'actual' rate of technology adoption resembled a bell curve which was synonymous to the diffusion of innovation (DOI) curve in **Figure 2.3**. According to the DOI theory, the ability of a portion of the population to adopt technology over a period, assumed, approximately normal distribution (Rogers, 1995). The shape of the curve in **Figure 5.2** was almost inverse to the shape of the curve for the perceived rate of technology adoption, in **Figure 5.1**. This indicated there was a misalignment between the 'perceived' and 'actual' rate of technology adoption in organisations.

For this research question, while the rate of technology adoption in organisations was determined, it was evident that there was disparity between the 'perceived' and 'actual' rate of technology adoption among the sample. This was further evident from the disparity in **Table 5.8**, where none of the respondents showed an exact match. The disparity in organisations was concerning yet not surprising. According to a recent report, CIOs ranked the alignment between IT (including technology infrastructure) and business strategies as one of their main concerns (Kappelman et al., 2019). Interestingly, this was a major concern over the last 5 years, and in 2014 Preston (2014) highlighted the contradiction between 'perceived' and 'actual' measurement of IT alignment. Coltman et al. (2015) stated that the right level of alignment was essential for businesses, and it was suggested that more measurable goals such as business value or customer value be used as an alternate means of defining IT-business alignment. For this reason, Research Question 3 focussed on establishing if there was a relationship between the rate of technology adoption and organisational effectiveness.

6.4 Discussion of results for Research Question 3

The important role of technology in enabling other organisational components was previously discussed. For technology to be effective in performing this role, it must be adopted into the business (Oliveira & Martins, 2011). Technology adoption when considering influencing factors was also discussed earlier. The final part of this study was to understand the relationship, if any, between rate of technology adoption and organisational effectiveness.

6.4.1 Customer satisfaction for organisational effectiveness

The results presented in **Table 5.9** showed collectively, participants' rankings of key concerns in relation to the success of the business. It was evident from the results that customer value was regarded as the main concern in this regard. 12 of 16 respondents selected a rank of first or second position, for customer value. Upon combining the rankings for first and second position of the selected components, the following trend was identified, customer value > technology = innovation > pricing model = competitors. Interestingly, pricing model featured the highest number of times (7) in last position.

However, from the narratives it was evident there was a close relationship between customer value and pricing model, be it through value-cost trade off or solution-based service models. For this reason, the rankings for these two components were combined to establish an overall ranking for customer value. To prevent confusion the combined ranking indicated in **Table 5.10**, was termed **customer satisfaction**.

The reason for this approach was that a key aspect of traditional strategy models was a value-cost trade off (Porter, 1980). In more recent strategy models (Kim & Mauborgne, 2015), pricing and customer value was also an important, but featured at the forefront of strategy design to break the value-cost trade off. Therefore, a combination of the importance given to customer value and pricing was regarded as the overall emphasis placed on customer satisfaction by an organisation.

The organisational model in **Figure 2.1**, showed organisational effectiveness as the output when considering strategy implementation. From the above reasoning, customer satisfaction was considered a suitable measure to determine effective strategy, hence organisational effectiveness. Therefore, for this study, the emphasis placed on customer satisfaction by organisations was indicative of the priority assigned toward achieving organisational effectiveness.

6.4.2 The impact of technology adoption

From the results presented in **Table 5.10**, a plot of customer satisfaction vs. rate of technology adoption was constructed and depicted in **Figure 6.2**. The customer satisfaction rankings were subtracted from a factor of 10, which enabled a suitable high-low scale for the plot. **Figure 6.2** was an illustration of the results presented in **Section 5.6** and for this reason was considered a discussion of the results, and not presentation of new results.

From the plot of the graph, it was evident that there was a relationship between rate of technology adoption and customer satisfaction. Customer satisfaction was dependent on the rate at which organisations adopted technology. From the plot below, it was deduced that those organisations which adopted technology at a faster rate were more likely to deliver higher customer satisfaction than those that were slower in their adoption process.

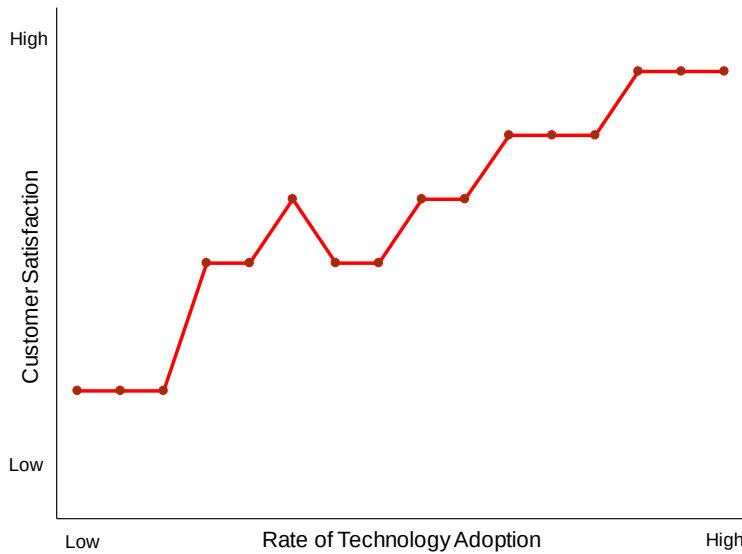


Figure 6.2: Plot of customer satisfaction ranking vs. rate of technology adoption.

It was understood that this was a highly systemic environment which contained many moving parts and interdependencies (Patel & Mehta, 2017). Thus, the narratives were further analysed to gain deeper insight into this relationship.

6.4.3 Strategic business models

As indicated above, from the results in **Table 5.9**, customer value was considered the key concern for business sustainability. However, from analyses of the narratives it was evident that guarding against competition underpinned the priority of customer value in most organisations. Traditionally, this approach which was founded on Porter's five forces strategy framework (Porter, 1980) formed the basis of business models. It was reported that organisations which operated in this traditional manner reduced growth and profit as a result of limited demand in the market (Mi, 2014).

It was understood from the narratives that the value-cost trade off was an important consideration for organisations defending a competitive stance. However, it was also understood from the narratives that competition should not be the departure point for strategy. This point of view was increasingly important when considering how the reduced cost of technology has lowered financial barriers for new entrants into the market (Neirotti et al., 2018). Porter's theoretical framework which considered structural advantages as a means of developing competitive advantages, did not easily apply to the internet economy (Dälken, 2014; Hales & Mclarney, 2017).

In contrast, a reconstructionist approach based on blue ocean strategy (Kim & Mauborgne, 2004) or value innovation management involved making the competition irrelevant. This method provided a series of approaches that maximised opportunity and minimised risk for the organisation (Alam & Islam, 2017, p.7). Other differences between the strategic approaches termed, blue ocean and red ocean (traditional strategy models), were listed in **Table 2.1**.

The blue ocean strategy was regarded as being more suitable in the internet economy, dominated by platforms and application-based services. A prime example of this was Uber's platform application, which enabled the company to break the value-cost trade-off as well as to create and capture demand in a new, uncontested markets (Hales & Mclarney, 2017, p.18). This strategic approach allowed organisations to improve organisational performance, generate increased profits and improve value creation (Alam & Islam, 2017, p.4). Another feature of this model included placing pricing at the forefront of the strategic sequence, as indicated in **Figure A.1 of Appendix A** (Kim, & Mauborgne, 2015). Another indicator of blue ocean strategy was implementation of 'as a service' model which ensured customer value as a key component in strategy formulation (Demirkan et al., 2015). Through this approach, new uncontested market spaces were created which proved advantageous over traditional services (Cramer & Krueger, 2016).

From the results of technology adoption (see **Table 5.10**), three respondents were considered early adopters. From the narratives and **Table E.1**, it was understood that all three organisations had migrated from traditional business models to 'as a service' model. This strategic approach considered subscription models to break free of the value/cost trade off associated with red ocean strategy. These respondents were very clear about moving away from CAPEX models and competing in spaces where competition based on pricing was driving products into commodity status. The early adopters regarded the pricing model as high importance and, pricing was placed together with customer value at the forefront of strategy. It was evident from the responses from these participants that this new strategic approach was providing new opportunities and increasing value creation and profits for the organisation. Resultantly, organisational effectiveness had improved, and this was evident from the results depicted in **Figure 6.2**.

In contrast, it was noted that organisations that assigned a low priority to the pricing model, implemented the traditional strategic approach. Interestingly, these organisations adopted technology at a slower rate and were primarily concerned with what the competition was doing or how innovation/ technology can be used to strengthen the competitive position.

From literature it was also understood that those organisations offering the same utility at the same stage in the customer experience journey (as indicated by the buyer utility map in **Figure 2.6**) did not offer much in terms of differentiation (Kim and Mauborgne, 2000). From the results in **Table 5.3**, it was evident that there was a high concentration of activity towards the earlier part of the customer journey and less towards the latter stages.

Thus, from the above discussion it was understood that there was a relationship between organisational effectiveness and technology adoption. Increased rate of technology adoption resulted in increased emphasis towards customer satisfaction. Consequently, this showed enhanced performance and improved organisational effectiveness. However, it was noted that this was a systemic process and parts of the system cannot be considered and evaluated in isolation. Concluding remarks for this research study were presented in the next chapter.

Chapter 7: Conclusion

7.1 Overview

The layout of this research was an important consideration for the presentation of the report. The prescribed guidelines regarding the format of the report were adhered to. However, there was no indication regarding the layout of subsections within chapters. All the same, the report was consistent in its appearance. Each of the previous chapters contained an introduction which provided the reader with a holistic understanding of the chapter. While chapters in the report contained brief summaries, which served as a gateway to succeeding chapters, concluding remarks were reported under this chapter. Similarly, all reference were consolidated under a single section.

The research questions in Chapter 3 formed the foundation of this study and were designed to address the gap in literature, as indicated in Chapter 2. The research questions explored the importance and the adoption rate of technology in relation to strategy implementation. The reason for this was to address the concern highlighted in Chapter 1. The research methodology which was used for this study was underpinned by an inductive technique. The qualitative approach, described in Chapter 4, provided new insights through analyses of the data, which was conducted through a dual coding process. The research questions were enabled through a research instrument which was tested for reliability and validity. The findings and analyses in Chapters 5 and 6 respectively, were considered next. This was followed by limitations and recommendations.

7.2 Conclusive research findings

This research considered the effectiveness of technology adoption for strategy implementation. Accordingly, three key research questions were examined. Understanding the importance of technology among other key components in the business model was first investigated. From the findings, technology was not regarded as the most important component, instead it was referred to as an enabler of other components within the business. Thereafter, the rate of technology adoption was determined through a scoring system which considered the restrictive ability of influencing factors. The findings showed that the curve for the rate of technology adoption of the selected sample resembled the diffusion of innovation curve. This

indicated that scoring system could potentially be utilised to determine technology adoption in organisations across differing industries.

This was significant considering technology enabled cross-sector disruptions of business models. Lastly, there was a relationship between the rate of technology adoption and customer satisfaction. **Section 6.4.1** described the relationship between customer satisfaction and organisational effectiveness. Hence, the relationship between technology adoption and organisational effectiveness (strategy implementation). Organisations with greater emphasis towards customer satisfaction adapted the positioning of their pricing models to feature together with customer value at the forefront of strategy. This was an important aspect regarding the effectiveness of technology adoption in relation to strategy implementation.

7.2.1 Theoretical considerations

From literature it was understood that there was an alignment between organisational components namely, human resource systems, management processes, structure and technology (Oliveira & Martins, 2011; Cummings & Worley, 2015). However, there was no indication of the level of importance of these components, or their relationship with each other and the environment. From the findings, **Figure 6.1** was constructed as a revised organisational model which also illustrated the alignment between these components. From the findings, respondents ranked human resource systems in first position more often than any other component. Human resource systems which also included human capital, enabled dynamic capabilities within organisations. This allowed organisations to explore new opportunities (Teece et al., 1997). Trying new things enabled organisations to exploit uncontested markets as indicated through the theoretical blue ocean framework (Kim & Mauborgne, 2004).

Traditional business models with hierarchical structures were set in their ways while those organisations that moved away from traditional pricing models redefined the strategy and structure of the business. In these organisations customer value and pricing were placed at the forefront of the strategy (Kim & Mauborgne, 2004). Three organisations were regarded as early adopters of technology, and not only did all 3 adopt customer centric structures and but also a cyclic process to strategy implementation (**Table 5.2**). This allowed continuous monitoring to determine the

effectiveness of the adopted technology for strategy implementation (Sull, 2007). Further to this, Sull (2007) also indicated that this approach guarded against risk, which was evident given the high-risk appetite of these organisations (**Table 5.2**).

In recent years, structure was understudied in literature (Csaszar, 2012) and this was concerning since structure was an important aspect of technology adoption. Hierarchical structures were reported to be more rule-based with mountains of red tape when considering adoption and implementation of technology (Trompenaars & Woolliams, 2011). In contrast, relationship-based or a combination of rule and relationship models encouraged innovative thinking through business incubators (Mas-Verdú et al., 2015). In the context of technology advancements, innovation was a key contributor (Lee & Trimi, 2018). This allowed the organisations adopting this approach to try new things and adopt technology at a faster rate. Again, trying new things enabled organisations to exploit uncontested markets as indicated through the theoretical blue ocean framework (Kim & Mauborgne, 2004).

The way in which organisations were set-up i.e. the structural design, influenced the culture within the organisation. In this study, as mentioned three organisations revised the strategic approach which included placing emphasis of structure and pricing model. The reason for this was that these organisations considered the business model from a buyer's perspective (Kim & Mauborgne, 2000) and recognised the opportunity of exploiting uncontested markets, instead of competing on price in existing market spaces (Kim & Mauborgne, 2004). Resultantly, this ensured greater emphasis on customer satisfaction which was inter-connected with rate of technology adoption. On the opposite end of the scale, organisations with functional structures where strategy was regarded as a linear process showed a slower rate of technology adoption. Interestingly, the traditional business stance taken by these organisations also reflected a low emphasis towards customer satisfaction.

These factors namely culture, structure and risk appetite played an influencing role when organisations adopted technology. The other two factors considered in this study included compliance and financial resources. Compliance was regarded as number one concern among respondents and this was not surprising considering the disparity surrounding regulation of technology innovation. From a financial

perspective technology adoption was considered with long term benefits, where new systems could be integrated into existing technology infrastructure. A scoring system was designed which considered the restrictive ability of these factors towards technology adoption. The results of the adoption curve in relation to the selected sample resembled the innovation of diffusion curve (Rogers, 1995). The results concurred with the theoretical model which indicated that scoring system could potentially be utilised to determine technology adoption in organisations across differing industries.

In summary, analyses of the results from a theoretical perspective provided new insight into the design of the organisational model. It also provided insight into influencing factors which enabled the design of a scoring scale, which determined the rate of technology adoption in organisations. Lastly, there was a relationship between rate of technology adoption and customer satisfaction. This provided insight into the relationship between rate of technology adoption and organisational effectiveness. It was evident from the findings that elements acting within a systemic environment cannot be considered in isolation (Patel & Mehta, 2017). Therefore, for adopted technology to be effective in strategy implementation there must be a holistic consideration of all the inter-connected and interdependent parts acting together.

7.2.2 Business implications of the study

What was most important from a business perspective was the alignment between IT and business strategies (Bharadwaj et al., 2013). This was reported year-on-year as a key concern among CIOs (Kappelman et al., 2019). This alignment was underpinned by the adoption of technology, and the theoretical implications were considered above. However, what was important from this study was the comparison between the perceived rate of technology adoption (based on opinions only) and the actual rate of technology adoption (based on the restrictive ability of influencing factors). This comparison was enabled through the design of a scoring system which converted words into a quantifiable dataset (Luftman et al., 2017). It was noted that several respondents believed their organisations were adopting technology at a faster rate than was the case. Consequently, this has an impact on the operations and the effectiveness of strategy implementation. This was further evident from emphasis (or lack of) placed on customer satisfaction, as illustrated in **Figure 6.2**.

It was evident that organisations did not recognise the level of importance of technology in the business model. Those organisations that showed a low rate of technology adoption, prioritised guarding their current position, and as a result low emphasis was placed on customer satisfaction. However, this was not surprising since most respondents indicated that the information technology unit was only a support function, called upon when IT functional capabilities were required. This called for businesses to be more mindful of the overall disconnect between IT and business strategies (Preston, 2014; Coltman et al., 2015).

The misalignment between IT-business strategies should be further concerning given the disruption to traditional business models by technological innovations (Lui et al., 2016). Again, this can be traced to implementation of blue ocean strategy where some organisations were redefining their business models based on structure and pricing models (Kim & Mauborgne, 2004). Interestingly, from the results in **Table 5.1** structure was ranked in last position, more often than any other component. This implied that not much consideration was given to the importance of structural design in relation to technology adoption. While the findings from this study proved most valuable, there were also limitations to this study as indicated in the next section.

7.3 Limitations of the study

New insights from this study provided tentative answers to initial questions. This contributed to existing theoretical knowledge and did not build new theory. The scoring scale which was designed has the potential to develop into a new tool which can be used to determine the rate of technology adoption in organisations. However, potential nuisances stemming from varying sectors must also be accounted for. In the study, time constraints were an important consideration, and the research was confined to a cross-sectional time horizon. This presented only a snapshot of the situation. This research was not only impacted by time constraints. Other aspects included inherent bias of the selected sample at leadership/ senior management level. Also, while steps were taken to prevent any biases, there were no guarantees that the process was flawless.

7.4 Recommendations for future research

This research study provided valuable insight into the research topic. However, this work can be further developed, and the recommendations below proposed future research in specific areas of study.

- From the results, it was evident that structure was an important consideration in strategy implementation. However, there was limited research relating to the importance of structural design. It was also evident that some organisations were redefining its business models in terms of structural design, to enhance innovation. Therefore, it is recommended that a study considers the effectiveness of structural design in relation to strategy implementation.
- The scoring scale designed in this study has the potential to develop into a powerful new tool which can be used to determine the rate of technology adoption in organisations across different sectors. It is highly recommended that further research be conducted to include other organisational nuisances which can improve the reliability and validity of the scoring system.
- Given the time constraints, this study was confined to a cross-sectional time horizon. However, it would be interesting to consider a longitudinal study for this research. It is recommended that this research be carried out as a PhD study which can include a longitudinal time horizon.
- This study included respondents from public and private sector, with key considerations defined for sample selection. However, it would be interesting to conduct a similar study which provides a comparison between public and private sector. Interestingly, the 2 public institutions ranked culture as very likely to negatively influence technology adoption while compliance was not a major concern. Thus, a comparative study may provide valuable insight into the factors which influence technology adoption in public and private sectors. Resultantly, it would enable learnings from one another.

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Appendices

Appendix A: Supporting data for Literature

Table A.1: Advantages, disadvantages and contingencies in differing organisational structures.

	Functional	Divisional	Matrix	Customer-centric
Advantages	Promotes technical specialisation. Enables communication and performance. Supports flexibility and common processes.	Enhances division cohesion. Accountability by divisional manager. Allows diversification. Enables divisional outcomes	Easy adapting to environmental changes. Integration of functional expertise. Uses people flexibility. Lateral communication	Understands customer requirements. Tailors solutions for customers. Robust customer response capability.
Disadvantages	Emphasises routine task. Difficulty coordinating and scheduling. Longer decision making. Obscures accountability. Narrow perspectives. Lateral relations.	Inefficient use of skills and resources. Difficult to create common processes. Promotes divisional objectives. Multiple role demands.	Pressure on shared resources. Inconsistent demands. Conflict between business and functions. Lowers overall performance.	Disconnect between fronts and back office. Clarifying marketing function is difficult. Developing functional skills is difficult.
Environments	Stable environment	Unstable and uncertain	-	Complex and uncertain
Organisation size	Small to medium	Large size organisations	-	Large organisations
Technology	Interdependency within functions	Interdependence across functions	High information processing capacity	Highly uncertain technologies
Organisation strategy	Efficiency and technical quality goals	Product specialisation and innovation goals	Product demands and technical specialisation	Customer focus and solutions driven

(adapted from Cummings & Worley, 2015)

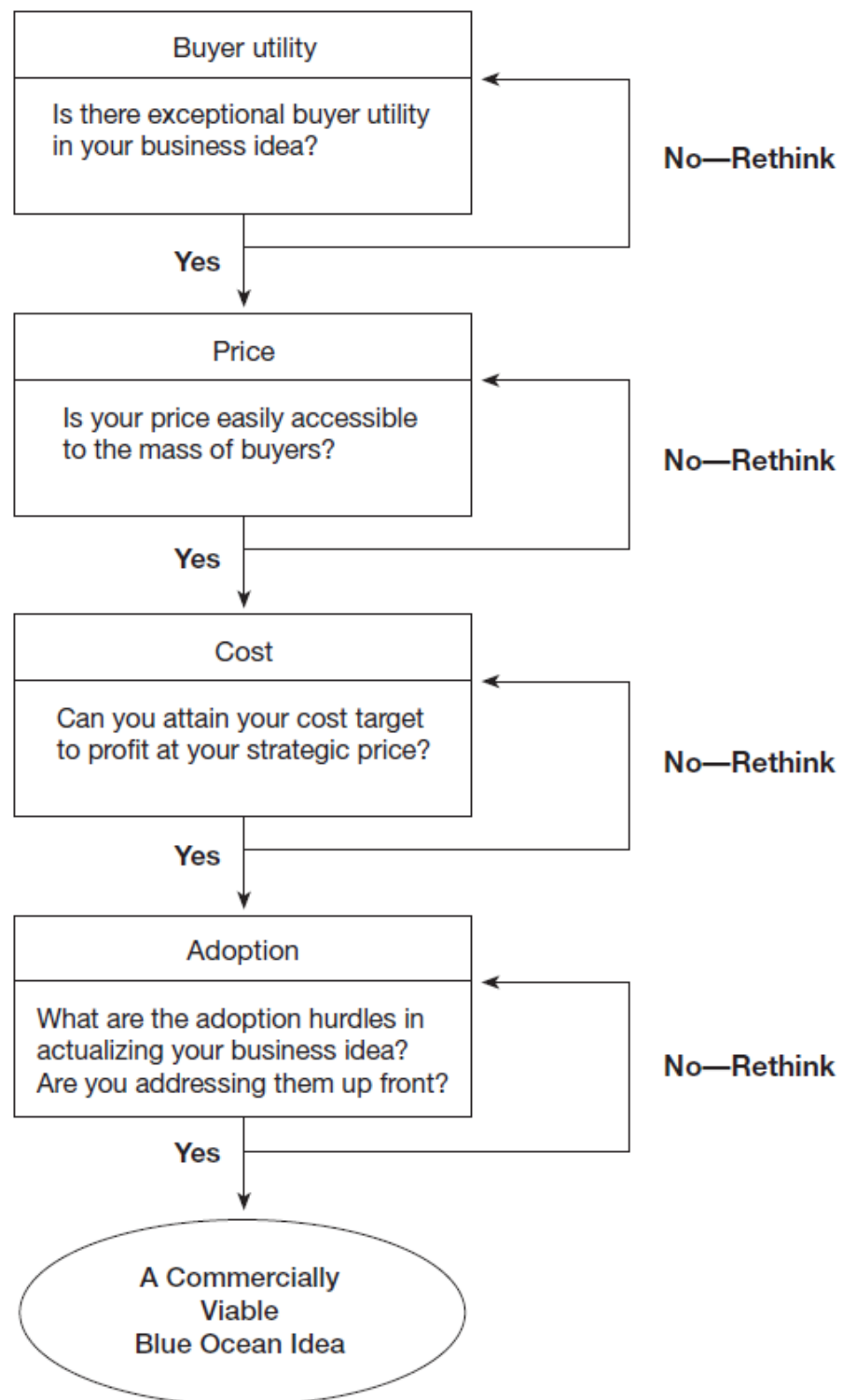


Figure A.1: Right strategic sequence required for blue ocean strategy (adapted from Kim, & Mauborgne, 2015, p.118).

Appendix B: Interview schedule with research instrument

Part A. Explanation of the consent form: (2-3 mins)

An explanation of the consent form will be discussed with the research participant. Particularly, the data acquired through the interview will be confidential and not drawn back to the research participant or the participant's institution. The information provided will be used for the research report of this study and may be used for academic dissemination in scientific articles or conference papers.

Part B. Introduction: (5 mins)

It is expected that the research participant will meet the criteria set out in sampling method and size. Thus, pre-screening of the research participant and the institution will prove valuable for brief introductions.

The purpose of the study (as outlined in the consent letter), will be communicated when setting up an appointment for the interview. This will also allow introductions to be capped at 5mins.

Part C. Discussion and in-depth interview: (45 mins)

This section forms the basis of the interview and will be guided by the research questions outlined below. Further to this, additional insights provided by the research participant will be taken into consideration for data analysis. INTERVIEW QUESTIONS.

Part D. Conclude by asking the researching participant if there is anything further that may be insightful into this research. Thank the research participant for input into the research study (5mins)

Part C: INTERVIEW QUESTIONS

Technology associated with the core of the company and its competitive approach to the market and the beneficiary in this regard of the adopted technology is the organisation.

RQ1: Understanding what is the level of importance of technology towards strategy implementation?

1. What is your understanding of strategy implementation?

a. Do you believe your company is achieving its strategy?

2. What do you regard as a key threat to your current business model?

Can you rank these threats?

Technology	Innovation	Customer value	Competitors	Current Pricing model
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a. Can you expand why it is a key threat.

3. If you were given 100 points to allocate to the following components which contribute to strategy implementation, how would you allocate the points in order to establish importance?

Components	Points
Human Resource Systems	
Management Processes	
Structure/ Social	
Technology	

RQ 2: Establishing what is the rate of technology adoption in the organisation?

4. Does the organisation adopt trending technologies, or does it actively innovate new technologies?
 - a. Do you believe your rate of technology adoption is excellent, medium, low? Explain why.
5. What is the likelihood of the below factors to influence the rate of adoption of new technologies (where 1 is very likely and 5 is very unlikely)?

	Very likely 1	Somewhat likely 2	Likely 3	Somewhat unlikely 4	Very unlikely 5
Financial Fluidity					
Compliance					
Risk Appetite					
Structure					
Culture					

RQ3: Understanding what are the factors which influence the rate of technology adoption in the organisation?

6. When adopting a new technology, how does the organisation manage the change process in order to maintain or improve operational efficiency?

It's not handled	
The organisation continuously tries its best	
There is no need to be concerned	
Perfectly, agile as Ninjas	

7. What are the channels of communication in the organisation? and how often would the adoption of a new technology be communicated?
8. How does the organisation ensure relevant skillsets are in place when adopting a new technology?
9. How does the organisation respond to an emerging technology, when it is currently adopting a previously 'new' technology?
10. How does the organisation determine what is the most suitable technology to adopt and what is the role of IT in this process?
11. What are benefits and risks (if any) when considering effectiveness of adopted technology?
 - a. Top 3 or 4 focus areas regarding improvements.

	Purchase	Delivery	Use	Supplements	Maintenance	Disposal
Customer productivity						
Simplicity						
Convenience						
Risk						
Fun and Image						
Environmental Friendliness						

Appendix C: Ethics approval letter



31 July 2019

Pillay Jeseelan

Dear Jeseelan

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

Appendix D: Consent form

Dear Research participant,

I am currently a student at the University of Pretoria's Gordon Institute of Business Science and completing my research in partial fulfilment of an MBA. I am conducting research to determine the effectiveness of technology adoption towards enabling strategy implementation in South Africa.

Our interview is expected to last about 60 minutes and will help understand:

- i. The level of importance of technology towards strategy implementation
- ii. Rate of technology adoption in the organisation
- iii. The factors which influence the rate of technology adoption in the organisation

Further to this, the research considers the effectiveness of the adopted technology through the benefits and risks to the organisation, clients and employees. This insight will prove most valuable in enhancing operational efficiency in lieu of emerging technologies.

Your participation is voluntary, and you can withdraw at any time without penalty. Whatever you say in this interview is confidential and if reported, will be without identifiers i.e. it cannot be reasonably drawn back to you. The information provided will be used for the research report of this study and may be used for academic dissemination in scientific articles or conference papers.

If you have any concerns, please contact my supervisor or me. Please find our details provided below.

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Signature of participant: _____

Date: _____

Signature of researcher: _____

Date: _____

Appendix E: List of codes and categories

Table E.1: Descriptive coding assigned to themes.

Code	Code Group/ Themes/ Categories
Agility adoption/innovation	2.1 Rate of technology adoption
Ambidexterity	2.7 Fit for Purpose
Automation and robotics	3.1 Technology Advancements
Blue oceans vs red oceans	3.2 Customer comes first 3.1 Technology Advancements
Budget constraints	2.2 Financial fluidity
Business plan for tech adopt	1.2 Organisation Performance
Change management	2.6 Culture for Tech Adoption
Common understanding/shared vision	1.1 Strategy implementation
Communication	2.6 Culture for Tech Adoption
Communication rate	2.6 Culture for Tech Adoption
Competitor pricing	3.3 Competitors as a threat
Competitors as a threat	3.3 Competitors as a threat
Compliance	2.3 Compliance
Cost cutting objective	1.2 Organisation Performance
Credibility/ Reputation	1.5 Management processes
Cross sector disruption	3.1 Technology Advancements
Cross-functional teams/ Forums	2.4 Risk management for Tech Adoption
Culture driven by people	2.6 Culture for Tech Adoption
Customer centricity/ experiential	3.2 Customer comes first
Customer journey	3.2 Customer comes first
Customer value meaning	3.2 Customer comes first
Customer value Buyer's perspective	3.2 Customer comes first
Customer value through strategy tailoring	3.2 Customer comes first
Digital disruption threat of technology	3.1 Technology Advancements
Ecosystem for customer value	3.2 Customer comes first
Financing technology	2.2 Financial fluidity
Future readiness	2.7 Fit for Purpose
Global solution for Africa	2.6 Culture for Tech Adoption
Hardware vs software changes	2.7 Fit for Purpose
Industry 4.0	3.1 Technology Advancements
Innovation disruption	3.1 Technology Advancements
Innovation mindset	1.3 HR Systems
KPIs for measurement of deliverables	1.3 HR Systems
Labour rate vs tech adopt	2.1 Rate of technology adoption
Leadership for strategy	2.5 Structure for Tech Adoption
Management processes	1.5 Management processes
Market share objective	3.3 Competitors as a threat
Market trends for tech adoption	2.7 Fit for Purpose
Network effects	2.7 Fit for Purpose
New generation of customer	2.7 Fit for Purpose
Non bias approach	2.4 Risk management for Tech Adoption
Operational efficiency	1.1 Strategy implementation
People management	1.3 HR Systems

Code	Code Group/ Themes/ Categories
Performance cost to income ratios	1.2 Organisation Performance
Performance organisational performance	1.2 Organisation Performance
Pricing of the product	3.3 Competitors as a threat
Product life cycle shorter	2.7 Fit for Purpose
Profitability through performance	1.2 Organisation Performance
Profitability through customer value	3.2 Customer comes first
Regulations for tech adoption	2.3 Compliance
Revenue objective	1.2 Organisation Performance
Right people in right position	1.3 HR Systems
Right people set of values	1.3 HR Systems
Risk appetite based on KRI	2.4 Risk management for Tech Adoption
Risk management in tech adoption	2.4 Risk management for Tech Adoption
Role of IT	1.4 Technology Enabling Component
Safety adoption/innovation	2.1 Rate of technology adoption
Shareholder value through performance	1.2 Organisation Performance
SI Operational strategy	1.1 Strategy implementation
SI Strategy implementation core feature	1.1 Strategy implementation
SI Strategy measurables and deliverables	1.1 Strategy implementation
Skillset for tech adoption	1.3 HR Systems
Skillset hiring investment	1.3 HR Systems
Skillset upskilling/ training	1.3 HR Systems
Solutions as a service/ OPEX model	3.2 Customer comes first
Speed adoption/innovation	2.1 Rate of technology adoption
Structure for Org Model	1.6 Structure for Org Model
Structure for strategy	2.5 Structure for Tech Adoption
Structure disadvantage	2.5 Structure for Tech Adoption
Structure Federated model	2.5 Structure for Tech Adoption
Structure lean start-up	2.5 Structure for Tech Adoption
Tech adoption vs innovation	2.7 Fit for Purpose
Tech Fit for purpose	2.7 Fit for Purpose
Technology as an enabler	1.4 Technology Enabling Component
Technology constraints	2.6 Culture for Tech Adoption
Technology creating new roles	2.1 Rate of technology adoption
Technology integration	1.4 Technology Enabling Component
Technology transparency	3.2 Customer comes first
Technology rate of adoption	2.1 Rate of technology adoption
Technology rate of change/growth	3.1 Technology Advancements
Unemployment	2.1 Rate of technology adoption

Table E.2: Descriptive coding grounded in participants' responses.

Code	*R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	R16
Agility adoption/innovation	X	X	X							X	X	X				X
Ambidexterity		X	X							X	X	X	X	X	X	X
Automation and robotics		X	X							X						X
Blue oceans vs red oceans	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Budget constraints	X							X								
Business plan for tech adopt	X	X	X		X											
Change management	X	X	X			X	X	X	X	X	X	X	X	X	X	X
Common understanding/shared	X	X	X			X		X						X	X	
Communication	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Communication rate	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Competitor pricing	X			X		X			X			X	X			
Competitors as a threat	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Compliance	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cost cutting objective	X	X														
Credibility/ Reputation	X	X	X							X	X					
Cross sector disruption	X	X		X	X							X				
Cross-functional teams/ Forums	X	X														
Culture driven by people	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Customer centricity/ experiential	X	X	X			X	X								X	X
Customer journey	X		X										X			
Customer value meaning	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Customer value Buyer's perspective	X	X	X								X					X
Customer value through strategy tailoring	X	X	X			X				X	X					
Digital disruption threat of technology	X	X		X								X				X
Ecosystem for customer value	X										X					
Financing technology	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Future readiness	X	X				X		X		X		X	X			X

Code	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	R16
Global solution for Africa			X							X						
Hardware vs software changes	X		X	X		X	X	X	X	X	X	X		X	X	X
Industry 4.0		X	X							X						
Innovation disruption	X					X	X					X	X			X
Innovation mindset	X	X	X				X	X		X	X	X		X	X	X
KPIs for measurement of deliverables	X						X		X	X	X					
Labour rate vs tech adopt			X	X	X	X					X					
Leadership for strategy	X	X	X				X	X		X			X	X		X
Management processes	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Market share objective	X	X					X									
Market trends for tech adoption	X		X	X		X	X	X	X	X			X			X
Network effects			X				X						X			
New generation of customer		X	X		X	X	X			X		X	X			X
Non bias approach	X									X						
Operational efficiency	X	X	X			X		X		X	X		X	X		X
People management	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Performance cost to income ratios	X	X					X									
Performance organisational performance	X	X					X									
Pricing of the product	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Product life cycle shorter	X		X		X											
Profitability through performance	X									X						
Profitability through customer value	X									X	X					
Regulations for tech adoption	X	X	X			X		X		X	X	X	X			X
Revenue objective	X															
Right people in right position	X		X				X			X	X		X	X		X
Right people set of values	X	X					X			X	X					X
Risk appetite based on KRI	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Risk management in tech adoption	X		X		X	X	X	X		X	X	X				X
Role of IT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Code	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	R16
Safety adoption/innovation	X									X						
Shareholder value through performance	X															
SI Operational strategy	X						X			X						
SI Strategy implementation core feature	X	X		X	X	X	X	X	X	X		X		X	X	X
SI Strategy measurables and deliverables	X	X											X			
Skillset for tech adoption	X	X	X			X		X		X				X		
Skillset hiring investment		X							X					X		
Skillset upskilling/ training	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Solutions as a service/ OPEX model			X								X					X
Speed adoption/innovation	X	X					X			X	X	X	X			X
Structure for Org Model	X			X							X	X			X	
Structure for strategy	X	X	X		X	X	X	X	X	X	X		X	X	X	X
Structure disadvantage	X	X				X					X			X		
Structure Federated model	X	X	X						X	X						X
Structure lean start-up	X				X								X			
Tech adoption vs innovation	X	X					X			X	X		X			
Tech Fit for purpose	X		X			X				X	X				X	X
Technology as an enabler	X	X	X		X		X	X	X	X		X	X	X	X	X
Technology constraints	X							X		X						
Technology creating new roles		X				X	X								X	X
Technology integration	X	X			X	X	X	X	X	X	X	X		X	X	X
Technology transparency		X														
Technology rate of adoption	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Technology rate of change/growth		X	X			X			X			X	X			X
Unemployment				X		X										

*R = research participant

Appendix F: Sample description

Table F.1: Information regarding designation and sector of research participants.

Respondent	Designation	Industry/ Sector
Respondent 1	Director	Financial services
Respondent 2	Director	*FMCG
Respondent 3	Chief executive officer	Manufacturing
Respondent 4	Managing director	Manufacturing
Respondent 5	Director	Manufacturing
Respondent 6	Chief executive officer	FMCG
Respondent 7	Senior manager	Hospitality
Respondent 8	Senior manager	Public sector
Respondent 9	Director	Security
Respondent 10	Chief executive officer	Public sector
Respondent 11	Senior manager	Technology-company
Respondent 12	Director	Financial services
Respondent 13	Chief executive officer	Technology-company
Respondent 14	Senior manager	Financial services
Respondent 15	Managing director	Manufacturing
Respondent 16	Director	Technology-company

*FMCG = Fast moving consumable goods

Appendix G: Supporting data for Results

Table G.1: Points and positioning for key components in strategy implementation as indicated by research participants.

	Participant 1		Participant 2		Participant 3		Participant 4		Participant 5		Participant 6		Participant 7		Participant 8	
	Point	Pos.	Point	Pos.	Point	Pos.	Point	Pos.	Point	Pos.	Point	Pos.	Point	Pos.	Point	Pos.
HRS	30	1	20	3	10	4	35	1	10	3	30	1	30	1	35	1
MP	25	2	30	1	15	3	30	2	50	1	25	2	30	1	30	2
Struc	20	4	30	1	40	1	10	4	30	2	20	4	20	3	10	4
Tech	25	2	20	3	30	2	25	3	10	3	25	2	20	3	25	3
	Participant 9		Participant 10		Participant 11		Participant 12		Participant 13		Participant 14		Participant 15		Participant 16	
	Point	Pos.	Point	Pos.	Point	Pos.	Point	Pos.	Point	Pos.	Point	Pos.	Point	Pos.	Point	Pos.
HRS	20	2	30	2	10	4	10	4	20	2	15	4	35	1	70	1
MP	40	1	20	3	20	3	25	2	20	2	20	3	25	2	15	2
Struc	20	2	15	4	40	1	15	3	20	2	35	1	25	2	7.5	3
Tech	20	2	35	1	30	2	50	1	40	1	30	2	15	4	7.5	3

HRS = Human resource systems; MP = Management processes; Struc = Structure; Tech = Technology

Dedicated to
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