THE EFFECT OF TECHNOLOGICAL OPPORTUNISM ON THE PERFORMANCE OF SMEs: A DYNAMIC CAPABILITIES PERSPECTIVE.

By:

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Declaration

I hereby declare that this is my original work. Where other people's work is used, acknowledgements have been made. I declare that neither this work, nor a part of it has been previously submitted for the award of a degree in this or any other university.

Signed by candidate

…… 22 February 2019

Roline Tjipueja

Abstract

In today's fast changing business environment, small and medium-sized enterprises (SMEs) need to seize the technological opportunities that this environment provides, by developing dynamic capabilities to build and attain high performance. This dissertation looks at the effect that technological opportunism has on the performance of SMEs in Namibia. In addition, the dissertation looks at the mediating role of dynamic capabilities on the relationship between technological opportunism and SMEs.

The study draws from the dynamic capabilities view for theoretical context. The literature reviewed enabled the development of a conceptual model, which further contributes to theory. Data is drawn from a random sample of 209 SMEs located in Namibia. Results from the regression analysis suggest that the effect of technological opportunism on the performance of SMEs is partially mediated by dynamic capabilities. For the three capabilities assessed, the learning and integrative capabilities have a partial mediating effect on the link between technological opportunism and performance, while the transformative capability does not mediate this relationship.

The study offers important academic and business implications, and also points out future research directions. The findings serve as a guide to best improve the work done in this sector, with an emphasis on how to best develop SMEs' capabilities with regard to new technology initiatives, aimed at improving SMEs. SME owners are encouraged to build capacity, embrace partnerships and develop capabilities that results in better performance.

KEYWORDS: technological opportunism; dynamic capabilities; performance; SMEs; small and medium enterprises.

Dedication

To my father, for always believing in me!

Acknowledgement

I thank God for the will and strength to continue. *Aruhe Onguukarapo!*

To my best friend, my husband Hasting, for the unconditional love, unwavering support and being my steadfast partner through this remarkable journey of life.

To my children, for simply being my fuel.

A special thank you goes out to the SME entrepreneurs who participated in this research and to my dear friends, colleagues and family who kept me going.

I sincerely thank Prof. Irwin Brown for the guidance and continued support provided throughout the research; as well as Prof. Kyobe for his contribution.

A high five to my brother, Erwin who greatly assisted me in contacting the SMEs.

To all the readers of this paper, enjoy the reading and I trust that you will gain something from it.

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List of acronyms and abbreviations

DCs	Dynamic Capabilities
DCV	Dynamic Capabilities View
ICT	Information and Communication Technology
MTI	Ministry of Trade and Industry
SMEs	Small and Medium Enterprises
SPSS	Statistical Package for Social Sciences

CHAPTER 1 - INTRODUCTION

1.1 BACKGROUND AND PURPOSE OF THE STUDY

SMEs still experience difficulties in effectively leveraging new technologies to enhance business performance. Understanding how SMEs are able to make strategic decisions with regard to acquiring knowledge on technological developments and responding to new technologies in their environment, through the dynamic skill sets and capabilities that they have as an entity, is vital in determining their overall performance. Therefore, technological opportunism and dynamic capabilities are of great importance for SMEs and create enabling opportunities to thrive in dynamic business environments (Abbas et.al., 2019; Kurtz & Varvaki, 2016). Technological opportunism, in this case, refers to how SMEs are able to sense and become aware of technological developments in their environment, contextualize these developments as well as how they respond to these technological changes (Sheikh et al., 2017). The study builds on other studies conducted on explaining the relationship of technological opportunism and the performance of an entity, which is found in the following studies (Maphumulo, 2017; Chen & Lien, 2013; Sarkees, 2011 & Srinivasan, Lilien, & Rangaswamy, 2002).

By introducing dynamic capabilities, in this case the learning, integrative and transformative capabilities, as mediating effects on the relationship between technological opportunism and the performance of SMEs. This study looks at entities regarded as SMEs in Namibia. Dynamic capabilities involve the ability of the enterprise to persistently modify or create organizational configurations for competitive advantage and improved viability (Eisenhardt & Martin, 2000; Helfat et al., 1997; Teece, Pisano & Shuen, 1997). The dynamic capabilities perspective adopted in this study provides context as to the factors which affect and sustain the performance of SMEs. SMEs have to maintain and increase performance in order to stay in the market. It is therefore important for SMEs to realise their skill set or capabilities and to find technological opportunities that fit their core business.

The study presents technological opportunism and SME performance in a way that depicts the similarities and uniqueness of this specific study in relation to other studies conducted in the same field. Furthermore, the study briefly delves into the different theoretical frameworks related to technological opportunism and performance. A conceptual model grounded in the subject's literature is outlined and explained herein. Data in support of this model was collected, analysed, discussed and concluded on.

1.2 RESEARCH OBJECTIVES AND QUESTIONS

Despite the benefits brought by technology, there is still the need to uncover the effects that these technologies have on SMEs and how SMEs can effectively leverage opportunities in technology through different capabilities to improve and sustain their performance

The primary objective of this research study is to investigate the effect of technological opportunism on the performance of SMEs in Namibia. The study further seeks to investigate the mediating effect of dynamic capabilities on the relationship between technological opportunism and SME performance, by assessing the causal chain in which technological opportunism affects dynamic capabilities and which, in turn, affects the performance of SMEs, with dynamic capabilities being the mediator.

Technologically opportunistic businesses are more able to scan, understand and acquire knowledge about new technology developments (technology sensing capability) and the willingness and ability to respond to new technologies (technology response capability) (Srinivasan et al., 2002).

Several studies have been conducted on information technology, specifically from a dynamic capabilites perspective. However, not enough research is done that specifically focuses on technological opportunism and dynamic capabilities as crucial components, in relation to SME performance. Firstly, the few studies conducted in this field mainly have a focus on orientation (entrepreneurial, technological and strategic orientation), which are key organisational capabilities (Maphumulo, 2017; Rezazadeh et al., 2016; Salavou, 2005; Zhou & Li, 2010). Secondly, the focus in these studies are mainly on competitive advantage, rather than performance. Thirdly, many studies focus on large firms, with less focus on SMEs (Salavou, 2005), perceiving dynamic capabilities to be more beneficial to larger firms. Other studies have assessed dynamic capabilities in the context of SMEs (Adeniran & Johnston, 2016; Rezazadeh et al., 2016), which paved the way for this study.

The argument in this research is that since technological opportunism introduces the ability for firms to be opportunistic, it therefore influences the ability for firms to learn, integrate and adopt this technology. Few studies have explored this. This dissertation therefore presents technological opportunism as an enabling factor in improving SME performance, through dynamic capabilities.

Although the reverse way, where dynamic capabilities influence technological opportunism might hold, it can be an area to be explored in further studies since this was not part of the scope of this study.

The objectives of the study are as follows:

1. The main objective of this study is to examine the relationship that exists between technological opportunism (*the way SMEs sense and respond to new technologies*), and SME performance.

2. To determine the mediating effects of dynamic capabilities on the relationship between technological opportunism and SME performance. *(The influence that dynamic capabilities have on the relationship between technological opportunism and SME performance)*

3.The study further seeks to establish the types of technologies used by SME entrepreneurs and the derived benefits thereof. *(i.e. The technologies SME entrepreneurs use and the benefits derived from using those technologies)*

The study attempts to answer the following research questions:
1. What is the effect of technological opportunism on SME performance?
2. What is the mediating effect of dynamic capabilities on the relationship between technological opportunism and the performance of SMEs in Namibia?
In addition, the following sub research question is assessed:
3. Which technologies and to what extent do SME entrepreneurs in Namibia own and use technologies?

A conceptual framework was created, using the above questions.

1.3 SIGNIFICANCE OF THE STUDY

SMEs have experienced higher rates of failure and weak performance (Sitharam & Hoque, 2016). Therefore, it is of significant value to evaluate factors affecting SMEs' performance and contribute towards enabling SMEs to positively contribute to their performance and ultimately to their development challenges. The dissertation contributes to the existing body of knowledge and attempts to narrow the research gap by providing empirical evidence regarding technological opportunism, the role of dynamic capabilities and the performance of SMEs in Namibia. The importance of this study is that it can act as a guide to improve the work done on developing SMEs' capabilities with regard to new technology initiatives aimed at improving SMEs in key projects such as the Namibian National Development Plan, where development of SMEs is a key driver.

1.4 OVERVIEW OF RESEARCH METHODOLOGY

This study outlines the theoretical frameworks as well as the conceptual framework before presenting the empirical data collected. The study uses deductive reasoning by using a set of statements

(premises) to arrive at a conclusion. Data was collected from SMEs in Namibia across all economic sectors, using survey data where 209 questionnaire responses were obtained. The data generated was quantitative and qualitative in nature (mixed methods) and the few qualitative data was coded to be quantitative to a large extent, the method employed generated both quantitative and qualitative data. Quantitative data was analysed using IBM SPSS Statistics version 25.

1.5 STRUCTURE OF THE STUDY

Following the introduction, Chapter two presents an overview of the theoretical and empirical literature reviewed for this study as well as the research questions and hypotheses that were developed from the conceptual framework. Chapter three provides a description of the research methodology employed for the study which encompasses the research philosophy (research ontology and epistemology, and approach adopted for this study), data collection methods and data analysis methods.

CHAPTER 2 - LITERATURE REVIEW

2.1 INTRODUCTION

The literature reviewed in this section is mainly conducted with reference to the objectives of the study. Relevant literature on aspects related to the impact of technological opportunism on SME performance, from a dynamic capabilities perspective is brought to the fore.

The different sections of this chapter are presented as follows: Section 2.1 provides an overview of the chapter; Sections 2.2 and 2.3 discuss SMEs as a whole as well as their performance and measurements thereof. Section 2.4 discusses technological opportunism. Section 2.5 sheds light on dynamic capabilities as mediators, with an emphasis on the learning, integrative and transformative capabilities. An outline of the research hypotheses is presented in section 2.6. Thereafter, the conceptual model developed from literature and a summary of the review is provided.

2.2 SMALL AND MEDIUM ENTERPRISES

The success of SMEs is dependent on adequate finance, investment and development in ICT capabilities Adeniran & Johnston (2016). The above, in this regard, being primarily explained as part of the strategies and capabilities that that lead to SME performance.

It is very difficult to arrive at a common definition of SMEs. Due to the varying definitions of SMEs, there is therefore no common accepted definition of SMEs Muriithi (2017). The term “SME” is typically broadly defined. Guidelines for defining SMEs are set uniquely by international organisations and countries set their own guidelines for defining an SME, often based on the number of employees, sales, or assets (Ramsden, 2010). Statistics released by the Namibian Ministry of Trade and Industry in November 2016 indicated that there are currently about 33 700 SMEs in Namibia, of which 15,000 (45%) are formally registered. These SMEs provide employment and income to approximately 45 percent of formal sector workers. It is indicated that SMEs in Namibia contribute to approximately 24 percent of the total GDP (MTI brief, 2016).

An updated definition of SMEs was proposed from the results of studies conducted by the then Ministry of Trade and Industry where the study concluded that on average, SMEs in Namibia have an average of less than three (3) employees and are very small. (MTI, 1998b: 54). This research was conducted in 1998 and no other research in this regard has since been conducted. The research outcomes of this dissertation will provide an indication on different aspects of the SME sector in Namibia.

In addition, the definition was reviewed for alignment with international definitions of the SME sector in order to allow comparisons (Jauch, 2010). SMEs in Namibia are now defined according to two criteria; firstly, according to the number of employees and secondly, based on the annual turnover. A micro

business is defined as having up to ten (10) employees and an annual turnover of up to N$300,000. A small business has 11 to 30 employees and an annual turnover of up to N$3 million. A medium business has 31 to 100 employees and an annual turnover of up to N$10 million.

Table 1: Namibia SME Definition and categorization

Category	No. of full-time employees	and/or	Annual turnover (N$)
Micro enterprise	1 to 10	And/or	0 to 300,000
Small enterprises	11 to 30	And/or	300,001 to 3,000,000
Medium enterprises	31 to 100	And/or	3,000,001 to 10,000,000

Source: National Policy on Micro, Small and Medium Enterprises in Namibia

A number of factors distinguish the term MSE (micro and small enterprise) from SME (small and medium enterprise). It is argued that there are no implicit conceptual overlaps between the two terms since the word “small” appears in both terms and also due to the fact that there are no commonly universally accepted definitions of the number of employees or turnover thresholds between micro, small, and medium enterprises (Donner & Escobari, 2010).

Review of literature suggests that amongst the little research conducted on this topic, there have been no published studies on SME performance as influenced by technology in Namibia. The majority of studies regarding SMEs in developing countries are centred on understanding the challenges faced by SMEs, which mainly focus on access to finance. (Shah et al., 2013; April, 2013; Ogbokor & Ngeendepi, 2012; Jauch, 2010) sought to understand the problems associated with the success and failure of SMEs. Technology, or the lack thereof, is identified as one of the key elements of constraints to the growth and development of SMEs (April, 2013). Hence this study seeks to provide knowledge and assist SMEs, in this regard, as the use of technology in SMEs has a key role to play in the ultimate performance of SMEs.

2.3 TECHNOLOGICAL OPPORTUNISM IN SMEs

The decision to implement a certain technology depends on the intuition, training and experience of the entrepreneur (Mwangi & Brown, 2015). It remains that the exact value and extent to which these technological changes contribute to SMEs performance is not fully established (Rumanyika & Galan, 2015; Kabanda & Brown, 2017). Technological opportunism, as defined by Srinivasan et al. (2002), is the capability of the firm to (i) acquire intelligence about technology developments in the environment and make sense of these developments and (ii) respond to technological changes it senses in its environment.

Srinivasan et al. (2002) argue that organisations that are technologically opportunistic will proactively adopt new technologies to further their business objectives, while SMEs that are not technologically opportunistic will be more tentative in their adoption of new technology. An underlying factor in technological opportunism is the adoption of new and radical technologies (Srinivasan et al., 2002). Technological opportunism and the adoption of new and radical technologies have significant implications for SMEs since radical technologies can potentially affect SMEs' business operations by overwhelming the existing technologies and operations (Srinivasan et al., 2002). In addition, the adoption of radical technologies may affect existing assets adversely in a way that may also affect resource planning as new resources might need to be added and the new or existing technology may require differing employee skill sets. This can lead to additionally required interventions such as training, where there might be cost considerations for the SME.

Srinivasan et al. (2002) indicate that if a firm (in this case generalised to mean SME) is technologically opportunistic, then the SME owner or manager is more likely to be aware of general technological developments in the business environment. This indicates that companies whose management is involved in daily operations, mainly reap the benefits and their business performance is positively influenced (Muhanguzi & Kyobe, 2014). This study did not look at management involvement as a construct or a control variable. Similar studies conducted have also excluded the role of management to particularly focus on the outlined relationship built thus far through literature. Intentionally excluding management involvement avoids broadening the focused scope of the current study. This therefore sets a departure point for further research to look at management involvement in technological opportunism.

2.3.1. Technological Opportunism - Sensing and Responding Capabilities

In the current changing business environments that SMEs operate in, sensing is considered to be the initial skill that an SME should possess to stay abreast and ahead of other entities operating in the same business environment (Lindblom et al., 2008). In this vein, the tendency to sense opportunities and threats is consistent with previous suggestions by Teece (2007) indicating the notion that an organisation should incorporate capabilities to continuously scan the landscape and any changes in the industry. "*Enhanced sensing capabilities should enable firms to observe opportunities and threats by scanning, interpreting, and understanding their environment*" (Teece, 2007). SMEs that acquire capabilities that enable them to sense the environment in order to gather market intelligence on consumers' needs, competitor moves and new technologies are able to improve their performance. (Lindblom et al., 2008; Pavlou, 2011).

Technology response capability mainly involves the SME's willingness and ability to respond to the new technologies it senses in its environment that may affect the organisation (Srinivasan et al., 2002).

There is a risk involved with regard to SMEs' response to technology, since it may not always be clear whether the new technology will yield positive outcomes for the SME (Srinivasan et al., 2002). Responding to new technologies therefore includes a level of strategic management and risk management since the SME needs to strategically align its business strategies for its own benefit or be aware of the risks posed by new technologies. Srinivasan et al. (2002) highlight that an SME may respond to a radical technology in several ways, including ignoring the technology which is often the case when an organisation already has a similar working technology or is simply not interested in exploring it; monitoring it by keeping abreast of new developments regarding the technology; exploiting the technology.

2.4 SME PERFORMANCE AND MEASUREMENT

The performance construct of SMEs can be measured using various indicators including financial performance and non-financial performance which focuses more on customer loyalty performance (Chen & Lien, 2013; Wiklund & Shepherd, 2005). An approach taken in this study is that performance is sub-divided into financial performance and non-financial performance as argued by Wiklund and Shepherd (2005), who describes performance a construct that incorporates different dimensions. Financial performance is measured by the overall profit levels, growth in sales as compared to competitors as well as the return on investment. Non-financial performance is measured by customer loyalty, which is measured by the current level of customer loyalty compared to the previous year, customer satisfaction as well as the ability to attract customers. The measures adopted in the firm performance construct are mainly from the study by Chen & Lien (2013).

Research suggests that a critical component to consider is that there may be a substantial time lapse between ICT investments and their effects. This means that if results for an effect is lacking, this may simply reflect the time lag before investments in these technologies begin to payoff (Matambalya & Wolf; 2001). Contrary to this, other researchers argue that studies taking time lags into consideration only relate to large organisations (Bayo-Moriones et al., 2013). Since the subjects of investigation in this case are SMEs, which are considered as small to medium organisations, with Namibian SMEs having an average of five to ten employees (MTI brief 2016), the time period between an investment in a certain technology, compared to when the research is conducted was not considered. The years in business was considered as a measure of the SME's years in operation. The study can be presented as a basis point of initial knowledge, where further research such as one that can consider the time lapse between the acquisition of a certain technology and SME performance can be conducted.

2.5 SME DYNAMIC CAPABILITIES AS MEDIATORS

The definition of dynamic capabilities has evolved over time, which leaves the existence of many definitions of dynamic capabilities by various scholars and authors (Ambrosini & Altintas, 2019). This study adopts the definition by Teece (2007) in which a dynamic capability is viewed as the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments. In this study, dynamic capabilities are classified as follows: (1) Integrative capability arising from opportunities (2) Learning capability - where firms mainly shape opportunities and threats; and (3) Transformative capability which arises from reconfiguring the firm's resources for business performance. Transformation is required for SMEs to sustain themselves as markets and technologies change. It came to light that the term dynamic capability emphasises the ability to react adequately and timely to external changes and requires a combination of multiple capabilities. Despite the interest in dynamic capabilities there is limited work done on how firms establish and maintain dynamic capabilities.

Hsu & Wang, (2012, citing the work of Szulanski, 1996) indicated that it is important to realise that intangible resources alone (in this case, being able to sense and respond to new technological developments) are not enough to determine firm-level performance; they need to be leveraged through capabilities. For this reason, dynamic capabilities are considered as mediators and act as a link for technological opportunism and SME performance. This relationship of having dynamic capabilities as mediators is in line with the definition by Protogerou et al., (2012) who appropriately indicate that dynamic capabilities can be considered as an enable that have the ability to convert a firm's resources into improved performance.

To further support dynamic capabilities as mediators, Wu (2007) suggest that dynamic capabilities can positively mediate the relationship between the resources of an organisation and SME performance. It is therefore important to understand the different capabilities that play a role in the way SMEs sense and respond to opportunities availed by new technologies and the effect that these have on SME performance. In line with dynamic capabilities being mediators, Rezazadeh et al., (2016) makes the case for dynamic capabilities as mediators between technology orientation and performance.

Since the study by Rezazadeh et al., (2016) is focused on dynamic capabilities as mediators between technology orientation and performance, the relation between technology orientation and technological opportunism in this case draws certain similarities. Firstly, technological opportunism is conceptually similar to market orientation since both concepts involve gathering, disseminating and responding to market intelligence related to customer needs (Kohli, 2017). Also, opportunism is viewed as a form of orientation, mainly due to the fact that the term orientation is often used to explain opportunism. Sarkees

(2011) indicated that technological opportunism is a positive orientation that enables a firm to better compete in its markets.

Furthermore, Lin & Wu (2014) argue for dynamic capabilities as mediators between resources and performance, where the types of dynamic capabilities tested are the learning, integrative and reconfiguration (like termed with transformation) as with the case in this study. The fact that dynamic capabilities are mediators for similar constructs, the literature presented therefore supports dynamic capabilities as mediators between technology opportunism and performance.

In essence, capabilities are what bring all the assets, monetary and non-monetary (such as skills), together and enable an SME to execute them to the SME's advantage Zhou & Li (2010). This background indicates that it is of importance to better understand SMEs and their capabilities, as well as the resources that SMEs ought to have to enhance performance. Following the approach of Teece et al. (1997), this study has classified SMEs' dynamic capabilities into three specific groups; learning, integration and transformation capabilities as outlined below:

2.5.1 Learning capability

Learning capability is defined as the ability to revamp existing operational capabilities with new knowledge (Pavlou, 2011). Zahra and George (2015) propose four underlying routines of the learning capability as acquiring, assimilating, transforming, and exploiting knowledge. Key to the learning capability is an SMEs' ability to make decisions about which opportunities to pursue, how to pursue and when to pursue these opportunities to enhance performance. The process of learning enables existing tasks to be performed better, quicker and more efficiently; or produces novel thinking and resources for new competencies to be identified and adopted (Madsen, 2010). If SME owners have the capability to learn, this capability can lead to higher performance.

2.5.2 Integrative capability

Integrative capability is defined as the ability to combine individual knowledge into new operational capabilities (Gathungu & Mwangi, 2012). Integrative capability plays a critical role in ensuring that all capabilities within the firm are effectively harboured (integrated) in the firm and harnessed as a function of the firm. Integration is the activity of obtaining, assimilating and developing new resources, an example being acquisition or alliances for accessing new technology (Madsen, 2010). Integrative capability enhances a firm's performance (Gathungu & Mwangi, 2012). Although it is not necessarily the first capability that SMEs ought to implement, Teece (2007) describes the integration of knowledge as the foundation of dynamic capabilities due to its ability to take in new resources, promote new ways of thinking and incorporate it into the existing system, creating a new common understanding and way of doing things. In this regard the willingness to benchmark and adopt best practices is of great importance (Teece et al., 1997).

2.5.3 Transformative capability

Transformation is integral to dynamic capabilities. Transformation draws on the other capabilities of learning and integration so as to initiate the necessary change to ensure a better fit with the environment (Madsen, 2010). In an ever-changing business environment, it is essential for SMEs to reconfigure their asset structure and achieve the necessary internal and external transformation (Teece et al., 1997). SMEs should be able to sense the need to reconfigure their internal and external structure to transform (Eisenhardt and Martin, 2000; Teece et al., 1997). This comes with the notion that SMEs should constantly be on the lookout for new advancements, be able to learn and be willing to make the transformation to achieve higher performance.

2.6 RESEARCH HYPOTHESES

Technology has great potential as a means of introducing and sustaining economic well-being (Kabanda & Brown, 2017; Muhanguzi & Kyobe, 2014). Since dynamic capabilities are mainly based on the context of competitive advantage, there is also an equal importance to investigate not just competitive advantage but also the impact on performance. The hypothesis has been developed with guidance by literature. The current study attempts to contribute by investigating how technological opportunism and the mediating influence of dynamic capabilities may affect SME performance, which led to the development of the following hypothesis:

Hypothesis 1

H_a: There is a positive relationship between technological opportunism and SME performance.

Hypothesis 2 (Mediation)

H_a: Dynamic capabilities have a positive mediating effect on the relationship between technological opportunism and SME performance.

The dynamic capabilities looked at in this research are: learning, integrative and transformative capabilities. The hypothesis developed are as follows:

Hypothesis 2a - The relationship between technological opportunism and SME performance is mediated by SME learning capability, such that the relationship is associated with learning as a dynamic capability.

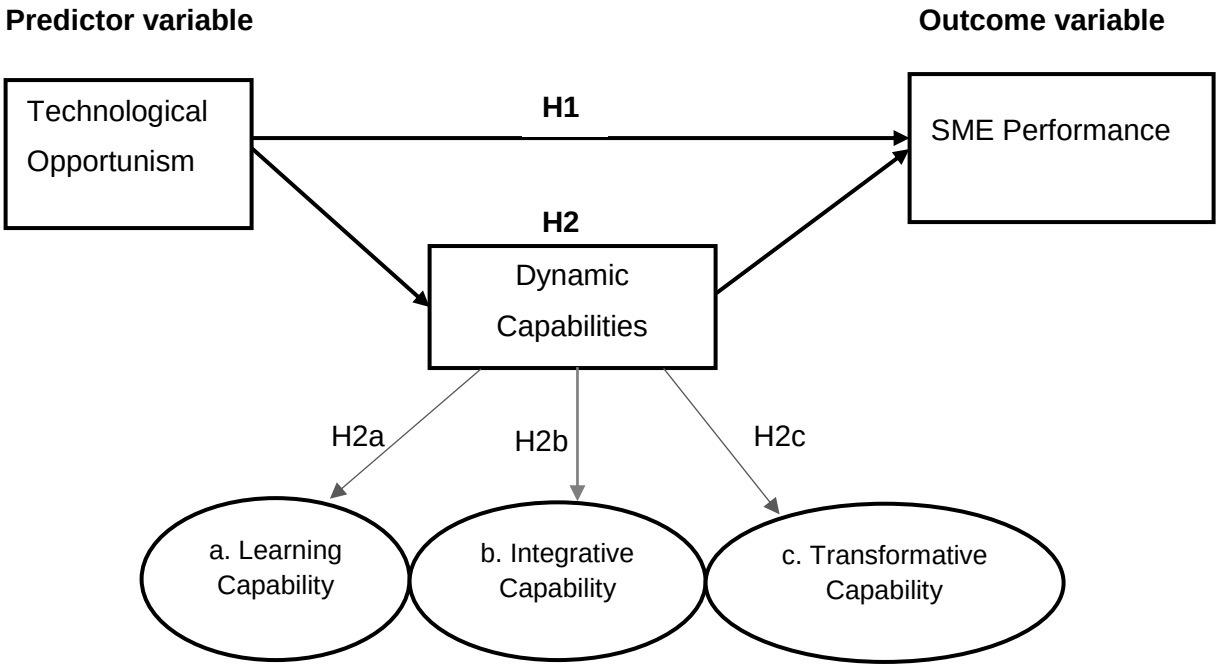
Hypothesis 2b - The relationship between technological opportunism and SME performance is mediated by the SME integrative capability, such that the relationship is associated with integration as a dynamic capability.

Hypothesis 2c - The relationship between technological opportunism and SMEs performance is mediated by the SME transformative capability, such that the relationship is associated with transformation of the business as a dynamic capability for SMEs.

2.7 CONCEPTUAL MODEL

The conceptual model below (Figure 1) depicts the linkages between technological opportunism, dynamic capabilities and SME performance. The conceptual model was developed, based on the literature review conducted and subsequent hypotheses. It is proposed that these variables have an influence on each other and that the way SMEs sense and respond to technology (technological opportunism) will have an effect on dynamic capabilities as a mediator, which in turn has an effect on the performance of SMEs. It is hypothesised that technological opportunism will have a positive effect on an SME's performance and that this relationship is mediated by dynamic capabilities. Dynamic capabilities in this case are measured by the learning, integrative and transformative constructs.

Figure 1: Conceptual Model



CHAPTER 3 - RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter presents the methodology employed in this study in an effort to assess the effect that technological opportunism has on the performance of SMEs in Namibia, as mediated by dynamic capabilities. In light of this, the different sections presented in this chapter are as follows: The research philosophy which outlines the ontological and epistemological stance of the study is presented. The approach of the study and sampling strategies, which indicates the sampling technique used to select the participants for data collection is presented. The data collection and analysis techniques employed in the study is also presented herein. The chapter closes off with the research ethics section, indicating the required ethics approval process that the study went through before commencing with the data collection.

3.2 RESEARCH PHILOSOPHY

Research philosophies reflect the thinking behind the development of the study (Saunders, 2015). The research philosophy is a key component, considering that it ensures a level of consistency across three vital components of an academic study namely the ontological, epistemological and methodological assumptions (Long et al., 2000). The research philosophy of this study is as discussed below:

3.2.1 Ontology

The ontology of a study is associated with the overall nature of what things are or what there is to study (Fitzgerald & Howcroft, 1998; Mingers, 2001). This dissertation adopts a *realist* ontological stance; on the belief that there is a real world that exists independently of our perceptions, theories, and constructions (Maxwell & Mittapalli, 2010). Realist ontology is objective (Lincoln et al., 2011). Based on an objectivistic point of view taken in this research, it employs the stance that entities exist independently of being perceived, or independently of our theories about them. According to Maxwell & Mittapalli (2010), realism facilitates a more effective collaboration between qualitative and quantitative researchers and can constitute a productive stance especially for mixed methods research, which is the research approach taken for this research.

3.2.2 Epistemology

The epistemological assumption is based on providing the premise on which decisions are made from what is known about a certain phenomenon and whether it is adequate and properly constructed (Orlikowski & Baroudi, 1991). Epistemology is concerned with the stance that our understanding of this world is inevitably a construction from our own perspectives and standpoint (Maxwell & Mittapalli, 2010).

Orlikowski & Baroudi (1991), based on the work of Chua (1986), suggested three categories of philosophical stances, based on the underlying research epistemology: positivist, interpretive and critical which are reviewed in this study.

This study follows a *positivist* epistemological philosophical stance. Positivist studies are premised on the existence of a prior fixed hypotheses that one typically investigates with structured tools (Venkatesh et al. 2013). This is the same stance employed in this study whereby there was no involvement with the objects of study and tests were carried out empirically, with a structured tool.

In *interpretive* studies, the researcher uses his/her preconceptions to guide the research process and mainly seeks to understand aspects of the phenomena being studied (Walsham, 2014). Interpretive research involves providing insight to a phenomenon under study through shared meanings, language, consciousness and interactions (Klein & Myers, 1999). *Critical* studies critique the status quo and aim to identify contradictions, oppositions and conflict from organizations and society (Myers, 1997). With criticism comes evaluation, therefore critical research aims to critically evaluate the social aspect under investigation, more than the positivist or the interpretive research perspectives (Orlikowski & Baroudi, 1991).

As a dominant perspective, it is argued that researchers should ensure that they ought to be open to the possibility of other assumptions and interests while adapting one that is compatible to and speaks to the research (Orlikowski & Baroudi, 1991). The study therefore considered the interpretive and critical perspectives as well, however the interests and predispositions of the research are more in line with a positivistic research philosophy. This is in line with the study as there was an empirical measurement of the relationship among technological opportunism, dynamic capabilities and the effect on SMEs performance.

3.3 RESEARCH APPROACH

Crotty (1998), defines research methodology as the techniques or procedures used to gather or analyse data based on some research question or hypothesis. The following sections present the research methodology considered for this study. The study follows a mixed method research approach, using a positivist survey questionnaire as a tool for data collection, with the quantitative research method being the dominant method employed.

3.3.1 Mixed methods

Mixed methods research has increasingly become the alternative to either quantitative or qualitative research designs. The mixed method approach employed in this study is based on Venkatesh et al. (2013, 2016) and can be classified as convergent parallel, which means that data was simultaneously collected from the participants, merged and both quantitative and qualitative data was used for analysis.

Therefore, the use of mixed method research is defined as both quantitative and qualitative research (Venkatesh et al., 2016).

The purpose of adopting mixed methods as opposed to either qualitative or quantitative in this research is mainly to ensure completeness. This is as summarised by Venkatesh et al., (2016) who argue that using mixed methods enables the researcher to make sure that a complete picture of the research is obtained. Prior Information Systems (IS) research conducted using mixed method as reviewed by Venkatesh indicates that the qualitative data provides rich explanations of the findings, which this research aims to do by including questions such as: *Have you derived any benefits from technology for your business? Has technology improved your business performance?* Where if yes, the participants are requested to kindly state how. In this case, responses regarding benefits derived from technology are of a qualitative nature. Following the work of Venkatesh et al. (2016), the purpose for mixing the methods was therefore deemed suitable as the two approaches would be complementary for the research and offer a more thorough understanding that might be missed when only a single research design is used. The same view is shared by Johnson and Turner (2003), who add that mixed methods research can offer greater insights, where individual methods cannot, due to the method's ability to leverage on the combined strengths and non-overlapping weaknesses of qualitative and quantitative methods.

Mixing quantitative and qualitative research designs further maintains the strengths and improves on the weaknesses in both designs. The ability to still quantitatively explore the propositions put forward in the research, whilst obtaining richer insights through the open-ended and probing survey questions is achieved.

One of the added reasons for using a mixed method approach is that words and narratives can be used in this approach to add meaning to the numbers and, equally so, that numbers can add statistics and accuracy to the words and narratives.

The research tool allows for more answers to certain questions of interest since the research had open-ended survey questions to get more insights, while preserving objectivity. This then fulfils the view of Venkatesh et al., (2013) which states that IS researchers ought to use mixed methods research mainly with the intention of bringing context to provide a more complete understanding of a phenomenon, which is the case in this study. Using mixed methods can therefore allow the researcher to handle a wider range of research questions, with no limitations to one research approach.

Cronholm & Hjalmarsson (2011, citing Johnson & Onwuegbuzie, 2004) point out some weaknesses of mixed method research, which include the argument that mixed method research can be difficult for a single researcher, especially if both the qualitative and quantitative research are to be used

concurrently. For this research, this is mitigated by the fact that the qualitative aspects, which are the open-ended questions are dealt with concurrently, as part of the questionnaire and not as a separate activity. This therefore proved to be more manageable. It is noted that mixed methods can be time consuming and expensive when concurrency is involved, however the sample population and geographical aspect restricted to a specific region, as outlined in the sampling strategy, reduces this possible weakness.

3.4 SURVEY INSTRUMENT

Survey research, using questionnaires was used to collect both quantitative and qualitative data by way of an emailed link to the different SMEs, with information from the Ministry of Trade and Industry database. Thirty (30) days were allocated for the SME owners or managers to respond.

The questionnaire was designed based on the current literature and guided by the conceptual framework. An important aspect of choosing to do data collection by means of a survey supports the philosophical stance of this research whereby the researcher can carry out the research objectively, with no involvement with the participants. The questionnaire included close-ended questions, using a five-point Likert scale to acquire information on the different constructs. The questionnaire was set in plain English language since English is the official business language in Namibia. Details such as a brief introduction of the study, consent details, instructions and high-level details of the identified constructs are outlined on the research instrument. The constructs in the instrument were aligned with the theory.

The research instrument measured (i) technological opportunism, (ii) dynamic capabilities constructs and (iii) performance. Technological opportunism had two dimension (sense and response capabilities) and dynamic capabilities had three (learning, integrative and transformative capabilities). Other sub research questions on the type of technologies in use as well as the extent and purpose of use by SME entrepreneurs in Namibia were included as part of the research instrument. The research instrument had 45 questions with six sections: 1) Demographics 2) Technology use, including the derived benefits thereof 3) Technological opportunism 4) Dynamic capabilities and 5) SME performance. The different constructs are discussed below in this section.

Piloting - The questionnaire was piloted with four (4) SME owners and one (1) academic from the University of Namibia's Statistics Department. Feedback was mainly sought on the wording and layout of the questionnaire, the time taken to complete the questionnaire and any omitted or unnecessary question(s) in the questionnaire. Besides the piloting, additional feedback was received from the supervisor of this research project. Special focus was given to the time taken to complete the questionnaire so as to ensure that participants were well able to complete it within the specified time,

which was 15 minutes. All recommendations were considered and incorporated in the questionnaire before the final version (See Appendix A which was used for data collection. The objective and ethical considerations were included in the introductory letter of the questionnaire.

Table 2: Variables employed in the survey

Concept	Description	Items on questionnaire	References
Descriptive Data	For basic information about the participants and the SMEs. E.g. Industry and size of organization, technology in use, number of employees.	12 items on technology use	
Technological Opportunism *(Predictor variable)*	Technological Sensing and Technological Responding	2 sub-constructs, measured by 8 items	Chen & Lien, (2013); Maphumulo (2017); Rezazadeh et al. (2016); Sarkees (2011) & Srinivasan et al. (2002)
Dynamic Capabilities *(Predictor variables / Mediators)*	Learning capability Integrative capability Transformative capability	3 sub-constructs, measured by 12 items	Adeniran & Johnston (2016); Zahra and George (2015); Chen & Lien, (2013); Eisenhardt & Martin (2000) & Teece (2007)
SMEs Performance *(Outcome Variable)*	**Financial Performance** The profitability of the business Return on investment Growth in Sales volume achieved **Non-financial Performance** Ability to attract customers Ability to satisfy customers Levels of customer loyalty Level of self-satisfaction	2 sub-constructs, measured by 7 items	Chen & Lien, (2013); Maphumulo, (2017) & Wiklund and Shepherd, (2005).

Besides the descriptive statistics employed in the survey, the questionnaire measured technology use, in terms of the type, level and purpose of use. In addition, the questionnaire included technological opportunism, SMEs performance and dynamic capabilities, using a 5-point Likert scale, where 5 = Strongly agree and 1 = Strongly disagree. Some items indicated with an (R) in the questionnaire as per appendix A were reverse scored, so that the opposite is true such that 1 = Strongly agree and 5 = Strongly disagree (i.e. The items were reversed before data analysis so that 1=5, 2=4, 3=3, 4=2, 5=1) since these specific items were negatively worded in the original research instrument. A high score on a question indicated a high belief in that construct. To explain some of the treatment of variables: 1. *Extent of ICT use* was measured using eleven variables. Although it used a 5-point Likert scale, the measurement scale was different (Not at all, Very rarely, Neutral, Occasionally, To a very large extent).

Technological opportunism used eight variables in total, using a 5-point Likert scale (5 = strongly agree to 1 = strongly disagree), four variables to measure the sensing and another four variables to measure responding. The sensing measure had one reverse coded measure and response measurement three reverse coded variables. Twenty (20) variables were used in total to measure dynamic capabilities as mediating factors of SMEs as follows: learning capability (3), Transformative capability (4) and Integrative capability (5). *SME performance* (7) variables in total were used. Financial Performance (3) and Non-Financial Performance (4). Other questions included a measure of whether the participants had derived any benefits from technology for their business and whether technologies improved their business performance. Some constructs and measurements included in the questionnaire were based on previous relevant studies as referenced in Table 2. Some wordings were modified to best fit it to a Namibian context or to make it more understandable to a small business entrepreneur.

3.5 TIME FRAME

This research follows a cross-sectional time frame since the study is concerned with gaining understanding of a particular group at a particular point in time (Sekaran, 2003). In addition, the approach was economical and effective in terms of time when compared to a longitudinal survey.

3.6 SAMPLE AND SAMPLING TECHNIQUE

The study population encompassed all owners of registered SMEs, managers as well as partners that are involved with the decision-making process of SMEs in the central region of Namibia (Khomas Region). A study by April (2013), showed the distribution of SMEs in Namibia being mainly in Khomas, specifically Windhoek and the neighbouring towns of Okahandja and Rehoboth. In addition, the study based its focus on the Khomas Region, mainly due to the favourable geographical location of these towns and also since Windhoek, which is the capital city and the neighbouring towns is in Khomas region and indicate greater involvement ICT related activities due to industrialisation. The researcher used the 2016 directory or database of registered SMEs in Namibia, through the Ministry of Trade and Industry. The sample frame for this study, obtained from the Ministry of Trade and Industry's registered SMEs database mainly provided the list of SMEs for sampling. Information obtained from this database indicated that there are approximately 15,000 registered SMEs in Namibia.

The Raosoft Sample Size Calculator was used (http://www.raosoft.com/samplesize.html) (Output included in appendix D). The Raosoft sample size calculator is a free sample tool on the internet, to determine the sample size taking into consideration the population size, the margin of error and the confidence level. Based on the calculations made on Raosoft, the sample to be used was 260.

The following is the Raosoft formula used for the sample size calculation, where the sample size is n and the margin of error is E:

$$x = Z(c/100)^2 r(100-r)$$

$$n = Nx/((N-1)E^2 + x)$$

$$E = \text{Sqrt}[(N-n)x/n(N-1)]$$

where N is the population size, r is the fraction of responses and $Z(c/100)$ is the critical value for the confidence level (90%) and c is the response distribution, with a conservative value of 50%.

In addition, an appropriate sample using a sampling technique (stratified random sampling) based on the type of trade was used to select the SMEs in order to effectively engage respondents in the selected SMEs. Stratified Random sampling was the best suited sampling method to satisfy the expectancy that all SMEs that had the attributes (trades) being investigated had equal chances of being selected. It was of importance to note that the study focused on the Khomas Region and not the entire Namibian population, as justified and explained above in this section, which is relevant to the eventual total of the sample size selected during the data collection phase.

3.7 DATA COLLECTION

It has been indicated that mixed methods data collection strategies can either be qualitative or quantitative (Tashakorri et al., 2015). In this research, data was collected by use of a survey questionnaire, which included an exploratory section to get more detailed understanding of the benefits derived from technology use in SMEs. This data collection strategy, which employed a dominantly quantitative data collection approach was deemed acceptable for mixed methods research (Venkatesh et al., 2013). Venkatesh et al. (2013) referring to Brannen (2008) who indicated that a mixed methods researcher does not always have to treat both qualitative and quantitative studies equally. The type of data collected was mainly numeric and collected written notes on the questionnaire, from the respondents for exploratory type questions. In other cases, the interviewer probed more on questions that were exploratory to get respondents' views on a specific topic. Besides the emailed questionnaires, data was collected by two local Business Studies final year students. Adequate training on the research instrument was provided. The questionnaire was equally distributed amongst the students and the target areas, keeping the different trade areas of SMEs mapped out to ensure adequate coverage and to avoid biasness.

3.8 DATA ANALYSIS

Quantitative data from respondents was collected, coded, processed and subjected to statistical analysis using IBM SPSS Statistics version 25. Spearman rank order correlations were obtained to see the relationship amongst the different constructs. Cronbach Alpha values was measured to check for reliability of the data. Factor analysis was then carried out to fully determine construct validity and to

define the different variables. A path analysis model, using regression analysis, was performed to test the research hypotheses. Multiple regression analysis was regarded as a suitable analysis method for explaining the relationship of the outcome variable, which is in this case the variance of SME performance (outcome variable) by technological opportunism (predictor variable) and the mediating effect of dynamic capabilities, which was also tested using hierarchical multiple regression analysis to determine the effects of dynamic capabilities on the relationship between technological opportunism and SMEs performance.

Microsoft Excel was used to for data cleaning and pre-analysis of the data collected. There were data collected as part of the research instrument, that were of a qualitative nature. In this case, qualitative data was coded in Excel and exported to SPSS for analysis and included in the study report. Other explanatory data, such as respondents providing further details on questions to explain or to indicate any other option, was analysed qualitatively, using thematic analysis by grouping the main themes arising, following the guidelines provided by Braun & Clarke (2019). This was analysed and discussed in this dissertation. The different sections of the above enabled the researcher to answer the research questions.

3.9 RESEARCH ETHICS

Since the study uses mixed methods as an approach, the ethical considerations pertaining to the quantitative and qualitative approaches were also applicable for this research. The survey instrument to be used was sent to the Ethics Committee of the University of Cape Town (UCT) for review, along with a completed copy of the ethics application form before the actual collection of data commenced. Respondents were informed about the purposes of the research and why the research was being conducted, the estimated time for completing the research questionnaire and how the results were to be distributed. During data collection, the researcher had to maintain objectivity at all times. During data analysis, ethical considerations were followed by the researcher by ensuring that all findings of the research are reported. Confidentiality and anonymity of the respondents were strictly adhered to in order to protect the rights to privacy of SME owners. Ethics were taken into consideration at all stages of the research.

3.10 CONCLUDING SUMMARY

This chapter provided an overview of the research design and methodology adopted for this study. The dissertation also highlighted the philosophical underpinnings for the research. A positivistic stance was adopted for this study and the study followed a mixed methods approach, using surveys for data collection. The research instrument involved both open- and closed-ended questions from a sample of 209 SMEs in Namibia.

CHAPTER 4 – ANALYSIS, FINDINGS AND DISCUSSIONS

4.1 INTRODUCTION

This chapter presents the detailed empirical analysis and results of the study on which the conclusion and recommendations were based. The instrument served to obtain information in solving the research objectives to determine the effect of technological opportunism on the performance of SMEs, as well as to determine the mediating effect that dynamic capabilities have on the relationship between technological opportunism and SMEs performance.

The chapter is organised as follows: Section 4.2 presents the demographic characteristics of the sample. Section 4.3. presents the reliability and validity tests of the sample. Section 4.4 describes the characteristics of the sample. The analysis on the exploratory descriptive research questions open-ended question analysis is presented in Section 4.5, followed by the hypotheses test results and a discussion thereof in 4.6 and 4.7 respectively. The concluding summary is presented in section 4.8.

4.2 DEMOGRAPHIC ANALYSIS

The respondent's demographic data was captured using information such as their gender and age, which were optional, as well as other information pertaining to the number of employees and type of sector of the SME. This survey did not capture the specific income level of the SME since financial indicators were captured in terms of position with other competitors in the market (e.g. profitability, return on investment, growth in sales volume, etc.) and the research interest therefore did not include specific SME financial information. In addition, the researcher had the assumption that it might be challenging to obtain a numeric value mainly because, in small businesses, business owners lack financial education and it is often the case that some SMEs do not have adequate information on their total financial earnings. Turnover is more often referred to as an average of revenue earned per day. In addition, quantifying profit / measuring true profit is often difficult and thus this measure was not included as part of the research.

The demographic characteristics obtained indicated that majority of the respondents have been in the business for around three to five years (based on the mean) and that the majority of the business owners were thirty years or younger and businesses mainly employed less than ten people.

Table 3: Demographic profile of respondents

Profile	*Parameters*	*N=209*	*%*
Age of the owner	lowest – 30 years	80	38.3
	31 - 40 years	59	28.2
	41 - 50 years	55	26.3
	more than 50 years	15	7.2
Gender	Male	111	53.1
	Female	89	42.6
	Other	9	4.3
Position	Business Owner	135	64.6
	Business Partner	16	7.7
	Business Manager	58	27.8
Size of business (number of employees)	Self only	62	29.7
	Less than or equal to 5	56	26.8
	6 – 20	49	23.4
	21 – 50	26	12.4
	51 to 100	16	7.7
	101 and more	0	0.0
Years in business	less than 1 year	15	7.6
	1 - 2 years	42	21.2
	3 - 5 years	51	25.8
	6 - 9 years	51	25.8
	10 and above	39	19.7

4.2.1 Age of respondents

The age distribution of the SME entrepreneurs who responded to the survey is presented in the table above. The majority of the small business owners were in the age groups of lowest - 30 and 31 – 40 represented by 38.3 percent and 28.2 percent respectively. The 41-50 age groups represented 26.3 percent of the respondents and only 7.2 percent of the respondents were above 50 years old.

4.2.2 Gender Distribution

Out of the significant sample of 209 responses, 42.6 percent were female respondents and 53.1 percent were male respondents. The questionnaire included an option for respondents who ‘opt not to answer’, which comprised of 4.0 percent of the respondents who selected this option. The gender information is particularly important in decision-making, stakeholder engagement and interventions targeted towards SMEs. The gender distribution of SME ownership showed that there is a fairly equal distribution along gender lines. This indicates that there is an almost equal representation of both genders in the market place, specifically for SMEs. The information was corroborated by recent studies

done in the field as well as by the then Ministry of Trade and Industry's Small Business Baseline Survey (Venditto, 2004).

4.2.3 Position within the organization

The respondents were either the small business owners, managers or partners. Most respondents in this study were owners or partners of the SME. Of the 209 SMEs surveyed, the majority (64.6 percent) were owners of the surveyed SMEs. The respondents were intentionally selected to be owners / managers who were involved in decision-making for the SME to ensure that the information for the survey was provided by an individual who was more likely to be aware of the general and/or technological developments in the business environment.

4.2.4 Size of the business (number of employees)

The respondents were requested to state the number of employees at the SME and the responses were then grouped as shown above in table 3. The majority operated their business alone, followed by those who had less than five employees and those who had between six and twenty employees. No SMEs surveyed had more than 100 employees, in line with the definition of SMEs.

4.2.5 Years in business

The study also sought to establish how long the small businesses have been operating. The number of years in business were captured as this was a useful indicator of the capabilities that are acquired over time that subsequently influence the performance of the SME. The results shown in Table 3 above indicate that on average, the respondents were in business for about three to five years, and 19.7 percent had been operating their business for more than ten years. The average lifespan of three to five years, which the researcher considered as minimal, hindered the time required for SMEs to successfully build internal capabilities so as to eventually improve their business performance over time.

4.2.6 Business sector / Type of industry

Information on business sector classification indicated that the majority of the respondents who participated in the survey were mainly in the sector of wholesale and retail trade, consisting of 18.0 percent, followed by three industries which more or less had the same number of SMEs classified in the *manufacturing* (12.9 percent), *transport and storage* (12.9 percent) as well as *food and accommodation (*12.0 percent).

Table 4: Business sector / Type of industry

Industry	*Count*	*%*
Trading – Wholesale & Retail Trade	33	15.8%
Manufacturing	27	12.9%
Transport & Storage	27	12.9%
Food & Accommodation	25	12.0%
ICT, Electronics and Business Consulting	24	11.5%
Health	16	7.7%
Hospitality, Tourism and Crafts	14	6.7%
Education	11	5.3%
Agriculture & Mining	4	1.9%
Construction	2	1.0%
Financial	4	1.4%
Other	22	10.5%
	209	100.0%

SMEs that participated in the study and that operated in the wholesale & retail trade sectors were mainly retail shops, gift shops, clothing shops, etc. Furthermore, SMEs who operated in the manufacturing sector were mainly small businesses involved with leather works, making of spare parts, trailer manufacturing and steel / aluminium fabrication.

The business sectors used were mainly guided by the grouping given by the Ministry of Trade and Industry report of 2015. Some trades and services were classified as others and included: plumbers, welders and carpenters. Although some SMEs indicated that they were involved in dual activities, the business sector that was captured for the purpose of this study was the main business activity that best reflected the SMEs' main business operations.

4.3 RELIABILITY AND VALIDITY OF MEASUREMENT SCALES

Different measurement terminologies related to reliability and validity for mixed methods research have been considered by various authors. One of these being suggested to indicate these measurement scales is the term *inference quality as suggested by* Teddlie and Tashakkori (2009). Venkatesh et al. (2013, citing Teddlie and Tashakkori, 2009) supported the notion of adjusting the validity terminology for mixed methods research by pointing out that the term validity had lost its intended connotation and indicated that new terminology was necessary to differentiate mixed methods validation from quantitative and qualitative validation. Venketesh therefore supported Teddlie and Tashakkori's view and used the term *inference quality* to refer to validity and the term *data quality* to refer to reliability in mixed methods research. However, as per the arguments highlighted in Venketesh (2013), a contrast was brought forth by Creswell and Clark (2017), where it was argued that since the term *validity* was

widely used in quantitative and qualitative research, it could therefore be used in mixed methods research and that a new terminology did not need to be developed. This research, which follows a mixed method approach supports this view and therefore uses the *validity* and *reliabilit*y terminology.

4.3.1 Reliability

A reliability test, using SPSS 25, was performed to assess the internal consistency of the survey instrument, based on the participants' responses to the questionnaire. Each component was also tested for reliability and the Cronbach alpha results surpassed the threshold of 0.7. Hair et al. (2017) based on the work of George & Mallery (2003) indicated that Alpha coefficient above 0.70 was considered acceptable, with some even arguing that 0.6 was acceptable (Tan & Teo, 2000). The overall Cronbach alpha for all elements tested was greater than 0.6. Table 5 reliability analysis shows significant values at *p=0.000<0.05, Cronbach's α > 0.6* (table 5). This indicates a good internal consistency and confirms that the data collection was fairly reliable. The items measured are Technological opportunism, SMEs performance and dynamic capabilities. Performance.

Table 5: Reliability test for all variables

Construct	Number of items	Cronbach alpha	Reliability
Technological opportunism	8	0.892	Good
Dynamic capabilities	12	0.885	Good
Learning capability	3	0.664	Acceptable
Integrative capability	3	0.798	Acceptable
Transformative capability	5	0.849	Good
SMEs performance	7	0.856	Good

Table 6: Inter-Item Correlation Matrix of Constructs in the Model (n = 209)

	TO	DC	LC	IC	TC	SME_P
Technological Opportunism	1.000					
Dynamic Capabilities	.529**	1.000				
Learning Capability	.438**	.717**	1.000			
Integrative Capability	.309**	.821**	.623**	1.000		
Transformative Capability	.528**	.616**	.494**	.439**	1.000	
SMEs Performance	.519**	.607**	.481**	.448**	.981**	1.000

**. Correlations significant at p<0.01 level

4.3.2 Validity

Validity refers to the legitimacy of the findings (i.e. how accurately the findings represent the truth in the objective world) Venkatesh et al. (2013). Factor analysis was used to assess the validity of the constructs. The values for the average variance extracted exceeded the threshold of 0.5, indicating convergent validity (Hair et al., 2010).

Correlation matrix of the factor analysis demonstrated that those constructs are properly discriminated as shown in Table 6. The three constructs explain 61.3 percent of the measurements employed in the research. The three constructs, which are technological opportunism, SMEs performance and dynamic capabilities indicate that the research is well in line with the conceptual model developed based on the total Eigenvalues.

Table 7: Total Eigenvalues / % explained by each construct

Component	Total % variance explained within each individual construct	Total Initial Eigenvalues for all constructs % explained by each construct		
		Total	% of Variance	Cumulative %
Technological Opportunism	72.8	7.2	39.8	39.8
Dynamic capabilities	71.1	2.3	12.9	52.7
SMEs Performance	75.3	1.5	8.6	**61.3**

Table 8: Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**.797**
Bartlett's Test of Sphericity	Approx. Chi-Square	2510.701
	Df	153
	Sig.	.000

Furthermore, the Kaiser-Meyer-Olkin (KMO) was tested to measure the adequacy of the sample for the complete model. The KMO statistic, presented above, was for the complete model and one can therefore conclude that since the value is 0.797 (which is above the threshold of 0.5, suggesting an average of 79.7 percent suitability for factor analysis and the results were significant at 0.05 significance level, thereby indicating that the sample was adequate (Hair et al., 2010).

Table 9: Scale validity

	Factor loading	KMO value	Total Variance Explained
Technological Opportunism			
Technology sensing α= 0.779			
3.1.1. We are often one of the first in our industry to notice technological developments that may potentially affect our business.	0.932	0.798	76.9%
3.1.2. We actively seek information regarding technological changes in the environment that are likely to affect our business.	0.791		
3.1.4. We periodically review the likely effect of changes in technologies on our business.	0.595		
Technology responding α = 0.863			
3.2.1 We generally respond quickly to technological changes in the environment.	0.858		
3.2.3. For one reason or another, we are slow to respond to new technologies (R)	0.876		
3.2.4. We tend to resist new technologies. (R)	0.807		
Dynamic capabilities			
Learning capabilities α = 0.664			
4.1.1. We are willing to try new and innovative ideas	0.743	0.662	71.1%
4.1.2. We often use market information to improve our business	0.675		
4.1.3. We encourage employees to communicate their ideas	0.607		
Integrative capabilities α = 0.772			
4.2.2. We embrace new innovations easily	0.697	0.782	
4.2.3. We often combine external resources / knowledge with internal resources / knowledge…	0.783		
4.2.4. We are able to manage both internal and external changes	0.692		
Transformative capabilities α = 0.849			
4.3.1. We are innovative in coming up with ideas for new service concepts.	0.806	0.753	
4.3.2. We find it hard to translate raw ideas into detailed services (R).	0.901		
4.3.3. Our organization experiments with new service concepts.	0.789		
4.3.4. We align new service offerings with our current business and processes.	0.910		
4.3.5. We encourage individual / team / management willingness to derive new ways of doing business	0.839		
SMEs Performance			
Financial performance α = 0.747			
5.1.1. The profitability of the business	0.915	0.761	74.9%
5.1.2. Return on investment	0.926		
5.1.3. Growth in Sales volume achieved	0.860		
Non-financial performance α = 0.662			
5.2.1. Ability to attract customers	0.766		
5.2.4. Level of self-satisfaction	0.851		

*KMO Value = Kaiser-Meyer-Olkin Measure of Sampling Adequacy.
α = Cronbach alpha value

For technological opportunism, exploratory factor analysis retained six items which converged into two factors as hypothesised (technology sensing and technology responding), explaining 77 percent of the variation in the scale measurements of that construct. The items removed were Q3.1.3, *We are often slow to notice changes in technologies that might affect our business* and 3.2.2 *We lag behind the industry in responding to new technologies (R)* which were removed as it had a factor loading of less than 0.4.

Dynamic capabilities construct retained all three factors. However, a question in the second factor, learning capability *Q 4.2.1. We are able to combine newly acquired knowledge with our existing knowledge successfully* was removed as it had a factor loading of less than 0.4.

The SMEs' perceived performance in relation to competitor's construct formed one factor, contrary to the two factors hypothesised. SMEs performance was initially hypothesised to be subdivided into two categories, financial and non-financial performance. From the results, all items measuring performance i.e. financial and non-financial formed a single factor. Two questions were removed as they had low factor loadings (benchmark of 0.4). The items removed were *Q. 5.2.2 Ability to satisfy customers and 5.2.3. Levels of customer loyalty.* This may have been due to the fact that customer loyalty and customer satisfaction were more a relationship or skills measure and the respondents might not have associated these factors to questions related to growth or business performance.

Table 9 above indicates the factor loading and signifies that all items that remained were well above the threshold of 0.5 and therefore, confirmed scale validity.

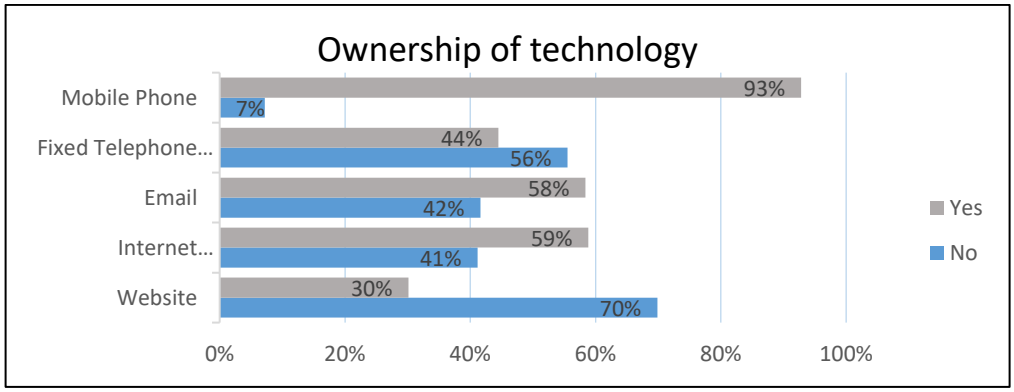
4.4 EXPLORATORY RESEARCH QUESTIONS

The following sub research question was assessed: *Which technologies and to what extent do SME entrepreneurs in Namibia own and use technology and what are the derived benefits of using these technologies?* The study seeks to establish the derived benefits of technology use for SMEs as well.

4.4.1. Ownership of technology

Questions were posed to participants in order to better understand their use of ICT for different purposes in their businesses.

Figure 2 : Ownership of technology



To understand ownership of technology, the participants were asked to indicate whether they have certain technologies as displayed in the graph above. The information further indicated that the mobile phone was the most used tool at 93 percent, followed by internet and email and then fixed telephone lines and a website. The info indicates that 70 percent of the interviewed SMEs did not have an official website for their business and 30 percent did. Those who did have a website were mainly SMEs from the wholesale & retail trade and manufacturing sectors.

Since not many businesses had websites, other forms of online presence were recognised and it emerged that of the total 198 who responded to this particular question, 144 (69 percent) of the participants had other forms of online presence and 54 indicated that they did not have other forms of online presence.

Other forms of online presence referred to those websites where businesses were able to communicate, network, advertise or broadcast information and where people could obtain information on the SMEs. The first table represents responses to the question: Do you have any other forms of online presence? The subsequent table is a summary of the responses. The question was structured to have multiple selections of the options.

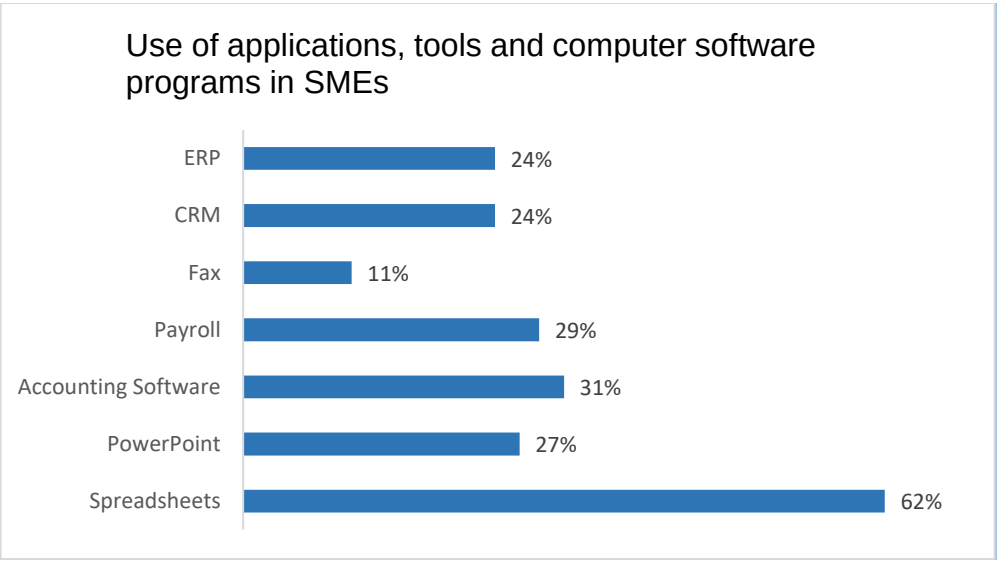
Table 10: Forms of online presence

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	54	25.8	27.3	27.3
	Yes	144	68.9	72.7	100.0
	Total	198	94.7	100.0	
No response		11	5.3		
Total		209	100.0		

Other forms of online presence Multiple responses (total = 264) (%)	
Facebook	136 (52%)
Instagram	82(31%)
Twitter	29(11%)
WhatsApp	15(6%)
Jayride	2(1%)

Since the selection was optional and/ or multiple selection for the participants who opted to respond to this question, the results showed that the form of online presence that most of the SMEs were on was mainly Facebook, with 136 respondents choosing this option, followed by Instagram with 82 and Twitter with 29. Others also included updates on the WhatsApp status function and Jayride, which is an online platform for the transport sector.

Figure 3: Use of applications, tools and computer software programs



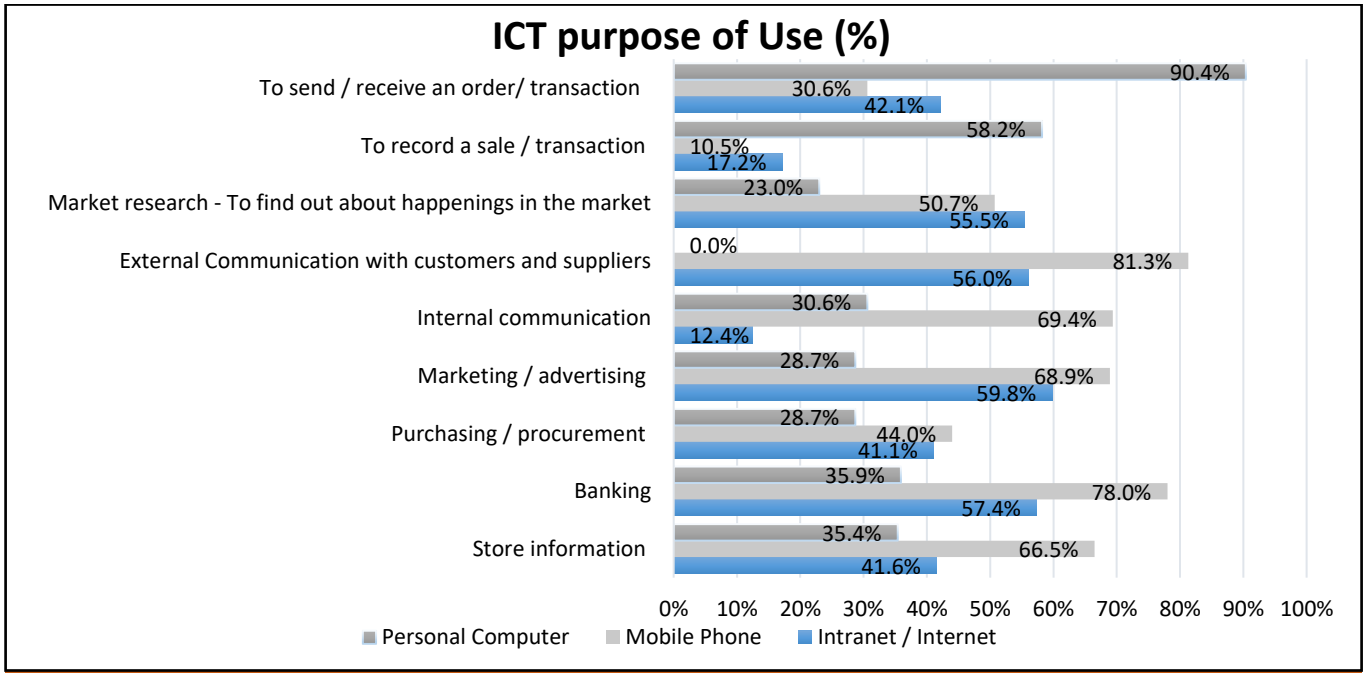
The applications, tools and computer software programs used for business purposes were included as part of the survey to obtain an understanding on the use of technology by SMEs. Guidance on the selection options for this question was sourced from Adeniran & Johnston (2016). The responses from respondents showed that spreadsheets (MS Excel) are commonly used in SMEs, with 62 percent of the respondents indicating the use thereof. To compare the use of spreadsheets with other business applications and tools, about 30 percent of SMEs used accounting software, while 60 percent mainly used spreadsheets. This indicated that the need for use, ease of use or economies of scale made it more familiar to use MS Excel as compared to a standard accounting software. The question included an indication of the use of tools such as enterprise resources planning (ERP) and customer relationship management (CRM) to assess the level of use of these tools in SMEs, which were somewhat perceived as more advanced for SMEs (Adeniran & Johnston, 2016). ERP is an integrated and often automated business process management system and CRM is an approach to manage the interaction with customers based on data analysis of customers' history to improve the relationships with customers and ultimately drive sales and growth (Hendricks, 2007). Since the study includes SMEs' performance, an indication of the use of tools aimed at enhancing performance and growth provided valuable information. Based on the respondents, ERP and CRM systems were not widely used. Only a quarter (24 percent) of the respondents indicated that they used these tools. The respondents who indicated that they used these systems were mainly the larger SMEs and those who operated in the following business sectors: (1) wholesale and retail trade, (2) ICT, electronics and business consulting and (3) food and accommodation. Even though the use of fax machines was on a declining trend, 11 percent of SMEs claimed that they use fax functionality, which was the least used tool by SMEs.

4.4.2 Purpose of use of Technology

The research sought to find out information only for the most common applications used, that are mainly found on mobile telephones (1), personal computers (2), as well as the internet or intranet (3), should the SME have this. The participants were requested to select as many options as applicable to them. The below figure indicates the responses. As shown below, the most important reason why the SME entrepreneurs used technology mainly involves communication to send / receive an order / transaction, for external communication with customers and suppliers and for banking. According to the responses of the customers, this included sending reminders to alert clients on newspaper adverts etc. The particular answer on banking indicated that SMEs were aware of the available variety of banking channels. Very few indicated that the purpose of ICT use is to record a sale / transaction. Mobile communication was mainly used for external communication and to send / receive an order / transaction as well as for internal communication. The SMEs indicated that they used the personal computer to mainly send / receive an order / transaction and to record a sale / transaction. The internet / intranet was mainly used for marketing / advertising, for banking and for external communication with customers and suppliers.

The lowest scoring use of ICT is mainly the use of ICT to record a sale / transaction. This suggested that SME entrepreneurs lacked the competencies required in using ICT in planning and effectively managing the finances of their businesses.

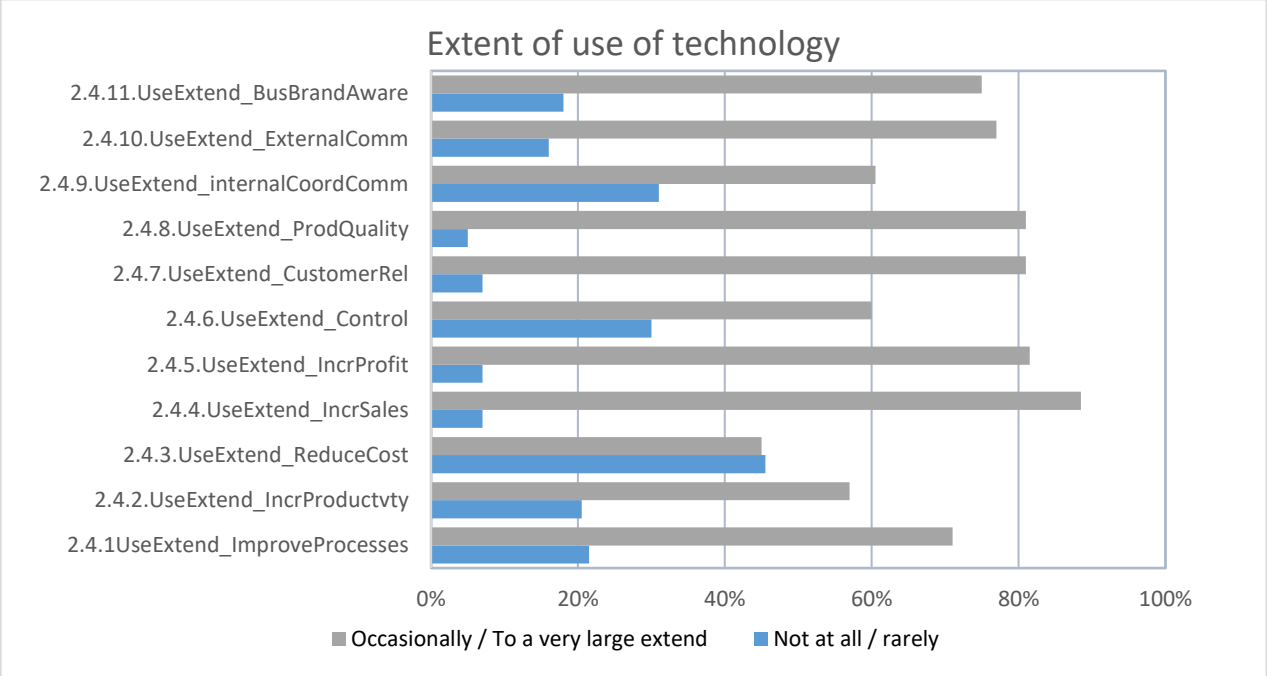
Figure 4 : Purpose of use of Technology



4.4.3 Extent of use

The participants indicated the extent of use for different purposes in their business as enlisted below in Figure 5. In this case, ICT refers to all the technologies used in business for information and communication purposes. This includes e-mail, internet, applications, e-commerce, mobile and fixed phones etc. Overall, the respondents who indicated that they used it occasionally up to a very large extent mainly indicated that the main purpose of using technology, in general, was to increase sales and therefore to increase profits, as well as for customer relations through communication and to increase production quality. Participants also indicated that technology was rarely or totally not used for the purpose of reducing cost or for control. The implications of the results pointed out the importance of interested parties and stakeholders to harness the power and benefits that can be derived from technology and its cost effective ways in order for SMEs to use ICT to ultimately cut cost, bring about development and change and ultimately improve the performance of SMEs.

Figure 5 : Extent of use of technology



4.5 OPEN-ENDED QUESTION ANALYSIS

4.5.1 Derived benefits of technology use

This section presents the results of the open ended question regarding the benefits that SME entrepreneurs derived from using different types of technologies for their businesses. Thematic analysis

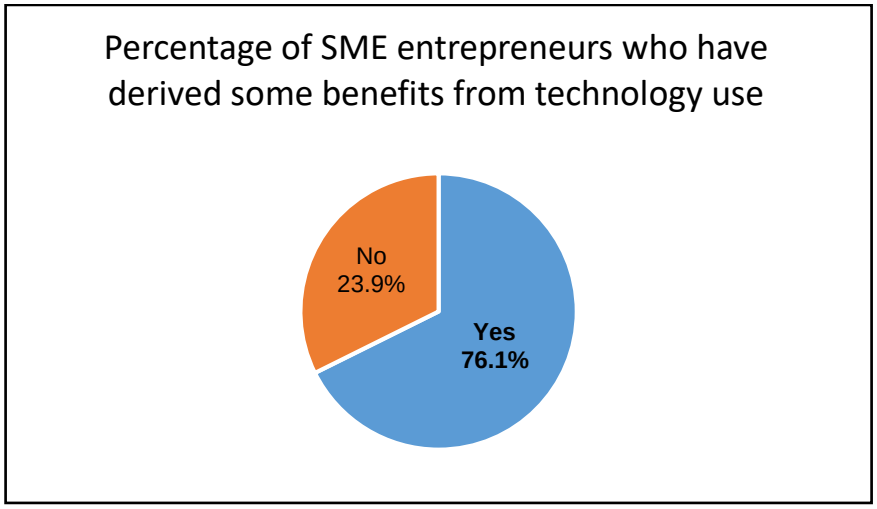
was used as discussed in Chapter 3, under data analysis. The benefits derived from technology from the perspective of the participants was analysed and is presented below.

Indication of benefit from using technology

The derived benefits by respondents from the use of technology for their business is discussed herein as well as the use of technology in their business and whether it had improved their way of doing business in any way. The initial response was to indicate a yes or no. The respondents who indicated a yes were asked to state how this had been achieved, of which the results are analysed in the next sub-section. Seventy-six percent of the respondents indicated that technology had improved their business performance and 23.9 percent indicated that they had not improved their business. The question posed was: Have you derived any benefits from technology for improvement of your business performance?

The researcher does recognize that further probing or an additional option to elaborate on this question could have enriched the data, especially to include those participants who indicated 'no' that they had not benefited from technology use.

Figure 6 : Indication of benefit from using technology



4.5.2 Thematic Analysis

Thematic analysis is the process of systematically identifying patterns or themes across a data set (Braun & Clarke , 2019). The thematic analysis guidance provided by Braun and Clarke (2019) was used in order to analyse the responses to the question. A semantic approach, as discussed by Braun and Clarke (2019), was used in analysing the thematic data. In that, the explicit meanings of the data were in most cases used as the researcher was not looking for ideologies, assumptions, and conceptualisations. However, in as far as possible, the underlying ideas were captured. Microsoft Excel

was used to identify and group themes as per methodology explained by Bree & Gallagher (2016). The method is outlined below.

157 of the SME owners who indicated that they had derived some benefits from the use of technology for their business provided details on their perceived benefits of technology use. The data collected were exported to MS Excel from SPSS. The comments were extracted from the completed questionnaire or by the data collector who completed the questionnaire on behalf of the participants, based on the responses provided. The remove duplicate function of MS Excel was used during the review of the data to ensure that any duplicate entries arising from data entry recordings for the same points were removed. Further checks such as alphabetical sorting was done on the data to ensure that all duplicate entries were removed. The data was then analysed by assigning themes to similar data. The data was then grouped and refined into initial 29 clustered opinions. Each individual cell was reviewed, assigned a single theme and colour coded. The themes were not pre-set but was rather guided by the data from the participants, indicating an inductive reason approach driven by the data in this case. This then led to the identification of four unique themes that emerged from the analysis of the data on how SME owners benefitted from technology use in their businesses (see Table 11).
The themes were: (1) marketing / advertising, which raises awareness of the business, attracts more clients, (2) practical for business, (3) convenience and ease, (4) being more in tune and in contact with customers, easier to reach. The below table presents the results of the respondents grouped in themes. Where some points associated with two themes, the comment was duplicated in each theme and coded appropriately to ensure everything was recorded and that the comments were correctly reflected under the different themes as per the approach by Bree & Galagher (2016). E.g. the comment: *'Informing clients of new arrivals and to pick-up their repaired phones'* was categorised under two themes, namely the (1) Marketing / Advertising, which raises awareness of the business and attracts more clients due to the process of informing / marketing new products to clients and the theme named. (2) Practical for business due to the practicality of the process due to technology, which benefits the business. The number of comments in total therefore became 158.
The number of respondents grouped under each theme is shown below in table 11.

Table 11: Grouping of the identified themes on derived benefits

Row Labels	Count/ number of respondents	Percentage
Marketing, which raises awareness of the business and attracts more clients	65	41.1%
Practical for business	48	30.4%
Convenience and ease	23	14.6%
Advantage of close contact with customers, ease of reach	22	13.9%
Grand Total	**158**	**100.00%**

Summary of the different themes were as follows:

Marketing / advertising, which raises awareness of the business and attracts more clients

The majority of the SME owners indicated that the main benefit derived from technology use in their business was that 1) they use it for advertising and hence they are able to raise awareness about their business and in turn were able to attract more clients. 2) The participants indicated that the use of technology for business operations resulted in them being able to advertise and market their business on social media (Table 10: forms of online presence) and were able to make customers more aware of their business and therefore attract more clients. The question on purpose of use of technology had the majority of respondents selecting the option advertising / marketing as per section 4.4.2 above. The results therefore agree with the perceived derived benefits since the majority of responds again selected a theme related to marketing / advertising as the most beneficial use of technology for their business. The benefits of marketing are vast as it increases visibility of the SME brand. Including brand recognition and awareness, creates relationship with customers and potential customers, promotes communication and therefore influences uptake of the SMEs product or services.

Practicality for business use:

Participants indicated that the use of technology for business operations was more practical to use. The responses for practicality of technology for business use included responses such as: *Alerting clients of their appointments, alerting customers if due dates have passed, contacting salvaged vehicles owners make sale easier, fast service delivery, informing clients to pick-up their repaired phones, make it easier to on orders and to finish client orders, research for the better prices more competitive in the market bring more sales, sending clients statements and online orders.*

Convenience and ease:

Participants also indicated that technology use in their businesses had benefitted them due to the ease and convenience that technology brought mainly due to: online bookings and handling of inquiries via phone / email and the ability of doing online payments.

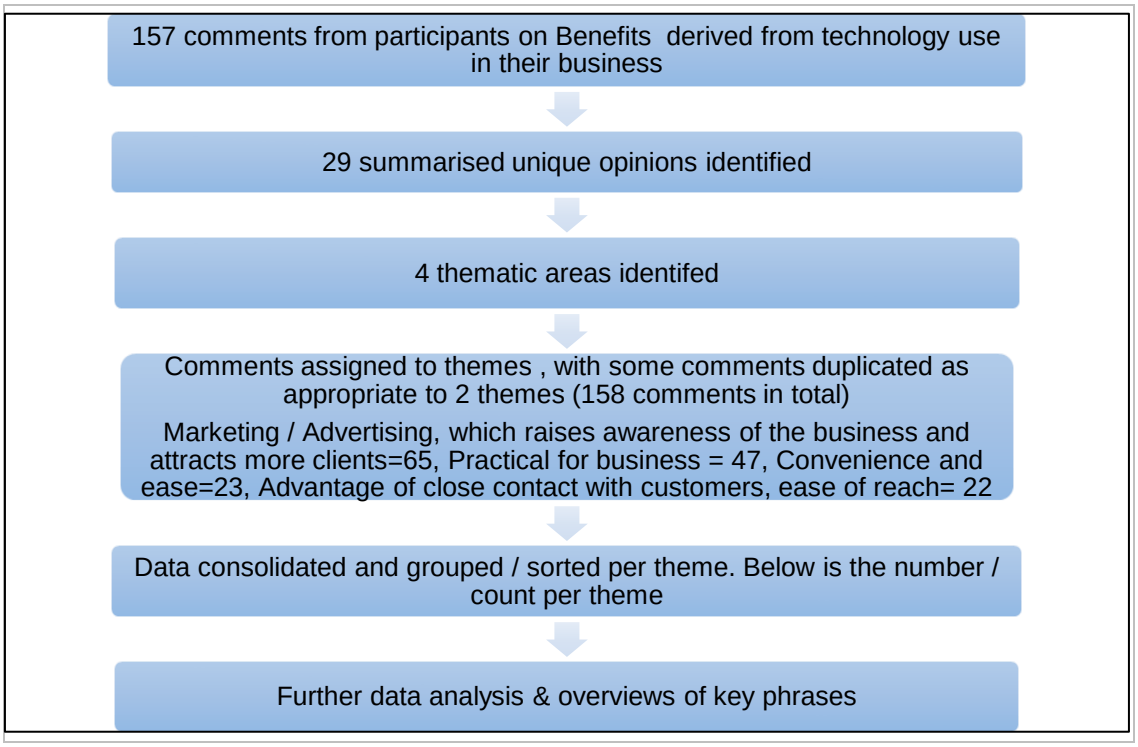
Advantage of close contact with customers, ease of reach:

The use of technology also enabled SME owners to contact customers and enabled contact with customers. Some comments from participants indicated that they communicated timeously with clients and were able to reach clients in remote places.

Table 12: Summary of the responses for each theme

Marketing, which raises awareness of the business and attracts more clients
A large group of clients *Advertise on social media raises awareness* *Attracts new clients on social media* *Awareness of the existence of the business* *Host specials to attracts new client on Social media* *Mass marketing strategy* *My Namibia.com has granted me many clients* *New clients sign up* *Reach a broad client base at once* *Social media brought in new clients that saw my work on Facebook and other platforms* *Social media marketing raised awareness and increased client based* *Informing clients of new arrivals and to pick-up their repaired phones*
practical for business
Alerting clients of their appointments *Alerting customers if due dates has passed* *Contacting salvaged vehicles owners make sale easier* *Fast service delivery* *Informing clients & statement* *Informing clients of new arrivals and to pick-up their repaired phones* *make it easier to on orders and to finish client orders* *Research for the better prices more competitive in the market bring more sales* *Sending clients statements and online orders*
convenience and ease
Client book their tickets online make it easier and convenient *Enquiries are done over phone or email, client don't need to come in* *Notify when to reorder new stock* *Online booking* *Online hires and payments*
Advantage of close contact with customers, ease of reach
Communicate easier with clients *Easy to reach clients even those from out of town* *Timeously being in contact with clients* *Timeously being in contact with old clients and prospective ones*

Figure 7: A summary of the thematic data analysis process



Adopted from Bree & Gallagher (2016).

The majority of the SME owners indicated that the main benefit derived from technology use in their business is that they use it for marketing their business and hence they are more enabled to raise awareness about their business and in turn were able to attract more clients. This was aligned to the research objectives of this study, related to technological opportunism and performance, both financial and non-financial.

The participants however did not indicate that technology reduces costs to run business operations. This is not mentioned in that the initial investment is there but in the long run that technology pays and increases business performance since tasks are able to be automated, traveling costs are sometimes cut due to technology etc. The participants' responses further highlighted the power of social media marketing, since this was the most prevalent theme. In that, the participants indicated that they were able to market their business, make potential customers aware of their products and services and attract more clients.

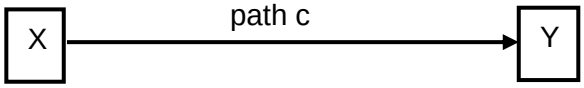
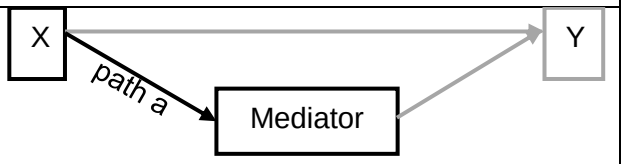
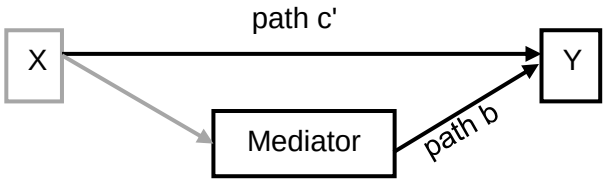
4.6 HYPOTHESES TEST RESULTS

A path analysis model using regression analysis was applied to test the hypotheses.
Research Question 1 sought to provide an answer to the following: *What is the effect of technological opportunism on SME performance?* The study hypothesised that technological opportunism had a positive effect on SME performance. A regression model with SME performance as the dependent variable, technological opportunism as the independent variable was fitted. The results are as reported in table 12 above and discussed below under hypothesis 1.

Research Question 2 sought to test the mediating effect by answering the research question on whether SMEs' dynamic capabilities had a positive mediating effect on the relationship between technological opportunism and the performance of SMEs in Namibia. The study hypothesised that dynamic capabilities had a positive mediating effect on the relationship between technological opportunism and SME performance. This was mainly tested by showing that Technological opportunism (Predictor variable) influences the dynamic capabilities (mediator) and also whether the mediator then influenced the performance (outcome variable). Mediation analyses can be performed with either multiple regression or Structural Equation Modelling (SEM). The logic of the analyses is the same in both cases since the methods are mathematically equivalent when applied to mediation models (Rijnhart et al., 2017). In this case, mediation was tested for the three dynamic capabilities variables namely, learning, integrative and transformative capabilities.

Mediation was tested using the steps recommended by Baron and Kenny (1986). This method of analysis was selected since it is fit for the purpose of testing the hypotheses and it was regarded as the most common method for testing mediation (Hsu & Wang, 2012) and used in this field by researchers such as: Srinivasan et al. (2002) and Sarkees (2011). The method consisted of four steps, performed with multiple regression to observe the existence of mediation. The objective in using this method was to establish that a variable (e.g. dynamic capabilities i.e. learning, transformation and integration capabilities) mediated the relation between a predictor variable (e.g. technological opportunism) and an outcome variable (e.g. SME performance).

There are four steps in establishing mediation for this method. The proposed steps are as follows:

1) The first step is to show that there is a significant relation between the predictor variable and the outcome variable (**path c**)	
2) The second step is to show that the predictor variable is related to the mediator (**path a**).	
3) The third step is to show that the mediator (dynamic capabilities) is related to the outcome variable (SME performance) (**path b**) and 4) The final step is to show that the strength of the predictor variable and outcome variable is reduced (partial mediation) or non-significant (full mediation) when the mediator is added to the model (compare path c and **path c**`)	

The method indicated that if dynamic capabilities *completely* mediate the relationship between technological opportunism and SME performance, the strength of the relationship *will not differ* at all after dynamic capabilities are included in the model. If SMEs' dynamic capabilities is an *indirect (partial) mediator,* which is more likely, the relation between technological opportunism and SME performance *will be significantly smaller* when dynamic capabilities are included but will still be greater than zero.

This approach has been criticized for the following reasons:
Hayes & Preacher (2010) and Zhao et al. (2010) pointed out the main limitation regarding this method, which is that the method does not provide an estimate of the indirect effect. To mitigate this weakness, the Sobel (1982) test was used to identify the statistical significance of the mediator. Other published researchers in the field such as Sarkees (2011) have similarly used the Sobel test to test the significance of mediation. This test measures whether an intermediation effect is significant. In addition, the Sobel test considers the total effect of the path between a predictor variable and a mediator and the path between the mediator and the outcome variable and is a more direct test of mediation (Shrout & Bolger, 2002).

A suitable way to describe the amount of mediation is in terms of the total effect that is mediated, which is defined by the estimated regression coefficients a, b, and c as ab/c by Shrout & Bolger (2002). This step does not conclude the significance level but only explains the change proportion caused by the mediator (Shrout and Bolger, 2002). The significance tests of the mediation effects were conducted and explained in the mediation tests sections using the Sobel test. The test for this research was conducted at 95.0 percent confidence level, i.e. at 0.05 significance level. Indicating that the results will provide assurance that the calculated statistical value based on this sample, would also be true for the entire population, with at 95 percent chance.

4.6.1 Hypothesis 1

Testing Hypothesis 1: Effect of technological opportunism on performance

Hypothesis (H_1): There is a positive relationship between technological opportunism and SME performance.

We reject Ho if $p<0.05$ for the regression test.

Test statistics: Regression analysis was conducted to test the direct effect of technological opportunism on SME performance. As shown in step 1, table 13 below, the unstandardised regression coefficient ($B=0.494$, $p<0.05$) associated with the effect of technological opportunism on SME performance was significant ($p<0.05$). Thus, Path c was significant, and the requirement for mediation in Step 1 was met.

Table 13: Testing Hypothesis 1 Technological opportunism and effect on SME performance

	Path	*B*	*SE*	**β**	F	R^2
Step1 (Testing Path c) Predictor: TO Outcome: SME performance	c	0.49	0.57	**0.52****	76.337	0.30

Conclusion on H1: It can be concluded that technological opportunism has a positive effect on SME performance, which supports Hypothesis 1.

The literature indicates that technological opportunism is the way SMEs sense and respond to technology i.e. If SMEs are able to sense their environment and respond to these technological developments within the environment, it is highly likely that the SMEs' performance will be positively influenced.

4.6.2 Hypothesis 2 (Mediation)

Introduction

The hypothesis on dynamic capabilities as mediators was tested using the regression analysis method as recommended by Baron and Kenny (1986), as discussed above in this section.

The three dynamic capabilities were coded in SPSS into one variable, dynamic capabilities as a mediating variable. The three (3) mediation variables were the Learning, Integrative and Transformative capabilities.

Individual tests for all other dynamic capabilities i.e. Learning, Integrative and Transformative capabilities were also separately tested to assess the mediating effect of each dynamic capability on the relationship between technological opportunism and SME performance. Firstly, the results of dynamic capabilities (Hypothesis 2) were presented followed by mediation Testing for H2a (learning capability). H2b (integrative capability) and H2c (Transformative capability) as well.

Testing conditions: In testing mediation, using the method by Baron and Kenny (1986), mediation can be said to occur when the following conditions are met:

Condition 1. The predictor variable significantly affects the outcome variable (mediator absent),

Condition 2. The predictor variable significantly affects the mediator,

Condition 3. The inclusion of the mediator variable into the model caused a reduction in the coefficient of the original predictor variable.

The following Hypotheses were tested for mediation:

- **Hypothesis 2 (H_2):** SMEs' dynamic capabilities have a positive mediating effect on the relationship between technological opportunism and SME performance.
- **Hypothesis 2a (H_{2a}):** SMEs' learning capability have a positive mediating effect on the relationship between technological opportunism and SME performance.
- **Hypothesis 2b (H_{2b}):** SMEs' integrative capability have a positive mediating effect on the relationship between technological opportunism and SME performance.
- **Hypothesis 2c (H_{2c}):** SMEs' transformative Capabilities have a positive mediating effect on the relationship between technological opportunism and SME performance.

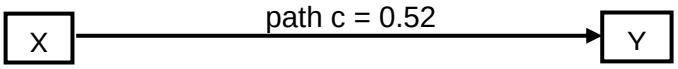
Table 14: Testing Hypothesis 2 (Mediator effect of total dynamic capabilities)

	Path	*B*	*SE*	**β**	F	R^2
Step1 (Testing Path c) Predictor: TO Outcome: SME performance	c	0.49	0.57	**0.52****	76.337	0.30
Step 2 (mediation) (Testing Path a) Predictor: TO Outcome: dynamic capabilities	a	0.75	0.08	**0.53****	80.372	0.30
Step 3 (Testing Paths b and c`) Outcome: SME performance Mediator: dynamic capabilities (path b)	b	0.26	0.06	**0.28****	75.51	0.42
Predictor: TO Direct / indirect effect of TO and SME performance (path c`)	c`	0.62	0.08	**0.46****		
	Hypothesis results: SUPPORTED					

Notes: B = unstandardized parameters, β = standardized parameters, n=209
β small if = < .05
R^2 = .1 (weak) effect = 10% of variance; R^2 = .3 (moderate) effect = 30% of total variance; R^2 = .5 (strong) effect = 50% of total variance
*Significance ** = p < .05*

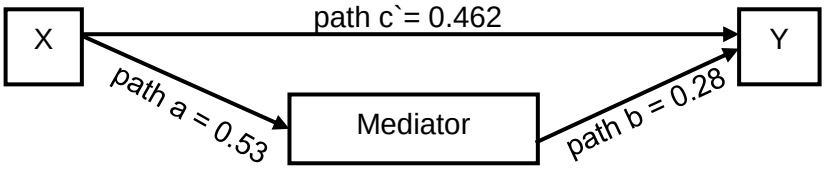
From the table, the different paths are presented below.

Figure 8: Direct effect of the Predictor variable on the outcome variable



(a) Direct effect of the Predictor variable on the outcome variable (Mediator not in the model, Hypothesis 1)

Figure 9: Mediation effect:



(b) Mediation effect: The relationship between the predictor and outcome variable was mediated by dynamic capabilities (Mediator in the model, Hypothesis 2)

Test steps for Hypothesis 2.

For condition 1, the first step intends to show that there is a significant relationship between the predictor variable and outcome variable. This is as shown in testing hypothesis 1 above. The relationship was reported as significant since p<0.001 (see Path c).

Condition 2, the relationship between technological opportunism and dynamic capabilities was tested and the results indicated that technological opportunism has an effect on dynamic capabilities (mediator) (B = 0.75, β = 0.53, p-value < 0.05) indicating significance based on the p-value, and it was, therefore, concluded that technological opportunism has an effect on dynamic capabilities.
Condition 3 was met since the coefficient for technological opportunism (path c and path c') declined from 0.519 to 0.462 after adding the mediator variable into the model.

Effect size: Using the unstandardized regression coefficients as a way to describe the amount of mediation in terms of the proportion of the total effect that is mediated, defined as ab/c, as explained by Shrout & Bolger, (2002). The test yields the following: (0.75*0.26)/0.49 = 0.398. Hence, 39.8 percent of the relationship between technological opportunism and SMEs' performance is mediated by dynamic capabilities, indicating a moderate effect.

Test results for Hypothesis 2: Since all conditions in testing for mediation have been met, we conclude that overall, dynamic capabilities mediate the relationship between technological opportunism and SMEs performance. The individual dynamic capabilities (learning, integrative and transformative capabilities) are analysed below:

Testing individual dynamic capabilities

Table 15: Testing Hypothesis 2a (Mediator effect of learning capability)

	Path	*B*	*SE*	β	F	R^2
Step1 (Testing Path c) Predictor: TO Outcome: SME performance	c	0.49	0.57	0.52**	76.337	0.30
Step 2 (mediation) (Testing Path a) Predictor: TO Outcome: Learning capability	a	0.52	0.07	0.44**	49.092	0.20
Step 3 (Testing Paths b and c`) Outcome: SME performance Mediator: Learning capability (path b)	b	0.36	0.06	0.38**	55.252	0.35
Predictor: TO Direct / indirect effect of TO and SME performance (path c`)	c`	0.35	0.07	0.31**		
Hypothesis results: SUPPORTED						

Notes: B = unstandardized parameters, β = standardized parameters, n=209
β small if = < .05
R^2 = .1 (weak) effect = 10% of total variance; R^2 = .3 (moderate) effect = 30% of total variance; R^2 = .5 (strong) effect = 50% of total variance
*Significance ** = p < .05*

For condition 1, the first step was to establish whether there was a significant relationship between the outcome variable and predictor variable, by regressing SME performance (outcome variable) on technological opportunism (predictor variable). The unstandardized regression coefficient (B = 0.49),

was significant at p<0.05 (see Path c). Therefore, Path c was significant, and the condition for mediation in Step 1 was met.

Condition 2, the relationship between technological opportunism and learning capability was tested by regressing learning capability on technological opportunism (Step 2) and the results indicated that technological opportunism is related to learning capability (B = 0.52, β = 0.44, p-value < 0.001) and the relation is significant, based on the p-value. The condition for condition 2 (path a) was therefore met.

Condition 3 was met since the coefficient for technological opportunism (path c and path c') declined from 0.52 to 0.31 after adding the mediator variable into the model. Thus, condition for step 3 was met.

Result: It was found that Learning capability partly mediates the relationship between technological opportunism and SMEs performance.

Effect size: Using the unstandardized regression coefficients, the results are: (0.52*0.36) / 0.49 = .382. Hence, about 38.2 percent of the relationship between technological opportunism is mediated by learning capabilities.

Significance:

Table 16: Testing Hypothesis 2b (Mediator effect of integrative capability)

	Path	*B*	*SE*	β	F	R^2
Step1 (Testing Path c) Predictor: TO Outcome: SME performance	c	0.49	0.57	0.52**	76.337	0.30
Step 2 (mediation) (Testing Path a) Predictor: TO Outcome: Integrative capability	a	0.31	0.07	0.31**	21.906	0.10
Step 3 (Testing Paths b and c`) Outcome: SME performance Mediator: Integrative capability (path b)	b	0.40	0.06	0.42**	58.231	0.36
Predictor: TO Direct / indirect effect of TO and SME performance (path c`)	c`	0.31	0.06	0.32**		
Hypothesis results: SUPPORTED						

Notes: B = unstandardized parameters, β = standardized parameters, n=209
β small if = < .05
R^2 = .1 (weak) effect = 10% of total variance; R^2 = .3 (moderate) effect = 30% of total variance; R^2 = .5 (strong) effect = 50% of total variance
*Significance * * = p < .05*

For condition 1, the first step was to establish whether there was a significant relationship between the outcome variable and predictor variable, by regressing SME performance (outcome variable) on Technological opportunism (predictor variable). The unstandardized regression coefficient (B = 0.49), was significant at p<0.05 (see Path c). Therefore, Path c was significant, and the condition for mediation in Step 1 was met.

Condition 2, the relationship between technological opportunism and Learning capability was tested by regressing learning capability on technological opportunism (Step 2) and the results indicates that

technological opportunism is related to learning capability (B = 0.31, β = 0.31, p-value < 0.005) and the relation is significant, based on the p-value. The condition for condition 2 (path a) was therefore met.

Condition 3 was met since the coefficient for technological opportunism (path c and path c') declined from 0.52 to 0.32 after adding the mediator variable into the model. Thus, condition for step 3 was met.

Result: It was found that Integrative capability partly mediates the relationship between technological opportunism and SMEs performance.

Effect size: Using the unstandardized regression coefficients, the effect size (ab/c) yielded: (0.31*0.4) / 0.49 = .253. Hence, about 25.3 percent of the relationship between technological opportunism is mediated by integrative capabilities.

Table 17: Testing Hypothesis 2c (Mediator effect of transformative capability)

	Path	*B*	*SE*	β	F	R^2
Step1 (Testing Path c) Predictor: TO Outcome: SME performance	c	0.49	0.57	0.52**	76.337	0.30
Step 2 (mediation) (Testing Path a) Predictor: TO Outcome: Transformative capability	a	0.40	0.05	0.53**	79.967	0.30
Step 3 (Testing Paths b and c`) Outcome: SME performance Mediator: Transformative capability (path b)	b	0.02	0.02	0.01	2573.061	
Predictor: TO Direct / indirect effect of TO and SME performance (path c`)	c`	0.71	0.01	0.98		0.90
Hypothesis results: NOT SUPPORTED						

Notes: B = unstandardized parameters, β = standardized parameters, n=209
β small if = < .05
R^2 = .1 (weak) effect = 10% of total variance; R^2 = .3 (moderate) effect = 30% of total variance; R^2 = .5 (strong) effect = 50% of total variance
*Significance ** = p < .05*

For condition 1, the first step was to establish whether there was a significant relationship between the outcome variable and predictor variable, by regressing SME performance (outcome variable) on Technological opportunism (predictor variable). The unstandardized regression coefficient (B = 0.49), was significant at p<0.05 (see Path c). Therefore, Path c was significant, and the condition for mediation in Step 1 was met.

Condition 2, the relationship between technological opportunism and transformative capability was tested by regressing transformative capability on technological opportunism (Step 2) and the results indicates that technological opportunism is not significantly related to learning capability (B = 0.41, β = 0.53, p-value > 0.005) and the relation is **not** significant, based on the p-value. The condition for step 2 (path a) was therefore NOT met.

Condition 3 was **not** met since the coefficient for technological opportunism (path c and path c') increased from 0.52 to 0.98 after adding the mediator variable into the model. Thus, condition for step

3 was not met. Therefore, transformative capability does **not** mediate the relationship between technological opportunism and SME performance.

Effect size: Using the unstandardized regression coefficients, the results for effect size (ab/c) yielded: (0.4*0.02) / 0.49 = .016 ≈2%; and p-value = 0.187>0.05 and therefore not significant. This confirms that the relationship between technological opportunism is not mediated by transformative capability.

Significance of mediator effects

To measure the significance of the mediator effects, the Sobel test was used. Overall, the results show that dynamic capabilities as a mediator partially facilitates the relationship between technological opportunism and SME performance. The Sobel test examines the total effects of the path between the predictor variable (Technological Opportunism) and a mediator as well as the path between the mediator and the outcome variable (SMEs performance). It is said that the test is a more direct test of mediation (Sobel, 1982). The test uses the Z values. If Z>1.96 and p<0.05, then the test is significant.

The results indicated that the effect of total dynamic capabilities as a mediator between technological opportunism and SMEs performance was significant since dynamic capabilities (Z=3.933, p<0.05), where Z >1.96 and p-value<0.05 and therefore, the effect of dynamic capabilities is significant.

The learning and integrative capabilities also facilitated relationship between TO an SME performance since *learning capability* (Z=4.668, p<0.05), *integrative capability* (Z=3.689, p<0.05), indicating that Z> 1.96 and p-value<0.05 and therefore significant. The results for *transformative capability indicate that* (Z=0.992, p>0.05), since Z<1.96 and p-value = 0.321>0.05, which does not meet the criteria for significance, the results are therefore **not** significant. The results for transformative capability confirmed that transformative capability did not mediate the relationship between Technology opportunism and SME performance.

Conclusion and discussion on the overall Hypothesis 2 test results

The results showed that dynamic capabilities mediate the relationship between technological opportunism and SME performance, tests for the different dynamic capabilities indicate that the learning and integrative capabilities have a mediating role in the relationship between technological opportunism and SME performance. However, the transformative capability did not.

4.7 DISCUSSION OF RESULTS

This study investigated the effect of technological opportunism on the performance of SMEs by applying dynamic capabilities as mediators on the relationship between technological opportunism and SME performance, through three dynamic capabilities namely the learning, integrative and transformative capabilities. The empirical findings of this study show that technological opportunism can improve SME performance through dynamic capabilities. The findings are consistent with prior studies such as that of Maphumulo (2017); Rezazadeh et al. (2016); Lin & Wu (2014) & Wu (2007) and offer additional insights as it specifically focuses on the link between technological opportunism, dynamic capabilities and the performance of SMEs. The study also researched the benefits derived from technology use in SMEs. Review of literature and the evaluation of the various themes, issues and frameworks helped to develop a more specific set of research questions, which were focused on the effect of technological opportunism on SME performance, including the mediating role of dynamic capabilities on this relationship. Analysis of the data collected helped answer this question.

The results of this study show that there is a positive relationship between technological opportunism and SME performance. On mediation, the results further indicate that the relationship between technological opportunism and SME performance is mediated by Learning and Integrative capability. However, the transformative capability does not mediate this relationship.

Learning is an integral part of a business and SMEs should continuously learn and integrate these learnings to achieve performance. The data revealed that the link between the transformative capability as a mediator of the relationship between technological opportunism and performance is not significant. The responses of the SME owners, based on their views, indicate that the relationship on how SMEs sense and respond to technology and the link to its business performance is mediated by the ability of SMEs to learn and integrate these new technologies into their businesses but transformation of the business does not necessarily mediate this relationship. i.e. SMEs view that the key to the success of their business in terms of performance is not so much about transformation, however, that learning and integrating new innovation without necessarily transforming their asset base will yield more positive results towards their business performance.

4.7.1 Discussion - Effect of technological opportunism on performance

Hypothesis 1:

Firstly, the research found that there is a positive relationship between technological opportunism and SME performance. From hypothesis 1, the results showed that technological opportunism has a positive effect on SME performance. These findings indicate that the way SMEs sense their environment and respond to technological developments in their environment positively influences the SME's performance. The results, based on the research tool, show that SMEs who are technologically opportunistic take the lead in their industry in noticing technological developments that may potentially affect their business, actively seek information regarding technological changes in the environment that are likely to affect their business and review the potential effect of technology on their business. In addition, the results suggest that those SMEs who are generally quick to respond to new technologies in the business environment and who do not resist new technologies after they have sensed the environment or gathered intelligence regarding the business environment in which they operate in, are generally more likely to have better performance. This is because they are more capable to reap the benefits that technology brings (Srinivasan et al., 2002).

Technological opportunism is a strong driver of financial-based performance as indicated by Sarkees (2011). The finding regarding the relationship between technological opportunism and SME performance is supported by the conclusions of previous studies (Sarkees, 2011; Zhou & Li, 2010). SMEs should therefore continue to sense their environments and be well informed and clear on the decision to invest in a particular technology. Many SMEs in developing countries lack the resources and often do not have access to funds to take advantage of investment in technology, aimed at ultimately improving their businesses. It is the researcher's hope that in a moment of decision making, that SMEs will have this information and know that technological opportunism, which leans on being able to invest in technology, has a positive effect on the financial and non-financial performance components of the business and might help improve their businesses.

From general observations, in some cases, SMEs view investment in technology as a burden that will adversely affect the finances of the business. Linking this to the positive relationship of technological opportunism and SME performance from the test results, the SME need to understand that it is those investments that enable the SME to reach more clients, enable marketing and advertisement to reach more customers, boost sales, provide an opportunity for online booking, provide convenience and more sales. This view is reflected from the participants who indicated that they:

'Host specials to attracts new clients on social media', 'Reach a broad client base at once' and social media brought in new clients that saw my work on Facebook and other platforms', … and another who indicated that: *'Social media marketing raised awareness and increased our client base'.*

Providing marketing and advertising solutions mainly through social media result in a reduction of operational costs and therefore boosts the overall performance of the SME. The firm wide decision to invest its resources into technology therefore needs to be understood as an investment for the long run and for future benefit, even though taking financing to invest resources in technology may infringe on the resources of the SME. The data shows that over time, the true benefit of investment in technology is realised. It is important in that, the true value and power of technology be harnessed and the ability of technology as a cost saving way to improve the overall performance of SMEs. Examples of such ways that needs to be reiterated to SMEs is that sensing and responding to technologies that can enable SMEs to operate its business on the internet without the need of office space, should circumstances be favourable in such a setting. Hence the need to sense and to apply business intelligence and to then respond accordingly, should it fit the business needs. One way is to make use of online communication tools for presentations and meetings to cut travelling costs. Another way is automation of repetitive tasks so as to reduce staff costs and workload and enables the organisation to concentrate on more productive tasks.

4.7.2 Discussion - Mediating effect of dynamic capabilities

The mediating role of dynamic capabilities under Hypothesis 2 was analysed and the result show that overall, dynamic capabilities mediate the relationship between technological opportunism and SME performance.

Analysis of the individual dynamic capabilities revealed that the learning and integrative capabilities mediate the relationship between Technological opportunism and SME performance. However, this relationship is not mediated by transformative capability.

This study has found similar findings to that of Maphumulo (2017); Rezazadeh et al. (2016); Lin & Wu (2014) & Wu (2007), whose studies supports dynamic capabilities as mediators. This study showed that dynamic capabilities indirectly mediates the relationship between technological opportunism and SME performance. The below discussion looks at the specific dynamic capabilities, namely the learning, integrative and transformative dynamic capabilities.

Hypothesis 2a – Mediating effect of the Learning capability - Based on the analysis of hypothesis 2a using regression, the statistical results support the hypothesis for mediation. The $R^2 = 0.349$ and suggests that 34 percent of the variance in the link between technological opportunism and SME performance is explained by learning capability. The results indicate that technological opportunism has

a positive effect on learning capability, which then ultimately influence SME performance. From the findings, SME owners perceive learning as a tool to partially mediate the relationship between technological opportunism and their business performance. Hence, continual efforts that encourages learning in the form of support, resources and strategies from stakeholder and from the SME management itself should be directed towards learning as a key effort and as part of the strategy within the SME to achieve higher performance.

Hypothesis 2b – Mediating effect of the Integrative capability - The analysis of hypothesis 2b using regression analysis supports the hypothesis for mediation. The $R^2 = 0.361$ and suggests that 36 percent of the variance in the link between technological opportunism and SMEs performance is explained by integrative capability. The results indicate that technological opportunism has a positive effect on integrative capability, which then ultimately influences SME performance. From the findings, SME owners perceive the ability to obtain, develop and integrate new resources into their business as a tool to partially mediate the relationship between technological opportunism and their business performance. One cannot divorce integration with new ways of thinking as discussed by Teece (2007). The SME owners therefore need to create a common understanding amongst all parties to embrace innovation, combine external and internal knowledge and to manage change. It is therefore important that management involvement in this case is involved to ensure that any integration process is fit for purpose and that it aligns with strategic objectives of the SME to ultimately achieve business success. After the learning process, SME owners are encouraged to look at adoption of best practices and benchmarking from other entities in the market who meet the requirements in certain areas of interest when making decisions regarding integration of new resources and technologies.

Hypothesis 2c – mediating effect of the Transformative capability - Based on the analysis of hypothesis 2c using regression, the statistical results were not significant and therefore did not support the hypothesis and therefore concluded that transformative capability does not mediate the relationship between technological opportunism and SME performance, i.e. technological opportunism has no significant influence on transformative capability.

From the findings, SME owners do not perceive transformative capability as a tool to partially mediate the relationship between technological opportunism and their business performance. SME owners found that the way they sense and respond to technology does not have a significant influence on their capability to transform their business and that their transformative capability has no significant influence on performance.

The rejection of the hypothesis claim in this case is supported by literature. Srinivasan et al., (2002) suggest that when technology is radically *(drastically)* applied that it transforms *(alters/changes)* the

business, it can affect existing assets adversely in a way that may also affect resource planning and skill sets and may therefore have a negative effect on the SME and its performance.

Hence, continual efforts that encourages SMEs owners to learn and experiment with new concepts and new ways of doing things in order to integrate it into their business, while being prudent with radical transformation to achieve enhanced business performance.

4.7.4 Discussion - Ownership and Derived benefits of technology

An important element of interest in this study was the derived benefits of technology used in SMEs. The results indicate that the benefits derived relates mainly to the visibility of their business and in turn, which enhances the business performance.

The information further indicated that the mobile phone was the most used tool at 93 percent. Ownership of technology is an important matter that this dissertation looked at. Overall, the results showed that, followed by internet and email and then fixed telephone lines and website. The term website referred to relates to the SMEs' own website.

Information suggests that the majority of the SME owners do not develop websites for their business. From Chapter 4, it came out that 70 percent of the interviewed SMEs do not have an official website for their business. One of the possible reasons can be that this is mainly due to the popularity and usefulness created by the use of social media platforms. This, coupled with the prevalent use of mobile phones indicate that opportunism can be a great success in that, SME owners who utilise technology, including mobile phones and social media platforms can learn and be able to integrate the new technologies into their business and in turn, improve performance.

4.8 CONCLUDING SUMMARY

The summary of discussion is based on literature, results from the study and the researchers own experience and knowledge with SMEs and technology. The conclusion of the entire study will follow in the next chapter.

CHAPTER 5 - CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter summarises the detailed discussions and drawn conclusions presented throughout the dissertation. The implications, contributions of the research and the recommendations for future research are also presented herein.

5.2 CONCLUSIONS DRAWN FROM THE STUDY

The current business environments that SMEs operate in makes it is crucial for SMEs to be able to sense opportunities and threats and incorporate dynamic capabilities for higher and sustained performance. The study realised the three main objectives set out for it. For the first objective, the study aimed to assess the relationship that exists between technological opportunism and SME performance, which is the main problem of this study. The study was focused on determining the way SMEs sensed and responded to technology and how this, in turn, had an effect on the performance of SMEs. The second objective was to determine the mediating effects of dynamic capabilities on the relationship between technological opportunism and SME performance and through this, to establish the types of dynamic capabilities that would significantly mediate the relationship between technological opportunism and the performance. Thirdly, the study further established the types of technologies used by SME entrepreneurs and the derived benefits thereof (i.e. The technologies they used, and the benefits derived from using those technologies).

The positive effect of technological opportunism on SME performance was made evident in this study. The research focused on three main dynamic capabilities as meditating factors for the relationship between technological opportunism and SME performance. The dynamic capabilities were based on literature which suggests the importance of understanding SMEs and their capabilities, as well as resources that SMEs ought to have to enhance performance (Teece et al.,1997).

The mediation effect was supported for the learning and integrative capability but was, however, not supported by the transformative capability of SMEs. The detail indicated that the SMEs perceived learning and taking on what they had learnt and applying it to their business (integrate) to be important for their business performance. However, SME owners did not necessarily agree with the notion that they needed to transform their businesses i.e. to reconfigure their internal and external structure to attain success in their business performance.

Even though other studies have been conducted in a different context and did not necessarily focus on some of the constructs that were considered in this research, namely technological opportunism, SME performance and dynamic capabilities, the research mainly aligned with different research which were studies in the same direction mainly regarding the link between technological opportunism and performance (Sarkees, 2011 and Chen & Lien, 2013).

The researcher further assessed the perceived benefits and extent of use of technology in SMEs. The results showed the important advantage presented by technology which is the advertising and marketing tools which encapsulated the importance of communication and brand awareness as a determining factor that sets business apart and influenced performance. SME owners perceived that the main purpose of technology use is to increase sales. This is so, especially in the present day where social media is an integral norm and part of people's lifestyles. SMEs therefore perceived the ability to advertise and market their products and services as a distinct benefit brought on by technology. Further information indicated that the mobile phone is the most used device, this therefore brought forth the power of mobile phones in technology use for SMEs.

This research has an important message, based on technological opportunism, performance and the dynamic capabilities perspective adopted in this study. The raw message is that: SMEs should invest in learning opportunities and integrate these new internal and external learnings and technologies into their business functions to improve their performance, while staying true to their identity and existence (to not necessarily transform their business, but rather reconfigure through learning and integrate those learnings into their business operations). The definition of Teece et al., (2007), on which most of the dynamic capabilities work in this research is based, points out reconfiguration rather than transformation in the definition of dynamic capabilities. It is then befitting to say that SMEs should consistently rearrange elements of their business operations in a different form i.e. reconfigure. This was evidenced by the learning and integrative capabilities being supported and the transformational capability not being supported in this study.

5.3 LIMITATIONS OF THE STUDY

The identified limitations to this study are as follows:

Firstly, the sample consisted of participants from the Khomas region in Namibia only and generalisation of the results to a larger or different population might be limited. Secondly, there are some restrictions associated to the cross-sectional nature of the data. Even though the term 'effect' used in the research suggest a causal relationship, the research is cross-sectional and therefore only takes a point in time approach in measuring the real effect of the performance of SMEs in terms of timeline, compared to a longitudinal study. Another limitation is the subjective nature of respondents, which came as part of the survey design. The responses from SME owners regarding derived benefits or the general perception may not truly be reliable and may not truly reflect the actual underlying concepts. Furthermore, this study was to a large extent based on a single response form and did not capture the underlying concepts thereof.

5.4 CONTRIBUTIONS

In addition to the direction to be provided for future research in the next section, the study has added several contributions to literature.

1. The dissertation contributed towards strategic management of SMEs. It can be said that despite technology being an enabler for business functions, it is increasingly becoming the foundation on which the firm wide business processes are built. In that, since this dissertation focused on dynamic capabilities and the link towards performance, conclusions can be drawn from the discussion of dynamic capabilities and the effect on performance. Furthermore, the researcher hopes to shape policy direction and targeted interventions from different stakeholder with the aim of improving performance of SMEs through technology.

2. The inclusion of perceived benefits of ICT to better understand its link to technological opportunism, provides additional and related information in this area of interest. The hope is that this study will attract other researchers in this field, to this concept.

5.5 PRACTICAL IMPLICATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

1. This study did not look at management involvement as a construct or a control variable. Similar studies conducted have also excluded the role of management to particularly focus on the outlined relationship built thus far through literature. Intentionally excluding management involvement avoids broadening the focused scope of the current study. This therefore sets a departure point for further research to look at management involvement in technological opportunism.

2. SME owners are urged to seek and invest in available training and mentorship programmes to build capacity in running their businesses. Individuals, researchers, government and non-governmental agencies should collaborate to best improve the work done in this sector especially on how to best develop SMEs' capabilities with regard to new technology initiatives aimed at improving SMEs and are urged to take advantage of the existing facilities and initiative programs by the line ministry aimed at development of SMEs (such as the Namibian Chamber of Commerce and Industry (NCCI)

3. SME owners are further encouraged to embrace partnerships and develop capabilities that results in better performance. It is generally said that businesses with more than one owner/manager perform better than a sole trader.

4. Moreover, the study found that dynamic capabilities have a partial mediating role. Future research can look in greater detail into the causes of mediation of dynamic capabilities on performance. The causes of mediation can be explored and used to enhance SMEs performance in the market. The way one can look at the causes of mediation is by way of analysing the drive, motivating factors or the insight level of the SME as well as the role that management plays in ensuring that their business is enriched with capabilities to thrive in dynamic environments.

5. The capabilities explored in this dissertation were selected based on literature. However, more dynamic capabilities exist beyond what was studied in this research. Inclusion of other capabilities will ensure that a full and more holistic view of capabilities in the field of Information Systems and beyond are brought to light.

6. Furthermore, an interesting dynamic regarding transformation and how it is perceived came to light in this research. The link between technology, capabilities and performance and the role of transformation as a capability for SMEs need to be further investigated.

7. This research looked at the mediating role of dynamic capabilities. Future research can look at dynamic capabilities from a moderating effect perspective. Furthermore, a complete investigation into both mediator and moderator variables presents a more complete approach in understanding the dynamics on how technological opportunism leads to performance.

5.6 CONCLUSION

In conclusion, this chapter provided a summarised conclusion of this study, its limitations, contributions and recommendations for further research. The recommendations brought forth are important to advance the work done in literature with regard to SMEs and technology as a whole; and specifically, so in technological opportunism and the link to performance from a dynamic capabilities' perspective. Overall, the study contributes to empirical literature on technological opportunism, dynamic capabilities, SMEs and performance. The research has several implications and offers opportunities for governments, NGOS, parastatals and other stakeholders to advance strategic economic goals targeted towards SMEs and to steer the way forward, all with the aim of strategic management and technology advancement for development.

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APPENDIX A: COVER LETTER

A survey on Technological Opportunism and Small, and Medium Enterprise (SME) performance from a dynamic capabilities perspective

I am currently conducting a study in partial fulfillment of the requirements for a Master of Commerce degree specializing in Information Systems at the University of Cape Town (UCT). My research seeks to establish the effects of Technological Opportunism on SME performance and how this relationship is affected by the dynamic capabilities of SMEs in Namibia.

I am hereby asking you whether you will be able to respond to the short questions that appropriately represent your views. If you agree, please answer the questions as objectively as possible and to the best of your knowledge. The questionnaire will take approximately 15 minutes to complete.

Your participation in this research is voluntary. You will not be requested to supply any identifiable information, ensuring anonymity of your responses. You can choose to withdraw from the research at any time should you wish not to continue and you will not be prejudiced in any way.

This research has been approved by the Commerce Faculty Ethics in Research Committee.
All information will be confidential and used solely for the purpose of this research only. The findings of this research study will be compiled and presented to the University of Cape Town for academic purposes.

Should you have any questions regarding the research, please feel free to contact me via the following email roline.tjipueja@gmail.com or telephonically at +264 81 1252 519.

Thank you for your time and participation.

Sincerely,

Roline Tjipueja

Masters Student
Department of Information Systems
University of Cape Town
Email: roline.tjipueja@gmail.com

Prof. Irwin Brown

Research Supervisor
Department of Information Systems
University of Cape Town

APPENDIX B: RESEARCH INSTRUMENT - QUESTIONNAIRE

Section 1: Please provide the appropriate response to the following questions.

1.1. Please indicate your position within the organization	○ Business owner ○ Business Partner ○ Business Manager
1.2. Gender	○ Female ○ Male ○ Prefer not to answer
1.3. Please select your age	○ lowest to 30 years ○ 31 - 40 ○ 41 - 50 ○ More than 50
1.4. Please state your type of business or the type of sector it falls under	……
1.5. Please state the total number of employees in your businesses.	……
1.6. Age of business	○ Less than one year ○ 1 - 2 years ○ 3-5 years ○ 6 - 9 years ○ 10 and above

Section 2: The following questions are meant to understand your business' use of information and communication technology (ICT) for different purposes.

2.1.1. Do you have a mobile phone for your business?	○ Yes ○ No
2.1.2. Do you have a Fixed Line for your business?	○ Yes ○ No
2.1.3. Do you have internet connectivity?	○ Yes ○ No
2.1.4. Do you use e-mail for business purposes?	○ Yes ○ No
2.1.5. Do you have a website for the business?	○ Yes ○ No
2.1.6. Do you have other forms of online presence for the business? *i.e. where your business information can be found electronically*	○ Yes ○ No
If no: Kindly go to question 2.2. If yes: 2.1.6 (i) Kindly indicate which *(e.g. Facebook, LinkedIn, etc.)*	…… …… ……

2.2. Which of the following applications, tools or computer software programs does your business use? (Select as many options as apply)	○ Word processing ○ Spreadsheet ○ Presentation graphics (e.g. PowerPoint) ○ Email ○ Accounting software ○ Payroll ○ Fax machine ○ Fixed line ○ Customer relationship management software ○ Enterprise Resource Planning (ERP)
2.2.1. Is there any other information you would like to add?	…… …… …… ……

2.3. For what purpose do you use the following applications or tools? (Select as many options as apply)

	Mobile Phone	Personal Computer	Intranet / Internet
2.3.1. Store information	○	○	○
2.3.2. Banking	○	○	○
2.3.4. Purchasing / procurement	○	○	○
2.3.5. Marketing / advertising	○	○	○
2.3.5. internal communication	○	○	○
2.3.6. external Communication with customers and suppliers	○	○	○
2.3.7. Market research - To find out about happenings in the market	○	○	○
2.3.8. To record a sale / transaction	○	○	○
2.3.9. To send / received and an order/ transaction	○	○	○
2.3.10. Is there any other information you would like to add?	……		

2.4. Please indicate the extent that your company uses ICT for the following purposes.
In this case, ICT refers to all the technologies used in your business for information and communication purposes such as e-mail, internet, mobile phone, fixed line, e-commerce etc.

Extent of ICT use	Not at all	Very rarely	Neutral	Occasionally	To a very large extent
2.4.1. To Improve processes	○	○	○	○	○
2.4.2. To increase overall productivity	○	○	○	○	○
2.4.3. To reduce costs	○	○	○	○	○

2.4.4. To increase sales / revenue	○	○	○	○	○
2.4.5. To increase profits	○	○	○	○	○
2.4.6. To provides owner/management a greater control of the business	○	○	○	○	○
2.4.7. To improve customer relations	○	○	○	○	○
2.4.8. To improve product and service quality	○	○	○	○	○
2.4.9. To improve internal coordination and communication	○	○	○	○	○
2.4.10. To improve external communication with customers, suppliers and partners	○	○	○	○	○
2.4.11. To improve business / brand awareness	○	○	○	○	○

Instructions: Please respond to the following questions in relation to your business.

2.5. Have you derived any benefits from technology for improvement of your business performance?	○ Yes ○ No
2.5 (i) If yes, kindly state how:	…….. …….. ……

Section 3 The following statements are meant to identify and assess the perceived capability of your business to sense and respond to technological developments. Please indicate a response that best represents your views.

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
3.1.1. We are often one of the first in our industry to notice technological developments that may potentially affect our business.	○	○	○	○	○
3.1.2. We actively seek information regarding technological changes in the environment that are likely to affect our business.	○	○	○	○	○
3.1.3. We are often slow to notice changes in technologies that might affect our business. (R)	○	○	○	○	○
3.1.4. We periodically review the likely effect of changes in technologies on our business.	○	○	○	○	○
3.2.1 We generally respond quickly to technological changes in the environment.	○	○	○	○	○
3.2.2 We lag behind the industry in responding to new technologies. (R)	○	○	○	○	○
3.2.3. For one reason or another, we are slow to respond to new technologies (R)	○	○	○	○	○
3.2.4. We tend to resist new technologies. (R)	○	○	○	○	○

Section 4:

Kindly indicate the extent to which you agree or disagree with the following statements:

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
4.1.1. We are willing to try new and innovative ideas	○	○	○	○	○
4.1.2. We often use market information to improve our business	○	○	○	○	○
4.1.3. We encourage employees to communicate their ideas	○	○	○	○	○

4.2.1. We are able to combine newly acquired knowledge with our existing knowledge successfully	○	○	○	○	○
4.2.2. We embrace new innovations easily	○	○	○	○	○
4.2.3. We often combine external resources / knowledge with internal resources / knowledge to meet the goals and objectives of the firm	○	○	○	○	○
4.2.4. We are able to manage both internal and external changes	○	○	○	○	○
4.3.1. We are innovative in coming up with ideas for new service concepts.	○	○	○	○	○
4.3.2. We find it hard to translate raw ideas into detailed services (R).	○	○	○	○	○
4.3.3. Our organization experiments with new service concepts.	○	○	○	○	○
4.3.4. We align new service offerings with our current business and processes.	○	○	○	○	○
4.3.5. We encourage individual / team / management willingness to derive new ways of doing business	○	○	○	○	○

Section 5

Instructions: The following questions are based on the level of how you perceive your business performance relative to competitors in your market. Please rate your business performance over the past 12 months as compared to competitors.

	Much worse	**Somewhat worse**	**Stayed the same**	**Somewhat better**	**Much better**
5.1.1. The profitability of the business	○	○	○	○	○
5.1.2. Return on investment	○	○	○	○	○
5.1.3. Growth in Sales volume achieved	○	○	○	○	○
5.2.1. Ability to attract customers	○	○	○	○	○
5.2.2. Ability to satisfy customers	○	○	○	○	○
5.2.3. Levels of customer loyalty	○	○	○	○	○
5.2.4. Level of self-satisfaction	○	○	○	○	○

APPENDIX C: ETHICAL CLEARANCE LETTER

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11 October 2018

Ms Roline Tjipueja
Department Of Information System
University of Cape Town

REF: REC 2018/010/106

Dear Roline Tjipueja,

The effect of technological opportunism on the performance of SMEs: A dynamic capabilities perspective.

We are pleased to inform you that your ethics application has been approved. Unless otherwise specified this ethical clearance is valid for 1 year and may be renewed upon application.

Please be aware that you need to notify the Ethics Committee immediately should any aspect of your study regarding the engagement with participants as approved in this application, change. This may include aspects such as changes to the research design, questionnaires, or choice of participants.

The ongoing ethical conduct throughout the duration of the study remains the responsibility of the principal investigator.

We wish you well for your research.

Modie Sempu
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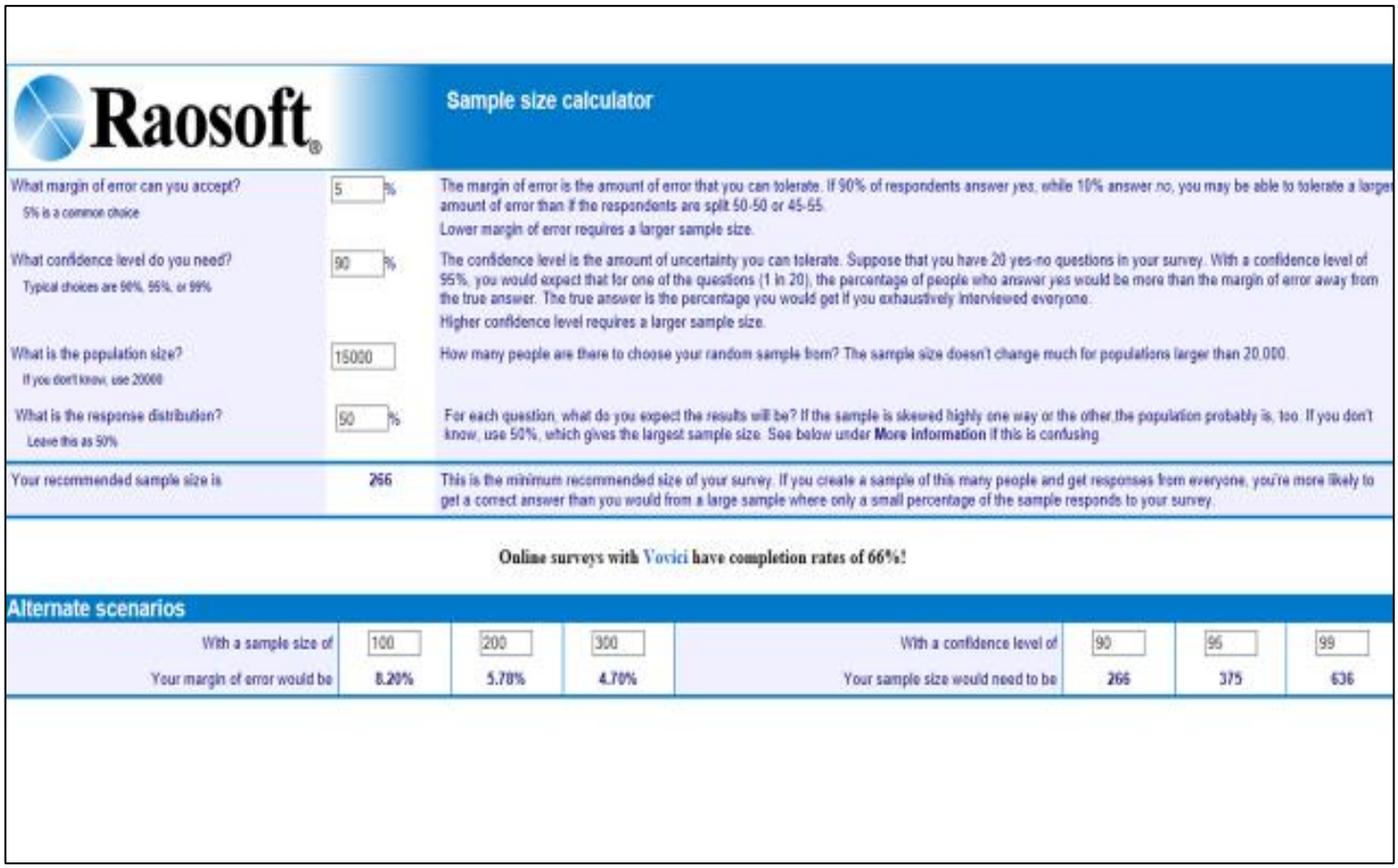
APPENDIX D: RAOSOFT SAMPLE SIZE CALCULATOR



Raosoft®

Sample size calculator

What margin of error can you accept? 5% is a common choice	5 %	The margin of error is the amount of error that you can tolerate. If 90% of respondents answer yes, while 10% answer no, you may be able to tolerate a larger amount of error than if the respondents are split 50-50 or 45-55. Lower margin of error requires a larger sample size.
What confidence level do you need? Typical choices are 90%, 95%, or 99%	90 %	The confidence level is the amount of uncertainty you can tolerate. Suppose that you have 20 yes-no questions in your survey. With a confidence level of 95%, you would expect that for one of the questions (1 in 20), the percentage of people who answer yes would be more than the margin of error away from the true answer. The true answer is the percentage you would get if you exhaustively interviewed everyone. Higher confidence level requires a larger sample size.
What is the population size? If you don't know, use 20000	15000	How many people are there to choose your random sample from? The sample size doesn't change much for populations larger than 20,000.
What is the response distribution? Leave this as 50%	50 %	For each question, what do you expect the results will be? If the sample is skewed highly one way or the other,the population probably is, too. If you don't know, use 50%, which gives the largest sample size. See below under **More information** if this is confusing
Your recommended sample size is	266	This is the minimum recommended size of your survey. If you create a sample of this many people and get responses from everyone, you're more likely to get a correct answer than you would from a large sample where only a small percentage of the sample responds to your survey.

Online surveys with Vovici have completion rates of 66%!

Alternate scenarios

With a sample size of	100	200	300	With a confidence level of	90	95	99
Your margin of error would be	8.20%	5.78%	4.70%	Your sample size would need to be	266	375	636