Cape Peninsula University of Technology

ADOPTION OF NEW ICT INNOVATION BY SMMEs IN CAPE TOWN

by

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ABSTRACT

Establishing Small, Medium and Micro Enterprises (SMMEs) is one of the options for South Africa to grow and develop the economy by creating and maintaining employment. SMMEs need to utilise technology innovation in their businesses for the sustenance of their growth and development in the market.

Although Information Technology (IT) has been identified as a key enabler of businesses, the adoption of IT by small businesses is low, owing to different disparaging factors and conditions SMMEs are faced with. The factors culminate in challenges which hinder evaluation, adoption and use of new technology innovation by SMMEs to develop the business. The aim of the study is to explore the evaluation and adoption of new technology by SMMEs. The research objectives are to investigate the evaluation factors affecting decision making and choice of technology adoption, and the effect evaluation and non-evaluation of new technology has on the business.

The purpose of the research is to establish the challenges SMMEs encounter with evaluating new technology by SMMEs, being that evaluation is a major contributing factor to the successful adoption of new technology by SMMEs. The study takes the form of a multiple interpretive case study employing both qualitative and quantitative methods of data collection. Qualitative data was collected using semi-structured interviews with 15 managers/owners of SMMEs. Quantitative data was collected in the form of an online survey and results were used against the qualitative data analysis process, with categories formed and patterns identified in the data samples.

The research reveals that SMMEs find it increasingly difficult to obtain knowledge on available new technology for business. SMMEs are unable to adequately determine how new technology could align with the business objectives and processes. It seems that government does not play any significant role in the SMME adoption process of new technology. Most SMMEs are oblivious to any government initiative or support available to them. The cost of compliance within the Financial Service Provider (FSP) sector is high due to new standards set by legislation. The increased cost burden of compliance has led to the demise of many FSPs in the financial sector.

The study further suggests that with quality evaluation and implementation procedures of new technology, the selected technology will have a positive effect on the SMME industry. SMMEs need to embrace an evaluation culture and practice to enable them to make quality decisions on new technology in order to capitalise on the potential the technology has to offer. This could lead to gaining a competitive advantage and ensuring survival and growth in the market.

Guidelines on new technology evaluation and adoption are proposed to SMMEs. These guidelines will assist SMMEs to evaluate and identify all factors relating to the business environment affecting the evaluation of new technology for the business. The study provides new insight and understanding on how SMMEs evaluate new technology. The evaluation includes issues surrounding availability of information, awareness of opportunities, decision-making and the need for increased and visible government participation in the process of SMME new technology adoption.

Keywords: SMMEs, evaluation, adoption, new technology, decision-making, business value, information, government, awareness, sustainability, competitive advantage.

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DEDICATION

Dedicated in loving memory of my Dad, my friend, my rock,

Professor Timothy Adeniyi Afolayan.

You always kept your faith and believed in me.

I am eternally grateful, without you there would be no me.

This is for you.

GLOSSARY

Acronyms/Abbreviations	Definition/Explanation
AMTS	Advanced Manufacturing Technology Strategy
APEC	The Asia Pacific Economic Cooperation
BEST	Benefits Evaluation of Systems and Technology
CCOC	Cape Chamber of Commerce
CPPP	Community Public Partnership Programme
CPPP	Community Public Partnership Programme
CPUT	Cape Peninsula University of Technology
CSIR	Council for Scientific and Industrial Research
DED	Department of Economic Development
DOI	Diffusion of Innovation
DSDM	Dynamic Systems Development Methodology
DST	Department of Science and Technology
DTI	Department of Trade and Industry
EC	European Commission
EU	European Union
FSB	Financial Services Board
FSC	Financial Services Cooperative
FSPs	Financial Service Providers
GDP	Gross Domestic Product
GEM	Global Economic Monitor
GITR	The Global Information Technology Report
ICT	Information and Communications Technology
IDC	Industrial Development Corporation
INFACC	Information Accounting Framework
InVEST	Investment Expert System Toolkit
IPU	Investment Promotion Unit

Acronyms/Abbreviations	Definition/Explanation
ITIA	IT Investment Appraisal
LFS	Labour Force Survey
MAFISA	Micro-Agricultural Financial Institute of South Africa
MFI	Micro Financial Institutions
MIT	Ministry of Industry and Trade
MSME	Micro, Small and Medium Enterprise
NAMAC	National Manufacturing Advisory Centre
NCR	National Credit Regulator
NEF	The National Empowerment Fund
NIP	National Industrial Policy
NPV	Net Present Value
NSB Act	National Small Business Amendment Act 1996
NSBAC	The National Small Business Advisory Council
NTTC	National Technology Transfer Centre
NYC	National Youth Commission
NYDA	National Youth Development Agency
OECD	Organization for Economic Cooperation and Development
PIIT	Personal Innovativeness in Information Technology
RAPID	Rigorous Appraisal and Processing of Investment Data
ROI	Return on Investment
SABRAE	Brazilian Micro and Small Business Support Service
SAMAF	SA Micro-finance Apex Fund
SAQI	South African Quality Institute
SEDA	Small Enterprise Development Agency
SMBs	Small Medium Businesses
SMEs	Small Medium Enterprises
SMMEs	Small Medium and Micro Enterprises
STP	Small Enterprise Development Agency Technology Programme

Acronyms/Abbreviations	Definition/Explanation
STREET	Scope, Track, Rank, Evaluate, Evangelise and Transfer of Technology
TAC	Technology Advisory Centre
TAM	Technology Acceptance Model
TAM2	Technology Acceptance Model 2
TEA	Total Economic Activity
TIA	Technology Innovation Agency
TOE	Technology-Organisation-Economic Model
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
TWIB	Technology for Women in Business Programme
UCS	Underhill Corporate Solutions
UN	United Nations
UNIDO	United Nations Industrial Development Organization
USA	United States of America
USAID	United States Agency for International Development
UTAUT	Unified Theory of Acceptance and Use of Technology
UYF	Umsobomvu Youth Fund
VAT	Value Added Tax
WEF	World Economic Forum
WTO	World Trade Organisation

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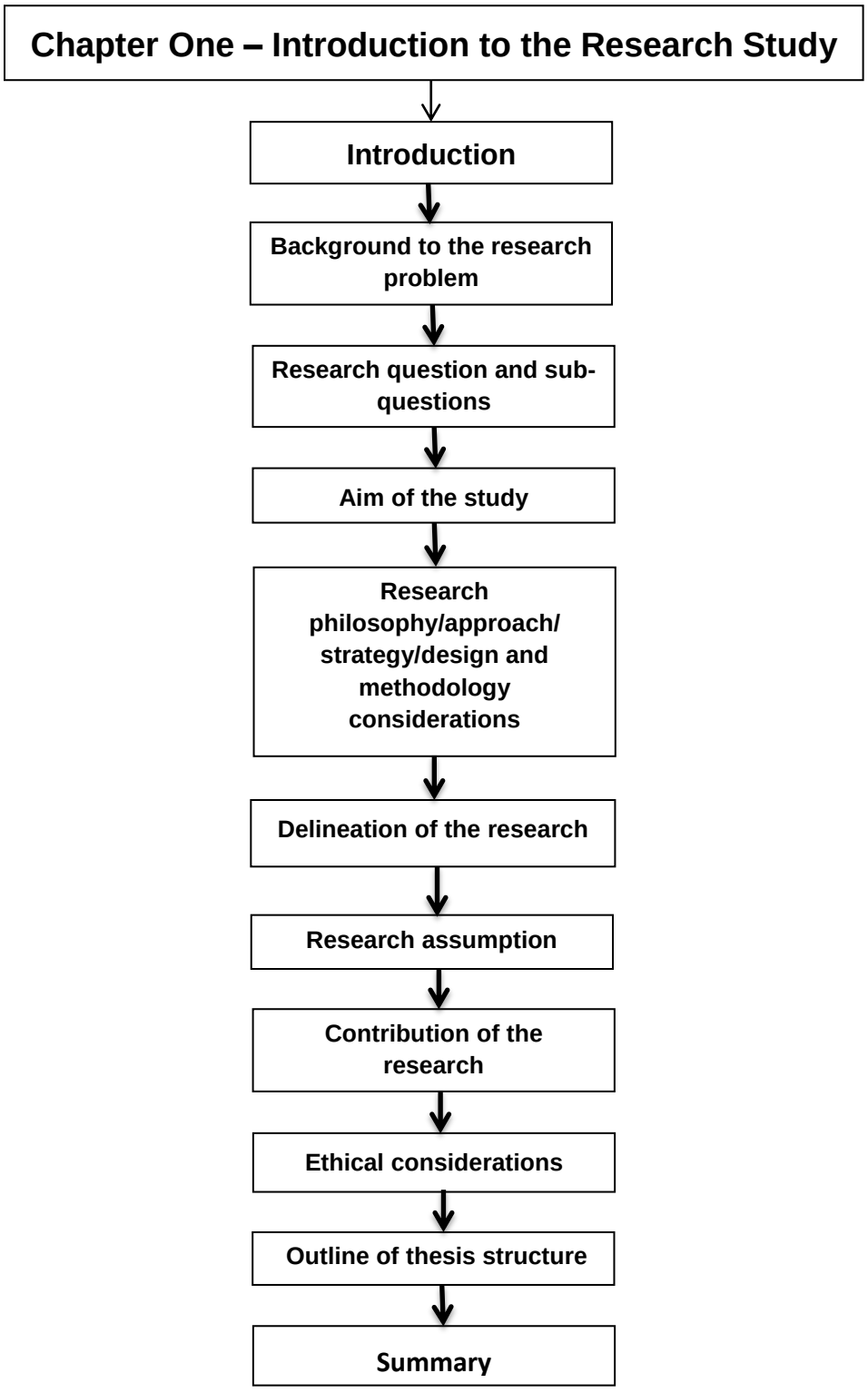

Figure 1.1: Graphical representation of Chapter One

CHAPTER ONE: INTRODUCTION TO THE RESEARCH STUDY

1.1 Introduction

For the last three decades, researchers have studied the role, nature, composition and contribution of the impact of Small, Micro and Medium Enterprises (SMMEs) on the economic development of various countries (Vaccaro *et al.*, 2010; Billon *et al.*, 2009; Berry *et al.*, 2002; McDonagh & Prothero, 2000; Lefebvre *et al.*, 1995; Thong & Yap, 1995; Lutkenhorst, 1989). From the mid-nineties, research focus has shifted towards developing countries where there is a gap in the development of economies relative to that of developed countries. Research is now more focused on the measurable difference and significant impact of Information Technology (IT) on the contribution of SMMEs to the economy of developing countries such as South Africa, as seen in Table 1.1 (Ndiege *et al.*, 2012; Nguyen, 2009; Motjolopane & Warden, 2007; Tan *et al.*, 2007; Berry *et al.*, 2002; Cloete *et al.*, 2002; Hallberg, 1999; Levy, 1996). The performance indicators and implications of technology in SMMEs have attracted and generated considerable interest among academics and entrepreneurs (Boateng *et al.*, 2010; Mohamad & Ismail, 2009; Fink & Disterer, 2006; Beck *et al.*, 2005; Grandon & Pearson, 2004).

The relevance of IT and SMMEs to the growth of the economy is followed and observed by international and national developmental agencies and departments. Agencies such as the World Bank, International Monetary Fund (IMF) and Organisation for Economic Co-operation and Development (OECD) among others, often perform an oversight function for the development, progress monitoring and providing of assistance to SMMEs at large (Cravo, 2010; Beck *et al.*, 2005; Bourgouin, 2002). The use of new technology by businesses creates opportunities which in turn enhance the potential of SMMEs, thus increasing the efficiency levels of business processes while improving operational effectiveness and productivity (Tan *et al.*, 2010; Mohamad & Ismail, 2009; Bahensky *et al*., 2008; OECD, 2004a; Bourgouin, 2002; van Akkeren & Cavaye, 1999). The impact of using new technology for business includes a considerable reduction in production and operational cost, and a sustainable expansion of potential target markets. New technology can boost the potential of SMMEs, create a competitive advantage and open new business opportunities for growth (Tarutė & Gatautis, 2014; Boateng *et al.*, 2010; Mohamad & Ismail, 2009; Al-Qirim, 2007; Fink & Disterer, 2006; Beck *et al.*, 2005; Grandon & Pearson, 2004).

Table 1.1: Social and economic impact of SMMEs in BRICS countries
(Arroio & Scerri, 2014:7)

	SME *(Million units %)*	**Labour Force** *(Million)*	**Unemployment** *(% of labour force)*	**GDP Growth** *(2008-12)*	**Interest Rate** *(short-term)*	Inflation*
Brazil	5.37/99	103.2	5.5	0.9	7.25	5.4
Russia	4/97	76.4	6.6	3.4	5.50	5.1
India	26	476.1		3.2	9.00	9.3
China	42/99.6	816.6	4.1	7.8	3.25	2.7
South Africa	2.5	18.6	25.1	2.5	5.40	5.1

Though the growth of SMMEs is important to the overall economic performance of a developing country's economy, SMMEs still largely fail to understand the impact of new technology on efficiency and growth of business (Fickenscher & Bakerman, 2011; Kumar & Subrahmanya, 2010; Tan *et al.*, 2007; Rogerson, 2004). Significant steps need to be taken by the governments of developing countries and role players in the SMME sectors to improve organisational efficiency and development. This is to help close the gap between the economies of developed and developing countries (Ndabeni, 2014; Alamro & Tarawneh, 2011; Tan *et al.*, 2007; Obadan & Agba, 2006; Rogerson, 2004; Jennex, 2003; Van Akkeren & Cavaye, 1999). Closing the economic gap between developed and developing countries can be achieved with significant IT investment in business systems and processes (Maryeni *et al*., 2012; Ndiege *et al*., 2012; Marais & Pienaar, 2010; Radas & Bozic, 2009).

Different scholars such as Marais and Pienaar (2010), Olsen and Eikebrokk (2009), Tan *et al*. (2007), Venkatesh *et al*. (2003), and Lefebvre *et al.* (1995) confirm that a large amount of work has been done in the literature on different models of adoption of technology by SMMEs. Previous research studies on the adoption of technology have been found to focus more on factors such as political, organisational, geographical and economic issues than on evaluation and planning for new technology adoption (Abulrub *et al.,* 2012; Tan *et al*., 2010; Love *et al.*, 2005). Issues concerning benefits perceived, management skills and fear of the unknown future of technology are usually associated with promoting the adoption of technology and its barriers.

The studies are more descriptive than exploratory, and do not incorporate other bearing factors relevant to the adoption of new technology into an evaluative approach (Cowan & Daim, 2011; Tan *et al*., 2010). The failure to highlight all relevant relationships relating to new technology and incorporating such factors into a comprehensive feasible appraisal, limits the potential to adopt new technology (Abulrub *et al*., 2012; Rodríguez & Pozzebon, 2011; Nguyen, 2009). Evaluation of new technology is paramount to adoption as this shows the inter-related relationship between the benefits, risks and operational effects. Thus, evaluation incorporates all angles, thereby forecasting the impact, future and relevance of the new technology to the business.

The research of this study focuses on the needs and constraints affecting and contributing to the successful evaluation of new technological innovations relating to the adoption or non-adoption of new technology by SMMEs in South Africa.

1.2 Background to the research problem statement

SMMEs represent a large percentage of established and operating businesses in most countries (Marais & Pienaar, 2010; Billon *et al*., 2009). SMMEs actively occupy and play a prominent role in contributing a major percentage to the growth and development of the economy (Maryeni *et al*., 2012; Marais & Pienaar, 2010; Billon *et al*., 2009; Harindranath *et al*., 2008; Tan *et al*., 2007; Da Silveira, 2001; Thong & Yap, 1995). IT can channel activities of SMMEs towards increasing growth, more sustained development and competitive strength and advantage (Vaccaro *et al*., 2010; Radas & Bozic, 2009; Bruque & Moyano, 2007; Obadan & Agba, 2006; McDonagh & Prothero, 2000; Lefebvre *et al*., 1995). Although the benefits of IT in SMMEs are well documented, adoption of technological innovation in SMMEs still remains low in developing economies and the difference in the impact on developing economies in relation to developed economies is quite large (Figure 1.2) (WEF, 2013; Maryeni *et al*., 2012; Ndiege *et al*., 2012; Tan *et al*., 2010; Nguyen, 2009; Uden, 2007; Molla & Licker, 2005).

SMMEs find it challenging to evaluate, adopt and manage new technology innovations due to a lack of knowledge of the new technology, its potential and other significant characteristics (Kim & Garrison, 2010; Kapurubandara & Lawson, 2007; Tiwari & Buse, 2007; O'Regan *et al*., 2006; Hadjimanolis, 1999). It has also been noted that SMMEs fail to understand the impact of new technology on the business (Nguyen, 2009; Marcati *et al.,* 2008; Fillis *et al.,* 2004; OECD, 2004b; Rashid & Al-Qirim, 2001).

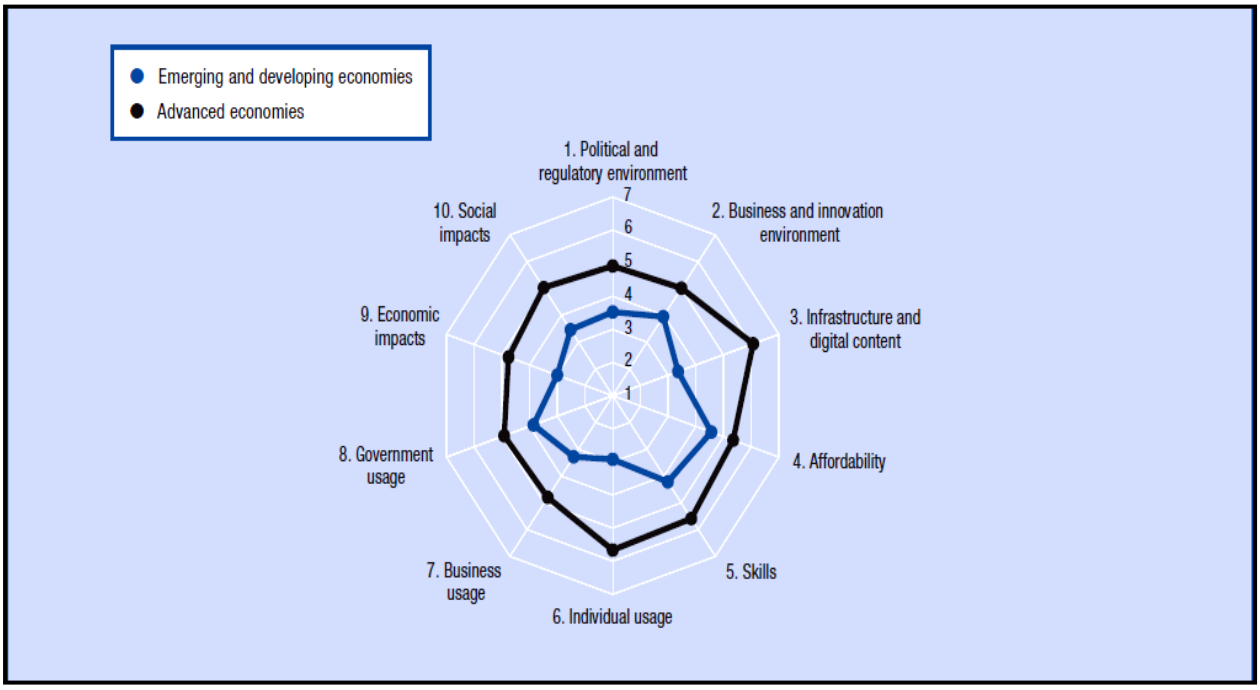

Figure 1.2: The digital divide of the 10 pillars of the Networked Readiness Index (NRI)
(WEF, 2013:17)

The challenges faced by SMMEs in evaluating, adopting and managing new technology innovations can be related to factors that influence the choice of adopting emerging technology. These factors are diversified in relation to political, organisational, geographical, economic, religious, cultural and also ideological contexts (Anderson *et al.*, 2008; Al-Qirim, 2007; Leidner & Kayworth, 2006; Chieochan *et al.*, 2000; Lakhanpal, 1994). Therefore SMMEs are constrained by the lack of awareness and knowledge of existing technology and its potential to the business, and also by the cost of acquisition and technical skills needed to operate the new technology (Abdollahzadehgan *et al.*, 2013).

The resultant effects of the aforementioned factors include the failure to evaluate and analyse the business potential of new technology, the application to business systems, perceived benefits, management skills of new technology, fear of the unknown future of technology and the immediate financial implications that will affect the adoption of new technology (Olawale & Garwe, 2010; Tan *et al*., 2010; Beck & Demirguc-kunt, 2006; Wong *et al.*, 2005; Hashi, 2001).

These factors essentially underline why SMMEs find it challenging to adopt technology innovation and also find it difficult to incorporate, integrate and manage new technology in the business system. These challenges are linked to the problem of non-evaluation of the potential of the new technology before adoption (Chan *et al*., 2012; Maryeni *et al*., 2012; Kim & Garrison, 2010; Dyerson *et al*., 2009).

1.2.1 Research problem statement

It has been found that SMMEs do not sufficiently evaluate the potential, adaptability and applicability of new technology in their business. SMMEs find it challenging to evaluate, adopt and manage new technology innovations due to a lack of knowledge of the new technology, its potential, other significant characteristics, and a lack of understanding of the impact of new technology on the business (Kim & Garrison, 2010).

Failure to understand the implications of new technology in the business may result in lost opportunities such as potential growth, improved efficiency rate and a more effective system process (Chan *et al*., 2012). As a result, SMMEs often fail to adopt potentially advantageous technology and lose opportunities to gain a competitive advantage in their market, which can impact the long-term viability of the business. Therefore the failure to evaluate and the lack of proper understanding of the implications of adopting a new technology on the business in its entirety, may lead to adoption of inappropriate technology or the non-adoption of a potential new technology with advantages for business growth (Palvalin *et al.*, 2013).

From the above, the research problem statement is defined as follows:

SMMEs do not sufficiently evaluate the potential, adaptability and applicability of new technology in their business, and as a result lose opportunities to gain a competitive advantage in their market, which can impact on the long-term viability of the business.

1.3 Research question and sub-questions

1.3.1 Research question 1 and sub-questions

Table 1.2: Summary of research question 1, sub-questions and objectives

Research problem	**SMMEs do not sufficiently evaluate the potential, adaptability and applicability of new technology in their business, and as a result lose opportunities to gain a competitive advantage in their market, which can impact on the long-term viability of the business.**	
Research question 1	What are the adoption challenges for SMMEs in terms of the evaluation of new technology?	
Research sub-questions	**Research method(s)**	**Objectives**
RSQ 1.1 What are the factors that influence evaluation and adoption of new technology?	Literature analysis Semi-structured interview	To identify and determine how these factors create challenges which SMMEs need to overcome before adopting new technologies.
RSQ 1.2 How do SMMEs initiate evaluation in the process of adopting new technology in business?	Literature analysis Semi-structured interview	To determine how evaluation is being practiced generally in business, and identify the types of process involved.
RSQ 1.3 What are the perceptions of SMME managers of new technology evaluation?	Semi-structured interview	Understanding the perceptions of SMME managers on evaluating new technologies will explain their priority allocations and the challenges they face before adopting new technologies.
RSQ 1.4 What is the role of government in actively facilitating and engaging SMMEs proactively in the evaluation and adoption process of new technology?	Semi-structured interview	Establish the role government plays as a stakeholder in providing support and assistance to promote active participation in the evaluation and adoption of new technology by SMMEs.

1.3.2 Research question 2 and sub-questions

Table 1.3: Summary of research question 2, sub-questions and objectives

Research problem	**SMMEs do not sufficiently evaluate the potential, adaptability and applicability of new technology in their business, and as a result lose opportunities to gain a competitive advantage in their market, which can impact on the long-term viability of the business.**	
Research question 2	How does the evaluation of new technological innovations affect the adoption of new technologies in SMMEs?	
Research sub-questions	**Research method(s)**	**Objectives**
RSQ 2.1 How can SMMEs evaluate the business potential of new technologies?	Semi-structured interview	To understand how SMMEs determine technologies suited for the business and find a process to assist SMMEs to evaluate the business potential of new technologies.
RSQ 2.2 How does the evaluation of new technology affect the decision making of new technology in SMMEs?	Semi-structured interview	To explore the significance and contribution of the evaluation process towards decision making on adoption of new technologies.
RSQ 2.3 How does the evaluation and adoption of new technology affect SMMEs' viability and sustainability of their business interest?	Semi-structured interview	To determine how the sustainability and development of SMMEs are influenced by the evaluation and adoption of new technology.

1.4 Aim of study

The aim of the research is to explore the reasons behind the failure of SMMEs to evaluate new technology for the business. The exploratory study is aimed at gaining a deeper insight into the previously identified barriers and other new factors that affect and inhibit evaluation and adoption in SMMEs. A further aim of the study is to synthesise prior identified factors affecting evaluation and adoption of new technology with the findings from the case study. The results of the findings will be used to propose a set of ICT evaluation and adoption guidelines for the successful evaluation for/and adoption of new technology innovations in SMMEs.

1.5 Research philosophy/approach/strategy/design and methodology considerations

Research methodology can be described as the step-by-step way we go about the process of our research. Data for this research was sourced from secondary sources (literature and documentation) and a primary source (survey and interviews) through a qualitative research method using a multiple case study strategy. With the research philosophy of the study being subjective in nature, an inductive approach was followed using a qualitative method of research, to build up previously identified theories or potential new ones by inferring from patterns formed from the observed data. Qualitative research is an interactive way of collecting data and it is usually associated with interpretive and critical paradigms (Saunders *et al.*, 2009:151). Qualitative methods are concerned with describing meaning rather than drawing on statistical inferences. It provides an in-depth insight into the subject of study, aiming to understand experience by investigating the perspective and behaviour in the natural context of the subject (Bhattacherjee, 2012). Qualitative methods are mostly concerned with collecting, analysing and interpreting information in a mostly non-numerical context. It tends to focus more on exploring in as much detail as possible to achieve 'depth rather than breath'.

Interpretive research studies focus on how people create and communicate knowledge from their own subjective perspectives, based on their unique experience and insight as they interact in their naturally defined context (Orlikowski & Baroudi, 1991; Burrell & Morgan, 1979). The research is based on an inductive approach because of the need to better understand the problem and to develop guidelines based on the empirical observations to address the identified research problem. The research has an ontological perspective with a subjective stance, which connotes that a situation having come into existence, does so only through the action of humans in creating and recreating the phenomena observed (Orlikowski & Baroudi, 1991). The epistemological norm of the research was to explore the phenomena surrounding evaluation and adoption processes in SMMEs by accessing the meaning and inductive reasoning behind the research respondents' perceptions of the problems concerning evaluation and adoption of new technology innovations in SMMEs in their subjective capacity.

In this research study, the investigation was to seek provision of different perspectives in terms of how adoption of new technology and SMMEs relate to each other, particularly from the view of evaluating new technological innovations by SMMEs as a means of facilitating the adoption process and integration into the system. This research employed a multiple case study design with analytical generalisation of concepts for the purpose of the study by providing a detailed description of each case within a unit, and generally comparing themes across cases**.**

This method was used because of the need to compare and relate the results of the research findings by determining the similarities/dissimilarities of the findings from each observed case in relation to the phenomena and existing literature (Saunders *et al*., 2009:146-147).

1.5.1 Units of analysis

The unit of study for this research is SMMEs in the Western Cape Province of South Africa, spreading over the City of Cape Town Metropolis at managerial, operational and decision making levels. The research focus was targeted at the owners/managers and decision makers in the business and technology management sections of their businesses. SMMEs considered were those with the number of employees less than 100 and annual turnover not exceeding 20 million rand in different business sector categories.

1.5.2 Sampling techniques

The sampling technique used is based on a non-probability sampling method for qualitative research. This sampling approach provides different techniques to select a sample based on subjective judgment (Saunders *et al*., 2009). The purpose of sampling techniques is to reduce the cost and/or the amount of work that it would take to select all samples of an entire target population for a research study using an appropriate sampling method (Zikmund *et al.*, 2010). Due to the exploratory and descriptive nature of the research which require an in-depth knowledge of the research problem, a total of 15 SMMEs was selected judgmentally as subjects for investigation to attain the data saturation level required for the research in the context of the phenomena being studied (Yin, 2009). According to Saunders *et al.* (2009), *judgmental sampling* allows for the use of the researcher's own judgment to select the best possible units of analysis, which will most appropriately bring the desired results and answers for the research questions in order to achieve the research objectives. This method was deemed the most appropriate, given the time constraints, finances, accessibility and nature of the problem.

1.5.3 Data collection methods

Yin (2009:101) identifies six primary sources of evidence for case study research, i.e. documentation, archival records, interviews, direct observation, participant observation and physical artefacts. Data for this research was sourced from interviews and surveys (primary data); other relevant data was sourced from literature (secondary source) which included documentation from articles, journals and government publications (Saunders *et al*., 2009).

An interview is an interpersonal relationship between an interviewer and the interviewee, set out to subjectively examine constructs of experience and knowledge the participants have of the phenomena under study in the context of the research study (Miller & Glassner, 2009:125). A semi-structured interview and an online survey tool were employed. A semi-structured interview type was used for the research because of its ability of in-depth exploration and delivering of a rich form of data. According to Miller and Glassner (2009), interviews produce a rich knowledge of the interviewee's experience, which benefits both the interviewer and the interviewee. The survey study was designed to ascertain the knowledge of the participants regarding the existing factors affecting evaluation and adoption of new technology, the importance of new technology to business, the role of evaluation in decision-making, and the advantages and benefits realisable from proper evaluation and adoption of new technology. Subsequent to the survey, interviews were conducted to further explore the phenomena to provide an in-depth knowledge and understanding of evaluation and adoption issues surrounding the low rate of new technology adoption by SMMEs in the City of Cape Town Metropolis.

1.5.4 Data analysis

The first step in analysing data that was collected in a study is the representation of that data in formalised written form (Saunders *et al*., 2009:485). All audio data collected in this study was transcribed and documented in MS-Word, using the Microsoft Word package.

Qualitative data can be analysed using a simple thematic coding system by reading through all data extensively, summarising all of the data collected, taking note of all the similarities that occur in the data, grouping key concepts into themes and identifying key themes according to their appearances in groups (Quinlan, 2011). In this study, keywords were identified from the interview excerpts and captured in a spreadsheet which was coded according to similarity in meaning and interpretation. The categories were identified by the number of occurrences and frequency, and relating categories with similar interpretation and representation were further grouped into different themes either of similar or recurring nature. A narrative descriptive qualitative analysis method was used with measurable, interpretative and descriptive tools to organise and analyse relevant data collected from the excerpts of survey responses developed to investigate the research problem. The data from the survey was analysed using a graphical representation of the respondent's emergent response from the questions asked under each category in a narrative format.

1.6 Delineation of the research

The research study excluded all companies with more than 100 employees and a turnover of more than 20 million rand, while the geographical location of the research subjects was situated in the Western Cape Province with a close proximity (50 kilometres) to the City of Cape Town Metropolis. The research was delineated in terms of the business sector categories of the selected SMMEs, as it only covered SMMEs operating and providing services in the business services, retail services, manufacturing sector and financial sector of the economy.

1.7 Research assumption

According to Neuman (2011), assumptions must exist in any form of research enquiry as it is regarded as the starting point of the research needed to build a theoretical explanation of the intended study. This research study is based on the assumption that the evaluation of new technology leads to a better understanding of its potential and increase in the adoption rate of the technology. The assumption applies to SMMEs operating under the umbrella of developing countries.

1.8 Contribution of the research

The significance of this study is to add to the general body of knowledge in terms of gaining new knowledge and insight into the process of evaluation and adoption of new technological innovations in SMMEs. Contribution to knowledge was achieved by inferring empirical results to extend and support previous existing theories. The research is channelled to explore the dynamics that surround the evaluation of new technology, incorporating all factors concerned. By exploring the challenges and factors that affect SMMEs in evaluating and adopting new technologies, the research developed a set of guidelines for evaluation of new technological innovations to assist SMMEs in understand the need and importance of evaluative action taken before making a decision to adopt or not to adopt new technology.

The development of the guidelines, which is a practical contribution to Industry, is a process of becoming familiar with the advantages, implications, constraints and risks associated with the new technology, and its effects in relationship to all relevant factors present in the business environment. The measure of the adaptability, applicability, compatibility and capability of the new technological innovation precedes the decision to possibly accept, adopt and implement the new technology based on the analysis of the evaluation of potential to develop and grow the business. This set of evaluative procedures will assist SMMEs to understand the suitability of a

new technology to their business needs and increase the potential to adopt, integrate and manage new technological innovations which will complement the business, increase its productivity and delivery levels, boost its rate of growth and survival, and give it a competitive advantage in the market place.

1.9 Ethical considerations

Ethical considerations must be taken into account by a researcher when investigating phenomena using a case study (Zikmund *et al*., 2010). A written request was made to selected participants to obtain informed consent to conduct an interview with each participant, while ensuring that the privacy of the participants is maintained at all times throughout the course of the interview and in the report (Saunders *et al*., 2009). Prior to commencement of the case study, strict confidentiality and anonymity was assured verbally and also in the letter of consent to participants, and all aspects of the study relating to them were clearly specified before commencement of the interviews and surveys. This action assisted in establishing a trust relationship with the participants, thus creating an enabling communication environment to deliver open and honest responses during the interview. To protect their privacy, the names and particulars of the selected SMMEs were not disclosed in the report, and feedback with the presentation of results and findings was presented to the participant SMMEs inclusive of recommendations derived from the findings and conclusions arrived at.

1.10 Outline of thesis structure

The dissertation comprises six chapters:

Chapter One: An introduction to the research problem is provided. The background to the research problem statement is presented and the research questions and sub-questions are formulated. A description of the methodological considerations is offered. The contribution of the research is explained and the ethical considerations are established. The chapter also provides the research assumptions and delineation.

Chapter Two: An in-depth review of existing literature is provided which includes the development of SMMEs, issues affecting SMME development, government agencies responsible for SMME development and the impact of government support initiatives and their limitations on SMMEs. The adoption of new technology in business is elaborated on to include the role of ICT in SMME development and factors affecting ICT adoption. Different theoretical

frameworks on adoption of ICT are discussed. The chapter also includes the evaluation of new technology in business as well as the decision-making process on new technology adoption.

Chapter Three: This chapter presents the research design and methodology of the study. It provides an overview of the philosophical assumption, paradigms and research approach. It describes the process of data collection methods and analysis strategies employed. Validation of methods and ethical considerations are also stated.

Chapter Four: Profiles of participating organisations are presented. Findings that emerged from both the surveys and interviews are analysed and presented. Complimentary findings from the surveys and interviews are synchronised.

Chapter Five: This chapter presents and discusses emergent themes from the categories of data. The research findings are discussed in relation to literature and research questions stated in Section 1.3. Answers to the research questions are provided. Findings are inferred back to the theoretical framework and literature. New emergent concepts are adapted to form a conceptual framework.

Chapter Six: Resulting conclusions and recommendations are based on research study objectives. Limitations of the research study are stated. A reflection on the research journey and recommendations for future research are provided.

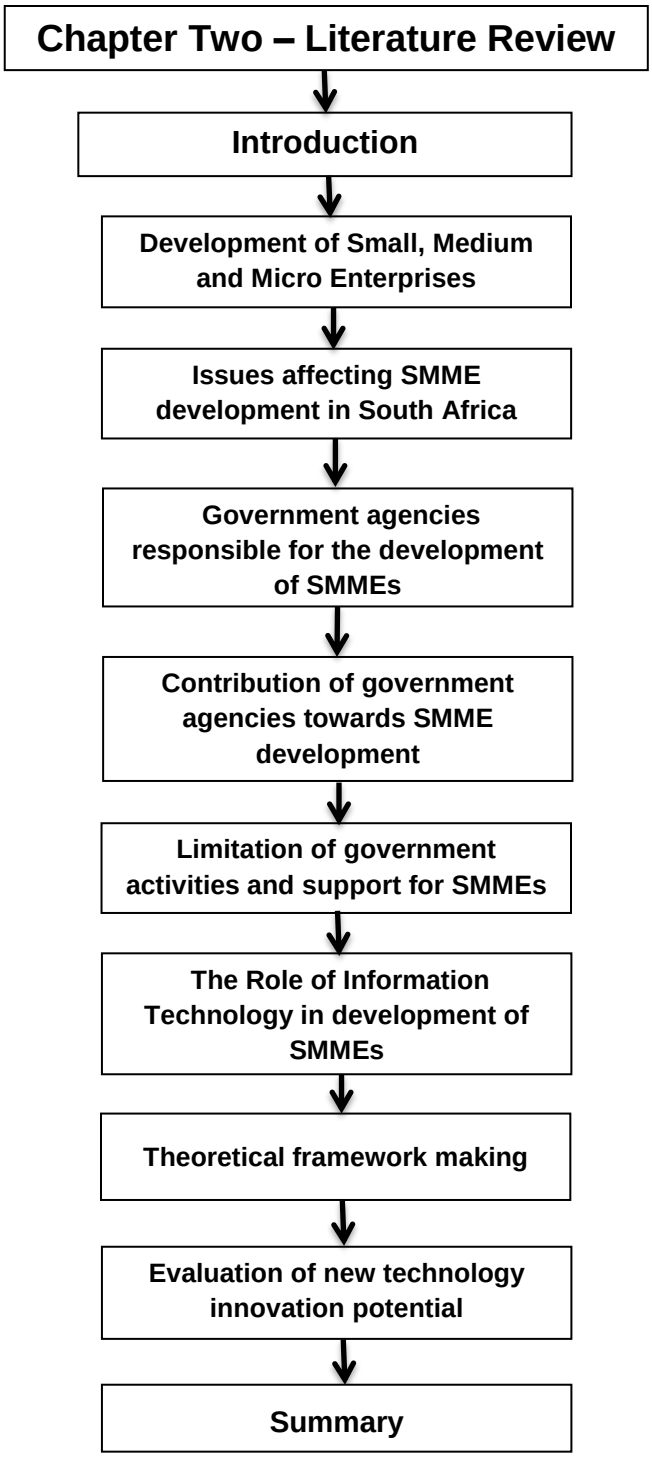

Figure 2.1: Graphical representation of Chapter Two

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter provides an overview of Small, Medium and Micro Enterprises (SMMEs), the different terms used for these enterprises by various international bodies, and issues affecting SMME development in South Africa. The various government agencies responsible for SMME development in South Africa and the contribution and limitations of these agencies, are discussed. The role of Information Technology in the development of SMMEs is addressed. The influence of evaluation on new technology adoption is discussed along with the process of awareness, knowledge acquisition and decision making of new technology for the business. The chapter concludes with a discussion on theoretical frameworks, and the stages of identifying potential of new technological innovations evaluated are highlighted.

2.2 Development of Small, Medium and Micro Enterprises

The small business sector of the economy is seen as heterogeneous with businesses usually ranging from micro-sized enterprises to medium sized firms. Small businesses are of diverse nature with a unique variety of business needs, operating in both the formal and informal sectors. *Some Small, Medium and Micro Enterprises* (SMMEs), also referred to as *Small Medium Enterprises* (SMEs), are start-ups, some are growing at a rapid rate, some have knowledgeable entrepreneurs at the helm of affairs, others are in survival mode, while some are very sophisticated with years of experience, all operating in different markets at local, national and global level. The acronym *SME* is commonly used in the European Union (EU) and also in other international organisations such as the World Trade Organisation (WTO), The United Nations (UN) and the World Bank, among others. While in the USA the term *Small Medium Business* (SMB) is preferred, the term *Micro Small Medium Enterprise* (MSME) is used in parts of Africa and the world. In South Africa, the term SMME is adopted for *Small, Medium and Micro Enterprises*. (For definitions of SMMEs, see Section 2.2.5).

SMMEs are important role players in the economy as they contribute substantially to the Gross Domestic Product (GDP) of a country's economy. SMMEs are also important for the economy as they contribute to the employment needs of the country (Tsoabisi, 2012). According to the Small Enterprise Development Agency (SEDA, 2013), SMMEs accounted for 27-34 percent of the total GDP in 2006, and it has remained relatively constant over the years. SEDA highlights the economically active SMMEs by their size and the amount of annual turnover as follows:

- Micro-business enterprises amount to 36 percent annual turnover
- Very small business enterprises account for 46 percent annual turnover
- Small business enterprises produce 11 percent annual turnover
- A four percent annual turnover is attributed to medium business enterprises
- A three percent annual turnover is attributed to large enterprises

The value of SMMEs to the national and economic growth of a nation cannot be over emphasised. Its contribution towards job creation, social advancement and economic growth is of a high value and seen as an important element in achieving the formula that propels the economic development of a country (Ndabeni, 2014; Ngek & Smit, 2013; Xavier *et al*., 2012; Oyelaran-Oyeyinka & Lal, 2006). In 2007, the World Bank estimated that SMMEs in South Africa contributed 39 percent towards the employment needs, while SMMEs in China contributed 78 percent towards its total employment population. In recent studies, Abor and Quartey (2010) stated that 91 percent of formal business enterprises in South Africa are in the SMME sector, which accounts for approximately 60 percent of the total employment whilst also contributing an estimated GDP value of 57 percent to the economy. The Global Economic Monitor report (GEM, 2009, as cited by UCS, 2011:14), emphasised that, when considering the impact of small businesses to the economy:

> …there is a very tight correlation between the level of entrepreneurship in a country and its rate of economic growth.

Table 2.1: SMME contribution and participation towards the economy in several countries
(UCS, 2011:14)

Country Name	Structure of the MSME Sector (% of all MSMEs)			SME Participation in the Economy		
	Micro	Small	Medium	SMEs	SMEs per 1,000 people	SME employment (% total)
Brazil	93.9	5.6	0.5	4 903 268	27.4	67.0
China	n/a	n/a	n/a	8 000 000	6.3	78.0
Egypt	92.7	6.1	0.9	1 649 794	26.8	73.5
United Kingdom	95.4	3.9	0.7	4 415 260	73.8	39.6
Ghana	55.3	42.0	2.7	25 679	1.2	66.0
India	94.0	3.3		295 098	0.3	66.9
Mexico				2 891 300	27.9	71.9
Malawi	91.3	8.5	0.2	747 396	72.5	38.0
Russian Federation				6 891 300	48.8	50.5
United States	78.8	19.7	1.5	5 868 737	20.0	50.9
South Africa	92.0	7.0	1.0	900 683	22.0	39.0

There is no uniformly accepted definition of SMMEs globally because firms differ in composition, characteristics and size, and numerous policies guard different countries' interpretation of small business characteristics. According to the report of the Organisation for Economic Cooperation and Development (OECD, 2004a), small businesses reflect not only the economic status of a country, but also the social and cultural aspects. These patterns are uniquely reflected within various definitions and indicators adopted by different countries in defining small businesses. Some use the number of employees as their major criteria, others use registered capital invested, while a third group uses the combination of capital invested, number of employed personnel, sales volume and classification of industry. Table 2.2 shows examples of the difference between SMMEs and large companies according to category.

Table 2.2: Qualitative indicator of the difference between SMMEs and larger enterprises
(UCS, 2011:23)

Category	SMMEs	Large Companies
• Management	• Proprietor entrepreneurship • Function-linked personality	• Manager-entrepreneurship • Division of labour by subject matter
• Personnel	• Lack of university graduates • All-round knowledge	• Dominance of university graduates • Specialisation
• Organisation • Sales • Buyer's relationship • Production • Research and development	• Highly personalised contacts • Competitive position undefined and uncertain • Unstable • Labour intensive • Following the market; intuitive approach	• Highly formalised communication • Strong competitive position • Based on long-term contracts • Capital intensive; economies of scale • Institutionalised
• Finance	• Role of family funds, self-financing	• Diversified ownership structure, access to anonymous capital market

2.2.2 European Union definition of SMEs

The definition of SMEs by the European Commission (2009) takes into consideration three different factors:

- Number of employees headcount
- Annual sale of business
- Assets of business

With these indicators as pointers, the European Commission (2009) describes Micro Business Enterprises as those businesses with less than 10 employees and annual sales or total value of

assets less than 3 million USD; small businesses employ no more than 50 people, with annual sales or total value of assets not exceeding 13 million USD. Medium Business Enterprises have less than 250 employees; their annual sales do not exceeding 67 million USD, and/or the total value of accruable assets amounts to no more than 56 million USD in a fiscal year.

2.2.3 United Nations Industrial Development Organisation (UNIDO) definition of SME

According to UCS (2011), the term *Small Business Enterprise*, as defined by the UNIDO Investment Promotion Unit (UNIDO/IPU), describes a small business as set by its affiliated Ministry of Industry and Trade (MIT), as follows:

- Micro-sized business enterprises employ between 1 and 9 employees, with total assets or registered capital not more than 42 300 USD
- Small-sized businesses employ between 10 and 49 employees, with a registered capital exceeding 42 300 USD
- Medium businesses employ between 50 and 249 employees, with a registered capital exceeding 42 300 USD

It also describes large businesses as those that employ more than 250 people and have a registered capital exceeding 43 200 USD.

2.2.4 Asia Pacific Economic Cooperation (APEC) definition of SME

The Asia Pacific Economic Cooperation (APEC) based its definition of a *Small Business Enterprise* on the number of personnel employed. UCS (2011), quoting USAID, defines a SME as a:

- Micro-sized business when the number of employees is less than 5, including self-employed managers
- Small business when a small firm employs within a range of 5-19 employees
- Medium business when the firm employs within a range of 20-99 employees

In a report prepared for the National Credit Regulator of South Africa, SMMEs are categorised into two groups: Economic and Statistical (UCS, 2011). The *Economic* definition of small enterprises states that a firm can be considered or deemed small if it meets the following criteria:

i) It has a relatively small share or percentage of the marketplace it operates in.
ii) It is managed by its owners or part owners in a non-formalised personal management structure.

iii) It operates independently of any similar or larger enterprise.

On the other hand, the *Statistical* definition is used in three significant areas:

i) To quantify the size and identify the sector of the business and its general contribution to GDP, employment and export rates of the economy.

ii) To determined and compare the contribution and changes the small business sector has brought to the economy over the years.

iii) To facilitate a cross-country evaluation and comparison of the economic contribution and impact of small businesses.

In South Africa, a small business is defined officially in Section 1 of the National Small Business Act of 1996, as amended by the National Small Business Amendment Act (NSB Act) of year 2003 and 2004, as:

> …any business which is of a separate and distinct business entity, including co-operative enterprise and non-governmental organisations, managed by one owner or more which, including its branches or subsidiaries, if any, is predominantly carried on in any sector or sub-sector of the economy mentioned in Column I of the Schedule…

The common mode of definition of a small business enterprise still stems from the combination of the category of the number of employees in relation to the size of the enterprise, combined with the annual turnover of the business which includes the gross assets while excluding the fixed property. The NSB Act goes further and categorises small businesses operating in South Africa into different distinct groups which brought about the term SMME as opposed to SME. The different component groups are:

- The Survivalist Enterprise: This type of enterprise is considered an informal trade, usually with income generated less than the minimum prescribed income standard or below the poverty line. This category includes vendors, hawkers and farmers of subsistence nature. In practise though, survivalist businesses are often classified as being part of the micro-business sector.

- Micro Business Enterprise: In this category, the annual turnover of the business is often less than the volume of the value added tax (VAT) prescribed registration limit of a hundred and fifty thousand rand (R150 000) per year. These enterprise categories are usually devoid of any form of formality in terms of registration of business. Examples

include household industries, spaza shops, minibus taxis etc; they do not employ more than 1-5 employees.

- Very Small Business Enterprise: This enterprise category usually operates in a formal environment with access to social infrastructure and technology. They do not employ more than 10 paid employees, with the exception of the electricity, manufacturing, mining and construction industry where the number of employees could rise to 20.

- Small Business Enterprise: This type of business is usually of a more established and structured nature; they present more complexity in the nature of their business practice. The employees are kept below the 50-persons ceiling. Examples include warehousing, locally based private practices and small manufacturing industries.

- Medium Business Enterprise: The number of employees in this category ranges between 100-200 employees for the electricity, mining, manufacturing and construction industry. This type of business often functions with decentralisation and separation of powers, and sometimes includes an additional layer of management.

2.2.5 South Africa's definition of SMME

The definition generally accepted in Industry and adopted by the Department of Trade and Industry (DTI) and other government agencies is defined in South Africa by the **National Small Business Act No. 102 of 1996** according to industry-based sector. It indicates any business, classified under any sector of the economy, with number of employees ranging between 1-200, with an annual turnover of more than 150 000 rand but less than 50 million rand, and gross assets, excluding fixed properties, of more than 100 000 rand but less than 18 million rand.

As highlighted above, there are different definitions and criteria used to define SMMEs in a number of contexts (ranging from the number of employees, capital base, turnover, profits, magnitude of imports and exports, etc.). Varying definitions of SMMEs are developed, reviewed and applied in different countries, including the European Union, World Bank, United Nations and other organisations (European Commission, 2009; Obadan & Agba, 2006; Hallberg, 1999). More than one definition is adopted for tax purposes and other business applications.

For the purpose of this research, the definition of SMME as defined by the **National Small Business Act No. 102 of 1996 of South Africa** is used. The definition particularly references SMMEs with number of employees less than 100 and an annual turnover of not more than 20

million rand. (Table 2 in Annexure E highlights the different types of SMMEs according to industry based categories).

2.3 Issues affecting SMME development in South Africa

Though the importance of SMMEs and contribution to economic development is widely acknowledged, particularly in South Africa, SMMEs are faced with various challenges of a different nature, which impedes the potential of business growth. This problem, though prevalent, is not exclusive to South Africa, but considered a general and concerning challenge across the globe (UCS, 2011). It has been established by previous studies that the SMME sector in South Africa has a high failure rate with a low growth, success and survival rate (Ngek & Smit, 2013).

According to the 2012 Annual Global Entrepreneurship Monitor Report (Xavier *et al*., 2012), the South African economy has a low Total Economic Activity (TEA) with established business owner rates standing at a low of 2 percent. The measure of a country's Entrepreneurial Activity (Table 2.1 showing EA of other developing countries in Africa) is based on the conditions of the business, social and cultural environment, the actions of regulatory bodies, the state and condition of infrastructure, the levels of technology usage and the impact on economic variables (Awajan *et al.*, 2013). Xavier *et al*. (2012), in the Annual Global Entrepreneurship Monitor Report, list South Africa as one of the countries with the lowest number of entrepreneurial activities among all developing countries reviewed.

The survival rate of SMMEs in South Africa is also listed as relatively low compared to other countries' SMMEs reviewed. Herrington and Mass (2007) state that a large percentage of SMMEs in South Africa are of a micro and survival nature, with limited potential for growth because of the lack of support and facilities. This is one of the reasons why South Africa performs below average in their interest in providing support and adequate measurement of entrepreneurial activities by small businesses (Timm, 2012).

According to Tsoabisi (2012), African governments do not provide adequate support to enhance the development and growth of SMMEs. The African governments often impose stringent and overbearing regulations on SMMEs in terms of registration and assessment processes, and are usually subjected to excessive taxation which stifles the growth and development of SMMEs. The 2009 Global Economic Monitor report (GEM, 2009, as cited by UCS, 2011:14) points to the low level of sustainable entrepreneurship, with South Africa having one of the lowest rates of

entrepreneurial activity in creating new sustainable small businesses. South Africa's TEA, which is the main Global Economic Monitor Report measure of new business creation, is substantially lower in comparison to other similar countries (Ngek & Smit, 2013). The low level of innovation and ICT adoption has been one of the major barriers to the business development and survival of SMMEs operating in South Africa, even though ICT adoption and usage has been established globally as a major driver in the success and survival of a business (Ngek & Smit, 2013).

Table 2.3: Entrepreneurial activity in some GEM Countries in 2012, by geographic region
(Xavier *et al*., 2012:24)

Country	Nascent entrepreneurship rate	New business ownership	Early-stage entrepreneurial activity (TEA)	Established business ownership rate	Discontinuation of businesses	Necessity-driven (% of TEA)	Improvement-driven opportunity (% of TEA)
Angola	15	19	32	9	26	24	38
Botswana	17	12	28	6	16	33	48
Ethiopia	6	9	15	10	3	20	69
Ghana	15	23	37	38	16	28	51
Malawi	18	20	36	11	29	42	43
Namibia	11	7	18	3	12	37	37
Nigeria	22	14	35	16	8	35	53
South Africa	4	3	7	2	5	32	40
Uganda	10	28	36	31	26	46	42
Zambia	27	15	41	4	20	32	46
Average (unweighted)	15	15	28	13	16	33	47

Owning to the complex nature of difficulties and constraints encountered by small businesses in its operations in the market, the use of IT is identified as a major tool with the potential ability to enhance SMME productivity, efficiency and growth level of the business. The effect of the measurable difference and significant impact of IT on the contribution of SMMEs to the economy of developing countries such as South Africa is well researched and documented (Ndiege *et al*., 2012; Nguyen, 2009; Berry *et al*., 2002).

It is necessary to identify and invest in technologies that can assist in increasing the efficiency of SMMEs. There exists a direct relationship between the growth of the economy and technological innovations. This position is reflective for example in India, where industrial capacity has grown

considerably in recent years, in particularly the business services linked to ICT resulting in a significant rise in GDP (Arroio & Scerri, 2014).

Further key challenges faced by SMMEs include the availability and accessibility of ICT infrastructural services, i.e. physical infrastructure among many others (Xavier *et al*., 2012; Tsoabisi, 2012). Xavier *et al*. (2012) listed entrepreneurial finance, government policy, support programmes, research and development activities, regulations, educational level, legal and business structure, social infrastructure, and cultural and societal norm as conditions that tend to affect entrepreneurial activities in a country (Table 2.4).

Table 2.4: The GEM entrepreneurial framework conditions
(Xavier *et al*., 2012:35)

Entrepreneurial Finance The availability of financial resources, equity, and debt, for new and growing firms, including grants and subsidies.	**Government Policy** The extent to which government policies, such as taxes or regulations) are either size- neutral or encourage new and growing firms.	**Government Entrepreneurship Programs** The extent to which taxes or regulations are either size-neutral or encourage new and growing firms.
Entrepreneurial Education The extent to which training in creating/ managing new, small or growing business entities is incorporated within the education and training system at all levels. There are two sub-divisions – primary and secondary school entrepreneurship education and training; and post-school entrepreneurship education and training.	**R&D Transfer** The extent to which national research and development will lead to new commercial opportunities, and whether or not these are available for new, small and growing firms.	**Commercial and Legal Infrastructure** The presence of commercial, accounting and other legal services and institutions that allow or promote the emergence of small, new and growing business entities.
Entry Regulations There are two sub-divisions – market dynamics, i.e. the extent to which markets change dramatically from year to year; and market openness, i.e. the extent to which new firms are free to enter existing markets.	**Physical Infrastructure** Ease of access to available physical resources – communication, utilities, transportation, land or space – at a price that does not discriminate against new, small or growing firms.	**Cultural and Social Norms** The extent to which existing social and cultural norms encourage, or do not discourage, individual actions that might lead to new ways of conducting business or economic activities which might, in turn, lead to greater dispersion in personal wealth and income.

According to Herrington *et al.* (2010), there is a need for establishing a centralised agency with the responsibility to coordinate all available support to small businesses in the form of programmes and funding. Their study also revealed concern about the inadequacy of reliable data regarding SMMEs, with studies often conducted in isolation, leading to the lack of proper form of official repository that houses data in the SMME sector.

In spite of numerous research projects conducted on SMMEs in South Africa, very little is known about the exact figures of SMMEs operating in the country. In 2007, the Statistics South Africa Labour Force Survey estimated that a total of 2.4 million SMMEs operate in South Africa, but according to the FinScope Small Business Survey (FinMark Trust, 2010), there are approximately 6.6 million registered small business enterprises in the South African market. These figures cannot be entirely relied on because it is difficult to obtain accurate information on small business enterprises in various sectors of the economy of the country. This is mainly due to the lack of credible and documented information at provincial and national government level.

SMMEs are categorised and grouped to facilitate services and provide support to all firms that falls within the category. However, the lack of complete statistics and precise quantification of the SMMEs in each category gives rise to the problem of providing adequate assistance to small businesses by government and other forms of non-governmental agencies (Ndabeni, 2014).

According to SEDA (2013), there were 1.87 million registered small and big enterprises listed in the 2007 Stats SA Integrated Business Register, covering only the formalised businesses, thus excluding partnerships and sole proprietorship. SEDA also highlighted that SMMEs are affected by the following factors:

- Availability of information
- Ownership of the small business
- The size of the SMME
- Experience of the small business owner
- Accessibility to finance
- Registration and legal formality

The actual number of SMMEs, both formal and informal, cannot be adequately determined based on the type of data available. SEDA stated two reasons for this situation:

i) The Labour Force Survey (LFS) does not report figures for SMMEs as a separate category.
ii) The LFS reports figures for individuals whereas the Stats SA Integrated Business Register reports figures for enterprises.

UCS, in the 2011 NCR Annual Report, identified the following areas as critical concern that affects the survival and growth of SMMEs in South Africa (UCS, 2011):

i) The level of formality of SMMEs (that is, its legal status and composition).

ii) The lack of available information with respect to business, and poor quality of information if it exists.
iii) The lack of collateral and capital investment.
iv) The poor level of managerial competence and skills level of owners of businesses.
v) The age and strategy of the business.
vi) The failure to access financial services and credit facilities due to the perception business owners have of the requirements and challenges in obtaining these services.
vii) The lack of awareness of facilities available (technology).

2.4 Government agencies responsible for the development of SMMEs

According to UCS (2011), there are different types of agencies saddled with the responsibility of developing and supporting SMMEs in South Africa, overseeing the increase in growth and contributions of SMMEs to the economic strength. These government agencies are widely distributed among five departments within the government structure of South Africa. (Table 1 in Annexure E lists SMME Support Programmes in South Africa).

2.4.1 The Department of Trade and Industry (DTI)

The Department of Trade and Industry (DTI) is responsible for the promotion of economic growth, industrial development and fostering job creation opportunities in the economic market. It has various agencies responsible for SMME development and support, namely:

i) **Small Enterprise Development Agency (SEDA):** This is an agency with the mandate to support and assist SMMEs in the development and growth of their businesses. This agency was founded from a merger between different agencies such as Ntsika Enterprise Promotion Agency, National Manufacturing Advisory Centre (NAMAC) and the Community Public Partnership Programme (CPPP) in 2004. An initiative called the *SEDA Technology Programme* was borne from the *GODISA Trust Technology Programme* in 2006 to support SMMEs in the areas of technology use and advancement to boost their business development. This is also one of the key focal areas of investigation in the research study.

ii) **The National Empowerment Fund (NEF):** This agency became operational in 2004 although it was established in 1998. The NEF is aimed at funding black-owned businesses, both SMMEs and large enterprises. From 2003 to 2010 a total of 457 million rand out of 1.5 billion rand spent was allocated to small enterprises.

iii) **The National Small Business Advisory Council (NSBAC):** The NSBAC was inaugurated in 2006 after the first council was unsuccessful amidst various allegations of mismanagement. Its function is to advise the Minister of Trade and Industry on how to increase and enhance developmental support for SMMEs.

2.4.2 Department of Economic Development (DED)

The Department of Economic Development was established in the 2009 with its main function to formulate and coordinate South African economic policies guiding business, economic and industrial growth. DED has the following agencies in its fold:

i) **Khula Finance Limited:** This is a wholesale financial institution operating along the private and financial channel with networks and supply of funds targeted at small businesses. It was established in 1996 as a small business financial organisation with the objective to assist and fund SMMEs in the country. It channels funds through the media of which it is also a partner, including retail finance institutions, commercial banks, joint ventures and specialist funds. Its aim is to bridge the gap in terms of funds available to small businesses though the commercial banking sector. It has four major components:
    - Funding for retail financial institutions (RFI)
    - Equity capital
    - Credit guarantee scheme
    - Gearing capital for private and public funds for small businesses

ii) **Industrial Development Corporation (IDC)**: The IDC was established as far back as 1940 with funding of small businesses as part of its major function. It funded SMMEs to the tune of 2.1 million rand which was 23 percent of the total value assigned to SMMEs with less than 200 employees and an annual turnover of less than 51 million rand or total assets not exceeding 55 million rand.

iii) **SA Micro-finance Apex Fund (SAMAF):** The SAMAF was established under the Department of Economic Development to facilitate access to loans and support to micro businesses. SAMAF was set up with the primary objective of reducing the rate of poverty and unemployment, and expanding the reach of financial services widely into rural and semi-urban areas. It has the task of facilitating the access and provision of affordable finance to the survivalist micro and small businesses to enable them to develop and generate their own income for sustainability. This process is done by SAMAF providing funds for micro finance to intermediaries such as the Financial Services Cooperative

(FSCs) and Micro Financial Institutions (MFIs) who then provide the loans to micro and small businesses who are their members and clients with prescribed stipulations.

2.4.3 Department of Science and Technology (DST)

The Department of Science and Technology (DST) is the government department concerned with the promotion and enhancement of technological advancement and capability of the country with emphasis on development of scientific innovation and research.

The Technology Innovation Agency (TIA) is a recently established umbrella body with the responsibility of providing funds for innovative activities. It was initially set up in 2009 but only became operational in 2010. It comprises of the following programmes:

- Tshumisano Trust which houses the technology transfer stations
- The Innovation Fund
- Council for Scientific and Industrial Research (CSIR) with the Advanced Manufacturing Technology Strategy

2.4.4 Department of Agriculture

The Department of Agriculture oversees all aspect of support and programmes designed for the agricultural sector business and industrial development. It houses the **Micro-Agricultural Financial Institute of South Africa (MAFISA)** which provides support for small businesses. MAFISA was set up to enhance the ability of small business farmers to properly operate existing, and develop new agricultural businesses into fully fledged commercial and operational ventures. Thus, MAFISA provides initiatives and financial services to boost the levels of very small and micro business level farmers, small holders, farm workers, farm tenants and landless potential farmers and their farming processes.

2.4.5 The Presidency

The Presidency directly oversees the development of SMMEs through the activities of the **National Youth Development Agency (NYDA)**. The NYDA was formed by the merger of the National Youth Commission and the Umsobomvu Youth Fund. It provides funds to help entrepreneurial youths establish their own businesses and also help youths developing their career skills. The agency funds developmental trainings for youths and provides access to small business loans.

2.5 Contribution of government agencies towards SMME development

The DTI is majorly responsible for overseeing the management of policies and activities geared towards the implementation of support programmes, initiatives and infrastructure for the development of SMMEs to enhance their development and survival in the market. The research also focuses on the agencies tasked with the mandate to ensure that the SMME sector continues to grow and has the adequate assistance it needs in the form of access, not only to finance but also to support business initiatives. SMMES requires assistance in terms of Information and Communications Technology (ICT) use, access and acquisition of new technology in relation to their business process. In terms of developing and advancing the levels of ICT intake in small business enterprises, SEDA and the Small Enterprise Development Agency Technology Programme (STP), which operates within the purview of SEDA, are the two bodies directly responsible for ICT initiatives and support programmes for the small business enterprises sector. (Table 3 in Annexure E shows DTI performance information on SEDA and STP support goals and targets for 2012/2013).

2.5.1 Small Enterprise Development Agency (SEDA)

The Small Enterprise Development Agency (SEDA) is an agency in the South African Department of Trade and Industry (DTI) which was established through the **National Small Business Amendment Act 29 of 2004**, in December of 2004. It was established by merging three other organisations together to form a single agency: Ntsika Enterprise Promotion Agency, National Manufacturing Advisory Centre (NAMAC) and the Community Public Partnership Programme (CPPP).

In April 2006, the GODISA Trust and the Technology Programmes were integrated into SEDA to become the SEDA Technology Programme (STP). The mandate given to SEDA by the government includes the following:

- Carry out the small enterprise business strategy of the government
- Design and implement a common and standard national delivery network for small enterprise development
- Help integrate government support agencies to assist small enterprises across all the tiers of government

SEDA's responsibility is geared towards the development and sustenance of a highly competitive environment where SMMEs can thrive and develop further to contribute to the

economy. According to its annual 2013 report, SEDA's goals were primarily focused on ensuring client satisfaction, improving client business performance, increasing the reach of their clientele base, improving client retention, enhancing rural development, maintaining cost-sharing with delivery partners, fostering cooperation with delivery partners, improving the image of SEDA, improving cost efficiency, and achieving improved organisational staffing (SEDA, 2013). All these objectives were highlighted as successfully accomplished by various reports, and successful positive rates of return on targeted goals have extensively been documented in the SEDA Annual Report. These goals and targets were based on three main core objectives:

i) To enhance the competitiveness and capabilities of small business enterprises through delivering coordinated services, programmes and projects beneficial to SMMEs.

ii) To ensure equitable access for small business enterprises to adequate business support services through different partnerships.

iii) To strengthen the organisations in helping them deliver on their mission statements.

To aid SEDA in providing assistance and support to small businesses as articulated in its core objectives, there are some tools in place which are designed to render support and assistance to SMMEs. The following three packages are offered for support by SEDA to small business enterprises:

i) *SEDA Business Start Package* which provides tools and techniques for clients who are ready to start a business and require some form of assistance and guidance. The package focuses on the following aspects:
    - Business planning
    - Business counselling
    - Access to finance
    - Business support

ii) *SEDA Business Build Package* is designed to assist clients who want to acquire skills on how to strengthen and sustain their business. The package offers the following:
    - Capacity building systems
    - Mentorship
    - Tender advice/procurement
    - Export readiness
    - Franchising

iii) The third package is the *SEDA Business Grow Package* which offers entrepreneurs who wish to grow their businesses widely and expand national and internationally, the following assistance:
    - Business systems development
    - Cooperative support
    - Growth strategies

2.5.1.1 Small Enterprise Development Agency Technology Programme

The Small Enterprise Development Agency Technology Programme (STP) was created by the DTI as a special programme housed within the purview of SEDA. STP was created as part of government's national strategy of consolidating and rationalisation of small business enterprise support schemes across all the different departments and government agencies, with the sole aim and objective of providing and improving the access and delivery of small business support interventions and services to small enterprises and entrepreneurs.

STP was established by incorporating the various programmes of existing agencies like GODISA Trust, which included the combined activities of:

- The National Technology Transfer Centre (NTTC)
- The Technology Advisory Centre (TAC)
- The technology transfer activities of the Technology for Women in Business Programme
- The SMME support activities of the South African Quality Institute (SAQI)

Working within the DTI's framework of National Industrial Policy, and the previous activities of the consolidated programmes, STP came up with a structured and streamlined approach targeted on some particularly important areas of focus which include:

- Increasing the accessibility, utility and management of technologies support for small business enterprises through the use of structured platforms such as technology business centres
- Facilitating acquisition and subsequent transfer of technology to small business enterprises, particularly those operating in the second economy
- Promoting standards and use of quality standards by small businesses
- Improving small business performance and productivity levels
- Improving the state of competitiveness among small businesses
- Promoting an increase in entrepreneurial activity and success rate of identified groups, in particular women and youth

- Most important of all, reducing the failure rate prevalent among small business practices

According to SEDA, these seven particular focus areas are identified as the major reason behind the failure of technology-based small businesses during their first three years of operation. The STP is charged with addressing these areas with regard to technology transfer, providing needed business development and quality support services to the small business enterprises and entrepreneurs in specifically identified market sectors.

2.6 Limitation of government activities and support for SMMEs

Evident in the Annual Global Entrepreneurship Monitor Report (Xavier *et al*., 2012), a major reason for the failure of government support programmes to deliver on their promises and mandate is poor delivery of service, especially the lack of professionalism of the people supposedly tasked with delivering the government programmes and support. According to UCS (2011), there is a general lack of awareness of most government initiatives and support for small business enterprises, and in the situation where they are aware, there are sceptical feelings about the value it holds for their business. Berry *et al*. (2002) identified various reasons behind the failure of the impact of government support and initiatives for small businesses, materialising in the following:

- Lack of awareness of support
- Uneven distribution of accessible support with a high concentration in urban areas
- High cost associated with searching for how and where to access support services
- Bureaucratic administrative bottlenecks and protocols that usually wear down the users, leading to a large degree of disappointment

According to the FinScope Small Business survey, as cited by UCS (2011:41):

> …75% of small business owners are not aware of any organisations that gave advice and support small business owners in their sector.

The availability of quality accessible and affordable business process support is an important aspect of the development of small business enterprises (UCS, 2011). SEDA is the government agency shouldered with the bulk of responsibility and mandate to provide quality accessible and affordable business support to SMMEs through its various activities and schemes, and supported by STP in creating an enabling platform to boost the growth and development of SMMEs in the country. According to UCS (2011), it was noted in the FinScope Small Business Survey (FinMark Trust, 2010), that only a meagre four percent of small businesses knew of the

existence of SEDA and STP and only a disappointing one percent had actually accessed support from its branches.

Timm (2012) states that SEDA's performance in the small business sector received criticism from different fronts over the years. It has been argued that prominent among the drawbacks of SEAD is encapsulated in the inexplicable and questionable focus on mainly survivalist and micro business enterprises that have a minimal capacity to generate employment. He further notes that there is no existent support provided for medium sized business firms in contrary to SEDA's claim that it channels 20 percent of its support to the medium sized firms. Also of significance is the observation that SEDA provides its support on a generic and heterogeneous type of platform. This type of support does not take into consideration the different homogenous characteristics and factors of each of the business and industrial sectors (UCS, 2011). Though SEDA is set up as a 'one-stop shop' for SMMEs, SEDA does not have any form of control over other available government support, activities and programmes to enable their consolidation for the benefit of small businesses.

Technology incubators provide an essential platform for the development and implementation of new creative business ideas by SMMEs. Government must provide support for businesses in the form of information on available new technology for business, access to funding and other necessary support required to promote the growth of SMMEs (Arroio & Scerri, 2014). In the 2013 report released by the Small Enterprise Development Agency Technology Programme (STP), it shows that out of the 42 technology incubators presently in the country (Figure 2.2), a total of eight are present in five provinces including the Western Cape, and the 34 remaining centres are concentrated in four provinces.

The setting up of incubators is expensive and should be strategically targeted at providing more support for businesses with a high potential and capacity to produce goods and services sought after in the international market to ensure the growth of the economy and development of these businesses (Timm, 2012).

> Therefore more effort should be placed on increasing the number of high quality new SMEs rather than increasing merely the number of new SMEs, which will yield only a slightly positive or even a negative marginal economic effect on growth (Ngek & Smit, 2013:3048).

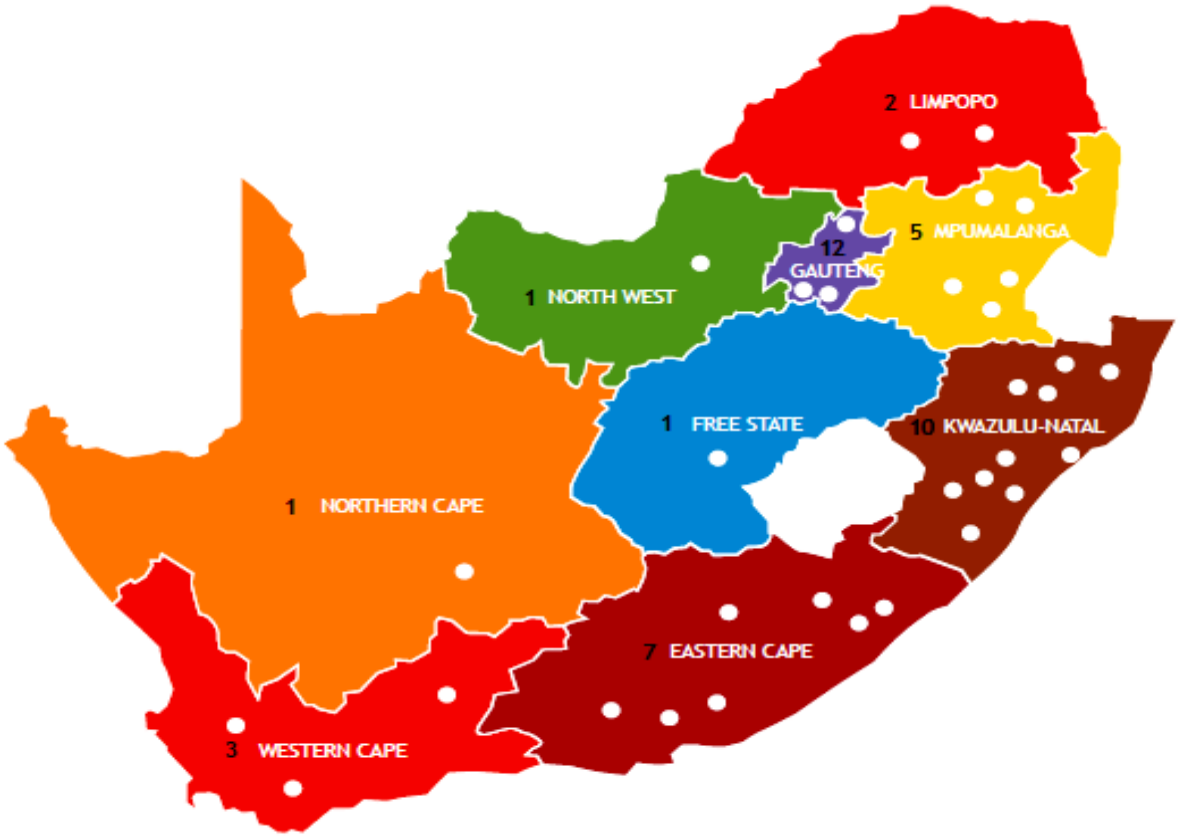

Figure 2.2: Map showing the location of STP incubators in South Africa
(STP, 2013:58)

The lack of an information repository and the required quality in respect of small business awareness of existing facilities and programmes available is of great concern even though the information can be of significant benefit (UCS, 2011). The Department of Trade and Industry introduced an initiative called the National Directory of Small Business Support Programmes, with the goal of providing a single database and act as a single 'one-stop shop' where all available information about technology and support programmes and how to access and utilise it as a SMME, is available (Timm, 2012). The impact and effect of the programme on SMMEs is yet to be subjected to proper verification as it stands.

There exists a need to publicise the various schemes, forums and platforms through which information on new technology and support is made available through a wide variety of relevant media targeted at the small business sector (DTI, 2013).

The rate of adoption of new technology is influenced by knowledge of the new technology. The knowledge creates the awareness and exposure needed to initiate the evaluation and adoption

process. According to Weiner (2013), the more awareness generated by the knowledge of the new technology, the more the interest is generated to increase the rate of adoption.

IT can be a tool of great benefit to businesses in developing countries provided that existing and pervading problems affecting the diffusion and adoption of new technology is addressed by the governments of developing countries in a show of taking responsibility and showing goodwill (Kumar, 2013).

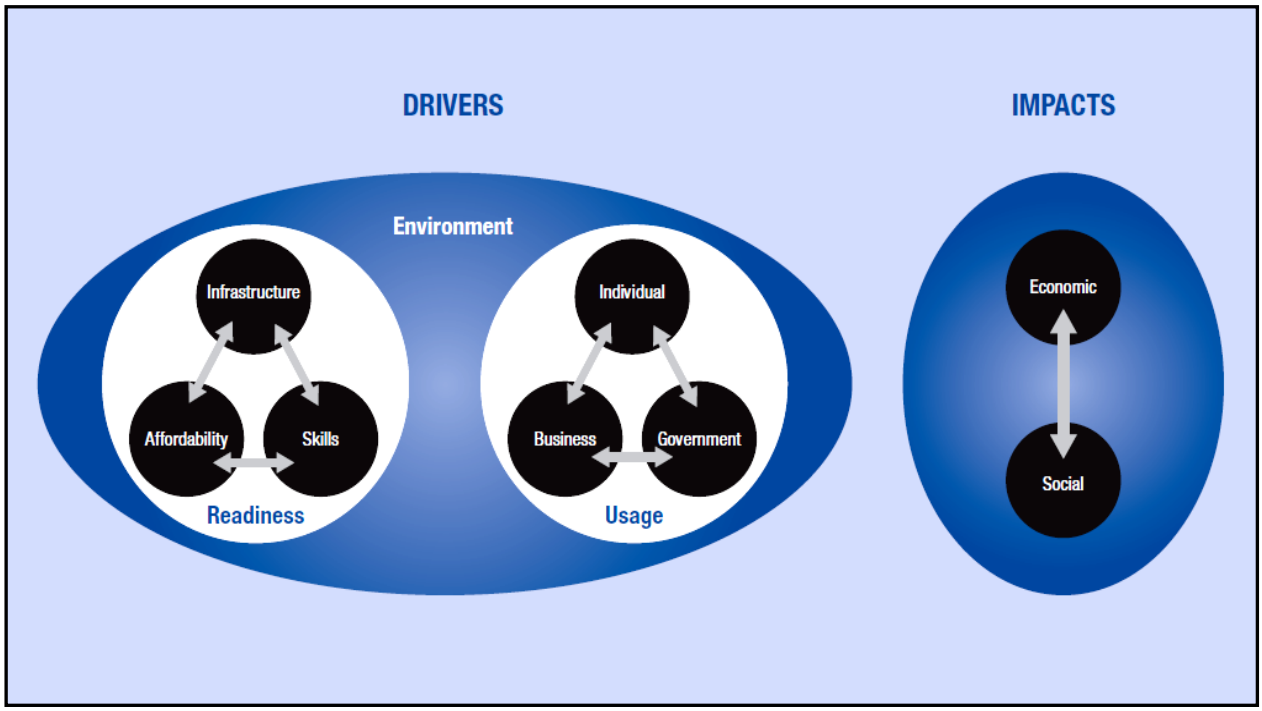

Figure 2.3: The networked ICT Readiness Index Framework
(WEF, 2013:5)

For new technology to make a significant impression and impact on the organisational vision and business processes, the owners/managers of SMMEs must have access to reliable and sufficient information to evaluate a new technology based on relevant, verifiable and objective information (Abdollahzadehgan *et al*., 2013).

According to Weiner (2013), the *Prague Declaration on Information* policy states that one of the major factors affecting information dissemination is not recognising the relevance of information in economic development, and governments are challenged to develop programmes to facilitate the circulation and accessibility of information especially in the business environment. Stoneman and David (1986, as cited by Kumar, 2013:41), state that:

The impact of government policies and initiatives has been shown to have direct and indirect stimulation to the supply of information which produces faster technology diffusion.

There is an absence of an integrated national policy on information accessibility and distribution in most developing countries, in particular an extensive information policy applicable across board to businesses due to disoriented government involvement and application (Kumar, 2013). Wright *et al.* (2013) indicate that a high level of government programmes and interventions, providing high knowledge and practical support to SMMEs to inform them of the benefits and applications of new technology, is evident in studies in France.

2.7 Information Technology adoption and SMME development

The word *technology* is said to have originated from the combination of the Greek words *techne* which means '"craft" and *logia* which stands for "the study of" to form the Greek word *technologia* now used as technology. For the purpose of this research, new technology is defined as **new devices, equipment, processes, or systems that enhance, increase or maintain the performance rate, productivity level, and overall output of an existing business process and/or system. The technology in question has not been acquired and has recently been introduced to the market (from 2010 onwards), and has not been utilised or explored by the SMME.**

IT and business have a history that dates back many decades when technology and innovation was first described as the major key to organisational social development and competitiveness. Personal Innovativeness in the domain of Information Technology (PIIT) is the propensity and disposition of an individual to change, which differs from innovativeness defined by Rogers (1995) as a behavior, and within the context of ICT it can be described as an emotional tendency which elicits a feeling of mistrust and misgiving towards the use and adoption of new ICT innovations (van Raaij & Schepers, 2008). Therefore individuals with a positive form of PIIT are predisposed to boldly experiment and avail themselves with new technology, using their experience and acquiring knowledge to make decisions on the adoption of the new technology (van Raaij & Schepers, 2008).

The seminal work of Schumpeter (1947), who formed the Foundation for Innovation Adoption and Technology Research, is evident in the research works of many renowned scholars today. Among many other researchers that cited the work is Rogers (1995), whose theory and construct later evolved into most of the present day models, e.g. Drucker (1998), Huff and Munro

(1985), Davis *et al.* (1989), Thong and Yap (1995), Agarwal and Prasad (1998), Lal (1999), Premkumar and Roberts (1999), and Frambach and Schillewaert (2002), to mention a few whose work contains advanced knowledge on technological innovation and adoption theory. Despite much research conducted on innovation and technology adoption, the depth of the research and impact in a small organisation context are notably lacking, especially in developing countries where a low rate of adoption is still prevalent**.**

2.7.1 Impact of adoption of new technology by SMMEs

ICT should be seen as a dynamic social-technical entity, which exists and interacts within an organisational context (Haider, 2011; Serafeimidis & Smithson, 2000; Walsham, 1995). The research of ICT is best understood when the interaction between the technical and social components are observed as related components in an organisational context (Serafeimidis & Smithson, 2000). Rogers (1995:11) defines innovation as:

> …any idea, object, practice that is perceived as new by an individual or other unit of adoption.

Innovation is viewed and perceived differently by people largely due to their exposure or awareness of it. Rogers, through his definition of innovation, has permeated the concept of innovation between and through different disciplines lending a basis to innovation adoption studies among multiple fields. IT has been identified as a major element of business operations because it helps to develop internal operations, production capacity and capabilities, and enables an active and swift response to environmental and external pressures. Reinforcing this point made by OECD (2010), the studies of Boateng *et al*. (2010), Mohamad and Ismail (2009) and Al-Qirim (2007) also support that these characteristics of IT are well founded in antecedents and it is arguably the most important means of sustaining, facilitating and promoting SMMEs' business operations and efficiency. OECD (2010) describes IT as a tool that enables SMMEs to steadily develop in status nationally and globally, enhancing cross-country relationship and transactions in the global world. The concept of the adoption of new technological innovation as a powerful competitive weapon is illustrated and emphasised by past and growing present literature (Chan *et al*., 2012; Boateng *et al*., 2010; Mata *et al*., 1995).

Tarutė and Gatautis (2014) state that the implications of new technology in business include the considerable reduction in production and operational cost, and sustainable expansion of potential target markets, which create an avenue for competitive advantage and opening new business opportunities to sustain growth. Many studies have been done to investigate the

motives behind the adoption and non-adoption of IT in various types of businesses, including SMMEs, with a vast majority of the work carried out in developed countries (Booyens, 2011; Marais & Pienaar, 2010; Uden, 2007; Oyelaran-Oyeyinka & Lal, 2006). Figure 2.4 below shows the impact ICT can have on business processes.

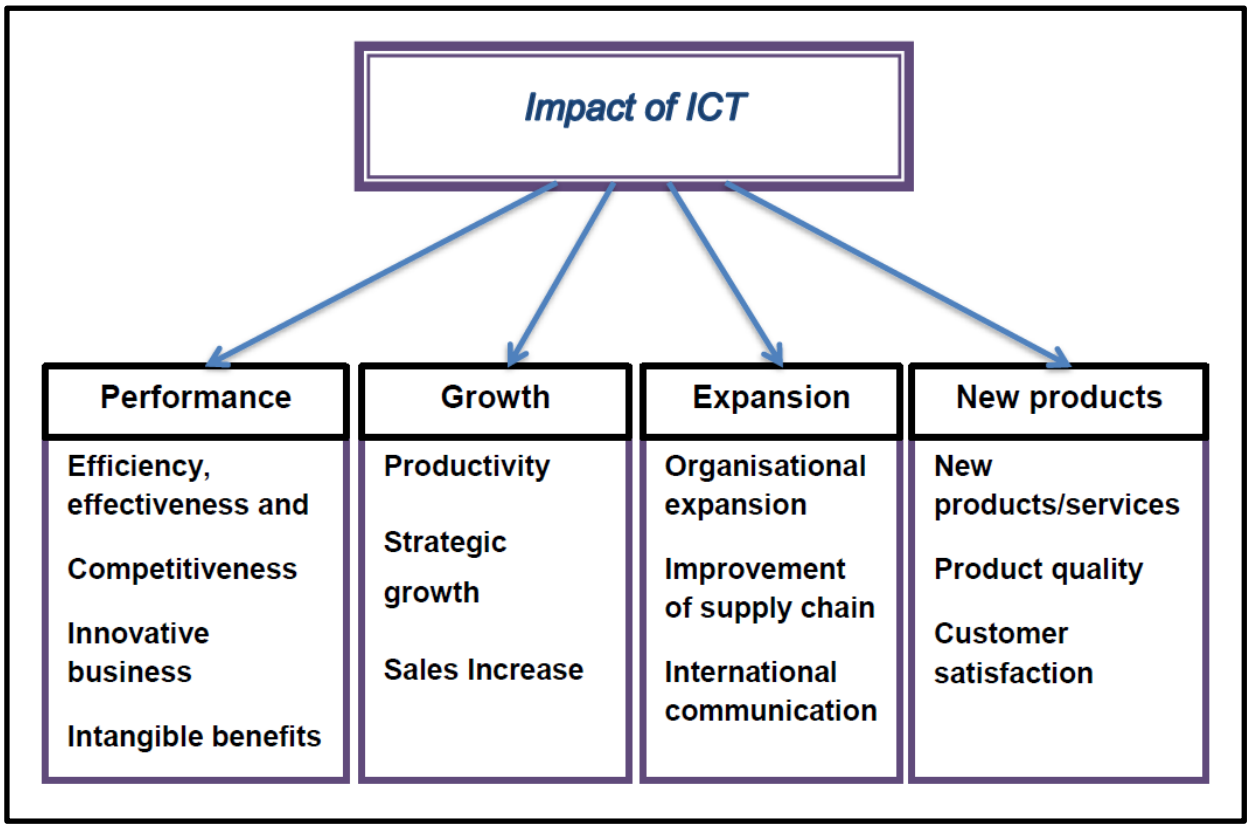

Figure 2.4: Impact of ICT adoption on the business sector
(Consoli, 2012, as cited in Tarutė & Gatautis, 2014:1221)

Although attention has moved to the developing countries and the intricacies involved in the adoption of IT by various types of SMMEs, there is still a gap in respect of the rate of adoption of new technology in developing countries (Ndiege *et al*., 2012; Cowan & Daim, 2011; Warden & Motjolopane, 2007; Cloete *et al*., 2002). The bulk of the research done on the sustainability and competitive advantage as accruable benefits of adoption of new technology has been mostly conducted in the context of large firms and developed countries (Volpe *et al*., 2013, Wright *et al*., 2013).

There is a need to concentrate more studies on SMMEs and their adoption of new technology to advance development in the developing countries (Wright *et al*., 2013; Chan *et al*., 2012; Nguyen, 2009).

When considering technology-based industrial firms, SMMEs can be divided or classified in terms of technology as high-technology firms, medium-technology firms and low-technology firms according to their usage and propensity for technology development (Ndabeni, 2014).

Table 2.5: Classification of industries by technology intensity
(Ndabeni, 2014:209)

Technology Intensity	Industry
High-Tech	Aerospace, Computers, Office Machinery, Electronics Communication, Pharmaceuticals
Medium High-Tech	Scientific, Instruments, Motors, Vehicles, Electrical Machinery, Chemicals
Medium Low-Tech	Rubber and Plastic Products, Shipbuilding, Fabricated Metal Products, Petroleum Refining, Ferrous Metals
Low-Tech	Paper, Printing, Textile and Clothing, Food, Beverages and Tobacco, Wood Products

There exists a big disparity in the adoption rate when comparing SMMEs to larger firms, as SMMEs are still behind larger firms in the adoption and utilisation of new technology (Chan *et al*., 2012; Maryeni *et al*., 2012; Harindranath *et al*., 2008). Due to the prevalence of research studies on the adoption of new technology with a focus on large organisations, the results are not generalisable in a small business context. The differences in application of new technology to the business can be attributed to the inherent difference in characteristics and context of small and large firms (Abdollahzadehgan *et al*., 2013).

The focus of academic literature has been mostly on larger organisations despite numerous calls for more studies on the adoption culture of SMMEs. It has been observed that increasing attention is given to the adoption of new technology with the focus on large firms (Volpe *et al*., 2013). Therefore more studies on SMMEs and their adoption of new technology to advance development in developing countries need to be carried out (Wright *et al*., 2013; Chan *et al*., 2012; Nguyen, 2009). The call for increased research further buttresses the point that there is still a slow increase in the adoption rate of SMMEs to new technology, especially in developing countries (Pavon & Brown, 2010; Kapurubandara, 2009; Uden, 2007; Stockdale & Standing, 2006; Cloete *et al*., 2002).

The benefits of the adoption of new technology has been well documented in literature, but the adoption of new technologies by SMMEs in developing countries still remains a perennial issue evident at a low level of adoption over the years (Chan *et al*., 2012; Ndiege *et al*., 2012; Nguyen,

2009). Although work has been done in the area of adoption of new technology in SMMEs in the IT discipline over the years, Harindranath *et al.* (2008:2) state that:

> There continues to be a growing need for better understanding of the factors that drive or inhibit adoption and the use of new technologies within specific context of SMMEs.

And this point has been further buttressed in recent literature (Maryeni *et al*., 2012; Tan *et al*., 2010).

Research on IT adoption continuously focuses on the performance of SMMEs over the past decades, presenting different developmental adoption models (Maryeni *et al*., 2012; Lawrence, 2009; Olsen & Eikebrokk, 2009; Warden & Motjolopane, 2007**;** Brown & Russell, 2007; Al-Qirim, 2007; Cloete *et al*., 2002; Lefebvre *et al.*, 1995; Davis, 1989; Yap & Walsham, 1986). However, many SMMEs are still without competent IT capabilities due to the slow and non-adoption rate found to be prevalent among SMMEs, especially in developing countries in Africa. Of concern is the fact that IT adoption and utilisation of new technology is observed to still be low across the globe even though various adoption models have been developed to address the problem (Pavon & Brown, 2010; Harindranath *et al*., 2008; Pool *et al*., 2006). Earlier studies into adoption factors of innovation carried out by Schumpeter (1947), Rogers (1995) and Drucker (1998), show different factors such as organisational, cultural, political, economic and organisational as those that promote and inhibit adoption of innovation. Many adoption models have been developed by various scholars coming up with varying types of models, designed in an effort to update the adoption model developed by Schumpeter in 1947. Notably among these scholars are Peppard and Ward (2004) with the IT Competency Model, Davis (1989) with the Technology Acceptance Module (TAM), and Ajzen and Fishbein (1980) with the Theory of Reasoned Action (TRA).

2.7.2 Factors affecting the adoption of new technology by SMMEs

Even though existing literature holds some factors identified as causes of a low adoption rate of new technology among SMMEs, the researcher should err towards caution not to assume that all possible angles have been exhausted because of the pervading nature of the problem over the years of study (Hoffmann, 2011). Kapurubandara and Lawson (2006) categorise internal and external barriers that impede the adoption of ICT by SMEs in a developing country. The internal barriers include owner/manager characteristics, firm characteristics, cost and return on investment, and external barriers including social, cultural, political, legal and regulatory infrastructure.

Prominent factors affecting new technology adoption among SMMEs in developing countries are often related but not limited to technology infrastructure, cost factors, uncertainty and risk (Kumar, 2013). SMMEs are constrained by the lack of awareness and knowledge of existing technology and its potential to the business, and also by the cost of acquisition and technical skills needed to operate new technology (Abdollahzadehgan *et al*., 2013). Previous studies of Kwon and Zmud (1987) suggest that the implication of cost and availability of relevant technical expertise are major factors that affect the adoption and implementation of new technology in small businesses. It has also been observed that organisations tend to make decisions about adopting new technology based on the perception and perspective of similar organisations observed within their purview and environment (Abrahamson, 1991).

SMMEs in developing countries are found to be slow to adopt new technology for their business. This situation according to Kuyoro *et al.* (2013), is owing to the lack of awareness by owners and managers, high cost of acquisition of ICT, lack of skills and training, lack of adequate government policy that supports ICT adoption in small firms, and a limited understanding of required knowledge by SMMEs. It has been found that SMMEs which do adopt new technology are often satisfied with the status of their investment, but usually are more agitated and interested in the cost of acquiring the investment in technology and the benefits derivable (Dalipi *et al.*, 2011).

SMMEs have limited access to information on new technology, and this prevents them from understanding the implications of new technology, effective ways of managing competitors pressure and pace, determining business and customer needs, and the ability to make strategic and sustainable decisions in the market (Wright *et al.*, 2013). According to Nguyen *et al.* (2013), it appears that there is no clear indication of how small businesses perceive new technology in terms of opportunity or threat to their business. Small businesses, especially new start-ups, are prone to uncertainty and ambiguity, and SMMEs in general tend to adopt new technology without proper planning in place, which consequently affects the successful adoption and implementation of a suitable technology that supports the business process (Nguyen *et al*., 2013). Such lack of proper evaluation of the significance and appropriateness of technology often leads SMMEs towards practices that ultimately endanger their businesses and places them in a precarious situation. According to Abdollahzadehgan *et al.* (2013), studies have shown that firm size has an influence on the adoption capability of business organisations, with small businesses in particular showing unwillingness and uneasiness to adopting new technology even though they are found to be more adaptable to new technology than large firms.

Hoffmann (2011:42) maintains that the rate of adoption of new technology is also influenced by the following factors:

- The type of decisions to be made by potential adopters
- The channel by which the new technology was communicated and diffused at different stages of the decision making process
- The nature of the environment and social system in which the diffusion and adoption takes place
- The actions and degree of effort exerted by the change agent in diffusion and adoption of the new technology

Prominent factors affecting new technology adoption among SMMEs in developing countries are often related, but not limited to, technology infrastructure, cost factors, uncertainty and risk (Kumar, 2013). The Global Information Technology Report (WEF, 2013) notes that the state of the low standard of educational systems obtainable in most developing countries, also contributes to the lack of adequate ICT and business skills required of business managers/owners and employees, which acts as widespread barriers to the adoption of effective new technology. Failure or inadequate communication may lead to employees not seeing the value of new technology which may cause anxiety about their job security and continued relevance, therefore creating a negative attitude towards the proposed change (Nguyen *et al*., 2013). Low PIIT elicits tendencies of trepidation towards the adoption and use of new technology, often limiting the usage and benefits accruable through the negative perception and avoidance of new technology (van Raaij & Schepers, 2008).

Chan *et al.* (2012) and Cowan and Daim (2011) argue that too much emphasis have been placed on other factors long identified by past scholars and recycled over and over. These factors, i.e. regulatory environment, top management support, competitive pressure, perceived benefits, perceived financial cost, technical competence, technology competence, firm size, external support and uncertainty, are said to largely affect the adoption rate of SMMEs in developing countries. Chan *et al.* (2012) and Cowan and Daim (2011) further state that the major problem of the adoption of new technology in SMMEs may be due to the lack of knowledge by SMMEs of the applicability and adaptability features of the new technology (technical and operating skills), the lack of understanding of the compatibility and capability features of the technology (management knowledge and integration skills), and lack of technology forecasting and knowledge of the dynamics of the potential of the new technology innovations. These factors, they state, are the biggest barriers to potential adoption, thus emphasising the importance of evaluating new technology.

2.8 Theoretical Framework

> A theory consist of a systematic set of logical premise that presents an explanation to a particular phenomenon by representing and showing the relationship that exist between the phenomenon and others (Zikmund *et al.*, 2010:39).

A theory is built by reviewing and applying the findings from previous and similar studies, making logical deductions from the prior studies and seeking the theoretical knowledge of applicable areas of study. This section presents the theoretical framework underpinning this research study. To enable the researcher to come up with a suitable and applicable theory to help investigate and understand the reasons behind the low rate and failure to evaluate and adopt new technologies by SMMEs in Cape Town, some previous theories and models for adoption of technological innovations and evaluation process are presented here. The conceptualised framework underpinning the research is consequently presented in Chapter Five.

Several theories and models have been developed by researchers in the quest to understand and examine the dynamism of the diffusion and adoption of technological innovation, whether it has been developed recently or whether it is in existence already. In the research of the Information Systems/Information Technology (IS/IT) domain, research on the acceptance and adoption of technology has been largely promoted by models based on behavior, intentions and believes which are firmly grounded in cognitive psychology posits (Orlikowski & Baroudi, 1991; Lopez-Nicola *et al.,* 2008, as cited by Tarutė & Gatautis, 2014). These theories and models have been developed by different recognised researchers all over the world, and it has evolved over the years and been widely discussed and used by various researchers (notable examples are shown below) attempting to establish the inherent factors and conditions affecting the acceptance and adoption of technology in different contexts. The following are the acknowledged theories and models developed over the years by these distinguished scholars:

- **Theory of Reasoned Action (TRA):** Developed by Martin Fishbein and Icek Ajzen in 1975 (as cited in Ajzen and Fishbein, 1977).
- **Theory of Planned Behavior (TPB):** Extension of TRA developed by Icek Ajzen in 1991 (as cited in Ajzen, 1991).
- **Diffusion of Innovation (DOI):** Initially developed by Rogers in his original book of 1962 (as cited in Rogers, 1995).
- **Technology Acceptance Model (TAM):** Developed by Fred Davis (1989).
- **Technology Acceptance Model 2 (TAM2):** Extension of TAM to TAM2 (Venkatesh & Davis, 2000).

- **Unified Theory of Acceptance and of Technology (UTAUT):** A Unified model of eight existing models was developed by Venkatesh *et al.* (2003).
- **Technology–Organisation–Economic Model (TOE):** Theory developed by Tornatzky and Fleischer in 1990 (as cited by Oliveira *et al*., 2011).

2.8.1 Theory of Reasoned Action (TRA)

The TRA is a theoretical model developed and proposed to predict the behavioral intention of people. The TRA was developed by two renowned scholars, Martin Fishbein and Icek Ajzen in 1975 (as cited by Ajzen & Fishbein, 1977), which is based on initial research work on the theory of attitude, consequently leading to the theory of attitude and behavior in the later work of Ajzen and Fishbein. Ajzen and Fishbein (1980) then separated behavioral intentions from actual behavior to make room for further explanation on the factors affecting attitudinal influence. TRA is developed from the social psychology domain and underpinned by three defining constructs:

i) Behavioral intentions (BI): It is a combination of both functions of attitude and subjective norm towards a particular behavior, which can be used to predict an actual behavior.

ii) Attitude (A): The combination of beliefs of a certain behavior weighted against each other.

iii) Subjective norm (SN): The amount of influence people in a social environment have on one's behavioral intentions.

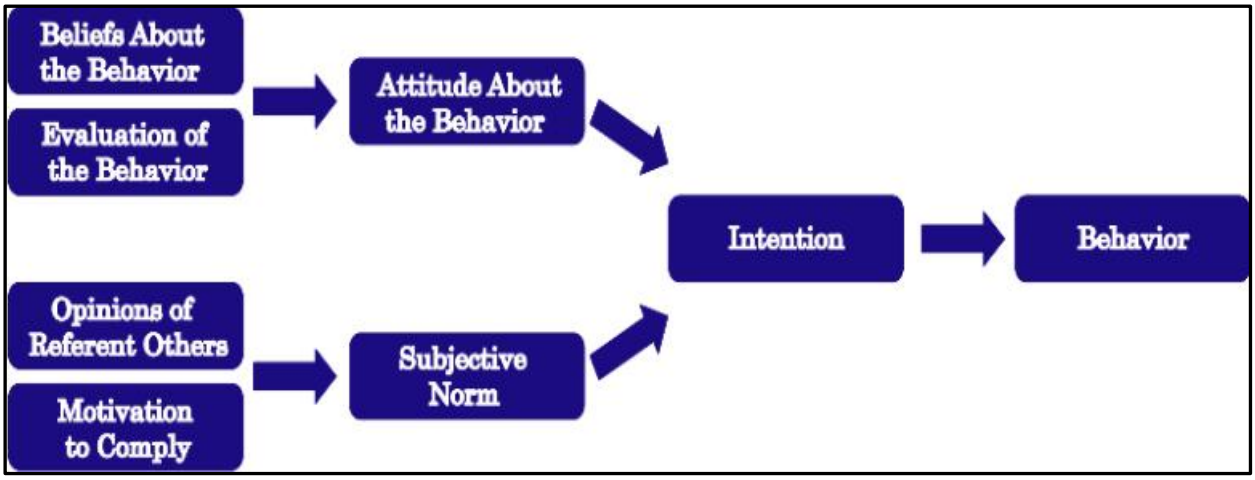

Figure 2.5: Theory of Reasoned Action
(Hale *et al*., 2002:163)

The TRA proposes that the behavioral intention of a person is based on the person's attitude relative to the behavior and the subjective norms, which translates that, if a person intends to behave in a certain manner, then he will do as intended. However, Ajzen and Fishbein (1980) suggest that norms and attitudes are not of equal weight when predicting behaviour; it depends largely on the person and the situation involved, and the effect of these factors might vary depending on their behavioral intention. As a consequence of this situation, a predictive formula has been formulated with a prescribed weight for each factor. Hale *et al.* (2002) presents the formula in a simplified form as follows:

$$BI = (AB)W_1 + (SN)W_2$$

Where

- *BI = Behavioral Intention*
- *(AB) = Person's attitude towards performing a behavior*
- W = Weights derived empirically
- SN = Person's subjective Norm relating to actual behavior

Sheppard *et al.* (1988, as cited by Venkatesh *et al.,* 2007), argue that there exist three limiting conditions for the use of subjective norms and attitude in predicting a person's intention, and for the use of intentions in the prediction of one's behavior. These limiting conditions are:

i) Goals and behaviors: Setting a distinct boundary between a goal intended and a behavioral intention.

ii) Choice among other alternatives: When there is an existence of choice, the nature and role of the intention process in the actualisation of behavior may change considerably.

iii) Intentions and estimates: Intentions formed are sometimes equitable to the reality of situation.

Hale *et al.* (2002) posit that there are other exceptions to the theory as well because the TRA does not give consideration to other types of behavior which act on impulse, habit, cravings and spontaneity. These behaviors might invoke a conscious judgment on the part of the person. But, according to Sheppard *et al.* (1988, cited by Venkatesh *et al.,* 2007), the model performs well in the prediction of activities with clear-cut alternative choices and the prediction of goals, although over half of the researches based on theory tend to apply it to situations for which the model has not originally been developed.

2.8.2 Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour (TPB) is developed as a continuation of the TRA; it was extended in 1991 by Icek Ajzen to include three main considerations which guide human behaviour, i.e.:

- Behavioural beliefs (Attitude)
- Normative beliefs (Subjective Norm)
- Control beliefs (Perceived Control)

Ajzen (2002) posits that the act of combining "behavioural attitude" with the subjective norm and perceived control leads to the development of "behavioural intentions". He also states that behavioural control increases exponentially with the increase in attitude towards a behaviour and the subjective norm.

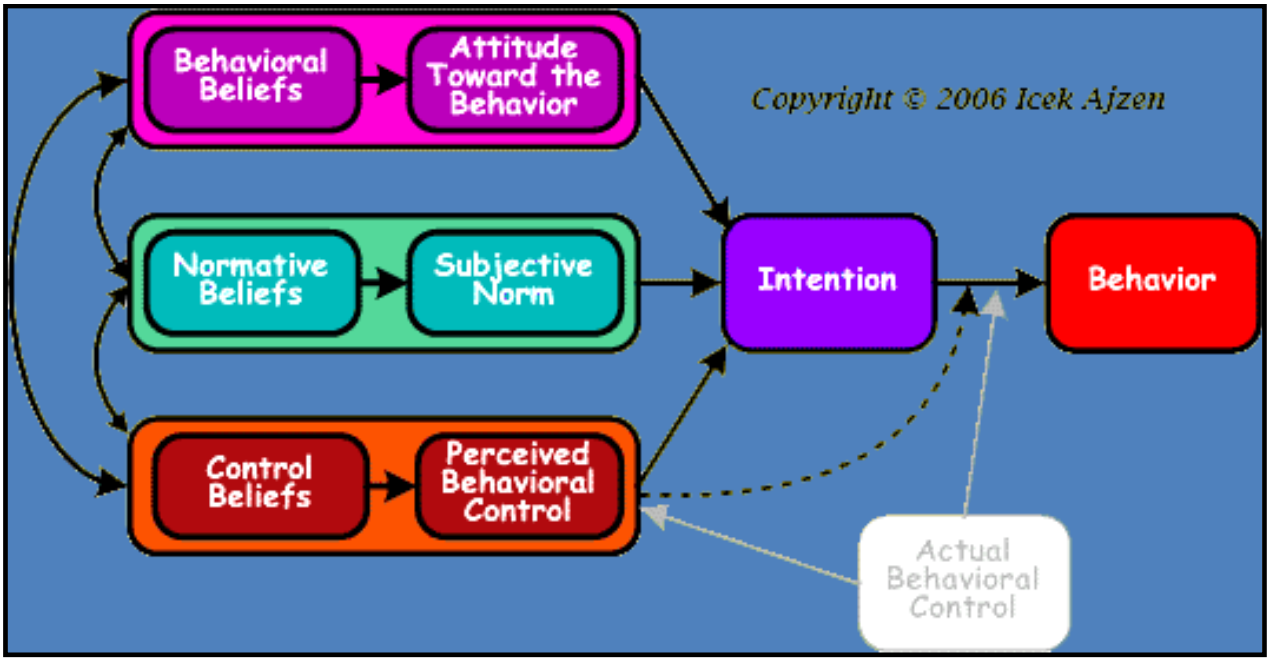

Figure 2.6: Theory of Planned Behavior
(Ajzen, 2002:1)

It is represented in mathematical form as:

$$BI = (W_1)\ AB[(b) + (e)] + (W_2)\ SN[(N) + (m)] + (W_3)\ PBC[(c) + (p)]$$

Where the following factors are represented:

- *BI = Behavioral Intention*
- *(AB) = Person's attitude towards performing a behavior*
- *(b) = Strength of the belief*
- *(e) = Evaluation of the outcome of the belief*
- SN = Person's subjective Norm relating to actual behavior
- (n) = Strength of each normative belief
- (m) = Motivation to comply with a previous antecedent
- (PBC) = Perceived Behavioral Control
- (c) = Strength of individual control belief
- (p) = Perceived power and influence of control factor
- W = Weights derived empirically

The major criticism is that the theory does not, or has done little, to consider emotional variables that might affect behaviors in the form of fear, mood, threat, and the effects of positive and negative feelings. According to Dutta-Bergman (2005), this flaw is most evident in predicting health-related behavior because someone's health is mostly affected by their state of personal emotions. Naturally this poor level of predictability of health-related behavior observed in earlier researches could be due to the nature of the excluded variables when applying this theory, because of its experimental characteristics which do not necessarily establish validity.

2.8.3 Diffusion of Innovation (DOI) Theory

The DOI theory was initially developed to help explain the rate at which new ideas and innovation are spread by asking the questions *how*, *why* and *when* these ideas and innovations are actually dispersed. This theory was made popular by Everett Rogers, a professor in the field of Communication Studies in a book he wrote entitled *Diffusion of Innovation*, which was initially published in 1962 (as cited in Rogers, 1995), and is currently in its fifth edition of print. The book describes diffusion of innovation as a process within a social system where innovation is communicated through some particular channels over a period of time. The theory encapsulates four basic attributes that influence the dispersion of a newly created idea. These elements are:

- Actual innovation
- Set of communication channels
- Time
- Social system

Critical to this process is its reliance on human capital, and self-sustenance of the innovation depends largely on the size and reach of adoption which is liable at a point for the innovation to reach the stage of critical mass. The theory classifies adopters in different categories, including:

- Innovators
- Early adopters
- Early majority
- Late majority
- Laggards

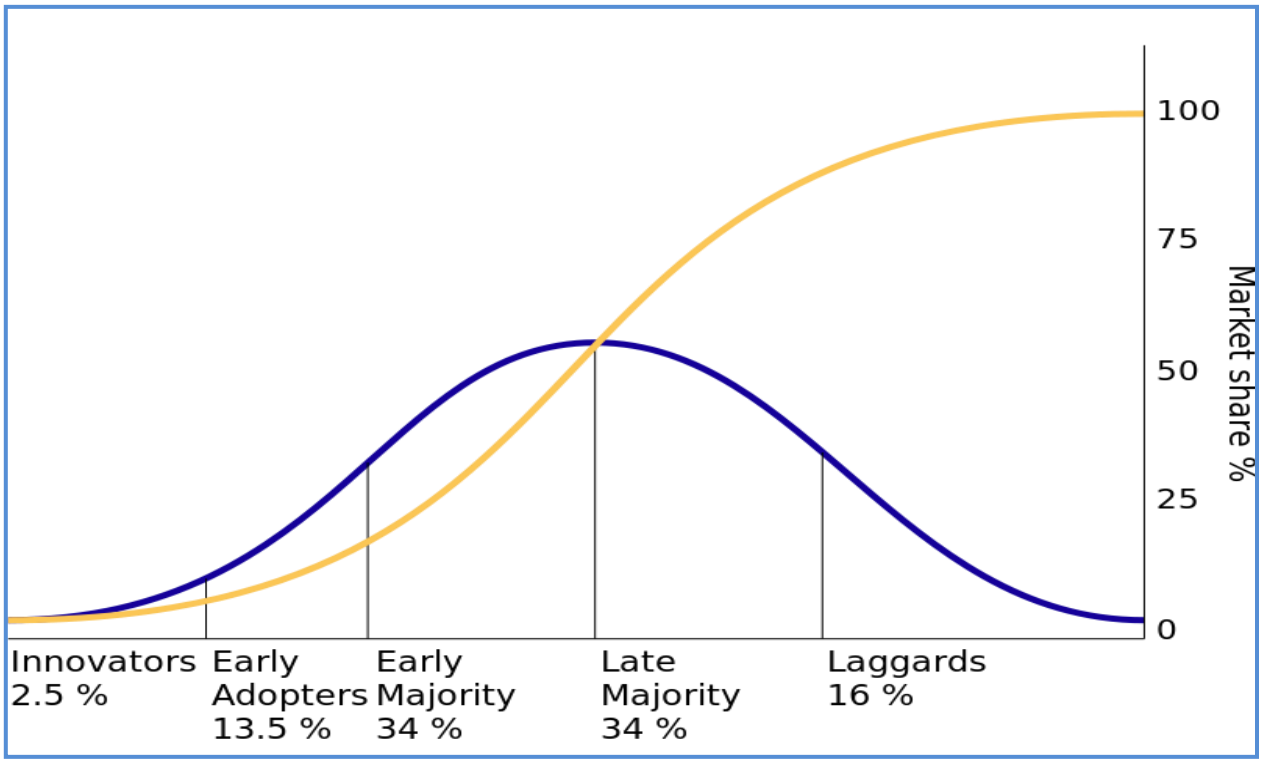

Figure 2.7: Adopter category of innovation
(Rogers, 1995:262)

Diffusion of innovation transcends in many ways through different cultures and is subjectively disposed to the decision making process of the innovation and the person adopting it. According to Rogers (1995), there are two types of factors that account for the type of decisions that can be made, namely:

- Is the decision made and implemented voluntarily and free of cohesion?
- Who is responsible for making the decision?

Based on this premise, Rogers (1995) continues in his book and postulates that three forms of decisions can be made on innovation, based on the theory of diffusion of innovation. These are:

- Optional innovation decision—a decision made by somebody within a social system who in some ways of function is set apart from the rest
- Collective innovation decision—when the decision made is a combination of all the people together within a social system
- Authority innovation decision—a decision for a set of social entities within a system is made by an authoritative power for them

Diffusion of innovation is characterised by five process steps, typically made up of decision making procedures which occur through different channels of communication among a particular set of social systems usually over a certain period of time. Rogers (1995) initially identified five steps in the maiden edition of his books: awareness, interest, evaluation, trial and adoption. These steps were used before adoption was viewed as a process. It later gave way to modification of the stages and steps in subsequent editions, which have remained similar to date. The steps are:

- Knowledge: This is the person's first contact with the technology. It is the stage where awareness and knowledge of the technology are gained through a particular medium. This could be through the media, networks, exhibitions and advertisements, among many others. The adoption process cannot start without the *knowledge* stage where only formal knowledge applies and has to be absorbed.
- Persuasion: A conscious interest develops and effort is made to obtain more detailed information and insight into the technology. This is the stage where a person moves beyond awareness to conscious interest and actively seeks more detailed information such as features, design, cost and user reviews.
- Decision: At this stage, the person takes into consideration the benefits, advantages, disadvantages, cost, risk and other applicable factors, and weighs them against each other; then the person makes the decision to either adopt or reject the technology. According to Rogers (1995), this aspect of decision making is most critical due to the subjective nature of the person making the decision, and the difficulty to gather empirical data.
- Implementation: The person is tasked with the integration of new technology into existing or new processes. At this stage the applicability, compatibly, adaptability and capability of

the technology is observed and measured to determine whether it performs as expected. Further information might be needed to improve the usage and stability of the technology. Re-invention might be considered if the technology does not perform according to expectation. This implies the process of modifying and making the technology adaptable to the needs of the person, and ensuring compatibility within its system of operation. According to Rogers in the 2003 edition of diffusion of innovation (as cited by Hornor, 1998), the essence and entirety of re-invention was missed for several years by various authors, including himself, who have conducted research on TA models.

- Confirmation: During this stage, the decision on the adoption of new technology is finalised, with the choice of either continuing with the use of the technology or discontinuing and rejecting the technology usage after it has been operational for some time (referred to as a delayed rejection). The decisions are either made by a single person or by a group of people. Technology can also be discontinued in several ways, i.e. if the technology becomes obsolete over a period of time or has outlived its usefulness by completing a cycle; if technology malfunctions or under performs, there is a need to replace it with a newer version with more capability than the previous one; and most controversial, when the person becomes tired of the technology and uses it less often until it is abandoned because of feelings of dissociation towards it—this becomes most regrettable because all effort, time and money invested in selecting the technology essentially go to waste in the face of rejection. Fig 2.8 shows the decision making process prescribed by Rogers (1995).

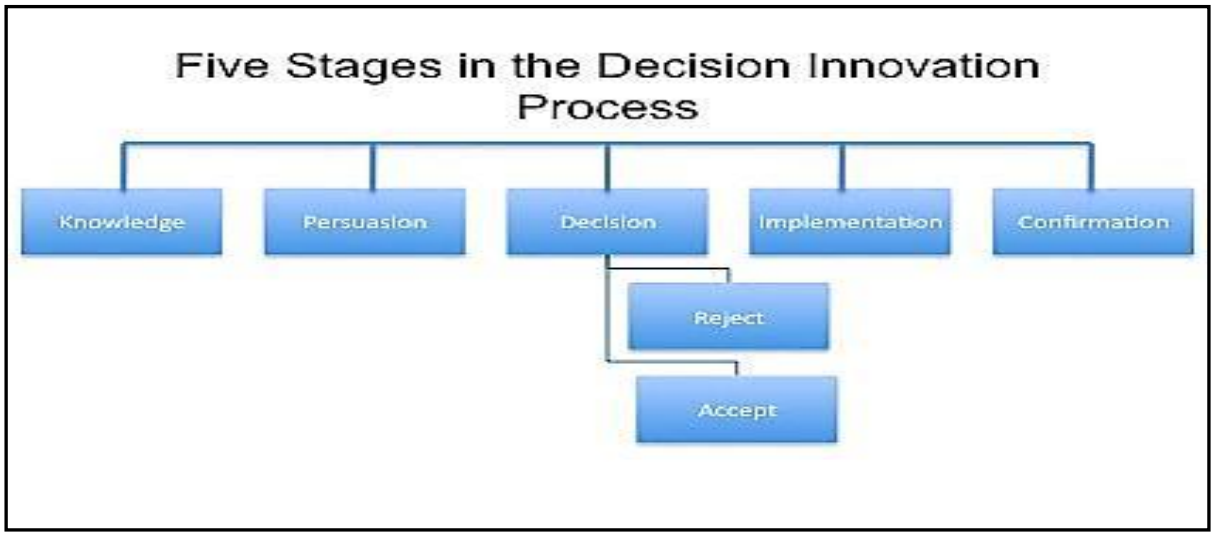

Figure 2.8: Rogers' innovation decision process for technology adoption
(Rogers, 1995)

Rogers' diffusion of innovation essentially describes the way a technology is adopted, can be rejected or is ultimately abandoned in a cycle. This theory, according to some researchers, does not inform the inherent reason why some technology are adopted over others. Rogers (1995) proposes five factors of technology diffusion, with some characteristics implicit to technology, while the others are concerned with the person adopting and the actual usage of the technology. These factors are:

- Relative advantage: The technology must display the qualities and advantage it holds over other technologies in comparison, in the form of increased benefit, reduced cost, increase in performance and increase in social status.
- Compatibility: Shows the level of compatibility the technology has with the person's life and use of it. The technology is intrinsic to the individual's life and as such must merge seamlessly. Compatibility can be of a technical nature, which can include either software or hardware devices.
- Complexity or simplicity: The degree at which the person views the technology as being difficult, equates to the sense of complexity an individual has towards understanding and using the technology. This goes beyond the sense of difficulty to understanding the reason behind the appropriateness and potential benefit of the technology. The higher the sense of complexity, the less likely the person will adopt.
- Trialability: The opportunity the individual has to experience the use of the technology first hand before making a decision. It gives the individual the opportunity to test the technology, through demonstration or simulation, without actually having to commit to adopting this technology. At the persuasion and implementation stages, trials are often part of the process because it assists in forming a good and accurate impression of the technology.
- Observability: According to Rogers (1995), this factor is the most salient embodiment of the diffusion of innovation. Observability is the extent of the visibility of technology to others; that is, the extent of how visible the actual use of technology is to people in the same societal system, determines the clarity at which the technology is seen and heard across the network of people and peers. The more a technology is observable and seen to be used in a society among peers, the higher will the interest and actual motivation be to adopt such a technology.

Rogers (1995) shows the impact of observability when he plots the number of adoptions against time, which produces a bell shape. He also plots the number of cumulative adoptions against time, which produces an S-shaped curve. This is interpreted as adoption usually being slow in the beginning because of the low intensity of awareness; as more people begin to use the new technology, more people will become aware of it and more people will adopt, until it reaches a saturation point where after it will begin to decline again. The impact of the *knowledge* and *observability* factors on the rate of adoption is represented in Figures 2.9 and 2.10 below:

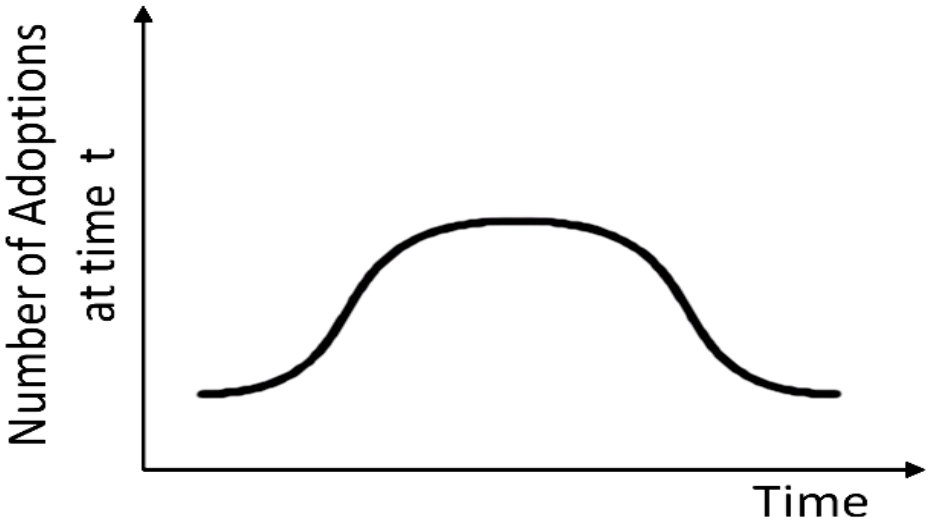

Figure 2.9: Adoption against time (Bell curve of adoption frequency)
(Rogers, 1995:108)

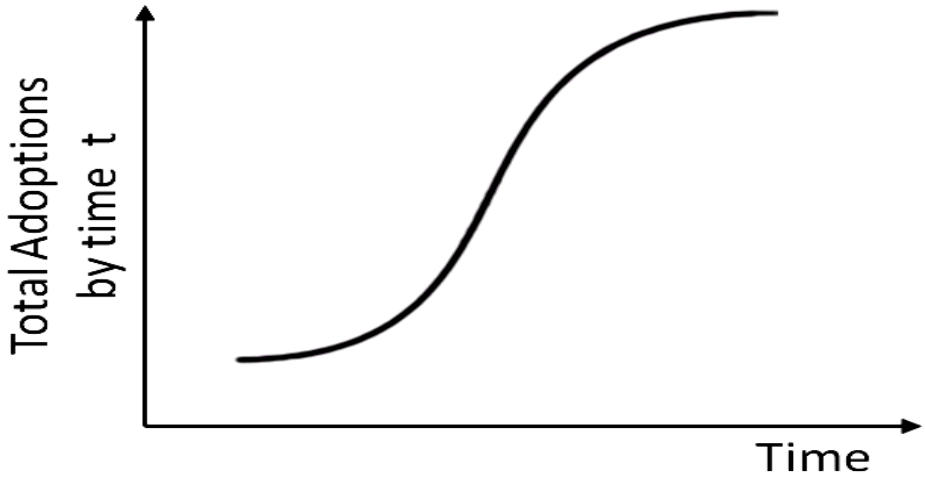

Figure 2.10: Adoption against time (S-curve of cumulative adoptions)
(Rogers, 1995:106)

2.8.4 The Technology Acceptance Model (TAM)

TAM is a theory developed by Fred Davis in 1989, which sought to explain the factors in existence that determine how and when users come into contact with, and accept to use, a technology. TAM has been influential an accepted extensions of the original TRA in 1975 (as cited by Ajzen & Fishbein, 1977), and had a considerable impact in the research on technology acceptance (Bagozzi, 2007).

TAM is based on two major constructs which replace the many attitudinal measures of TRA with its own technology acceptance construct and is defined by Davis (1989) as:

- Perceived Usefulness (PU): This is described as the extent to which an individual believes or is convinced that using a particular technology would lead to a better performance of his/her job and productivity level
- Perceived Ease of Use (PEOU): This is the degree to which somebody believes there is relatively little or no effort required to use the technology on his/her own

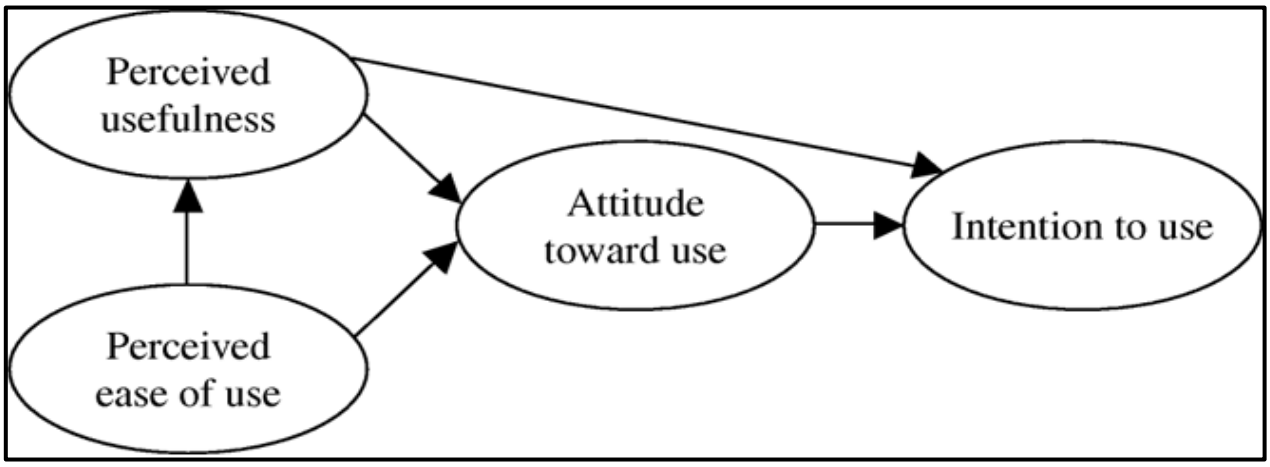

Figure 2.11: Davis' Technology Acceptance Model
(Davis, 1989:985)

Both TAM and TRA have their foundations entrenched in behavioral constructs which assume that a person is free to make decisions formed on an intention without any constraints. Contrary to TAM/TRA prescribed reasoning of personal freedom, Bagozzi *et al*. (1992) state that in the reality of a real life situation, there are many impeding constraints present with the limited freedom to carry out intentions accordingly. Bagozzi *et al*. (1992:664) clarified this statement as follows:

> Because new technologies such as personal computers are deemed complex, which brings an element of certainty into the minds of decision makers in relation to the actual adoption of the technology, people thus form attitudes and intentions which are geared towards trying to understand and trying to learn the usage of the technology before commencing plans directed at adopting it. Attitudes formed towards usage and intentions to use a technology may be found lacking in conviction or ill-advised, otherwise it may only come into existence after preliminary findings on how to use the technology has been made. This then means that actual usage of a technology may not be directly related to the immediate or direct actions of such intentions formed and attitudes.

There has been a growing concern over the level of appropriateness and extensiveness of TAM and other similar adoption theories and models, with questions raised about the models being too penurious and fragmented (Bagozzi, 2007). The construct of TAM is more applicable in an organisational ambience, deterministic in nature and too repetitious, and not taking into consideration the effects of social influence. Its significance to intentions has also generated considerable interest of great concern among scholars (Lopez-Nicola *et al.,* 2008, as cited by Tarutė & Gatautis, 2014; Bagozzi, 2007). Despite continuous use among scholars, TAM has come under some critique from various researchers, notably among them are Chuttur (2009), Bagozzi (2007), and Benbasat and Barki (2007). Bagozzi (2007) implies that:

> TAM has diverted researchers' attention away from important research issues and has created an illusion of progress in knowledge accumulation. Furthermore, the independent attempts by several researchers to expand TAM in order to adapt it to the constantly changing IT environment have led to a state of theoretical chaos and confusion.

Bagozzi (2007) argues that when considering TAM generally, the focus is mainly on a person's perception and use of a computer, thus using the concept of "perceived usefulness" with the view to explain a user's degree of "perception of usefulness" with some other factors brought into consideration. The model effectively ignores intrinsic social processes of information systems development and implementation considerations where there is availability of superior technology and social implications of technology use (Chuttur, 2009; Bagozzi, 2007). Bagozzi (2007) also states that the focus of researchers on TAM because of its aura of simplicity, has led many researchers overlooking the intrinsic determinant elements of decision making, and turning a blind eye to the fundamental limitations in the TAM model.

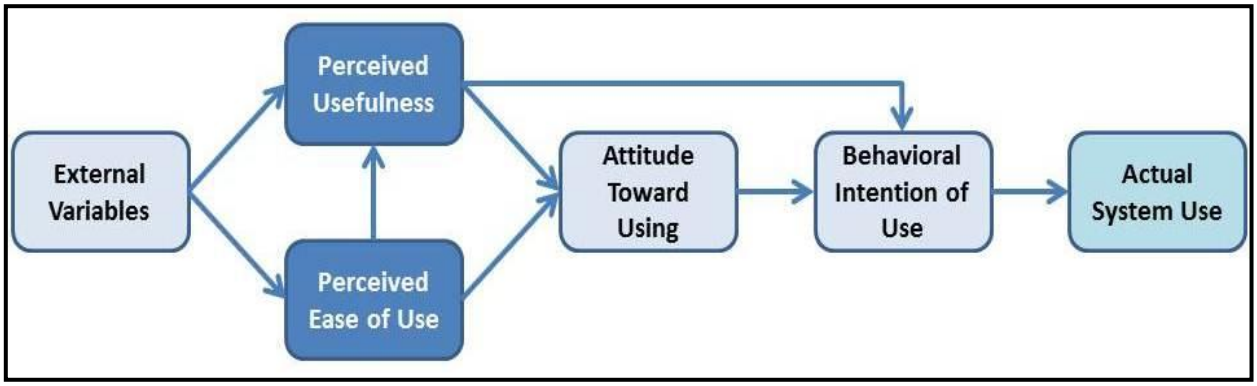

Figure 2.12: Technology Acceptance Model 2
(Venkatesh & Davis, 2000:188)

Due to the nature of the limitations observed in the original TAM, Venkatesh and Davis (2000) decided to extend TAM to include other variables, and to adapt TAM to TAM2. TAM3 has been released by Venkatesh and Bala in 2008 (as stated by van Raaij & Schepers, 2008).

2.8.5 Unified Theory of Acceptance and Use of Technology (UTAUT) Model

The Unified Theory of Acceptance and Use of Technology (UTAUT) Model has been developed by Venkatesh *et al.* (2003) with the focus on explaining user intention to use information technology and the level of usage behavior as a consequence of action taken.

By combining the attributes of eight previous models which include the theory of TRA, TAM, TPB, Motivation Model (MM), Model of PC Utilisation (MPCU), Social Cognitive Theory (SCT), Innovation Diffusion Theory (IDT), and combining TAM with TPB (C–TAM–TPB), Venkatesh *et al*. (2003) arrived at a theory that unifies aspects of existing theories and models together with four major determinants. The determinants are Performance Expectancy (PE), Social Influence (SI), Effort Expectancy (EC) and Facilitating Conditions (FC). The combination plan of Venkatesh *et al.* (2003) has been developed to introduce managers to new technology assessment tools, enabling the managers to understand the driving factors involved in technology acceptance. It assists managers to predict and explain the different behavior patterns of users' acceptance of technology, thus creating a holistic platform for users to accept the new technology (Lee *et al*., 2010).

Figure 2.13 displays the diagram of the Unified Theory of Acceptance and Use of Technology Model (UTAUT), showing the relationships between the different constructs and attributes.

Bagozzi (2007), in its critique of the UTAUT model, states that the model is overly complicated in that it uses 41 independent variables to predict intentions and at least another 8 independent variables to predict behavioral patterns, making the construct of the model chaotic. There have been arguments suggesting that UTAUT in its construct is addressing only the fundamentals and generics, thereby not accommodating other independent variables that future studies might uncover (Chuttur, 2009). Van Raaij and Schepers (2008) criticise UTAUT as being vaguely penurious and much more so than TAM, TAM2 and TAM3 because the high point of the coefficient of determination R^2 is achieved only by the moderation of correlation of as many as 4 variables. They also state that the combinations of the different constructs are largely uncoordinated and too disparate to form an appropriate psychometric model.

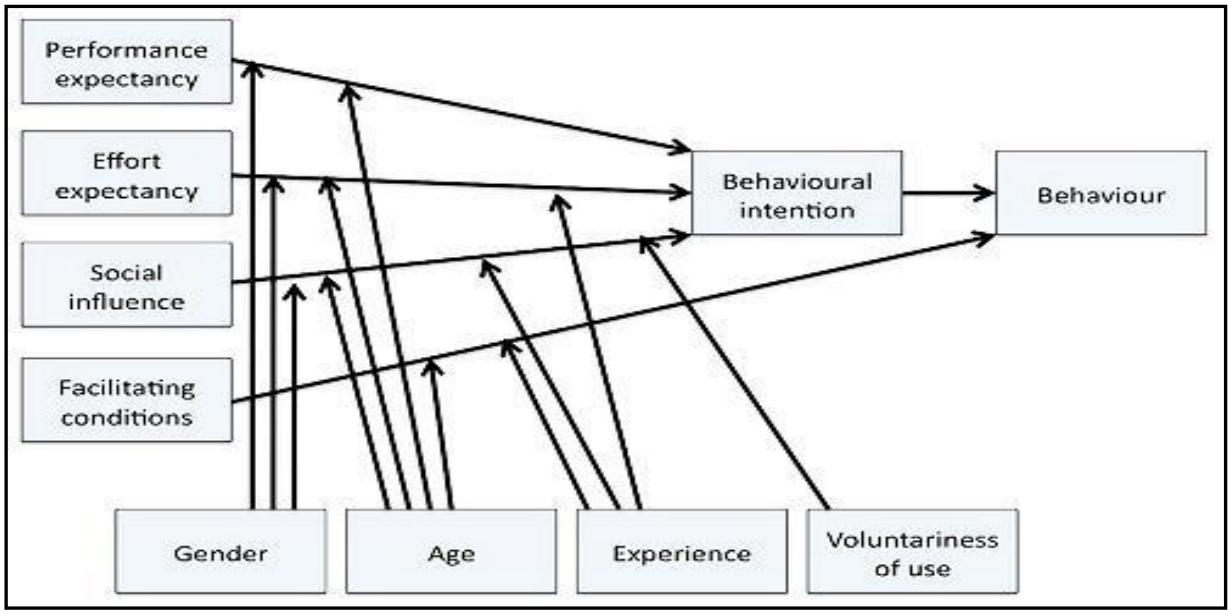

Figure 2.13: Unified Theory of Acceptance and Use of Technology Model
(Venkatesh *et al*., 2003:447)

2.8.6 Technology—Organisation—Environment Theory (TOE)

The TOE theory, developed by Tornatzky and Fleischer in 1990 (as cited by Oliveira *et al*., 2011), is proposed to accommodate organisational elements and components that influence technology adoption decisions of a firm. Dalipi *et al*. (2011) posit that the TOE theory of Tornatzky and Fleischer's (1990) uses nine propositions based on the framework to explain the principle governing organisational contexts where SMMEs adopt and implement new technology for business (Figure 2.14).

According to Oliveira *et al*. (2011), the construct of the TOE framework is based on three contexts namely:

i) Technological—includes both externally available technology and current internal technologies of relevance to the organisational process.

ii) Organisational—describes the characteristics of the organisation in terms of size, scope of business and management structure.

iii) Environmental—describes elements pertaining to the business environment, e.g. physical location, competitors, industrial sector and interaction with government agents.

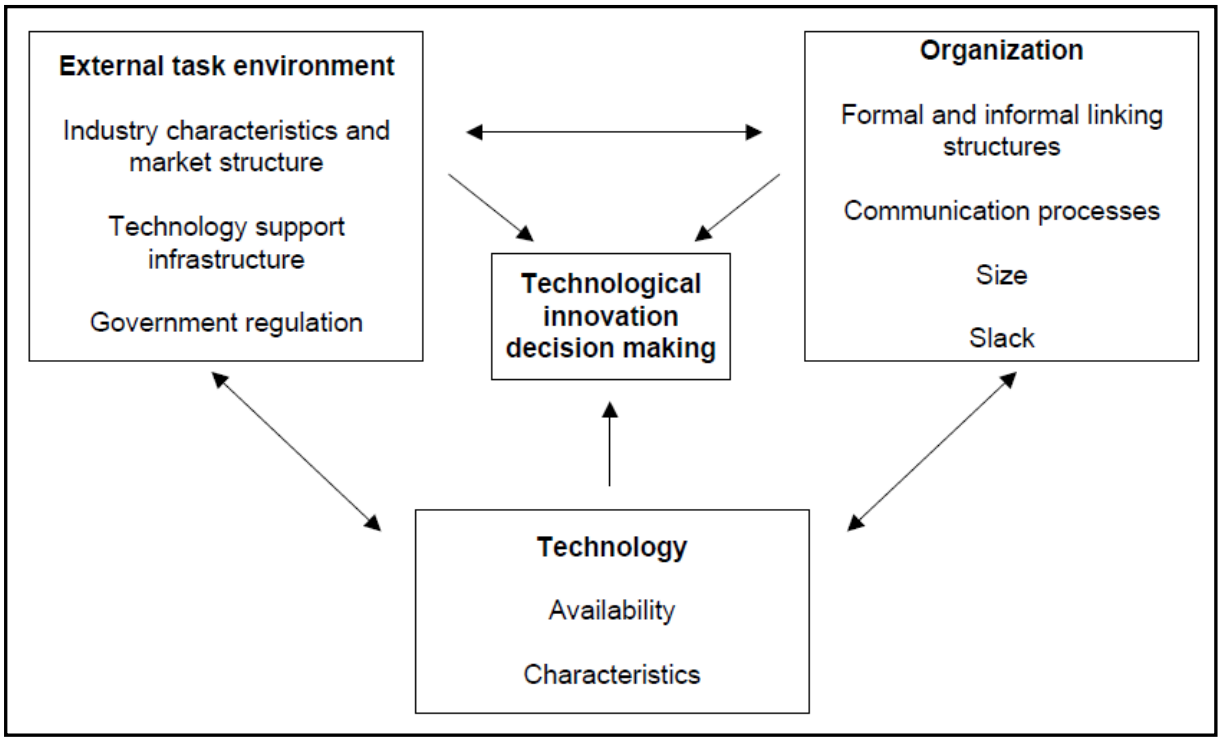

Figure 2.14: Technology, Organisation and Environment framework
(Tornatzky & Fleischer 1990, adapted from Oliveira *et al*., 2011:112)

Using the TOE framework to analyse the effect of organisational components on decision making to adopt new technology, Tornatzky and Fleischer (as cited by Dalipi *et al.,* 2011:113) indicate that the three factors represent "both constraints and opportunities for technological innovation", therefore the three influential factors describe the way a business identifies the need for new technology, conducts a search for it, and makes a decision to adopt the new technology.

The DOI and TOE frameworks are the only two prominent technology adoption models that are organisation based; the rest are individualistic (Oliveira *et al*., 2011). Thus, Oliveira *et al*. (2011:112) posit that:

> The TOE framework makes Rogers' innovation diffusion theory better able to explain intra-firm innovation diffusion.

2.8.7 Information Technology Adoption in SMEs: an integrated framework

The research adopts an integrated framework of Information Technology Adoption, proposed by Nguyen (2009) as theoretical framework for the study and a basis of forming a theoretical assumption that underpins the research.

The integrated framework (Figure 2.15) includes components of DOI and TOE, which supports research on new technology adoption in an organisational context, with consideration of factors that promote and affect the adoption of new technology.

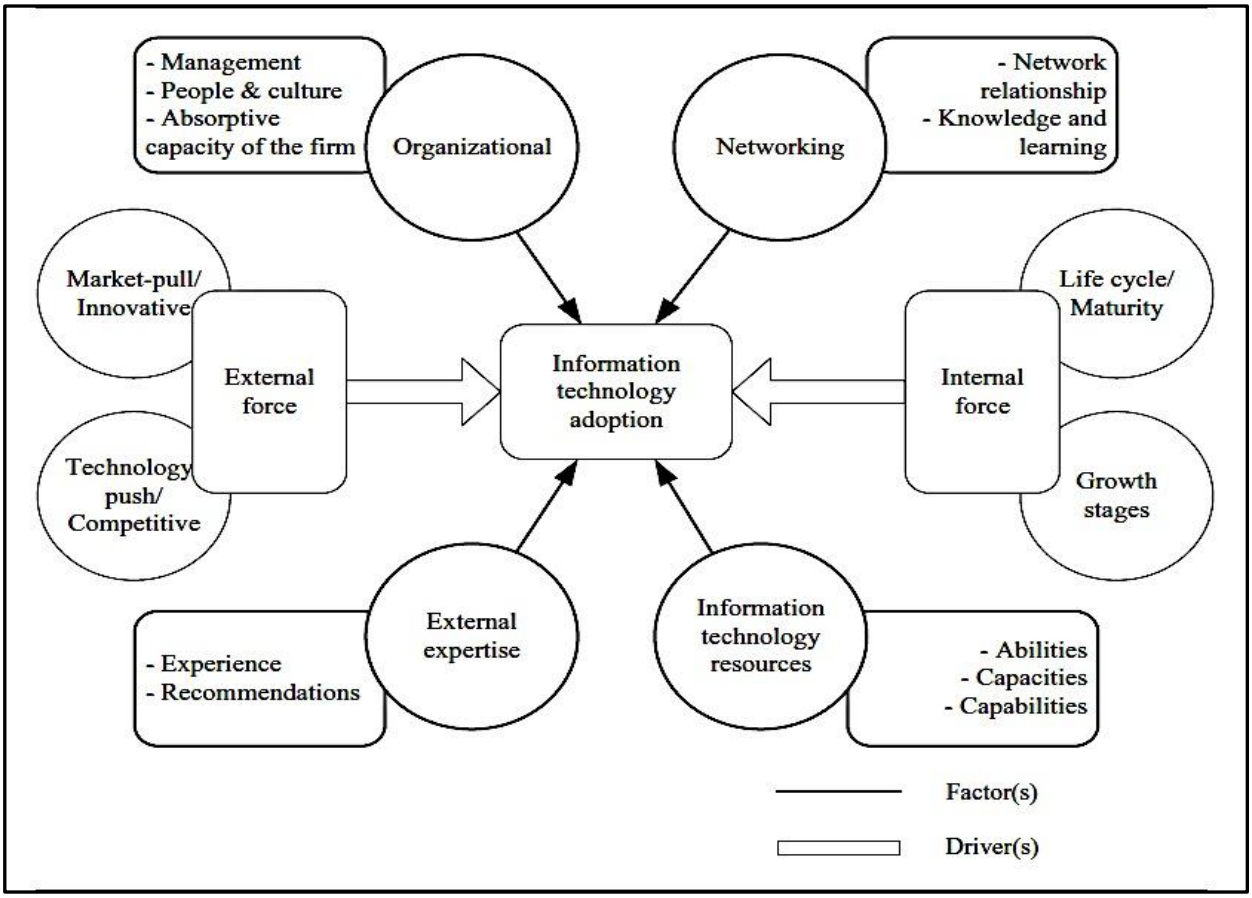

Figure 2.15: Information Technology Adoption in SMEs: an integrated framework
(Nguyen, 2009:164)

The integrated framework acknowledges the essence of decision-making and elements of new technology diffusion. The composition of the components of DOI and TOE elements, which describe a suitable approach for adoption decision-making applied in the context of SMMEs in developing countries, lends credence to the relevance of the theory to this research.

The adopted framework serves as a guide to enable the research study to transverse and further delve into the problems linked to the evaluation of new technology and adoption by SMMEs. The framework is adopted because it has been developed for SMMEs in developing countries, with a similar context, constructs and subjects that relate to the research study.

The findings from the research data will be inferred back to the theoretical framework to provide support that validates the findings and possibly provides new insights which will advance the knowledge of research.

2.9 Evaluation of new technology innovation potential

The description of evaluation is captured by Serafeimidis and Smithson (2000:94):

> Evaluation is a socially embedded process in which formal procedures entwine with the informal assessments by which actors make sense of their situation.

Evaluation is an integral part of adoption with its presence clearly seen in the seminal work of Schumpeter (1947) in the Diffusion of Innovation theory. When Schumpeter (1947) developed his theory about the diffusion of innovation, he acknowledged the role of evaluation by articulating the initial steps that need to be taken when considering the adoption of new technology. These steps, if taken properly, lead to the awareness of a need to evaluate the functionality of the technology before adopting or rejecting it. Unfortunately further research lead to the development of various adoption models which clearly obfuscated the initial part of the adoption, with its importance eroded by these different models that kept on evolving into themselves without recourse to the fundamental steps prescribed by Schumpeter (1947) as crucial in any adoption process.

Serafeimidis and Smithson (2000) argue that the evaluation of new technology is often a complex but important part of an organisational process, and organisations should adopt the interpretivist approach to entrepreneurial activity which has more relevance to current business practices, and discard the narrow traditional approach. Haider (2011:1) therefore posits:

> Information systems, therefore, are not objective entities, such that they could be implemented without considering their interaction with technical, organisational, economic, social, and human factors.

The validity, rationalisation and generalisability of the traditional approach has been criticised and challenged in the areas of social research because of the inability to include elements of risk and uncertainty, external and internal factors, and other forms of context considerations in determining the appropriateness and impact of the value of technology to the business (Haider, 2011; Serafeimidis & Smithson, 2000; Symons, 1993). Symons (1993) argues that an interpretive approach tends to take seriously into consideration the experience and history of the organisation in a realistic context, and the perception, perspective and interest of the stakeholders are solicited in relation to the new technology under consideration. Arguments are made that the evaluation of technology and its study would be greatly advanced by using an interpretive epistemology approach (Berghout & Remenyi, 2005; Walsham, 1995). Hirschheim and Smithson (as cited by Serafeimidis & Smithson, 2000:93) state:

> In general, more attention has been focused over the years on prescribing how to carry out evaluation (with project-driven and cost-focused accounting frameworks) rather than analyzing and understanding their role, interactions, effects and organizational impacts.

The use of objective measurements is often utilised to capture financial implications of an investment on time and resources. The intangible benefits, uncertainty and other factors can only be measured qualitatively in a subjective manner (Palvalin *et al*., 2013).

According to Serafeimidis and Smithson (2000), studies were conducted in 1989 to determine and evaluate available frameworks and methods for ICT investment benefit analysis and appraisal, which produced the Benefits Evaluation of Systems and Technology method known as BEST. The method is used as a ranking and comparison tool for IT projects, but is subject to scepticism mainly from financial managers and other supporters of financial models (Serafeimidis & Smithson, 2000). The BEST approach was subsequently succeeded by other models such as the Information Accounting Framework (INFACC), the Investment Expert System Toolkit (InVEST), IT Investment Appraisal (ITIA), and the Rigorous Appraisal and Processing of Investment Data (RAPID), all of which failed to stand the test of time. In 2005, Berghout and Remenyi identified three models of evaluation that have received the most interest over a period of 11 years, from 1994 to 2005 (Berghout & Remenyi, 2005). The models are the Balanced Scorecard, the Simulation Analysis, and the Dynamic Systems Development Methodology (DSDM).

The numerous evaluation methods and approaches developed over the years have been formulated on the basis of a traditional approach for large organisations, with no applicability to the small business environment (Palvalin *et al*., 2013). The failure or inadequacy of the earlier models gave credence to the argument and proposition to the approach of investigating and evaluating the value and benefits of ICT in a particular context or circumstances with observable impact.

> The acknowledgement of the subjectivity, indeterminism and context dependency of evaluation distances the entrepreneurial approach from the positivistic paradigm and aligns it much more closely with interpretivism (Serafeimidis & Smithson, 2000:94).

The Technopolis Group and Mioir (2012), commissioned by the European Commission, describe evaluation as:

> …a systematic way of collection, coordination and analyzing information based on the functions, characteristics and output of a process which is intended to form the grounds for judgment, inform decisions made on current and future events, and while also looking at the level of effectiveness and efficiency of its outcomes.

Evaluation is divided into two stages namely:

i) Formative Evaluation: This process is intended to support an individual or group in helping them to understand a programme or object, and improve their ability to make decisions on it.

ii) Summative Evaluation: This helps to examine the after effects of a process by determining the effect of the delivery, to ascertain if the process actually contributed to the overall outcome.

According to Baehr (2004), the following are key parameters of value which have to be considered when planning an evaluation, for the evaluation process to be successful:

- Deciding at what point in time to start evaluation procedures
- Deciding what exactly needs to be evaluated
- Deciding what the purpose of the evaluation is
- Deciding on the person to conduct the evaluation (evaluator)
- Deciding what particular scope and type of questions the evaluation intends to address
- Making adequate plans to facilitate the evaluation study and the time of expected outcome

- Deciding how to present the findings in the report of the evaluation study
- Making provision to accommodate potential interpersonal, political and ethical considerations in the evaluation study

2.9.1 Decision process of new technology adoption

The evaluation study is geared towards providing a comprehensive knowledge base to assist in making and defending informed decisions about an objective. An evaluator or decision maker, or a combination of both, will conduct the evaluation. This is done by going through a series of stages, obtaining knowledge of the subject of evaluation, and subsequently collecting detailed information about the subject which will assist in making informed decisions and conclusions about the objective of the evaluation (Figure 2.16 shows the different steps in the process of decision making).

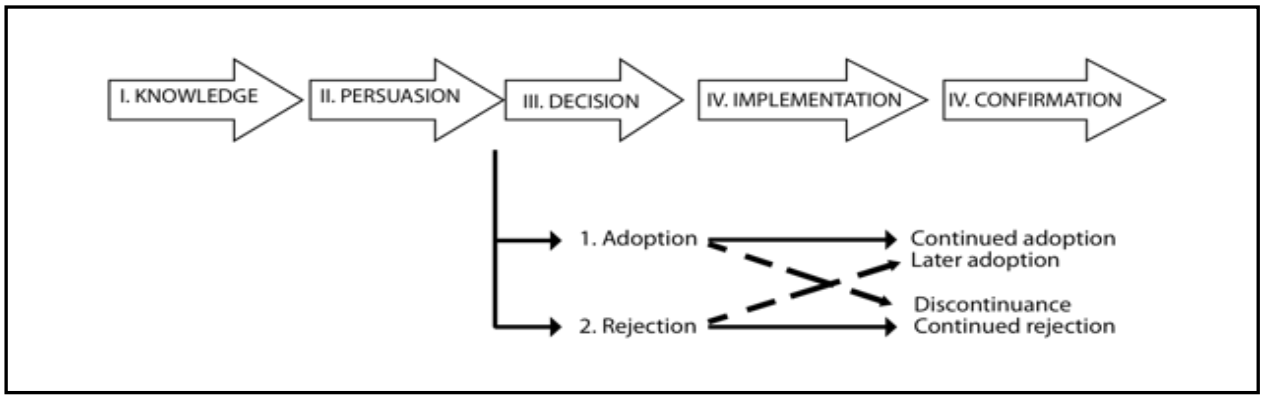

Figure 2.16: Model of stages in the innovation decision process
(Rogers, 1995:163)

Without evaluating the feasible potential of a new technology, it could be difficult for SMMEs to understand the dynamics and magnitude of the potential obtainable from the adoption of the new technology. Nguyen *et al.* (2013:2) state that:

> The key to this lack of success appears to be a disconnection between vision and execution: organizations do not do enough research and planning before implementing the new technology, often because management is unclear about how and why their firms are adopting IT in the first place.

The challenges SMMEs face are linked to the problems that emanated from the non-evaluation of the potential of a new technology before adoption (Chan *et al*., 2012; Maryeni *et al*., 2012; Kim & Garrison, 2010; Dyerson *et al*., 2009; Nguyen, 2009). The lack of new technology

evaluation before adoption and integration often leads to many SMMEs not adopting new technology with potential advantage, or adopting the wrong technology. The low rate of adoption can be ascribed to a lack of the evaluation of new technologies because SMMEs do not have the knowledge of the dynamics and potential of the new technology.

As a result of non-evaluation and non-adoption of new technology, SMMEs forfeit the opportunity to gain a competitive advantage for their business in terms of an increase in growth and efficiency rate, and an improvement in the quality of goods and services rendered (Maryeni *et al*., 2012; Boateng *et al*., 2010; Verhees *et al*., 2010; Uden, 2007; Kim & Mauborgne, 2005).

The evaluation process starts from the point of no knowledge or first knowledge to increased knowledge of its features and characteristics, to an in-depth evaluative measurement, which results in an analytical and predictive conclusion (Palvalin *et al*., 2013; Cowan & Daim, 2011; Dyerson *et al*., 2009). The evaluation process of new technology starts with the familiarisation of the advantages, implications, constraints, information and potential of the new technology. When knowledge of a new technology has been obtained, the adaptability, applicability, compatibility and capability of the technology determine the decision to possibly accept, adopt and implement the new technology (Dyerson *et al*., 2009). Thus, non-adoption of technology is often based on the lack of evaluation of the potential and constraints relating to the adoption and utilisation of the new technology (Cowan & Daim, 2011; Cragg *et al*., 2010).

Whatever the factors involved in the choice and adoption approach implemented by SMMEs, the ability to successfully adopt, integrate and manage new technology lies largely in the evaluation procedures which lay the foundation for successful adoption and integration (Rodríguez & Pozzebon, 2011; Cragg *et al*., 2010; Brown & Russell, 2007; Love *et al*., 2005). The foundation for evaluating and adopting new technology must be properly planned and laid out with the necessary implementation and procedural approaches. Also, integration and management of the new technology with the required technical skills must be in place or planned for upon implementation. This should be done before the desired and potential impact on the deliverable products, services and returns on the investment can be fully realised.

The decision making process in an organisation or by an individual is an important aspect which has a considerable impact—it could either reflect a positive or negative effect. The adoption of new technology processes in the DOI theory has been found to be quite tautological in design and does not resonate nor encapsulate the nature of the new technology (Landt & Damstrup, 2013). Technologies are not of static nature and therefore should not be regarded as such.

Bagozzi (2007) argues that the IS/IT field is at a risk of being deceived, misled and cohearsed by the gradual build-up of intermittent evidence being presented by research to support decision making processes in relation to the acceptance and rejection of technology.

Bagozzi (2007) argued that going forward a unified theory is needed and required and required to guide decision process, and as a result, he developed the core of decision making presented in the following diagram (Figure 2.17):

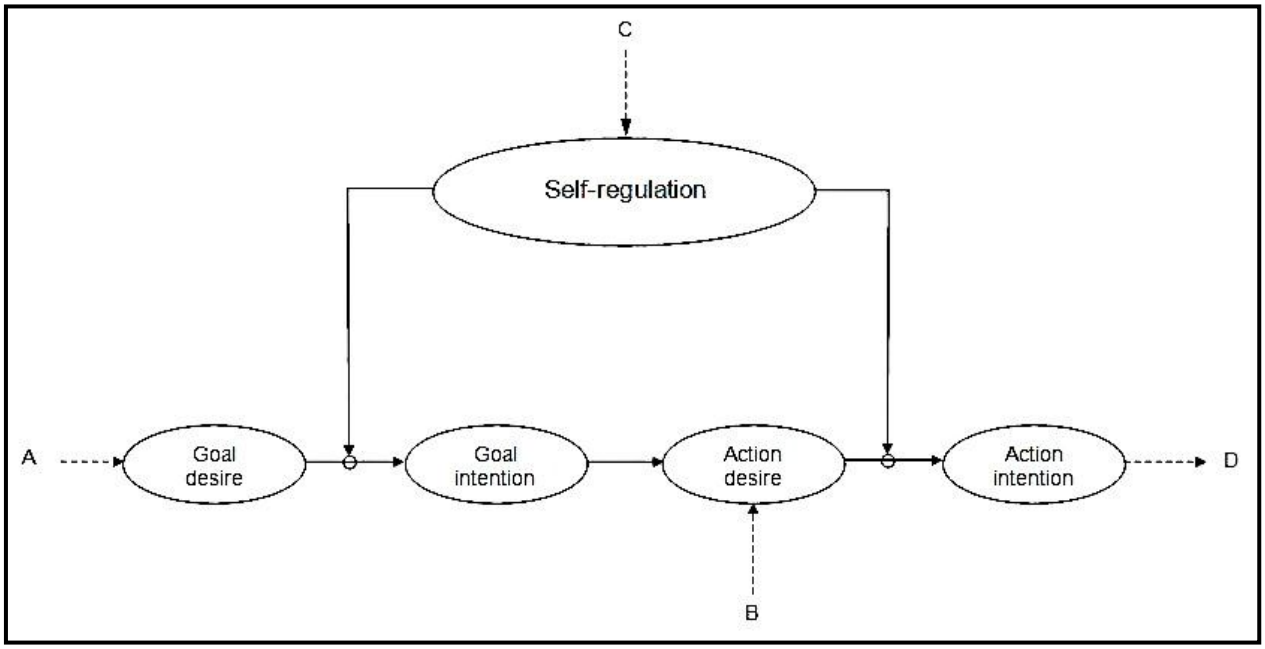

Figure 2.17: The core of decision making
(Bagozzi, 2007:250)

2.9.2 Knowledge and awareness of new technology

Rogers (1995) in his book defines the Innovation Decision Process (IDP) as the stage which a person or other decision makers such as groups, businesses, a country, society and other applicable units consciously pass through. This stage of innovative decision making consist of five processes which are applicable to business enterprises as follows:

- Having the first knowledge of the new technology
- Forming a constructive attitude towards the new technology
- Making the decision to either adopt or reject the technology
- Implementation and integration of the new technology
- Confirmation of the compatibility, adaptability, capability and applicability of the new technology

Rogers (1995) describes the first stage of technology decision making as the point of awareness where the person obtains knowledge about the existence of a new technology. This point entails three basic types of knowledge accumulation about the technology, described as:

- *Awareness* knowledge—provides information about the existence of the technology
- *How to* knowledge—provides the required information about the proper usage of the technology
- *Principles* knowledge—consists of the essential information on the principles of the functioning ability and operability of the technology. The information shows the characteristics and features of the new technology

According to Lundmark (2008), most of the research on diffusion of innovation and technology acceptance is based on a rational pattern of selected theories and models. It is assumed that the people involved have clear and defined objectives and goals which prompt a rational way of choice. This view offers no explanation for the reason why efficient new technologies are not adopted, or technically inefficient new technologies are in fact adopted. A major barrier to the study of adoption with regard to new efficient or inefficient technology is the ability to determine which new technology has the potential to deliver the desired result (Lundmark, 2008). New technology cannot be generally accepted to be efficient or that efficiency would be guaranteed. It could be ambiguous because of the conditions under which an organisation or individual might reject a technology based on their own typical decisions and choices of models. This leads to the question whether the model is inaccurate or whether the technology is not capable of what is required. The rationale behind the adoption of new technology is thus dependent on factors of exposure and the visibility of use by other people (Lundmark, 2008; Rogers, 1995).

The knowledge of the adoption of new technology is advanced by the understanding of the different communication channels, particular actors, and social networks involved in the adoption process. The rate of observability and use of new technology are influenced by communication channels which include networking with peers, the media, internet, professionals, societal trends and many others (Nguyen *et al*., 2013; Hoffmann, 2011; Rogers, 1995). Network communication promotes the sharing and exchange of information and knowledge, based on interaction with external elements with similar interests or stakes applicable to the organisations within a network (Nguyen *et al*., 2013). Rogers (1995) therefore describes the inclination of peers to follow the recommendations of others based on the similarities that exist between them, as having homophilous or heterophilous attributes.

According to Rogers (1995), a person is likely to listen to recommendations or examples of peers that operate in a similar environment having similar attributes (homophily) rather than someone with differing and multiple types of attributes (heterophily). Some individuals are seen as change agents in a network because of their propensity to be ahead of others in new grounds and they often wield an influence on others because of their connections and power they possess. A change agent can be a manager or managers and directors of other organisations within a sector whose decision to adopt a new technology might lead to other peers following suit (Hoffmann, 2011; Rogers, 1995).

2.9.3 Investigating business potential of new technology

Introducing a new technology within the company involves a broad decision making process which not only affects the individual users but the stakeholders as well. This tendency is in alignment with many of the technology acceptance models that embrace the fact that social, environmental, organisational and governmental factors contribute to the user's perception and acceptance of new technology (Abulrub *et al*., 2012; Chan *et al*., 2012; Cowan & Daim, 2011). According to Melville *et al.* (2004, as cited by Palvalin *et al.,* 2013:548) the business value of technology can be defined as:

> …the organizational performance impacts of information technology at both the intermediate process level and the organization-wide level, and comprises both efficiency impacts and competitive impacts.

The impact of new technology on the organisational performance is visible in aspects of profitability, efficiency, market value and shares, productivity, quality, competitive advantage and many others.

Evaluation of new technology by SMMEs is essential due to the high capital outlay required to invest and the considerable degree of uncertainty and unknown associated risks applicable to the technology (Love *et al.*, 2004). According to Fitzgerald (1998), evaluation of ICT investment is a difficult process, especially to determine the return on investment. The failure to evaluate and the lack of proper understanding of the implications of adopting a new technology on the business in its entirety, may lead to the adoption of inappropriate technology or the non-adoption of a potential new technology with advantages for business growth (Palvalin *et al*., 2013; Abulrub *et al.*, 2012). However, due to the nature and variety of evolving technologies available in the market, it is challenging to identify and measure the applicable benefits and productivity impact on the business process (Palvalin *et al*., 2013).

The more effort is put into a detailed analysis of a new technology, the more advanced knowledge is gained of the potential impact of the technology. For a business to fully realise the accruable beneficial impact of new technology, the technology must be suitably in synchronisation with the business process and utilised in the best manner to function appropriately (Palvalin *et al*., 2013).

One of the motives for businesses adopting new technology is to gain more from their initial investment outlay according Chan *et al*. (2012), Lee *et al*. (2010) and Love *et al*. (2005) is by focusing on improving the profitability of the business through an increase in work efficiency, quality of service, productivity ratio and cost reduction in the long run. Chan *et al*. (2012), Cowan and Daim (2011), Rodríguez and Pozzebon (2011), Dyerson *et al*. (2009) and Nguyen (2009) posit that for new technology to be fully adopted and utilised appropriately, an evaluation of the applicability, adaptability, compatibility and capability features and characteristics of the new technology must be highlighted. The evaluation must be done in view of the potential benefit of integrating new procedures into the business system.

The projected life span and continuing relevance, estimated cost implications over a period, and the expected returns on investment projected for the same period, are important considerations. Abulrub *et al.* (2012) and Cowan and Daim (2011) state that these evaluation procedures of technology forecast (mentioned above), need to evaluate each particular technology and SMME according to individual context or collective characteristics. The evaluation thus incorporates surrounding factors such as environmental, political, cultural, ideological, religious, economic, geographical, organisational and regulatory policies and behavioral tendencies of the business (Landt & Damstrup 2013). The relating relevant factors present must all be taken into account in the evaluation process. The evaluation should be properly investigated, documented and show the advantages and disadvantages of the potential technology. The result of the projected impact of the new technology on the business over a set period and range of time should be clearly stated. Another key factor to take note of is the risk involved in the uncertainty of the future of the technology, although it is generally expected that return on technology should outweigh the risks associated with the adoption (Abulrub *et al*., 2012; Chan *et al*., 2012) However, Lee *et al*. (2010) and Love *et al.* (2005) state that decisions of owners/managers also depend on how much the decision makers are willing to accept, as an equitable risk, to balance the level of uncertainty, and probability of the outcome, which is relatively unknown.

Not meeting financial and time targets due to not realising the planned outputs, highlights the consequence of not adopting new technology (Abulrub *et al*., 2012; Cowan & Daim, 2011).

Investment decisions have been further broken down by the application of risk analysis using financial techniques to support informed investment decision making processes in the business. The challenge for SMMEs remains in the lack of adequate resources and proper knowledge needed to get the necessary information and data needed for accurate evaluation, in order for the new technology to be feasible (Chan *et al*., 2012; Cragg *et al*., 2011; Dyerson *et al*., 2009).

Also of note, according to Abulrub *et al.* (2012), is the potential need for training and support of employees if the adopted technology requires up-skilling and operational knowledge of the new system. This requires delicate and successful change management handling to integrate the new technology into the business process. SMMEs usually do not possess the required skills and knowledge to handle new technology (Chan *et al*., 2012). The business could incur losses or delays in terms of productivity due to the expenses needed to train employees to the standard required; also, hiring additional staff might negatively impact user acceptance of the technology (Abulrub *et al*., 2012; Love *et al*., 2005). There is a need to determine the impact of the new technology on the operability level of employees. Further consideration might also include maintenance and support of the system which SMMEs will view as another expensive commitment, although suppliers are often expected to provide some form of sales support for a certain period. This usually has a good effect on the level of intention and plays a role in technology adoption.

The role of government cannot be over emphasised when talking about providing support for SMMEs to enable them to capitalise on the benefits of adopting new technology (Abulrub *et al*., 2012). Cowan and Daim (2011) and Lee *et al.* (2010) posit that government can assist SMMEs by creating platforms that will sensitise them to the need of identifying the relevant technology to boost and develop business through a process of evaluating the business potential and decision-making concerning new technology. Although much attention is placed on analysing the potential benefits, it is only one part of the evaluation process of a new ICT investment (Fitzgerald, 1998). Evaluation employs a holistic approach to measure and compare new technology in terms of business needs, benefits, cost implication and potential risk. Suitability to business processes, implementation and organisational development are ranked accordingly to justify investment decision (Love *et al*., 2004).

According to Petty and Cacioppo (1986, as cited by Lundmark, 2008) and Aronson *et al.* (1998, as cited by Lundmark, 2008) in the Elaboration Likelihood Model (ELM), there are two subjective ways of decision making, namely *central* and *peripheral.*

Under the *central* type, people pay more attention to facts from a communication channel because they are motivated to do so. They can be convinced when the logical reasoning of the argument compels them. Also, the central type is considered more subjective, because over time, it produces more relatively stable attitudes. Factors that characterise the central style are expertise on subject matter, high need of subjectivity and high relevance of status.

On the other hand, people can base their decision on physical attributes, how attractive and appealing it is, and the position of the communicator, thus, *peripheral* decision making. Factors attributing to this type of decisions are low self-esteem, an unfocused mind and low need for subjectivity as a variable to personality. Decisions can be made in an organisational context by a single person, a single person after deliberations and consulting with others, or as a group by reaching a consensus, thus, organisational decisions are made by individuals acting on behalf of the company, or by a group of people in the organisation.

2.9.4 Decision making on new technology (Acceptance or Rejection)

Table 2.6: Theoretical perspective explaining the diffusion and rejection of administrative technologies (Abrahamson, 1991)

Outside – Influence Dimension ↓	Imitation – Focus Dimension →	Imitation Process Do not Impel the Diffusion or Rejection	Imitation Process Impel the Diffusion or Rejection
Organisations Within a Group Determine the Diffusion and Rejection Within This Group		Efficient—Choice Perspective	Fad Perspective
Organisations Outside a Group Determine the Diffusion and Rejection Within This Group		Forced—Choice Perspective	Fashion Perspective

Efficient-Choice Perspective—built on two major assumptions:

- Organisations existing within a social group are free to independently choose whether or not they want to adopt an Administrative Technology
- Usually organisations have concrete goals and objectives, and their expectations on how efficient technologies can help to reach their desired result

Consequently this perspective promotes the assumption that choices can be seen as rational, leading to the choice and acceptance of efficient technologies (Abrahamson, 1991). Organisations adopt new technology that is considered a means of attaining goals, and reject technologies that do not have the required potential. This makes the relative advantage of the new technology the primary factor that promotes the adoption (Lundmark, 2008).

Forced-Selection Perspective—based on the premise that powerful groups and organisations outside the targeted sector of diffusion of the new technology may have interest in influencing and forcing choices made by the organisations to either accept or reject the new technology due to exerted pressure of political nature. This makes the political or legislative pressure a relative force in promoting adoption; likewise inefficient technology might end up being circulated and adopted among an organisational sector if it receives the backing of a powerful group.

Fashion Perspective—is built on the assumption that if organisations are uncertain about the goals, environment and efficiency of the technology, they tend to be easily swayed and influenced by communication actors outside of their group such as business media, mass media and consultancy companies which leads to the imitation of others outside of their community. The indicative power of the fashion setters (early adopters) is a strong influence for promoting adoption.

Fad Perspective—is built on the assumption similar to that of the fashion setting, that organisations are faced with uncertainties such as goals, environmental factors and efficiency of the new technology. The fad perspective states that diffusion of innovation occurs when similar actors within a community imitate themselves within that same community. The factor promoting adoption among the organisation is the number of compositions and influence of status within that community.

New technology needs time to mature, with levels of experimentation and ample experience to fulfil its purpose and potential. The time period is dubbed “time-to-value gap” by Fenn and Raskino (2008, as cited by Landt & Damstrup, 2013:40). Landt and Damstrup (2013) state that the time-to-value term is the time frame between the knowledge of a new technology, and the capacity to determine the value as a currently predominantly introduced technology. The time lag usually takes longer in emancipating than people would think. As a consequence, a feeling of negative hype is generated when it comes to light that there is a variation between the potential offered by the technology and actual realisable value.

In order to predict the value of a new technology, there are four areas of concern where potential voids needs to be covered. These areas are:

i) Performance: The new technology must perform consistently with a high level of accuracy within the levels of its capability, must be adaptable to new or existing processes, compatible with other functional equipment in the system, and the

applicability to the business functions must be duly established, with a reliable level of performance and output, and any other relevant performance and functional metrics.

ii) Integration: The new technology must be made operational in a real time working environment and conditions, within a certain budgeted cost, and a specific time frame. This period must also be supported by qualified and reliable technology vendors.

iii) Penetration: The individual users must embrace the new technology, recognise the advantage, capacity and capability, and understand the benefits it possesses.

iv) Payback: Understanding that financial returns may not be in a rigid capacity; it may not immediately manifest in benefits as anticipated.

Every business enterprise, no matter what type of characteristic or profile, should have a conscious drive of adopting new technologies (Landt & Damstrup, 2013). They also indicate that the hype cycle methodology consists of four plots:

- Adopting too early
- Giving up too soon
- Adopting too late
- And hanging on for too long

The *Plot 1* hyperactive organisations adopt very early and are in the positive hype position, while the Plot 2 organisations, the impatient ones who give up too soon, are in the negative hype position just preceding the slope of enlightenment. The *Plot 3 and 4* organisations lag behind by failing to adopt early enough and are usually found to hang on to a technology for too long. As a result of stubbornly holding on to their present status because of the low-level of risk they feel comfortable with, they usually end up at the obsolescence cliff from the descent of diminishing returns. Extensions to the hype denote the stage of decline in the life cycle where the technology undergoes replacement and is discontinued.

When a technology is adopted late, it limits the potential and ability to exert influence on the market share because the tenacious incumbents have a strong domination on the market place, with a predominantly exclusive experience of the new technology in the market place.

Fenn and Raskino (2008) propose a technology decision making model process called STREET (Figure 2.18), the acronym for phases in the process, and represents **Scope**, **Track** and **Rank** in the first category. It also includes latter stages such as **Evaluate**, **Evangelise** and **Transfer** of the technology.

The model and processes were developed based on the principles and foundation of best practices from different types of organisations, the industry sector and general societal situations. The set of activities represented in the process forms part of the most important component of decision making that takes place in the early stages of the adoption of new technology. The organisation and Information Systems (IS)/IT literature consists of many theories, techniques, models, frameworks and various other tools that seek to explain the constraints and challenges that surround the selection of a new technology. The main objective of the STREET process therefore is to address the major difficulty and constraints in choosing the proper technology at the right time, thus laying the foundation for the broad usage of the technology for the operations of the business (Landt & Damstrup, 2013).

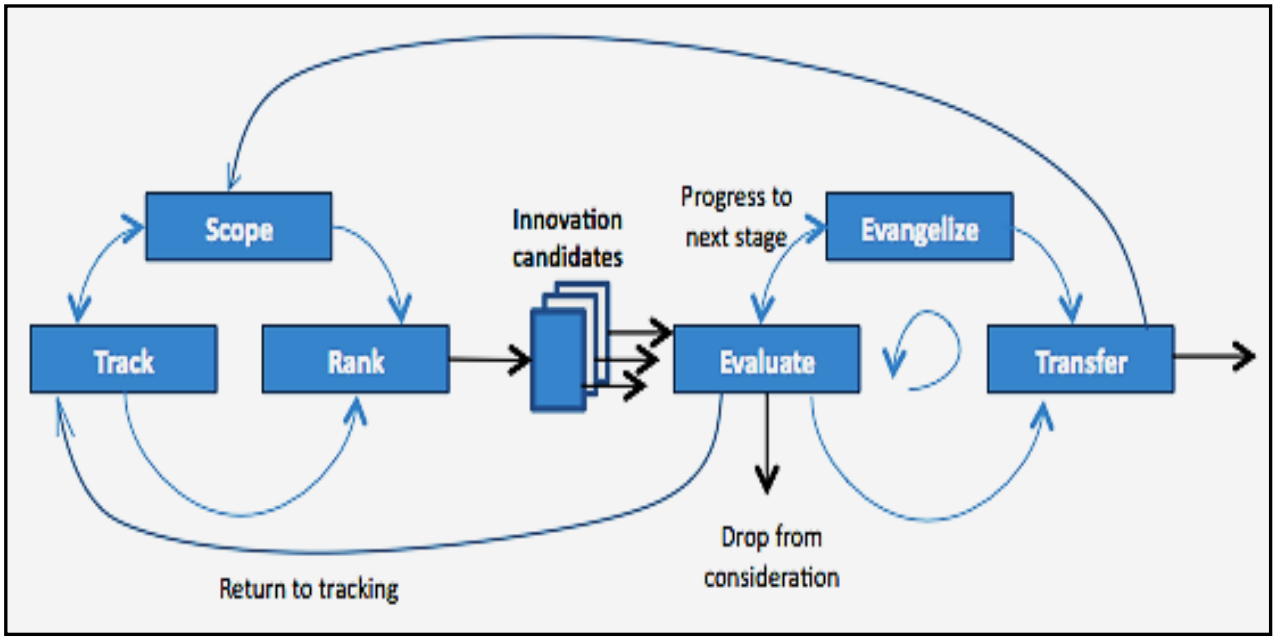

Figure 2.18: Decisions in the evaluation stage of the STREET process
(Fenn & Raskino, 2008, adapted from Landt & Damstrup, 2013)

Due to the unpredictability and evolving nature of technology, the STREET process covers activities in an iterative manner, with multiple directions of relationships existing between different stages of decision making. The process of adopting new technology has been widely researched for several years now and popularised by the seminal diffusion of the innovation theory by Rogers which has been used by many, with numerous acclaimed plaudits and accolades by researchers down the line (Landt & Damstrup, 2013). The STREET process presents a rather different angle from the DOI process as proposed by Rogers because it does not seek to explain the rate at which a new technology is adopted through asking *what*, *where*

and *how* in a sequential manner without giving consideration to the nature and composition of the new technology.

Both the STREET and DOI process share a number of similarities; both utilise a multiple phased process in the adoption of new technology, with the DOI stage consisting of the knowledge, persuasion, decision, implementation and confirmation similar to the five stages of STREET, but with different composition. However, what STREET rather does which is excluded from DOI, is establishing a business scope for the organisation, tracking a new technology that is aligned with the organisational scope, and ranking the various new technologies according to the priority of the business objectives (Landt & Damstrup, 2013).

The ranking process produces a list of the most appropriate, relevant and top-ranked new technology candidates. This list of potential candidates is subsequently put through a comprehensive and rigorous evaluation process where all aspects of functionality, performance, integration, risk and uncertainty are incorporated into business factors to determine the most suitable option. According to Landt and Damstrup (2013), there are four courses of action that can be taken in the aftermath of a decision made:

- Go ahead with the adoption process
- Re-evaluate the new technology
- Return the technology to the initial tracking phase until it further matures
- Discontinue the new technology

If the decision is made to proceed with the adoption, an informing process is initiated which involves evangelising and technology transfer.

Tracking—this stage provides a general idea of the potential new technology candidates before proceeding to the next stage of evaluation. Since the scope stage has already filtered the potential new technology according to the business values, the objective here is to appropriate a wide range of potential new technology candidates within the scope of the business objectives and not focusing solely on the hyped and media channelled ones. At this stage, there is a distinction between new technologies with the potential of going forward and those that lack the necessary acumen to be evaluated. Therefore a set of factors to determine the ranking process can be developed to assist in the prioritisation of objectives. Tracking also involves monitoring a competitor's strategy, operations, growth and other aspects, to stay informed about its progress so as to not lose sight of the competitive advantage and its effect on the market share.

Ranking—Ranking and prioritising involves setting the potential new technology according to the relevance of the organisation's functions and objectives. Ranking can be quite challenging because the resources needed to examine all related information on the potential value and future predictive value of the new technology are usually not available. The easier part is said to be mostly finding and tracking the new technology, while ranking is more difficult because of the rather undefined abstract nature of new technology. We can therefore only predict the future of the technology based on certain factors because there is no crystal ball in existence for that. Fenn and Raskino (2008) did put forward eight relevant factors for ranking new technology:

i) Scale of benefit: What value will the new technology bring to the business, and will it measure as transformational high, moderate or low benefits? (It is better when higher).

ii) Scope: Where and how will the new technology be adopted—within a group, section, specific unit, regionally? (The wider, the better).

iii) Current state of maturity: How mature is the new technology? (The higher the level, the better the maturity).

iv) Time to reach value/maturity: This is the period it will take the new technology to attain the pinnacle of productivity. (The faster it moves to the top, the more closely it should be examined).

v) Risk: What are the associated risks of the new technology in terms of performance, integration, penetration and payback? (The lower the risk involved the better).

vi) Cost: What are the cost estimates associated with the development, adoption, integration and implementation? (The lower the cost, the better).

vii) Sponsors/Champions: Are there people or groups associated with the new technology that wield some form of power or influence? (The potential adoption may depend on the sponsors and champions).

viii) Current activities inside the firm: Is there an existing technology with similar attributes to the new technology which can be leveraged, or has prior investigation been done? (Existing technology and prior knowledge as well as skills and expertise of a similar technology can aid the decision to adopt or reject the new technology).

These determinant objectives can be used as radials and inserted into a Spider Chart (Figure 2.19) as a ranking tool, which scores the potential new technology according to each factor as it fits best and meets the objectives.

A new technology that has a low objective will be plotted more closely to the center while the one that satisfies a high objective is plotted towards the high end of the radial, with a value attached to each different objective. A minimum standard score for each stated objective can be inserted which disqualifies any new technology that falls below that particular level, and these give a visual assessment of the new technology based on prioritisation.

After the ranking stage, the eligible candidate that meets the most desired priorities is selected for evaluation. This stage can also be conducted using other traditional methods such as scoring models, net present value (NPV), return on investment (ROI) and cost/benefit/risk matrices and analyses, but according to Fenn and Raskino (2008), the described method is more suited for, and applicable to evaluation processes in small business enterprises because of their peculiar characteristics (Landt & Damstrup 2013).

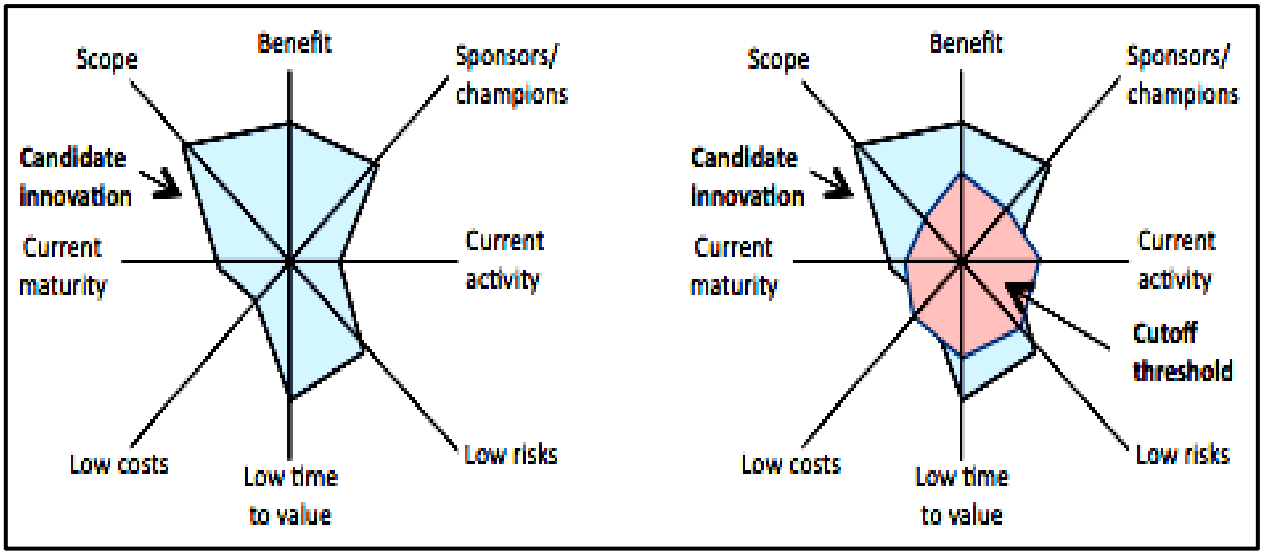

Figure 2.19: Ranking innovation and cut-off threshold
(Fenn & Raskino, 2008, adapted from Landt & Damstrup, 2013:50)

During the evaluation stage, a critical question has to be answered: Is there a justifiable business case and need for the new technology? After the two previous stages successfully filtered away the less favourable new technologies not in line with the business values, the remaining candidates are evaluated on the basis of their cost, benefit and risk profiles according to an adoption design and criteria which can include staff/training, milestones, cost, capacity of output, capability of processing, applicability to relevant key areas, adaptability to new or ongoing processes and decision profiles, among others.

The evaluation of the cost and risk associated are necessary and can also be done by addressing the value voids stated earlier, in the form of performance, integration, penetration and payback, by determining the estimate cost using methods such as ROI or NPV.

After the process of evaluation, a decision is sought to determine whether or not to proceed to the next stage, re-evaluate the technology, return the technology back to the tracking stage or stop the consideration of the technology. If a decision is made to proceed with the new technology, the processes of evangelising and technology transfer are activated.

Evangelising and technology transfer are the last two stages of the STREET process which mainly deal with managing the change that the technology has brought about in the organisation. At this stage the issues of resistance and potential barriers to the change have to be handled appropriately for the successful adoption, implementation and integration of the new technology.

Evangelisation is about sharing, communicating, explaining, informing and convincing people of the advantages and potential benefits of the new technology and getting users and stakeholders to buy into it. Guy Kawasaki in his book, *Enchantment: the art of changing hearts, minds and actions* (as cited by Landt & Damstrup, 2013), suggests five fundamental business evangelisms:

- Believe in the vision
- Understand the vision
- Believe in people
- Set an inspiring example
- Share the cause

Adopting a new technology without the people in the organisation supporting and accepting it can have a disastrous effect on the entire adoption process.

The final stage of the STREET process is called the transfer stage. It is the point at which the acquired knowledge, information and undertaking of the people who engineered, assessed and diffused the new technology, are transferred to the people who are tasked with implementing and activating the technology for the business. Transfer is the ability to make constructive knowledge as clear and straightforward as possible.

Although evaluation has been a factor affecting the adoption of new technology as indicated over the years by many researchers, studies have shown that the evaluation of new technology has not been sufficiently explored and deployed as a fundamental and important element that

influences adoption and non-adoption of new technology in SMMEs (Chan *et al*., 2012; Cowan & Daim, 2011; Harindranath *et al*., 2008). The above-mentioned scholars further state that it has only been researched in bits and pieces without attaching the much weighted importance and emphasis required to put evaluation forward as the major factor that influences the adoption process in SMMEs. Based on the stated premise, this research focuses on the needs of, and constraints affecting and contributing to the successful evaluation of new technology characteristics, relating to the adoption or non-adoption of new technology by SMMEs in South Africa. The stages of strategic acceptance as proposed by Abulrub *et al.* (2012) highlight key considerations and steps required to evaluate and adopt new technology by SMMEs. Abulrub *et al.* (2012) state that the stages represented in Figure 2.20 below, are important to SMME acceptance and adoption of new technology for the business. Failure to cover the steps appropriately leaves the business vulnerable to danger and challenges.

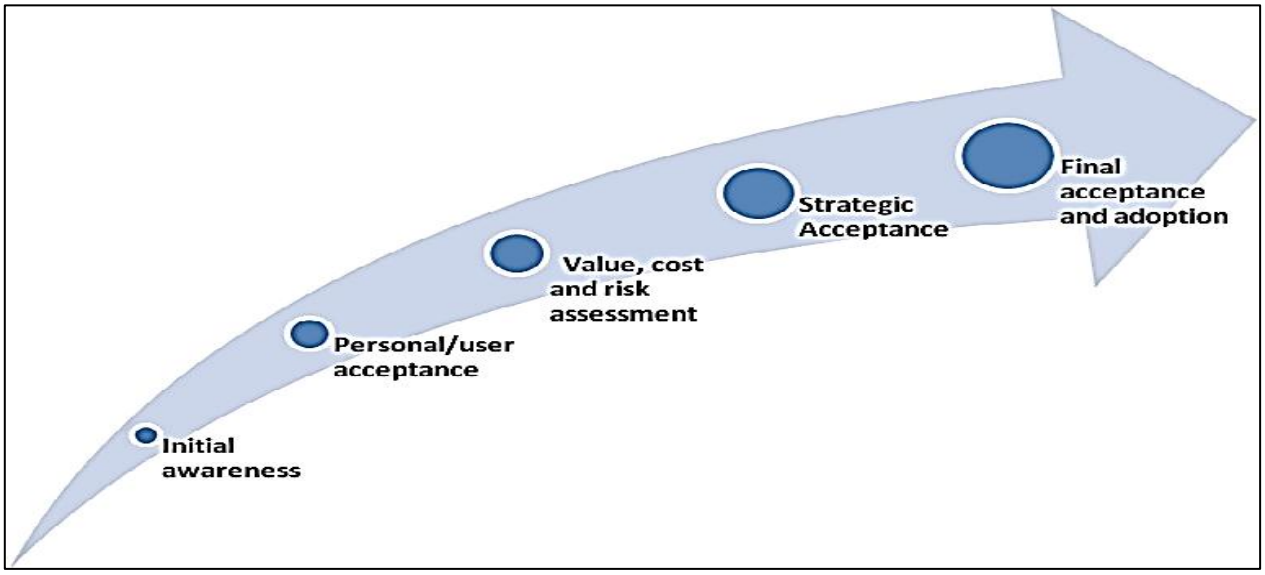

Figure 2.20: Stages and processes to strategic acceptance
(Abulrub *et al*., 2012:312)

When it comes to small business practice, the practicalities involved require a change in orientation on how evaluation is perceived by business managers, and it requires an understanding of the concept and values of risks analysis and benefit management practices in business (Palvalin *et al*., 2013; Serafeimidis & Smithson, 2000). Contrary to the objection of cost and unavailability or limited resources as main barriers of new technology adoption, studies have recently found the absence of proper planning and evaluation as the main barrier to new technology adoption by small businesses in the USA (Ghobakhloo *et al*., 2011).

Therefore, the more effort is put into a detailed plan and analysis of a new technology, the better knowledge is gained of the potential impact of the technology and its usefulness to the business. New technology adopted with disregard to the factors and relationship that exist within the dynamics of evaluating the new technology, jeopardises the potential benefit and realisation of the benefits accruable (Aleke *et al*., 2011).

SMMEs are predisposed to investing and adopting new technology for the business when it offers them a competitive advantage over competitors and enables them to increase their efficiency and productivity rate even though constrained by limited resources (Dalipi, *et al*., 2011). Such a position is only relevant when SMMEs understand the value and ramification of key decisions which can only be guaranteed by proper knowledge and evaluation of the new technology. Competitive advantage gives businesses a leading edge over competitors and it is used as a strategic tool to positively bring about organisational change in the business process (Nguyen *et al.,* 2013).

The main motive behind most extensive ICT innovation investments in business is the promise and potential of an increased competitive advantage and level of sustainability the new technology offers the business (Dalipi, *et al*., 2011). To ensure SMME transition from a local small business into international markets in dynamic and competitive situations, SMMEs need to rethink and adjust their business orientation, mission, evaluation, and adoption culture to ensure their continual survival (Palvalin *et al*., 2013). Compared to other adoption factors, evaluation plays a crucial role in the decision to adopt new technology, because of the necessity to establish and determine the fit between the business and the new technology and benefits accruable (Buonanno *et al*., 2005). SMMEs must endeavour to continuously research and acquire knowledge on new technologies available to them, taking into consideration factors of an environmental, social, organisational and technological nature (Rantapuska & Ihanainen, 2008).

2.10 Summary

This chapter reviewed the implications of using Information and Communication Technologies in the development of SMMEs. Various definitions of SMMEs were presented, including the South African definition on which the research is based. Different government organisations and agents tasked with the development of SMMEs, especially in terms of technology aspects, were illustrated and their contributions observed. The existing gap between developed and developing countries in the adoption rate and development of SMMEs was highlighted. Several barriers and factors affecting SMME adoption of new technology were also explored and examined.

The role of ICT in business and the benefits it offers to SMMEs were illustrated. The role of government policies and the position on promoting the adoption of new technology by SMMEs were examined critically.

Evaluation of new technology was explored from the knowledge acquisition stage to the decision and implementation phase. The history of uncomplimentary traditional approaches to evaluation was discussed. The practice, methods and models of evaluation available to assist organisations in evaluating the potential of new technology, were presented. The role and importance of evaluation especially to small business enterprises, was emphasised. The impact of evaluation and decision making on SMMEs was established. The limited research conducted on evaluation as a major influence on the adoption of new technology, was noted. No specific mention could be found in the literature of an evaluation tool to assist and guide SMMEs in particular during the evaluation of new technology.

Six Prominent ICT adoption models and frameworks were explored with the aim of understanding their premise and relevance, and potentially adopting one as a theoretical foundation for the research. The research adopted the *Integrated Framework on ICT Adoption* by SMEs because of its affinity to the research study. The framework combines features and concepts from DOI and TOE, which are the established firm-based models. The framework was developed in the context of SMEs in developing countries which resonates well with the context of this research. In retrospect, the initial adopted framework was found to be limited by the findings of the study, which lead to the adaptation of another model to provide a more comprehensive description and conceptualising of factors of evaluation and adoption of new technology by SMMEs (presented in Chapter Five).

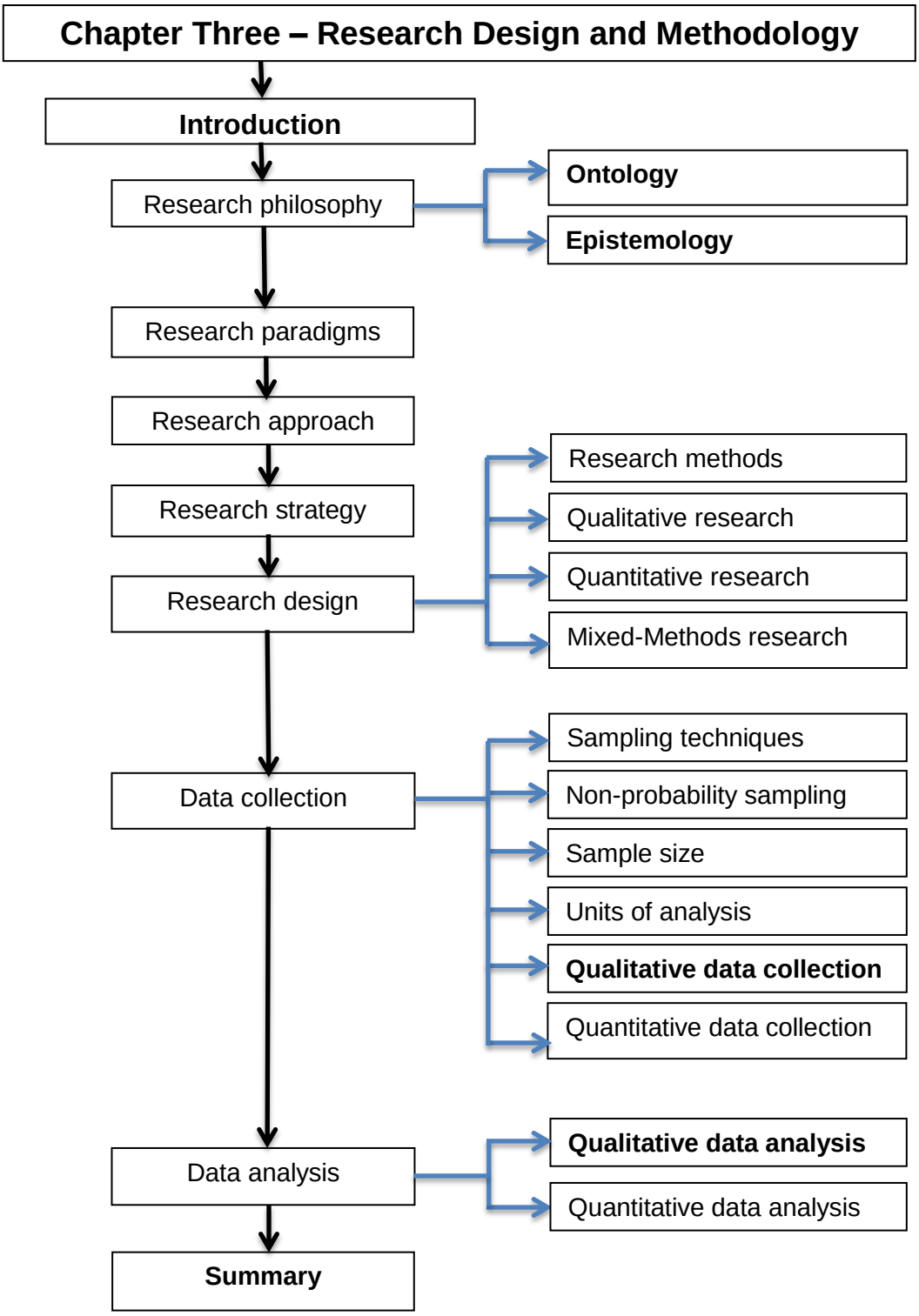

Figure 3.1: Graphical representation of Chapter Three

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter presents the research philosophy, approach and strategy that form the underlying basis for the choice of research design and methodology used in conducting this study. The concepts and techniques associated with a qualitative study are discussed within the specified scope of the study. The chapter further deliberates on the research design as well as the methods of primary data collection and sampling techniques that were used to select the participants and define the scope of the study. Also discussed are methods used in analysing and presenting the findings.

Research is a systematic structured enquiry that utilises scientific and empirical methods to understand problems and create new knowledge that is applicable to the nature of the problem, with the aim of contributing to the existing body of knowledge (Hughes, 2006). Scientific methods consist of systematic observation, classification and interpretation of data (Creswell, 2009; Plomp, 2010). The motive for research, according to Plomp (2010:13), "is to systematically organize an enquiry that aims at providing information and knowledge into issues with the objective of prescribing solutions to address the identified problems". All research enquiries are largely characterised by steps of procedures and processes in a laid out format. The form of enquiry is used to identify the characteristics and factors surrounding the research object to help achieve the set goals and objectives of the research study (Saunders *et al*., 2009).

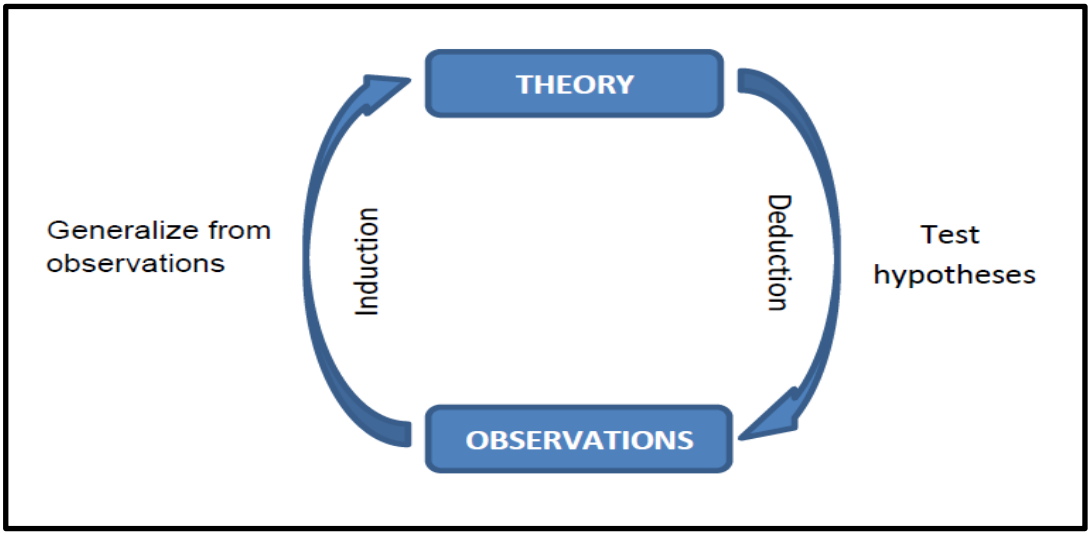

Figure 3.2: The cycle of research
(Bhattacherjee, 2012:4)

3.2 Research philosophy

The philosophical assumptions form the basis from which the research method and strategy are chosen and designed (Burrell & Morgan, 1979). According to Saunders *et al.* (2009), research is underpinned by the philosophical assumptions which show the particular way in which the world is viewed and understood. The philosophy of research is represented in three forms, i.e. ontology, epistemology and axiology. Research aims to contribute to the body of knowledge by seeking out the truth through various means of experimentation, investigation, observation and comparison, among others (Saunders *et al*., 2009). The philosophical constructs that underpin the research study are limited to the ontological and epistemological aspects of research.

3.2.1 Ontology

Ontology is concerned with the interpretation of the nature of reality (Saunders *et al*., 2009)**.** It represents a study of the essence of actuality and life within the concept of reality. Interpreting the nature of reality, and gaining clarity on understandable forms of reality, under the assumption of how the world operates in relation to each particular view point, can be of static nature or constant change (Bhattacherjee, 2012). Ontology seeks to answer the following question: "What is the truth based on the impartial view of subject matter?"

There are two concepts that influence an ontological stance or view of research—*objectivism* and *subjectivism*. Objectivism, according to Saunders *et al.* (2009:110)**,** "…dictates the ontological view of the researcher that in a social entity there exists a reality which is devoid of any social actors interested in its form of existence". A researcher with a subjectivist ontological view assumes that social phenomena emanate from the perception and conscious activity of those social entities that show interest in their existence. In a subjective reality there is a need to observe the situations, conditions and interaction of the social actors, to be able to derive an understanding of the reality of their existence (Burrell & Morgan, 1979). Social phenomena are not of a static nature; the phenomena constantly change due to the social activity and interaction surrounding it. The view of social constructivism is related to subjectivism because it believes the experiences, daily social activities and personal ideology are ways by which social actors create their reality (Saunders *et al*., 2009)**.**

This research study holds a *subjective stance* which implies that a situation observed can only come into existence through the action of humans in creating and recreating the phenomena observed (Orlikowski & Baroudi, 1991).

3.2.2 Epistemology

According to Neuman (2011:93), epistemology is all about understanding and knowing what the world is about and what truth is derivable from its essence. It involves what is needed to produce knowledge about the truth. Epistemology is concerned with the ways we go about acquiring knowledge in the world (Bhattacherjee, 2012). Epistemology is thus the reflection of the view which is applicable and most appropriate to the nature of the world, to determine what knowledge is, where and how we find the sources, and what limits the application of the knowledge (Easter-Smith *et al.*, 2008). The focus is on how humans can acquire knowledge and understanding of phenomena, looking to discover the truth and reality by the channelling of knowledge from one person to the other. According to Orlikowski & Baroudi (1991), there are three epistemological views used in conducting research. These views are:

- Positivism
- Interpretivism
- Critical Realism

3.2.2.1 Positivism

Positivism adopts the view that knowledge is only valid when it is created by empirical and verifiable means of evidence. Positivism believes knowledge is created only from observation. The beliefs and experience of the researchers are negligible to the output because the researcher is deemed to be excluded as part of the research process (Burrell & Morgan, 1979). Bhattacherjee (2012) agrees with Burrell and Morgan (1979), saying that positivism has an overlapping dependency on other types of theories, and it is only authenticated and certifiable through observations. The aim of positivist research is mainly to test theories through quantifiable forms of observation by generating statistical data and inference to improve the understanding and knowledge of particular phenomena being studied and generalising it to a population. The research in this study is not based on the philosophy of positivism because positivist researchers generally base their reality on an objective view, using measurable tools and quantifiable properties which are devoid of the contribution of researchers and subjects and their interpretation in a natural state (Neuman, 2011). This research study is not designed to test theory or generalise findings in a predictive manner (deductive research approach); rather, it seeks to infer patterns and relationships uncovered by the analysis of the data to the theory to create a better understanding of the subject matter.

3.2.2.2 Interpretivism

Interpretive research aims to understand phenomena subjectively through the empirical observation of the activities in human life (Saunders *et al*., 2009). Interpretive research studies are about how people create and communicate knowledge in their own subjective meanings, based on their unique experiences and insight as they interact in their naturally defined context (Neuman 2011; Burrell & Morgan, 1979). Interpretive research is based on the assumption that the social world is devoid of objectivity or rigid disposition, but rather a construct of embodiment of human experiences and social activities (ontology), and it is best studied and understood within its socially embedded context by deriving subjective meaning and interpretations from the subjects (epistemology) (Bhattacherjee, 2012). Interpretive research views the reality as phenomena embedded within a social context and tends to make sense of the phenomena by interpretation based on the subjectivity of the subject (Orlikowski & Baroudi, 1991). The interpretive researcher, unlike the positivist, ignores factual accounts of events, but creates his own meaning of the phenomena by subjectively interpreting the experiences and meanings of other people. The aim of the interpretivist researcher is not to generalise the population, but to provide a better understanding of how people obtain knowledge in a particular social setting (Neuman, 2011). The research of this study is based on an interpretive approach where the researcher acknowledges the different views of interviewees in a social setting devoid of abstractions. Thus, induction was derived from the multiple cases observed, and findings were generated from the views of the respondents interviewed to the effect of proposing an ICT evaluation and adoption of new technology guidelines for SMMEs. In order to capture the richness and depth required to understand evaluation and adoption issues of SMMEs, an interpretivist approach has been taken in analysing the extent of the success and problems faced by SMMEs.

3.2.2.3 Critical realism

Critical realism believes in the existence of a historical reality of the truth which is not reflective in the mind of person; however, this premise is not readily accepted as the truth even if the truth truly does exist (Bhattacherjee, 2012). Critical realism directs criticism at the social reality and attempts to transform the context of the reality of the phenomena (Orlikowski & Baroudi, 1991). Critical research believes that history is constituted of humans creating and recreating social reality, thus critical reality is aimed at changing a social reality from its current status by focusing more on the negative aspect of reality (Walsham, 1995). Orlikowski and Baroudi (1991) stated that critical realist researchers are not concerned with the interpretation of the views from a

social context, but the aim is active criticism of the phenomena with a view of changing the social status. Critical realism is closer to interpretivism than positivism because it also attempts to change the interpretation of the social reality thus acknowledging the existence of subjectivity in the reality of a social being. Critical realism though can be applied to both positivist and interpretive research paradigms as critical interpretivist or critical positivist (Saunders *et al*., 2009). The research study does not employ critical realism as the basis of the research philosophy because, according to Neuman (2011), critical research focuses on the basis of oppositions, conflicts and contradictions occurring in the contemporary settings with the aim to seek emancipation from the proponents of alienation and domination occurring in a society. The philosophical approach differs from the aim of the study in understanding the phenomena being studied in a subjective environment.

When conducting research, the most pertinent of all philosophical assumptions are those related to the underlying epistemology by which the research is guided (Neuman, 2011). The epistemology of this research study is based on an *interpretivist approach* where research is about how knowledge can be obtained based on an earlier conceived assumption.

Interpretivist studies are based on the assumption that reality is only accessible through mediums of social constructs which includes use of language, consciousness and expressed meanings (Myers, 1997). According to Walsham (1993, as cited by Myers, 1997), an interpretive research study in Information Systems is "…aimed at producing an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context". The philosophical concept of qualitative research is therefore captured by Myers below (Figure 3.3).

Figure 3.3: The philosophical functions of qualitative research
(Myers, 1997:4)

The philosophical foundation of interpretive study is based on the construct of phenomenology and hermeneutics which applies to the aim of the research study. The research study also adopts the principle of interpretive research as prescribed by Klein and Myers (1999). The table below shows the application of the principles to the research study and the emergent relationships reflective of the application of the principles.

Table 3.1: Summary of principles for interpretive field research
(Klein & Myers, 1999)

Principle	Explanation of research principle	Application to the study
1. The Fundamental Principle of the Hermeneutic Circle	This principle suggests that all human understanding is achieved by iterating between considering the interdependent meaning of parts and the whole they form. This principle of human understanding is fundamental to all other principles.	The coding and categorisation of the interview transcript was done by identifying similar meanings and translations in individual cases in comparison to others in an iterative circle, and looking at the combined pattern of emerging relationships in general.
2. The Principle of Contextualisation	Requires critical reflection of the social and historical background of the research setting, so the intended audience can see how the current situation under investigation emerged.	Existing technology acceptance and evaluation models were critically examined to establish prior and existing research done in the field of IS which provided the study with a background of rich historical context and application, thus the ability to relate previously established constructs to present conditions and happenings.
3. The Principle of Interaction between the researchers and the subjects	Requires critical reflection on how the research materials (or 'data') were socially constructed through the interaction between the researchers and participants.	Interview questions were based on the research assumption and theoretical data; responses from the interviewees were used as a measure of supporting or disapproving the premise on which the research assumption and impressions were based. Thus the interpretation helped to establish cognitive findings.
4. The Principle of Abstraction and Generalisation	Requires relating the idiographic details revealed by the data interpretation through the application of principles 1 and 2 to theoretical, general concepts that describe the nature of human understanding.	The research applied the principle of interpretive research by linking existing theoretical propositions and the underpinning philosophical constructs with the reality of findings observed from the empirical data collected. Analysis was done by using the current data collected and synchronising it with historical data from earlier research studies to ensure a good interpretation of the data collected.

Principle	Explanation of research principle	Application to the study
5. The Principle of Dialogical Reasoning	Requires sensitivity to possible contradictions between the theoretical preconceptions guiding the research design and actual findings ('the story that the data tells') with subsequent cycles of revision.	Conclusion of the research followed an iterative approach of multiple reflections which validated some pre-existing theoretical concepts from previous literature while also bringing into light unexpected possibilities and variations of outcomes.
6. The Principle of Multiple Interpretation	Requires sensitivity to possible differences in interpretations among the participants as are typically expressed in multiple narratives or stories of the same sequence of events being studied, similar to multiple witness accounts even if all tell it as they saw it.	Precaution was taken when treating individuals' responses based on their personal experience and narration of events by capturing the true meanings of their answers in their natural subjective environment. Efforts were made to deduce the inherent meanings and presenting it in its originality. Responses were carefully summarised and developed into themes composing of the different interpretations.
7. The Principle of Suspicion	Requires sensitivity to possible 'biases' and systematic 'distortions' in the narratives of the participants.	Diligent care was taken to eliminate bias and personal agendas in the narrative as much as possible by carefully presenting questions eliciting real life experiences and respondents showing genuine interest in the subject matter as stakeholders in the sector.

3.3 Research paradigms

A paradigm is a basic set of universally acceptable views that guide and channel the researcher towards the study of the phenomenon. Saunders *et al.* (2009:118) state that "…a paradigm is a way of examining social phenomena from which particular understandings of these phenomena can be gained and explanations attempted". The research design process is based on the mental models called beliefs systems or modes of information that were used to establish processes and interpret deductions and observations (Bhattacherjee, 2012). According to Burrell and Morgan (1979), a researcher's theory of knowledge can either be subjective or objective. Burrell and Morgan (1979) categorised four constructs into underlying quadrants which form a research paradigm for social research. They include the following:

- Radical Humanism
- Interpretivism
- Radical Structuralism
- Functionalism

Figure 3.4: Four paradigms of social science research
(Burrell & Morgan, 1979, adapted in Bhattacherjee, 2012:19)

Functionalism: This paradigm assumes rational human action on the premise that behaviours can be understood by the use of hypotheses and testing. It is objective/regulatory in nature and used primarily for organisational study.

Interpretivism: This paradigm seeks to explain the nature of behavior as it occurs in the individual's point of view. Researchers aim to observe the natural processes to understand the individual behaviors better in a certain context. It is subjective and regulatory.

Radical Humanism: It is a paradigm that visualises the current reality as separating people from their truth, and is concerned with emancipating the social reality from social constraints by using radical change. It is subjective with radical change and anti-organisational.

Radical Structuralism: This theory recognises intrinsic structural differences within a society that causes constant change through economic and political crisis. It is the basic paradigm of Lenin and Marx Engles. It is objective with radical change.

3.4 Research approach

Saunders *et al*. (2009) state that there are two types of approaches in research which clear the direction to which path should be followed. These research approaches are either deductive which is concerned with building a theory with hypotheses and seeking to test the validity, or an inductive approach which focuses on collecting empirical evidence and building a theory from the findings (Creswell, 2009).

Deductive research is the dominant approach in natural sciences where a theory is rigorously tested in a controlled context according to the prevailing laws of the environment which makes predictions about the outcome (Saunders *et al*., 2009). In inductive research, the aim of the researcher is to observe patterns derived from empirical evidence and infer the findings to the theory which is called theory building research, while in deductive research, the researcher aims to test and validate previous patterns and theories by utilising new empirical data, which is also called theory testing research (Bhattacherjee, 2012).

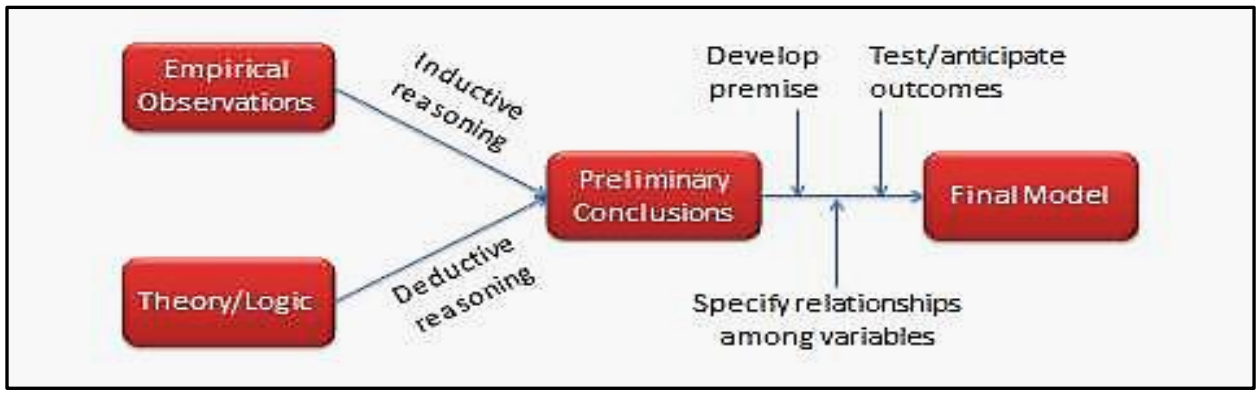

Figure 3.5: The theory and model building process
(Bhattacherjee, 2012:15)

Research is divided into two iterating halves of an inductive and deductive approach, and both of these research approaches of theory building and testing are crucial to the advancement of knowledge and science (Bhattacherjee, 2012). With the research philosophy of the study being *subjective in nature*, an *inductive approach* was followed using a *qualitative method of research*, to build upon previously identified theories or create new ones by inferring from patterns formed from the observed findings using empirical data**.**

3.5 Research strategy

A case study is described as an enquiry of empirical nature that seeks to investigate in detail a contemporary phenomenon chosen in its natural context (Yin, 2009). It can be used to investigate and explore an organisation in-depth, with meticulous attention observed in obtaining the desired detail (Zikmund *et al*., 2010). Research is carried out by using multiple sources of data which inform the triangulation of evidence, thus it increases the reliability of the data and serves to corroborate the data gathered from other sources (Yin, 2009). Case study research collects data through various methods such as interviews, document analysis, participant observations and longitudinal studies, with the aim of understanding the phenomena being

investigated and generating the required data that answers the research question. Yin (2009) states that case studies provide the researcher the opportunity to ask deeply penetrating questions designed to yield the depth and richness of the subject matter in its environment. Yin also describes a case study as a study strategy that benefits from prior theoretical propositions which guides the researcher in collecting and analysing data.

Case study research entails logically linking data collection methods to previously established questions and aims of the research study, while also showing the relationship between the questions and findings. According to Saunders *et al.* (2009), case studies is a good way of exploring existing theories, while also providing a challenge to the existing theories by asking new questions. The research is concerned with the composition of the right questions that speak to the research propositions, finding logic that relates the data and proposition together, unit(s) of analysis and the basis of interpreting the findings. According to Yin (2009), case studies can be utilised in situations where the research needs to ask the questions *why* and *how*, the researcher has limited control over the phenomena and environment being studied, and the focus is on actual phenomena existing within a real life context. Case studies are designed and anchored on three types of conditions according to the aim of the study, namely:

- Exploratory
- Descriptive
- Explanatory

A case study is the most accepted method in qualitative research because it provides the ability to capture the experience, reflection, and feelings of the subject while also observing the actions of the phenomena being studied in its subjective nature (Orlikowski & Baroudi, 1991).

Yin (2009) describes a case study to be either in a single case form or a multiple case form. A single case study involves investigating a single component as a case, while a multiple case study involves using two or more components. For a single case study, the example could be given of investigating a particular phenomenon within an organisation residing in a unique environment, and for a multiple case study, a distinct and single phenomenon is investigated in two or more organisations with particular reference to their individual context. Therefore, according to Yin (2009), four types of case study designs exist within the domain of research:

i) Single case (holistic design)—where the unit of analysis is one single subject, and where the subject is unique.

ii) Single case (embedded design)—has more than one unit of analysis present in an organisational context.

iii) Multiple case (holistic design)—where the phenomena being studied is of comparable nature with the others cases and findings are compared across the board.

iv) Multiple case (embedded design)—where each case study is uniquely addressed according to the phenomena being studied.

Multiple case studies are of a comparative nature as it aims to establish the patterns in each case across multiple platforms (Saunders *et al.*, 2009). It is therefore described as an enquiry of empirical nature with more than a single individual case in a study which seeks to investigate in detail a contemporary phenomenon chosen in its natural context (Stake, 1995). Multiple case studies can be used to investigate and explore across sections, units or organisations in-depth, with meticulous attention observed in obtaining the desired detail (Stake, 2006). The research in this study employed a *multiple case study design (holistic design) with multiple methods and an analytical comparison* by providing a detailed description of each case within a unit, and generally comparing themes identified across cases. The study adopted a multiple case study design because of the need to compare and cross examine the research findings by determining the similarities/dissimilarities of the findings from each unit of organisation in relation to the phenomena. A multiple case study design was applied to investigate and understand the perception owners and managers of SMMEs have towards the evaluation and adoption of new technology.

3.6 Research design

A research process follows a serial process of concurrent and interlocking sets of logical procedures to arrive at a conclusion that will address the research problem; the process of research and its procedural composition are often referred to as research design (Creswell, 2009). “Research design is an educational process aimed at systematically providing a better understanding and resolving a particular problem, while also contributing to our existing knowledge and insights of the nature and characteristics of the problem and the intervention developed” (Plomp, 2010:13). Research design is used to structure the research model in an outline that shows and relates all of the parts of the research project and process. It shows how all components of the research work together logically and progressively to arrive at an empirical deduction to address the highlighted problems of the research (Creswell, 2009). The research design gives a descriptive and exploratory explanation of the methodology employed in the

course of carrying out a research study, which also includes the tools and processes used in the sourcing and acquisition of data, the presentation, analysis and interpretation of the processed data (Figure 3.6 shows the layers of research design).

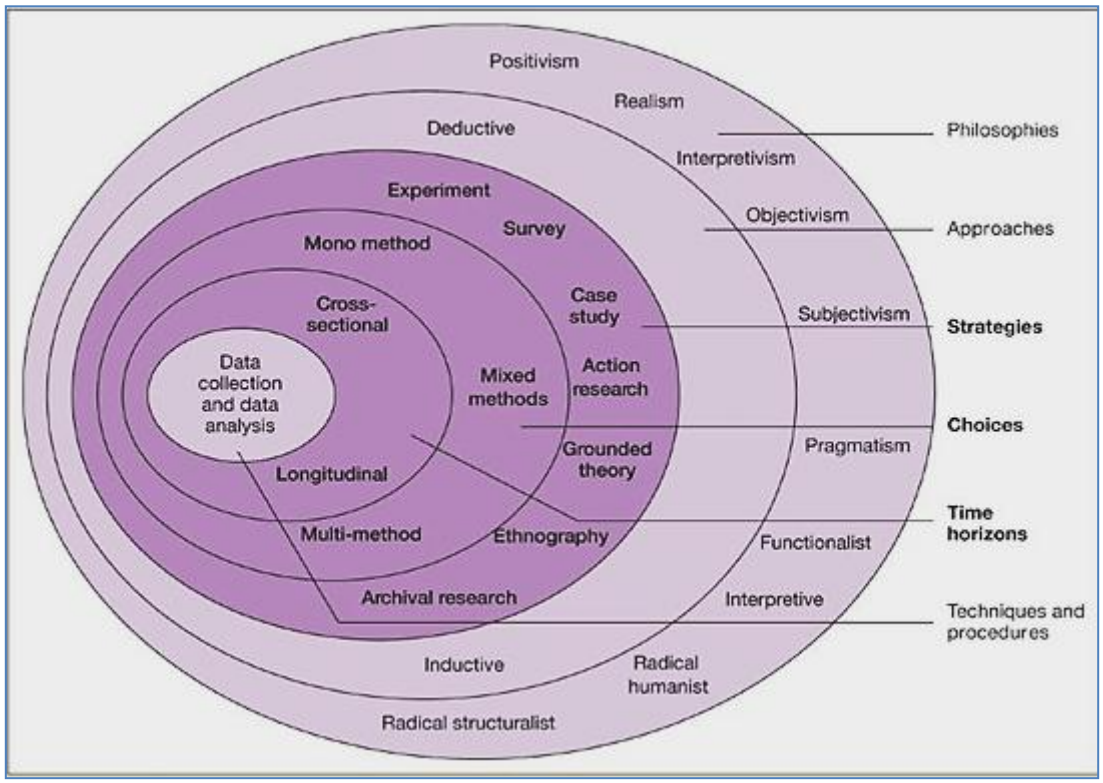

Figure 3.6: The research onion
(Saunders *et al*., 2009:138)

The research design is founded on the philosophical perspective of the researcher and the research paradigm the study follows, therefore this research study employed an *exploratory multiple case study within a qualitative design*. Data was collected through a survey and interviews together with existing literature and documentation to identify and understand the issues and factors that surround SMMEs in evaluating and adopting new technological innovations. The research investigated and identified prior attributed inhibiting factors from earlier literature and other forms of unidentified factors that affect the evaluation and adoption process in the selected SMMEs in the Cape Town Metropolis. This research employed a survey and multiple case study design of qualitative nature with descriptive analysis by providing a detailed description of each case within a unit, and generally comparing patterns across cases. A multiple case study is described as an enquiry of empirical nature with more than a single individual case in a study which seeks to investigate in detail a contemporary phenomenon chosen in its natural context (Simons, 2009:20; Yin, 2009:53).

Multiple case studies can be used to investigate and explore across sections, units or organisations in-depth, with meticulous attention observed in obtaining the desired detail (Zikmund *et al*., 2010:140). The method was chosen because of the need to compare and infer the research findings to theory by determining the similarities/dissimilarities of the findings from each observed case in relation to the phenomena (Saunders *et al*., 2009:146-147). The findings of the research therefore uncover the limiting factors that inhibit the possible evaluation and adoption of new technology by SMMEs in Cape Town.

3.7 Research methods

Research methods can be described as steps of processes and practices which incorporate broad logical and defined principles that state specific methods and procedures which may be used to investigate, deduce, analyse, interpret or rationalise different ideas and problems within the scope of a particular discipline (Creswell 2009; Saunders *et al*., 2009). Research methods can be described as the step-by-step way we go about the process of our research. Data for this research was sourced from primary sources (survey) and (interviews), secondary sources (literature) and using a qualitative research design. Prior theories from relevant literature were used as a guide in making enquires and collecting data, which together with the resultant findings from the multiple case studies of SMMEs selected were used to develop a better understanding of the subject of study. The three generally accepted methods used in scientific enquiry and popular among researchers are qualitative methods, quantitative methods and a mixed-methods approach of research.

3.7.1 Qualitative research

Qualitative research is an interactive way of collecting data and it is usually associated with interpretive and critical paradigms (Saunders *et al*., 2009:151). A qualitative method is concerned with describing meaning rather than with drawing more on statistical inferences, and it provides an in-depth insight into the subject of study, aiming to understand experience by investigating the perspective and behavior in the natural context of the subject (Bhattacherjee, 2012). According to Myers (1997), qualitative research methods in Information Systems research are designed to help researchers understand people's behavior within the social and cultural contexts where they exist. It is a method mostly concerned with collecting, analysing and interpreting information in a less numerical context. It tends to focus more on exploring in as much detail as possible to achieve "depth rather than breadth" (Saunders *et al*., 2009:151).

Qualitative research methods imply a direct concern with experience and feelings as it is undergone, thus an exploratory description helps primarily to identify causes and effects, and suggests possible relationships and dynamic processes. Strauss and Corbin (1990) and Sherman and Webb (1988) classify the use of qualitative research according to three broad categories:

- Understand any phenomenon about which little is yet known
- Gain new perspectives on things about which much is already known
- Gain more in-depth information on things that might be difficult to convey quantitatively

Table 3.2: Features of qualitative research mapped against the research study
(adapted from Hoepfl, 1997:49)

Hoepfl's (1997) Qualitative Feature	Application in the Research Study
Qualitative research uses the natural setting as the source of data. The aim of the researcher is to observe, describe and interpret settings as they occur naturally while taking a neutral position.	The empirical study took place in a natural environment in and around the Cape Town Metropolis on the premises of the interviewees except for the first interviewee who volunteered to be interviewed on the university premises, with discussions revolving around the subject of study.
The researcher becomes the human instrument of data collection.	As the main researcher in the study, primary data was collected by the researcher conducting both the interviews and survey, with the interview as the main source of data collection.
Qualitative researchers predominantly use inductive data analysis.	The categories and themes were developed by the researcher by applying a hermeneutic approach in the meaningful interpretation of data collected based on the key concepts identified in literature.
Qualitative research reports are descriptive, incorporating expressive language and presence of voice in the text.	Findings are described as a narrative of the interviewees' experiences and opinion shared, which formed the basis of summarised findings that emerged from the analysed data.
Qualitative research is aimed at discovering meanings individuals have of events and interpretation of those meanings by the researcher.	Contextual meaning of the primary data was derived from the interpretation of the main researcher from his understanding and experience of the subject matter.
Qualitative researchers pay attention to idiosyncratic as well as the pervasive, seeking the uniqueness of each case.	Discrete attention was given to observe respondents' disposition, emotions, reactions and other observable non-salient reactions during the course of the interviews in which data was gathered from various organisations to provide a rich depth of data.
Qualitative research has an emergent design which has researchers focusing on the emerging process as well as outcomes of the research.	The interview was designed in a flexible manner to accommodate new emerging discoveries during the course of the interviews, applying and merging it with the final outcomes of the research findings.
Qualitative research is judged using special criteria for trustworthiness.	Data was collected using multiple methods to verify and validate the primary data collected. The artefacts and documents attached in the annexures are provided to aid the evaluation and establish an acceptable degree of validity, reliability, confirmability and adherence to ethical considerations.

The goal of qualitative research is not to test the established, but rather to discover and develop the new with ample empirical study to develop grounded theories (Flick, 2010). Qualitative research is usually qualified as research that comprises of words, videos and pictures, and with data collected through interviews and analysed through categorisation (Saunders *et al*., 2009). Flick (2010) argues that the case study is a major tool in qualitative research, as it allows the researcher to be able to study the phenomena in a natural environment, and deriving a deep understanding of the subject matter while using various combinations of tools to develop a good insight. Qualitative research allows the researcher to derive meaning from the perspective and subjective nature of the phenomena which would have been missed by generalising the nature of the study.

The underlying assumption for this particular study is highlighted by the second category of qualitative research as stated above. In prior literature there are numerous cited references to different factors affecting both the adoption of new technology and SMMEs (Chan *et al*., 2012; Maryeni *et al*., 2012; Cravo, 2010; Tan *et al*., 2010; Lawrence, 2009; Al-Qirim, 2007; Brown & Russell, 2007; Warden & Motjolopane, 2007). The research study is channelled to provide a different perspective in terms of how adoption of new technology and SMMEs relate to each other, particularly from the view of the evaluation of new technological innovations by SMMEs as a means of facilitating the adoption process and integration into the business system.

3.7.2 Quantitative research

Quantitative research focuses on numeric values; it collects data using methods such as questionnaires and experimental data which are processed and represented by means of graphs or statistics (Saunders *et al*., 2009). Quantitative research is aimed at providing a collection of data from a large sample and then summarising it quantitatively through the use of numeric numbers to describe the phenomena being studied to a general audience (Bhattacherjee, 2012).

Quantitative research is more favoured by the positivist researchers because of its objective nature of enquiry and interpretation. It uses numbers to provide sampling and reports with estimates of reliability, measurement and validity of the data (Bhattacherjee, 2012). According to Saunders *et al*. (2009), even though quantitative methods are associated with numbers and statistics, it can still be analysed and presented in a descriptive format devoid of numeric interpretations. Therefore the aim of quantitative data was to determine the level of understanding of the evaluation process, its implications, its effect and the factors affecting it, in regards to the adoption of new technology by owners and managers of SMMEs in Cape Town.

The descriptive summary can be identified by the detailed description of each of the categories developed by the survey. Quantitative research design was not adopted as the primary method of data collection and analysis, based on the research of Kaplan and Maxwell (1994), which states that the aim of understanding a phenomenon from the point of view of participants in their peculiar social and organisational contexts is derailed when textual data is invariably quantified.

3.7.3 Mixed-Methods research

Saunders *et al*. (2009) argue that a research method can use both a quantitative and qualitative approach together with secondary and primary data to source for appropriate information concerning a mutual subject in the same study. Creswell (2009) states that a mixed method is when a qualitative and quantitative approach is planned as the method of research prior to commencement, or in an emergent form, where a second approach is adopted along the way of the research due to the inadequacy of the initial approach. Creswell (2009) further affirms that research can be planned in such a way that the results and interpretation of the initial quantitative phase lead to the emergence of the qualitative phase.

Data collection can be conducted and analysed using two distinct techniques (Figure 3.7), namely the *Mono Method* and *Multiple Methods*. For the *Mono Method,* a single quantitative data collection and analysis technique is categorised under a quantitative study, and a single qualitative data collection and analysis technique is categorised under a qualitative study.

Multiple Methods research refer to a combination of two or more data collection and analysis techniques categorised under one common data analysis technique and procedure (Saunders *et al*., 2009). It is a split between a 'multi method' which allows the use of quantitative or qualitative techniques to collect multiple sources of data unique to each different technique and mixed method in the same research study. Under *Mixed-Methods*, there are two types of approaches, according to Saunders *et al*. (2009), i.e. *Mixed-Method research*, and *Mixed-Model research*.

- *Mixed-Method* research collects quantitative and qualitative data either parallel or sequentially, and analyses it differently with one more predominant than the other, and does not combine them together.

- *Mixed-Model* research on the other hand combines both quantitative and qualitative data collection and analysis procedures together as well as other phases of a research study. It has the ability to quantify qualitative data into numeric codes for statistical analysis or qualify quantitative data into descriptive narratives to be analysed qualitatively.

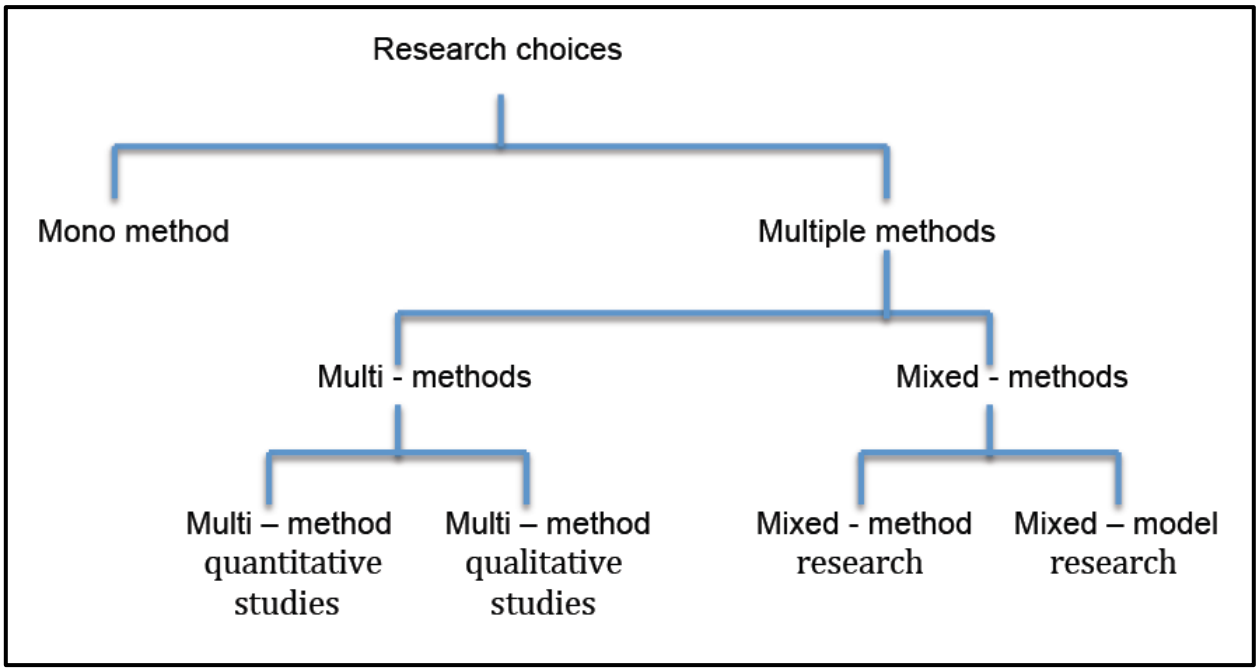

Figure 3.7: Research choices
(Saunders *et al*., 2009:152)

The combination of both techniques presents a more comprehensive form of data collection and analysis to produce a richer result (Creswell, 2009). The *Multiple Methods* approach to data collection was adopted for this research in other to exploit the complementary advantage the quantitative and qualitative data and techniques bring to the research front, where unanticipated research findings can be uncovered (Flick, 2010).

3.8 Data collection

Data for this research was collected from multiple resources which include secondary (literature) and primary sources (surveys and interviews). Data collection was carried out using an online pilot survey to establish salient points and semi-structured interviews to uncover deeper meanings through a qualitative research design method using a multiple case study.

3.8.1 Sampling techniques

Sampling is the process of determining an ideal number of subsets representative of a target population for the purpose of observing and analysing the population to be able to infer behavioural patterns within a chosen context (Bhattacherjee, 2012).

Simply illustrated, sampling is about choosing an appropriate sample to represent the population target because the cost and enormity of selecting an entire population for research within a certain context is unrealistic. Sampling can either be in the form of probability sampling which is usually associated with quantitative methods, or it can be non-probability sampling where selection is based on the subjective decision of the researcher regarding the sample type needed to answer the research questions (Flick, 2010). It is critical to choose a sample representative of the target population to make the proper and correct inference back to the population of interest. Bias and improper sampling methods are often the reason for misguided and flawed inferences made. Such examples are reported on and seen in the statistics of opinion and exit polls (Bhattacherjee, 2012).

The diagram below (Figure 3.8) represents the different types of sampling techniques under the probability and non-probability sampling methods.

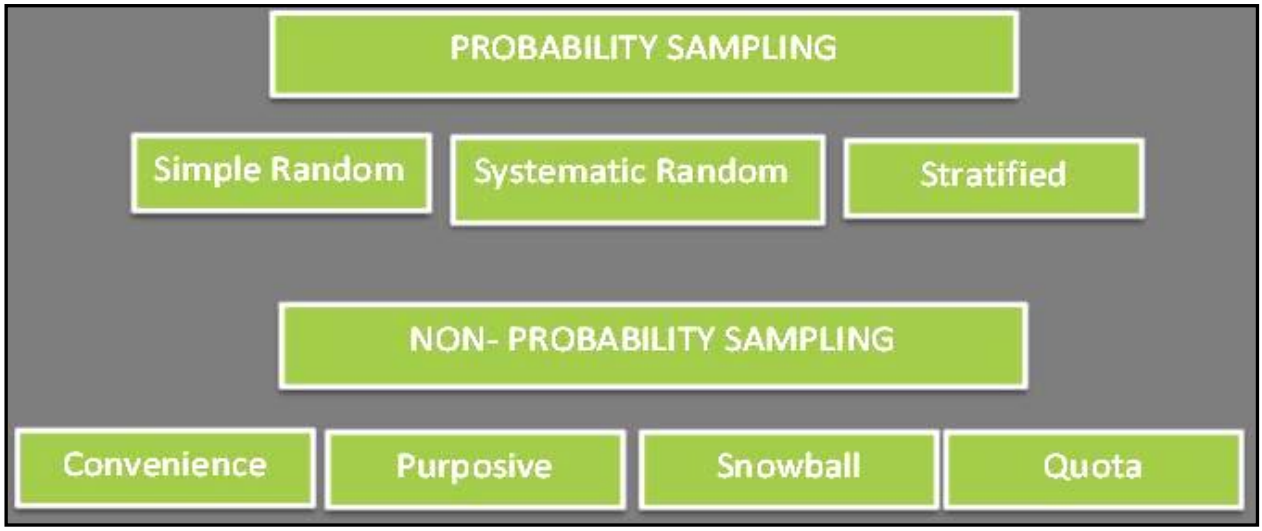

Figure 3.8: Sampling methods
(Waight, 2013)

The sample frame was provided by the Cape Chamber of Commerce (CCOC) database on SMMEs operating within the specified scope of sampling sizes in and around the Cape Town Metropolis. The sampling frame, according to Bhattacherjee (2012), is a list that covers the section of the population targeted where a sample exists. Access to the CCOC database was facilitated by an agreement of collaboration between the Cape Peninsula University of Technology (CPUT) and CCOC to allow the researcher a wider range of possible samples of participants in all organisational sectors within the scope and definition of SMMEs.

Table 3.3: Characteristics of probability and non-probability sampling methods
(Saunders *et al*., 2009:243)

Probability Sampling (Random)	Non-Probability Sampling (Non-Random)
Generalisation can be made to the population as defined by the sampling frame.	It cannot be generalised beyond the actual sample.
Population can be estimated using parameters.	It is not concerned with population parameters.
It accommodates the use of statistics and hypotheses testing.	Usually concerned about the exploratory nature of research.
Used to eliminate bias.	Adequacy of the sampling measure cannot be ascertained.
Units must be selected randomly.	It is easier, cheaper and can be done faster.

3.8.2 Non-probability sampling

According to Bhattacherjee (2012), non-probability samples are selected based on non-random consideration such as accessibility and composition within an environment, among many other criteria. Bhattacherjee also stated that the estimation of sampling errors is not possible in non-probability sampling, which gives case for some form of possible sampling bias. This condition informs that data and information generated from a non-probability sampling technique cannot be generalised back to the population of interest, but can be inferred only within the actual sample context (Saunders *et al*., 2009). Respondents chosen in a non-random manner have an in-depth knowledge of the subject matter, with ample experience of the phenomena being studied. This technique allows the researcher to have an in-depth source of credible information due to the nature of the wealth of knowledge and experience which the respondent has on the subject of study (Zikmund *et al*., 2010). The sampling technique used for this study was a non-probability sampling method based on qualitative methods of research which included convenience, snowball, judgmental (purposive) and quota (Saunders *et al*., 2009). The sampling approach provides different alternatives of techniques to make a sample based on subjective judgment (Saunders *et al*., 2009).

Judgmental sampling allows for the use of the researcher's own judgment to select the best possible units of analysis to most appropriately deliver the desired results and answers to the research questions in order to achieve the research objectives (Saunders *et al*., 2009). This method is deemed the most appropriate given the time constraints, finances, accessibility and the nature of the problem (Figure 3.9 highlights different methods of non-probability sampling).

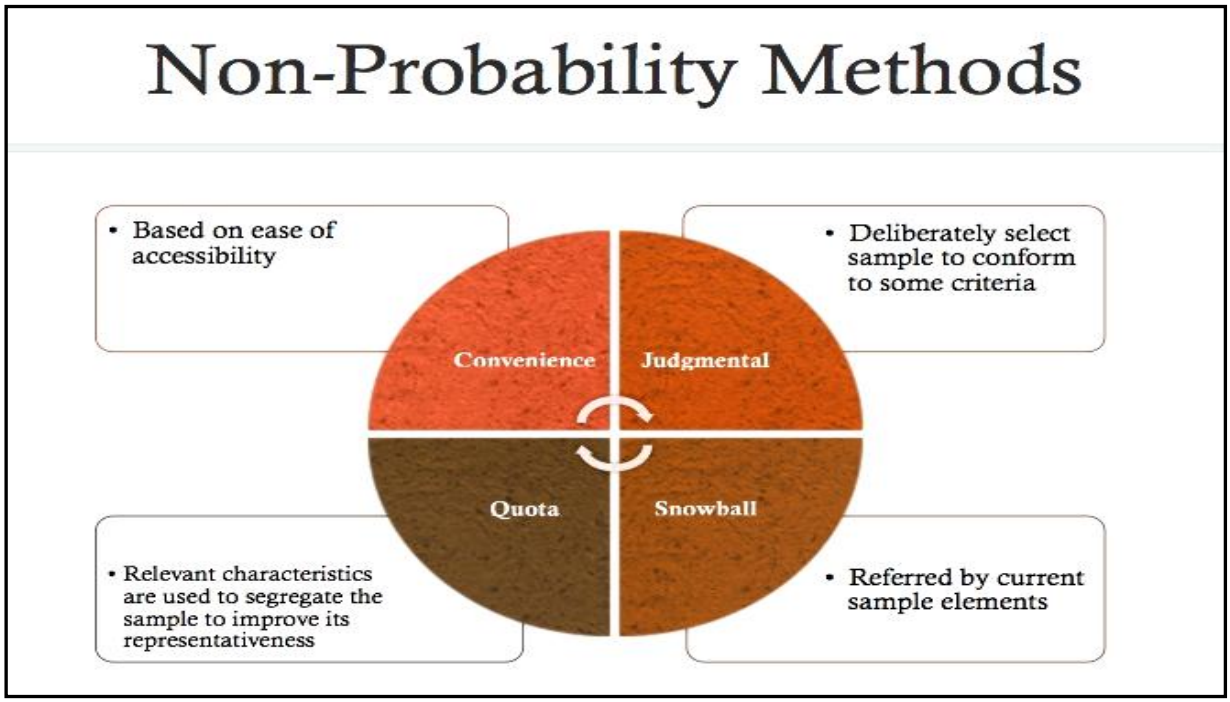

Figure 3.9: Non-probability sampling techniques
(Leveto, n.d.)

The purpose of sampling techniques is to reduce the cost and/or the amount of work it would take to select all samples of an entire target population, thus a judgmental sampling technique prescribed for qualitative research in a multiple case study design was adopted for this research (Yin, 2009). Since the nature of the research was exploratory which required an in-depth knowledge of the research problem, a total of 15 SMME samples were selected according their geographical location. The selected SMMEs were defined based on the number of employees and total annual turnover. Although an attempt was made to make the selections based on a cross-sectional category of business sectors, samples from only three sectors could be accessed to produce the required data and saturation level needed. The selected SMMEs worked with different types of technology and were characterised by those that have recently adopted a new technology, are in the process of adopting a new technology, or have not adopted any new technology.

An exploratory process of research was used to design the interview protocol and data collection procedures. In total, 15 SMMEs from the manufacturing, business services and financial service sectors within a range of 50 kilometres from the city center, were selected purposively. This was done while also taking into account geographical convenience and accessibility of the SMMEs. The number of SMMEs was chosen to attain the data saturation level required for the research in the context of the phenomena being studied.

3.8.3 Sample size

The SMMEs were selected based on their function and geographical coverage. The fifteen participating SMMEs were selected based on their operational size and geographical location in line with their business sectors. The diverse selection granted the researcher the opportunity to interact with individual activities, perceptions and experiences of each SMME within different cultural and business environments and social backgrounds. The selection thus allowed for the examination and analysis of the findings in a contextual and multi-variant environment. The business sectors refer to the SMMEs operating in the business services and manufacturing sectors, and to financial services providers (FSPs) who use some form of ICT in their business processes. These SMMEs were all in a range of between 10-100 employees and produced a total annual turnover of less than 40 million rand. The units of analysis selected were geographically placed in the Western Cape Province within a 50 kilometre radius of the city center metropolis to make the coverage of the study manageable given the time frame and financial restrictions.

3.8.4 Units of analysis

The subject of study for this research covered SMMEs in the Western Cape Province in South Africa, spreading over the City of Cape Town Metropolis at managerial levels of SMMEs, capable of making key business decisions. Special focus was on the owner/managers and other decision makers in the business and technology management section of SMMEs, with particular reference to SMMEs with a number of employees less than 100 and an annual turnover of not more than 40 million rand. A total of 15 SMMEs within a range of 50 kilometres from the city center was selected in order to attain the data saturation level required for the research in the context of the phenomena being studied (Yin, 2009)**.** This was done while also taking into account the geographical convenience and mode of operation of these SMMEs. The selected subjects of study were decision makers within the category of SMME enterprises selected in the business services, manufacturing, and financial services sectors operating in different contexts but within the specified criteria. Availability and willingness to participate was a key factor in selecting the participants. Many contacted were not willing to participate due to their perception of not having a direct benefit from the research study. As a consequence, the research time frame was affected and prolonged due to the difficulty in securing the availability of participants. More than 400 organisations were contacted to source participants for the survey; a total of 26 persons participated of which 22 participants successfully completed the online survey. The low response to the survey thus hindered the results being applied in a more generalisable context.

Bhattacherjee (2012) stated that “survey research is generally notorious for its low response rates. A response rate of 15-20% is typical in a mail survey, even after two or three reminders”.

Samples of 15 interviewees per organisation, representing a SMME owner or manager, were interviewed from the 15 participating organisations in the Western Cape Province within close proximity to Cape Town. The diagram below represents samples of participating organisations and their organisational sectors of operation from the selected SMME categories.

Table 3.4: Sample unit of selected organisations

Organisation Number	Organisational Sector
1	IT Consulting and Services
2	Business Management
3	Media and Communication
4	Manufacturing
5	Manufacturing
6	Financial Management
7	Retail Services
8	Business Management Consulting
9	Financial Management
10	Financial Services Provider
11	Financial Services Provider
12	Financial Services Provider
13	Financial Services Provider
14	Financial Services Provider
15	Financial Services Provider

3.8.5 Qualitative data collection

Qualitative research is concerned with data and information collected by observing, listening and interpreting (Zikmund *et al*., 2010). Yin (2009) identifies six primary sources of evidence for case study research; these are documentation, archival records, interviews, direct observation, participant observation and physical artefacts. Data for this research was sourced from the interviews conducted (primary data). Other relevant data was additionally sourced from the surveys and literature (secondary source), including documentation from articles, journals and government publications (Saunders *et al*., 2009).

The case for interviews as an important qualitative data tool was also argued by Zikmund *et al*. (2010), who said that qualitative research is most often used in exploratory designs because of the need to collect small samples within an interpretive process based on subjective judgment, and the unstructured interview is best suited for this purpose. Qualitative data for this research was sourced from interviewing the various owners and managers of the participating SMMEs.

3.8.5.1 Interviews

An interview is an interpersonal relationship between an interviewer and the interviewee, set out to examine constructs of experience and knowledge the participants have of the phenomena being studied subjectively in the context of the research study (Miller & Glassner, 2009). Figure 3.10 shows different types of interviews in research.

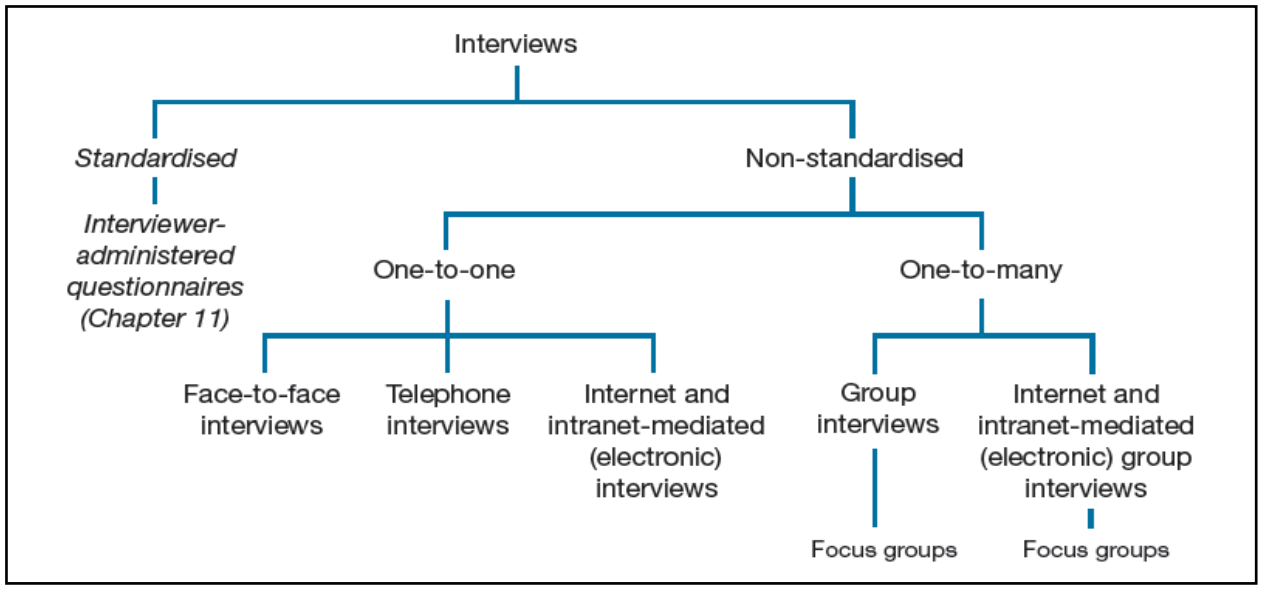

Figure 3.10: Types of interviews
(Saunders *et al*., 2009:321)

There are different types of interviews namely structured, semi-structured, unstructured, Internet and telephone interviews. Open-ended interviews in a semi-structured form are used to investigate in-depth the perspectives and impressions of the interviewee on the phenomena being studied. This type of interview provides an active symbiotic interaction of knowledge and analysis of the issue between the interviewer and interviewee (Simons, 2009). The semi-structured interview allows the interviewer to probe deeply, uncovering inner-feelings and response which hitherto would not have been revealed, bringing out underlying feelings and events that cannot be brought to light by mere observations and surveys.

Myers and Newman (2007) state that first impression is key to dictating the tone of the interview, with the aim of making the interviewee as comfortable as possible and minimise social distractions. Interviews can be seen as a drama where the performance level is expected to be of high standard since this determines the level of disclosure and eventual quality of the data (Myers & Newman, 2007). A guide to a successful qualitative interview is proposed by Myers and Newman (2007), represented in the diagram below.

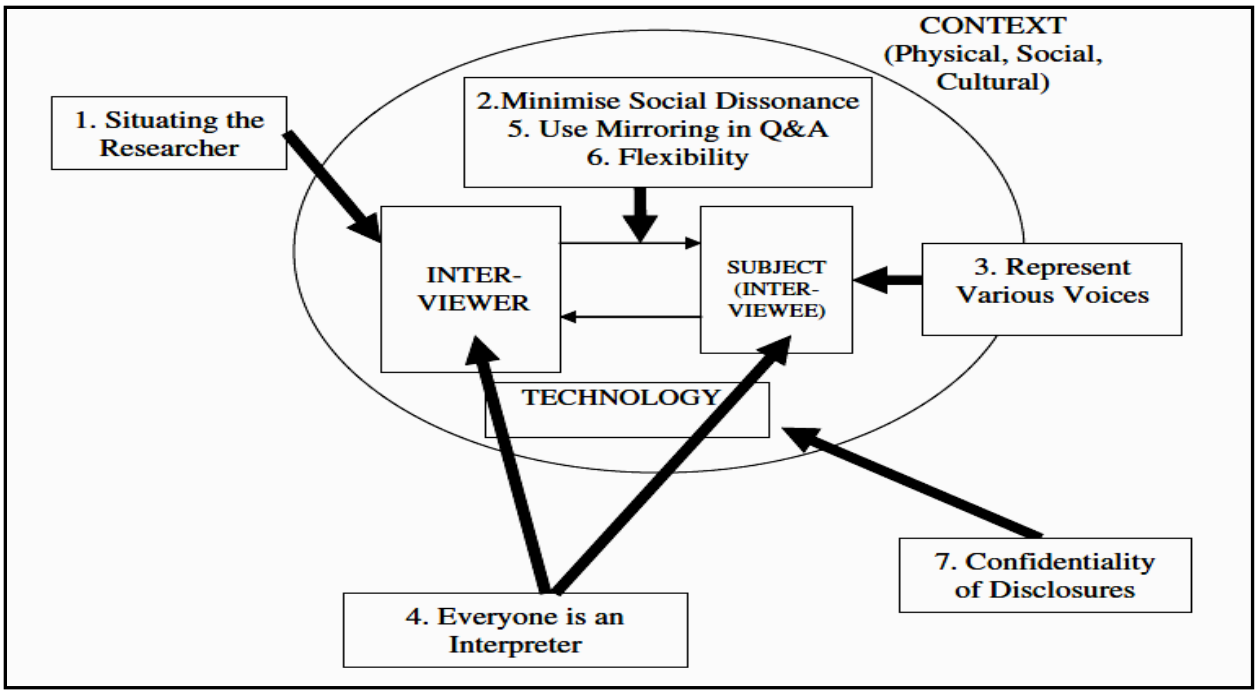

Figure 3.11: Guidelines for qualitative research interviews
(Myers & Newman, 2007:16)

Application of the prescribed guidelines in the research followed these steps:

i) **Situating the researcher—**the interpreter must place himself in a comfortable place where the interview will feel more at ease. He can start by asking questions such as "Who are you, what role do you play, what is your background, gender, age, experience, nationality?" All these questions will help the researcher to familiarise him/herself with the interviewee, and such information may become useful in validating the findings obtained from secondary data sources.

ii) **Minimise social dissonance—**since the interview takes place in a social setting, it is important to minimise all distractions that may make the interviewee uncomfortable. This involves making a good first impression, dressing in an appropriate manner and using the right and correct language to communicate. This is usually to improve the quality of

disclosure, and depending on the research topic, age, gender and culture, may be an important aspect to consider.

iii) **Represent various 'voices'—**in qualitative type of research it is necessary to get a variety of interviewees to contribute, and not rely on one voice emerging. Using different subjects as interviewees is called 'triangulation of subjects', all subjects are not of the same nature, therefore it is pertinent to try and avoid elite bias as stated by Miles and Huberman (1994, as cited in Neuman, 2011).

iv) **Everyone is an interpreter—**this means that subjects of study are creative interpreters of their personal world, as we are interpreters of theirs. For most of the subjects, interviewees are a rare event. Thus interview usually involves reading and creating one or more text, starting initially with the transcription of the interview.

v) **Use mirroring in questions and answers—**mirroring involves constructing follow up questions from words and phrases from the responses from a previous question. This allows the interviewee to focus on their world while using their language to express themselves; this allows them to describe and explain their worlds in their own voice. Open questions are preferable to focus on common and distinctly held events and stories, while moving from general to more specific grounds. The role of the interviewer therefore involves listening, prompting, encouraging and directing the conversation.

vi) **Flexibility—**semi-structured and structured interviews utilise an incomplete script which has a consequence openness, flexibility and improvisation. The researcher must be prepared to tow other lines of similar interest and be on the lookout for anything out of place, while subjects' differing attitudes to questions and their general disposition should also be noted.

vii) **Confidentiality of disclosures—**it is paramount that the researcher keeps the transcripts, records and the technology used in capturing the data confidential and secure. In certain cases it might be proper to provide early feedback to the subjects of study and organisations to check with them on the appropriateness of factual contents of the transcript.

The above qualitative research interview guidelines were employed in the course of the study, and the interviewer and interviewees were properly situated in a cordial and comfortable environment. The interviewee had the first discretion to the venue of the interview, which was mostly situated in the board room or offices of the organisation. This aided in minimising social dissonance and improving the quality of the data collected.

Attention was paid to the appropriateness of the apparel of the interviewer, and the interview was carried out in the language they fully understand and relate to, while the use of jargon was avoided. Questions were asked to describe the interviewee's organisation, their line of work, number of employees and years of operation. The interviewees were also asked about their role in the organisation, their background in the business and their experience as managers and owners of the business.

A variety of owners and business managers of SMMEs were interviewed during the course of data collection for the study. The interviewees came from different social, economic, cultural and political backgrounds. For some of the interviewees, the interview presented a rare occasion for them outside of their daily business life, while some had ample experience of interview sessions they have been involved in. Interviewees were allowed to express themselves in a comfortable and charismatic manner, with the use of follow-up questions to elicit more content and depth on an area of particular interest. The interview was transcribed into text format, and audio and text versions of the interview were saved on a flash drive and stored in a secure place as well as in a cloud storage facility with access control.

An exploratory process of qualitative research was used to design the interview protocol and data collection procedures. A semi-structured form of interview was used to explore the perceptions and knowledge of the subject matter, while ensuring openness and revelation of other relevant lines of research. In semi-structured research, the researcher uses an interview guide which consists of a list of predetermined questions developed to address the problem statement of the research.

Questions might vary from one interview to the other. The format of asking the questions can also change to accommodate the interviewee. Potential interviewees were contacted via email and telephonically; the objectives, purpose and contribution of the research study were explained in a letter of participation.

Ethical consideration of the research study were highlighted and presented in the form of a consent letter to the consenting participants before the commencement of the interview. The interviews were digitally recorded with permission obtained from the interviewee and notes were taken of the observations of the surrounding. The interviews spanned over a four month period and each lasted between 45 to 60 minutes.

3.8.6 Quantitative data collection

The objective of collecting quantitative data was to determine the level of understanding SMME owners and managers have of the role evaluation plays in the adoption process of a new technology, with their perception of the factors present—potential benefit and risk, evaluation processes, decision making, advantages, and the role of government in the evaluation and adoption process, all of which were discussed in detail in Chapter Two. Data was collected using the online survey tool called *Lime Survey*, an open source survey tool which was customised for the Faculty of Informatics and Design at Cape Peninsula University of Technology. According to recommendations of Flick (2010), each potential participant was sent an informed consent letter explaining the purpose, objectives and significance of the research study. The right of voluntary participation and withdrawal were explicitly explained; the privacy and confidentiality was guaranteed due to the non-anonymous nature of the survey—no personal information is accessible by any other person outside of the research unit. The data collected was used for pattern recognition and category classification. The participants were selected from the database list of operating SMMEs in the City of Cape Town Metropolis that was provided by the Cape Chambers of Commerce.

A total of 46 questions were asked under two sections of the survey with an array of six answers to select from; the arrays were labelled *strongly agree*, *agree*, *uncertain*, *disagree* and *strongly disagree*, with a short alternative text answer labelled *other*. Each question was mandatory with only one possible answer type chosen for each question. A mail was sent to potential participants with a letter of consent attached, which stated the rationale of the research and ethical considerations, and the link to the research was included for those willing to participate.

3.9 Data analysis

3.9.1 Qualitative data analysis

According to Stake (2006), qualitative data analysis enables the flexibility of comparing results among different cases. The interactive nature of the data collection and analysis of the research study enabled the researcher to recognise and visualise important emerging patterns, themes and relationships as data was collected (Saunders *et al*., 2009). Qualitative data analysis seeks to sieve out the meaningful content of data by attaching derived meanings to phenomena (Flick, 2010). Data processing was started by organising all the data collected into a database; all recording and interview guide notes were labelled properly and filed electronically on the computer and in the cloud for retrieval in case of accidental damage, loss and theft. Interviews

were subsequently transcribed by the researcher into text; reading the transcript assisted the researcher to familiarise himself with the information in the interview while making meaning of the relating answers and questions.

The first step in analysing data collected in a study is the representation of that data in written format (Saunders *et al*., 2009:485). All of the data collected was transcribed or documented in MS-Word, using the Microsoft Word package. The data were arranged and similar concepts and keywords were identified and coded according to their implied meanings. According to Richards and Morse (2007, as cited by Saldana, 2009:8), "…it leads you from the data to the idea and from the idea to all the data pertaining to that idea". Saldana (2009) developed a coding manual to assist researchers in understanding the coding process and concepts, and how it evolves into categories and themes (Figure 3.12). Miles and Huberman's (1994, as cited by Neumann, 2011:510) description of codes ascribes that "…codes are tags or labels for assigning units of meaning to the descriptive or inferential information compiled during a study. Codes usually are attached to chunks of varying size-words, phases, sentences or whole paragraphs, connected or unconnected to a specific setting".

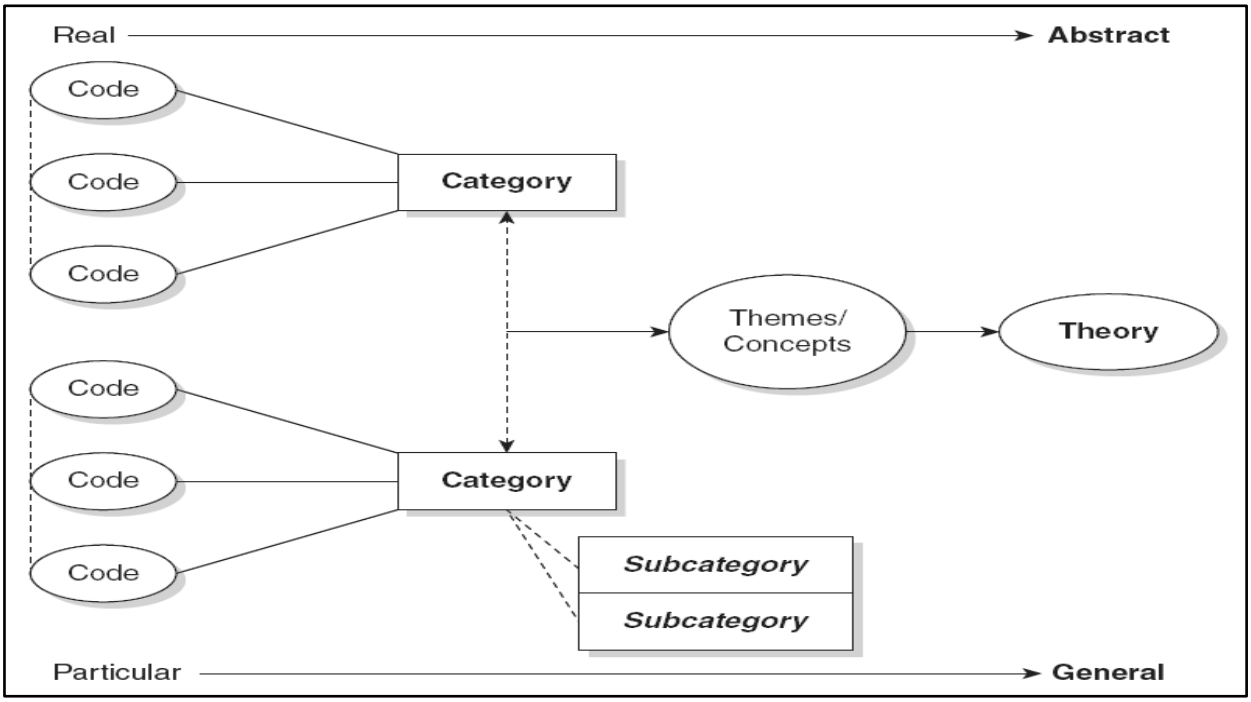

Figure 3.12: Streamlined codes-to-theory model for qualitative inquiry
(Saldana, 2009:12)

A qualitative thematic analysis method was used with meaningful, interpretative and descriptive tools to organise and analyse relevant data collected from the excerpts of interview schedules developed to investigate the research problem. Qualitative data can be analysed using a simple thematic coding system by reading through all data extensively, summarising all of the data collected, noting all of the categories that occur in the data, grouping key concepts into themes and identifying key themes according to their appearances in groups. Quinlan (2011) provides support for this method by stating that this method allows the researcher to look at documents, text or speech to see what themes emerged and identify recurring and similar themes.

3.9.1.1 Hermeneutics

Taylor (1976, as cited by Myers, 1997:10) describes hermeneutics in research as follows:

> Interpretation, in the sense relevant to hermeneutics, is an attempt to make clear, to make sense of an object of study. This object must, therefore, be a text, or a text-analogue, which in some way is confused, incomplete, cloudy, seemingly contradictory—in one way or another, unclear. The interpretation aims to bring to light an underlying coherence or sense.

Hermeneutics can be considered as an underlying interpretive philosophy approach of analysing specific qualitative data. Zikmund *et al.* (2010), state that meanings are derived by the connection of patterns from each case to the other, and to established themes and theories related to the research. Hermeneutics involves a deep and detailed reading of texts to derive a deep understanding with richer meanings rooted within the text (Neuman, 2011). The inherent interpretation of meanings and relationships are expressed by coding the key meanings and concepts in the analysis of the research data.

Hermeneutic units are concerned with the meaning of a text from the interview excerpt that can be connected to a key category within the interview excerpts, or one provided by the researcher (Flick, 2010). Hermeneutic units are used in qualitative data analysis software to group phrases of data that have similar meanings and interpretation. After reading through the transcript and excerpts of the interview and all relevant summaries were made and recorded, the summarised data were critically examined for existing similarities, then coded and categorised into identifying codes accordingly. A spreadsheet was used to categorise the summarised data and keywords into parts and similar parts with meanings called categories. This method called *memoing* was prescribed by Bhattacherjee (2012:115). Each developed category was given an appropriate description, and the process was done iteratively until all relevant phrases and keywords were coded and categorised.

Thereafter data were successfully categorised conceptually; meaningful relationships emerged which further lead to the identification of patterns and concepts, which subsequently developed into a theme.

This process continues in a cyclical manner until all available relevant data is captured and coded starting from open coding, focused and selective coding, which leads to axial or thematic coding that in return reveals meaningful patterns and relationships. Bhattacherjee (2012:115) posits that the process of thematic analysis is achieved when "…coding of new data and theory refinement continues until **theoretical saturation** is reached". Figure 3.13 illustrates the stages of coding in thematic analysis to theory.

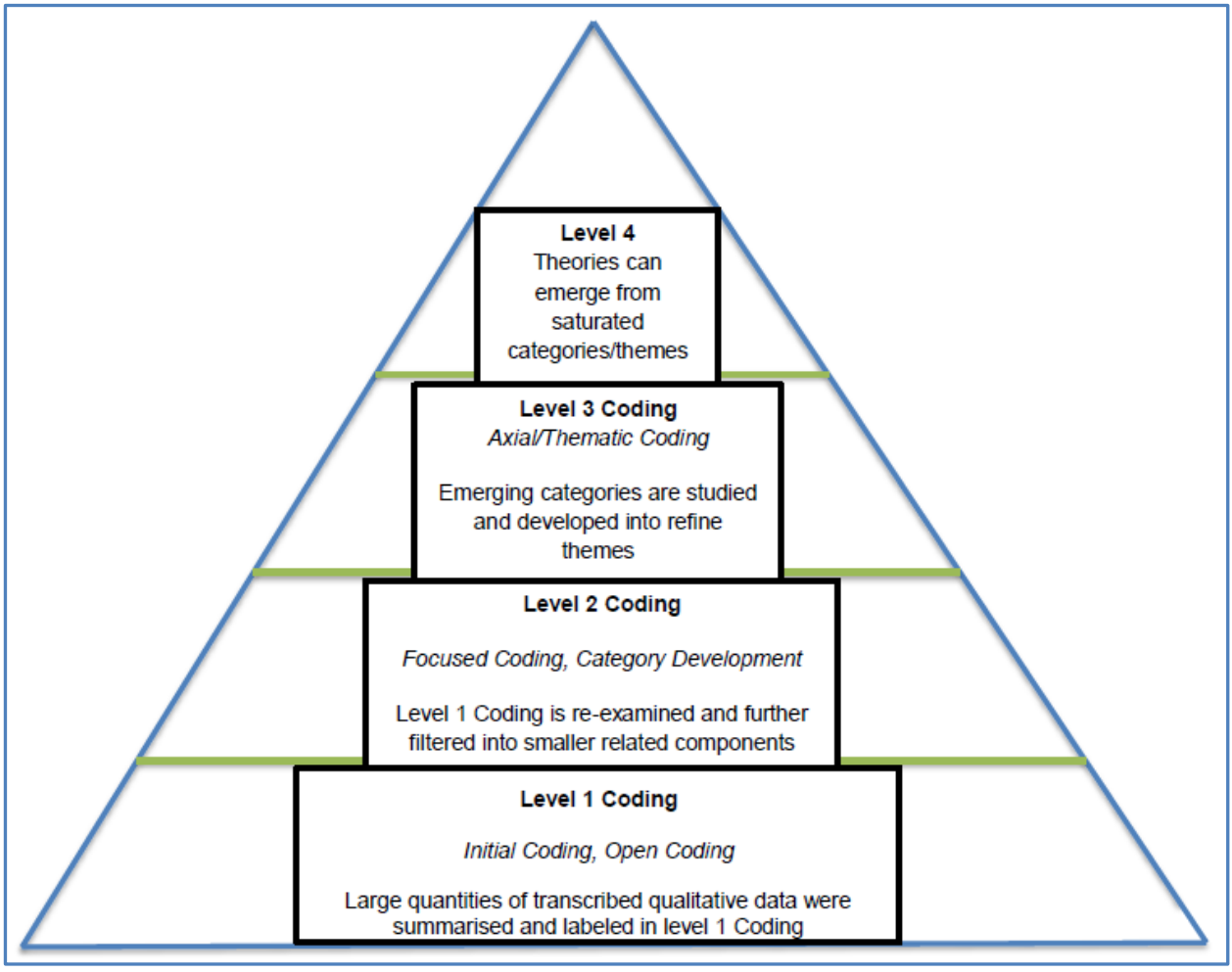

Figure 3.13: Stages of coding in thematic analysis to theory
(Strauss & Corbin, 1998, cited and adapted by Bhattacherjee, 2012)

The result of the findings was used to build an empirical set of guidelines, and an inductive inference was made to complement prior and relevant existing theory. This was done to offer a logical solution to the lack of sufficient evaluation and adoption of new technological innovations

in SMMEs. Thus the interviews aimed to explore and provide an in-depth knowledge and understanding of evaluation and adoption issues of new technology surrounding the low rate of adoption of new technology by SMMEs in Cape Town.

3.9.2 Quantitative data analysis

The quantitative data was designed and collected in an online survey format, where 22 respondents successfully completed the survey. Questions were grouped under a series of categories, informed by key research questions and contributing factors from the literature. A descriptive qualitative analysis method was used with measurable, interpretative and narrative tools to organise and analyse relevant data collected from the survey response schedule developed to study the research problem. Narrative analysis as described by Kaplan and Maxwell (1994:49) connotes “analyzing the relationships between elements in a particular text, situation, or sequence of events”.

Data was analysed by means of the classification of related questions under a set of mutually related categories. This was facilitated by each research sub-question as the focal point of inference; the rate of responses under each category of leading research question and data from the respondents was analysed qualitatively and interpreted using a descriptive data analysis tool. The graphs showed varying percentage levels of answers from the different questions in each category. A narrative summary of the graphs in each category was of descriptive nature with the level of response from each question discussed and the implications derived accordingly. The survey was designed to ascertain the knowledge of the participants regarding the factors affecting evaluation and adoption, its importance to business, the role in decision-making and the advantages and benefits realisable, while the interviews aimed at further exploration to provide an in-depth knowledge and understanding of evaluation and adoption issues.

3.10 Summary

This chapter provided an overview of the research philosophy followed, from which the ontology and epistemology guiding the research were presented and the research paradigm highlighted. The research design was also laid out with a description of the approach, strategy and methods of data collection in both qualitative and quantitative format. In conclusion, the ethical consideration and process followed, was stated.

In summary, the ontological perspective of the research was a position of subjectivism which believes that phenomena exist because of the social interaction and actions based on the perceptions of actors. The study adopted an interpretive paradigm based on the epistemological view which holds that reality is based on the subjective interpretation of the observer. The study therefore falls into the paradigm classification of the interpretivism of Burrell and Morgan (1979), with the aim to understand the reasons behind the low evaluation and adoption of new technology by SMMEs.

The research followed an inductive approach of inferring to theory, and using findings to propose a set of evaluation guidelines for SMMEs. The research was designed based on qualitative research using multiple methods of data. A multiple case study was adopted as qualitative strategy of enquiry to support multiple organisations, together with a survey to support the results from the qualitative data. Units of analysis consisted of selected SMMEs within the Cape Town Metropolis. Primary qualitative data was collected by means of semi-structured interviews, while quantitative data was collected by means of questionnaires together with literature and document analysis as secondary data sources. Both sets of data were analysed and presented in a qualitative manner using thematic analysis, hermeneutics and narratives.

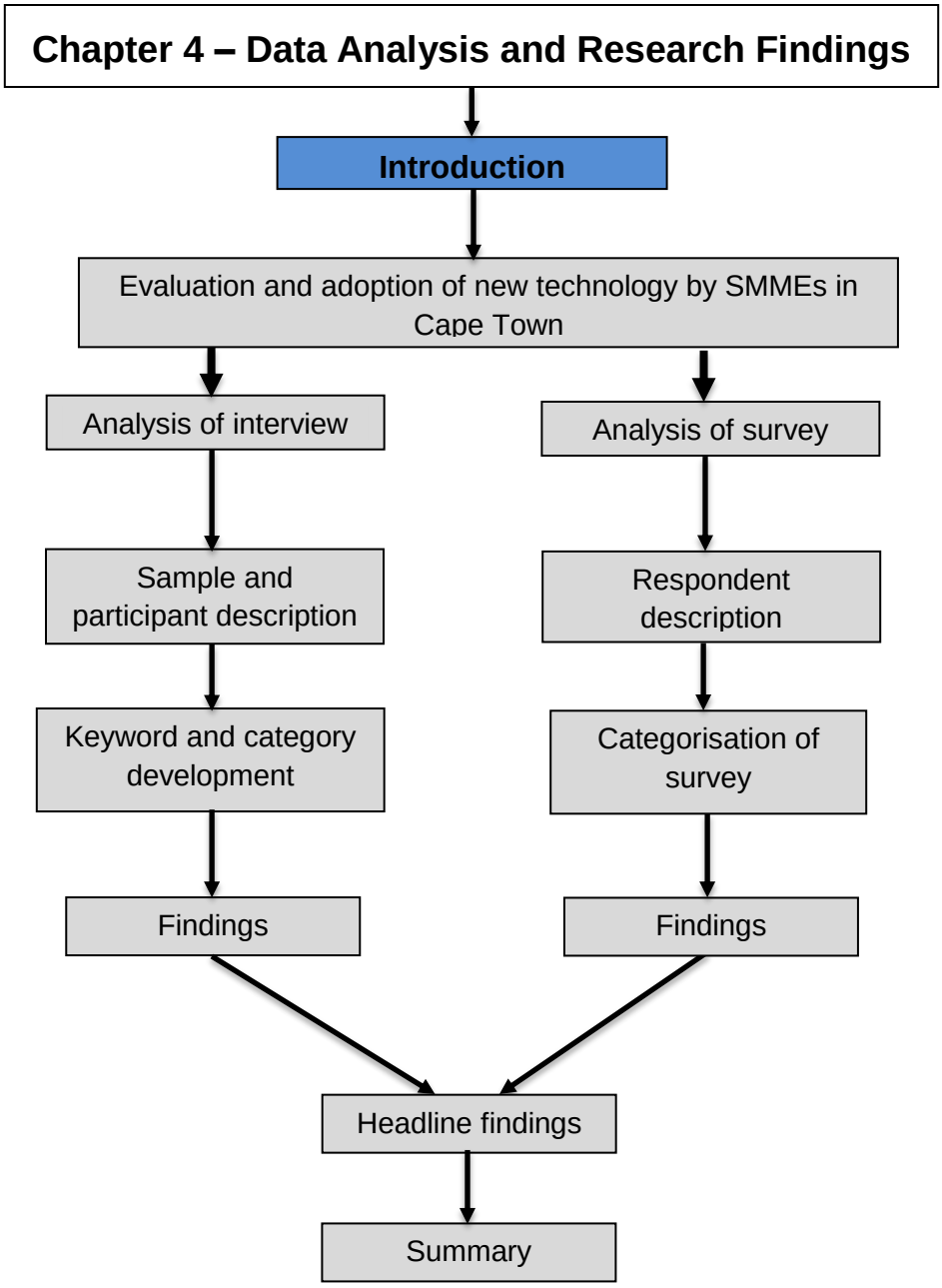

Figure 4.1: Graphical representation of Chapter Four

CHAPTER FOUR: DATA ANALYSIS AND RESEARCH FINDINGS

4.1 Introduction

Chapter Four presents the discussion of the data obtained from the interviews with the research participants and organisational cases of the research study. Categories and themes emerged from the research findings with the use of hermeneutics and thematic analysis methods for the interview data and a descriptive method of the survey data. The findings from the interviews and survey are presented in a narrative as well as descriptive form in relationship with the research questions and sub-questions. The business profile of the research samples, participants and cases of the research study together with their operational sector and number of employees are also described. Figure 4.2 shows the physical context of where the research was carried out in each location. It also shows the bigger Cape Town area including the areas known as the Cape Peninsula and Boland Region.

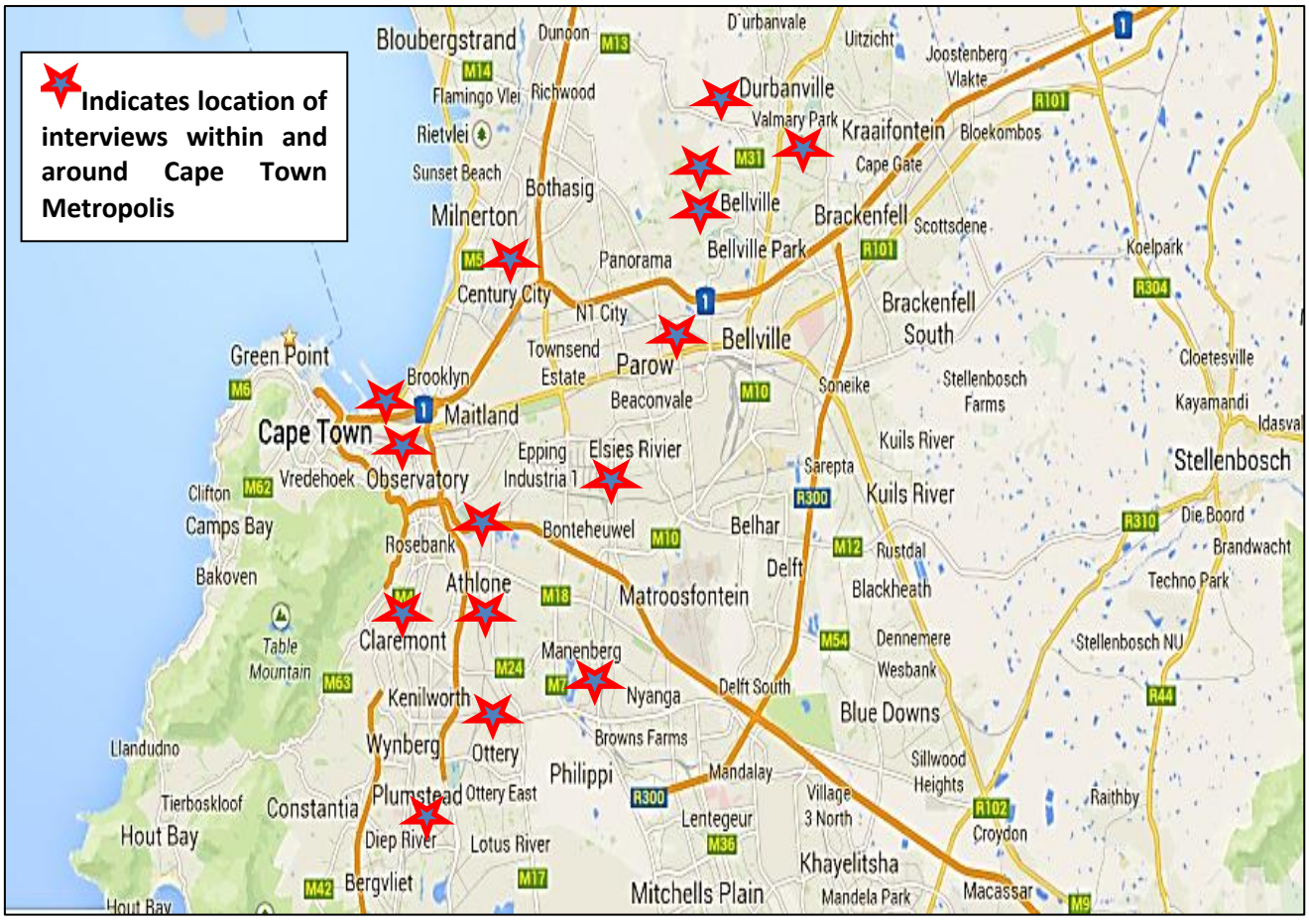

Figure 4.2: Map showing the Cape Town Metropolis and the interview locations

The study focuses on the importance and advantages of the evaluation and adoption of new technology with the potential benefit to the business process and ultimately the success of the enterprise. The study was conducted to propose a set of guidelines that could assist SMME owners and managers in making informed decisions on adopting new technology with potential benefits and value for the business.

As stated in Section 1.2.1, one of the many challenges SMMEs are facing is that SMMEs do not sufficiently evaluate the potential, applicability and adaptability of new technology for the business, and as a result lose opportunities to gain a competitive advantage in the market. This can have an impact on the long-term viability of the business.

In an endeavour to find answers to the research problem, two main research questions are asked:

Research Question 1: What are the adoption challenges for SMMEs in terms of the evaluation of new technology?

Research Question 2: How does the evaluation of new technological innovations affect the adoption of new technologies in SMMEs?

Supporting the problem statement and research questions, the aim of this research is to explore the reasons behind the failure of SMMEs in evaluating and adopting new technology. The exploratory study is aimed at gaining a deeper insight into unknown and previously identified factors in the literature that affect and inhibit evaluation and adoption of new technology in SMMEs. The findings are used to propose a set of ICT evaluation and adoption guidelines for the successful evaluation and adoption of new technology innovations in SMMEs.

4.2 Analysis of interview responses

Interviews were used to determine the interviewees' understanding of the evaluation and adoption of new technology for the purpose of advancing and developing their business processes, operations and output. The interviews were all conducted on the premises of the interviewees, with the exception of one that was done at the Cape Peninsula University of Technology in the boardroom of the Centre for Chief Information Officer (CIO) Research in Africa, in the Engineering Building on the Cape Town campus. The location of the interviewees were spread across Brackenfell, Heathfield, Durbanville, Bellville, Diep River, Observatory, Wetton, Athlone, Woodstock, Bridgetown, Parow and Century City, all situated within 50 kilometres of Cape Town City Center as previously shown in Figure 4.2.

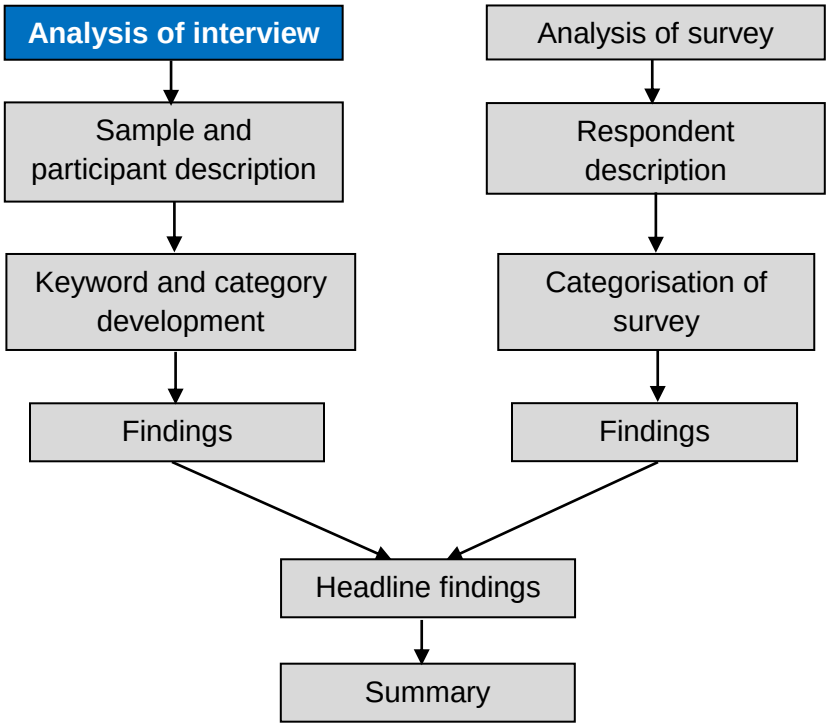

Figure 4.3: Chapter layout: Analysis of interview

The interviews were conducted in the environment chosen by the interviewee, which was mostly in the workspace of the SMMEs. The interviews were all recorded with written and verbal permission obtained from the interviewees. Sixteen (16) questions were asked; the average duration of the interview ranged between 45 minutes to 1 hour while following the sequence of the interview guide (Annexure C).

Interviewees were enthusiastic about being part of the research as they consciously identified with the aim of the research and displayed a positive propensity towards contributing their opinion and sharing their experiences in the course of the interview conducted.

4.2.1 Sample and participant description

Fifteen (15) SMMEs were purposively selected for collecting qualitative data by means of a semi-structured questionnaire in an interview format. SMMEs from the financial, business services and manufacturing sectors were used as the unit of analysis (Table 4.1).

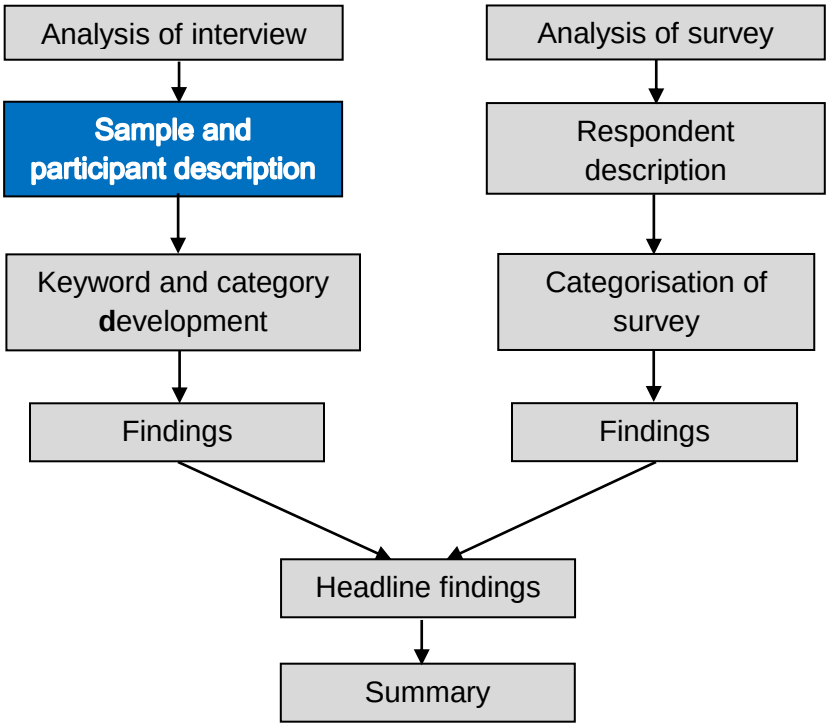

Figure 4.4: Chapter layout: Sample and participant description

The owners, co-owners, managers and information officers of the organisations were the units of observation. The interviewees had varying lengths of practice and experience in their specific sectors. Most of the interviewees can be classified as *early majority* and *late majority* according to Rogers (1995) because of their cautious predisposition and approach to new technology adoption and their perception of evaluating new technology for the benefit of the business.

Table 4.1: The unit of analysis used in the research

Cases	Industry	Scope of operations	Employees
1	IT and Services	South Africa	30-40
2	Business Services	Cape Town	10-15
3	Media and Communication	Cape Town	10-15
4	Manufacturing	International	90-100
5	Manufacturing	Cape Town	20-30
6	Business Services	South Africa	100
7	Business Services	Continental	8-10
8	Business Services	Cape Town	5-10
9	Business Services	South Africa	70-80
10	Financial Services	Cape Town	8-10

Cases	Industry	Scope of operations	Employees
11	Financial Services	Cape Town	5-10
12	Financial Services	Cape Town	15-20
13	Financial Services	South Africa	15-20
14	Financial Services	Cape Town	8-10
15	Financial Services	Cape Town	8- 10

Case 1: Is a South African based company with its head office in Cape Town and branches in Johannesburg and Durban. The business services include technical IT support, software and business solutions development, IT outsourcing services, web hosting and application services. While the research study was conducted, the company had 30-40 employees across its outlets.

Case 2: Is a Cape Town based company that deals in wholesale sales of stationeries, office furniture and cleaning materials. The company conducts business within the City of Cape Town Metropolis. In addition to 8 permanent employee members, it also makes use of a number of telesales marketers to generate sales.

Case 3: This Media and Communications Company specialises in video production that involves conceptualisation, script writing, recording events and providing beginners with video format file and support. It employs between 10-15 staff members with a few freelance workers hired when in need of extra hands on the set. It operates within the City of Cape Town Metropolis and surroundings.

Case 4: This Company has its operations in South Africa, producing and selling locally to the local and international market. It manufactures fencing materials, products with girth metals and fencing wire works. It has branches in Johannesburg, Bloemfontein, Port Elizabeth, Durban and George, and maintains interest in the United Kingdom and Israel. It employs between 90-100 employees.

Case 5: A manufacturing company that deals in the production of what is called fenestration products (windows, doors, aluminium, glass, among others). The company employs between 20-30 employees and makes use of extra labour when necessary. It operates within the City of Cape Town Metropolis and surroundings.

Case 6: The Company provides financial management and call centre solutions to large corporations. The company employs approximately 100 people and plans to move part of their

investment delivery business off shore in the coming years. Their operation currently covers a spectrum of domestic interests in South Africa.

Case 7: Company 7 runs an online e-commerce service, providing retail, wholesale and distribution sales services to customers and major agents and distributors. It operates in the continental market where it has agents distributing and selling to a number of African companies. The company employees between 8-10 employees and also has part time and contract staff members working in collaboration on sales, marketing and distribution.

Case 8: The Company runs a virtual online management business. It designs and runs management programmes for different organisations, acting as a management development entrepreneur in conjunction with business schools and various organisations. It also holds a license for a business simulation enterprise which it leases to others businesses to run, and which is also run by them. The company employs between 8-10 employees for its business operations based in South Africa, with its center of operations in Cape Town.

Case 9: Is a financial services development and compliant management company. They oversee small business compliance to stipulated legislation, especially businesses in the financial sector. They also provide risk management practices to small business enterprises to ensure sustainability of their businesses. The company operates within the South African market and employees between 70-80 employees.

Cases 12 and 13 are companies that focus on investment planning and risk planning services, and term themselves as wealth managers. They operate within the City of Cape Town Metropolis and surroundings. The companies employ about 15 to 20 permanent staff members.

Cases 10, 11 and 15 are financial services provider companies (FSPs) dealing in risk advisory services, financial planning, insurance portfolio management, medical aid, short term insurance, wills, retirement planning and other forms of financial services. They operate within the City of Cape Town Metropolis and its immediate surroundings. The three companies each employ between 5 and 10 people.

Case 14 Is a company that engages in financial coaching and tutoring of individuals and organisations in the area of financial management. The company provides downstream services as a result of the coaching activities, including financial planning services and insurance brokerage. They operate within the radius of the City of Cape Town Metropolis and employ between 8-10 people.

4.2.2 Keyword and category development

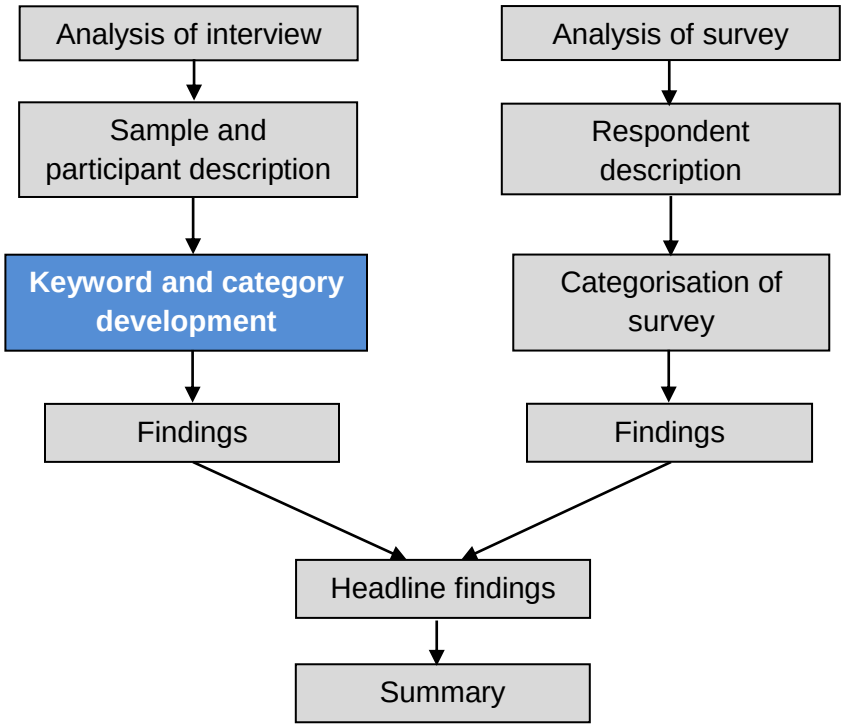

Figure 4.5: Chapter layout: Keyword and category development

Similar and relevant keywords were extracted from responses of the interview questions (Table 4.2). From the keywords identified, categories of similar keywords were developed (Table 4.3).

For the convenience of the reader, the main research questions and research sub-questions of the research study are once again stated below.

Research question 1: **What are the adoption challenges for SMMEs in terms of the evaluation of new technology?**

Research question 2: **How does the evaluation of new technological innovations affect the adoption of new technologies in SMMEs?**

Sub-question 1.1: What are the factors that influence evaluation and adoption of new technology?

Sub-question 1.2: How do SMMEs initiate evaluation in the process of adopting new technology in business?

Sub-question 1.3: What are the perceptions of SMME managers of new technology evaluation?

Sub-question 1.4: What is the role of government in actively facilitating and engaging SMMEs proactively in the evaluation and adoption process of new technology?

Sub-question 2.1: How can SMMEs evaluate the business potential of new technologies?

Sub-question 2.2: How does the evaluation of new technology affect the decision-making of new technology adoption in SMMEs?

Sub-question 2.3: How does the evaluation and adoption of new technology affect SMMEs' viability and sustainability of their business interest?

The following questions formed part of the questions asked by the researcher, and the eight interview questions stated below evoked the most response and produced the richest form of data from the interviews with managers and owners of the selected SMMEs in Cape Town.

- What steps would you take to acquire the use of new technology for the business?
- What are the difficulties experienced with/in the process of acquiring a new technology?
- How do you identify new technology with business potential that is applicable and adaptable for the business?
- What role do you think evaluation of new technology plays in the success of the business?
- What aspect of the new technology will you be interested in evaluating for the business?
- How do you make decisions on new technology to adopt for the business?
- Does the government play an active role in facilitating the adoption process of new technology by SMMEs?
- What effect do government policies have on creating a technology-oriented and friendly environment to boost the adoption rate among SMMEs?

Value of technology, business leverage, change, cost, legislation, skills and training, risk and uncertainty, government policy, technology, infrastructure, government programme, knowledge, competitive advantage, information accessibility and *business needs* were among the keywords mostly used during the interviews.

The keywords were identified by summarising related data relevant to the research questions answered in line with the research question objectives shown in Table 4.2. The emergent keywords were then presented in the number of subsequent occurrences from the different companies interviewed. A total of 22 keywords/terms were identified and used to summarise the data content.

Table 4.2: Keyword summary: Frequency of keyword(s) and number of organisations using the specific keyword(s)

Keyword	Number of frequency	Number of Organisation
Evaluation of New Technology	57	14
Accessible Information	49	15
Government Policy	42	14
Technology Potential	36	14
Business Value	33	12
Uninformed Decision	29	12
Role of Evaluation	21	10
Technology Infrastructure	21	13
Risk and Uncertainty	19	12
Business Needs	19	10
Research New Technology	18	9
Cost of Adoption	16	9
Evaluation Tool	15	14
Non-Evaluation	14	14
Competitive Advantage	13	8
Skills and Training	10	7
Technology Market	7	6
Cost of Compliance	6	5
Resistance to Change	5	4
Cost of Technology Support	4	3
Integration	3	3
Skills and Experience	3	2

4.2.3 Categories

The thematic method of grouping and categorising the transcribed data as described in Chapter Three, and applied to the interview data transcript, yielded a set of 12 categories (Table 4.3). The categorisation of the data was done by grouping keywords and phrases with similar meanings together, and placing them into complimentary categories. It is recognised that some level of bias could be evident in the frequency of use of some certain keywords and phrases as well as by the number of organisations mentioning the keyword(s). Some SMMEs interviewed provided answers using specific keywords that were part of the questions asked during the interview.

Table 4.3: Categories

Categories	Frequency of number of related keywords	Number of Organisation
Evaluation of New Technology	142	15
Accessible Information	49	15
Government Policy	42	14
Business Needs	33	14
Technology Infrastructure	33	13
Non-Evaluation	43	12
Business Value Added	33	12
Cost of Adoption	24	12
Risk and Uncertainty	19	11
Competitive Advantage	13	8
Technology Market	7	6
Resistance to Change	6	5

The findings from the interviews are discussed from the highest to the lowest frequency of keyword categories being mentioned by the participants of the different organisations. Figure 4.6 is a representation of the categories of keywords from the highest to lowest frequency of use as well as the number of organisations mentioning the keyword(s). The current category being discussed is highlighted in each figure under the corresponding categories.

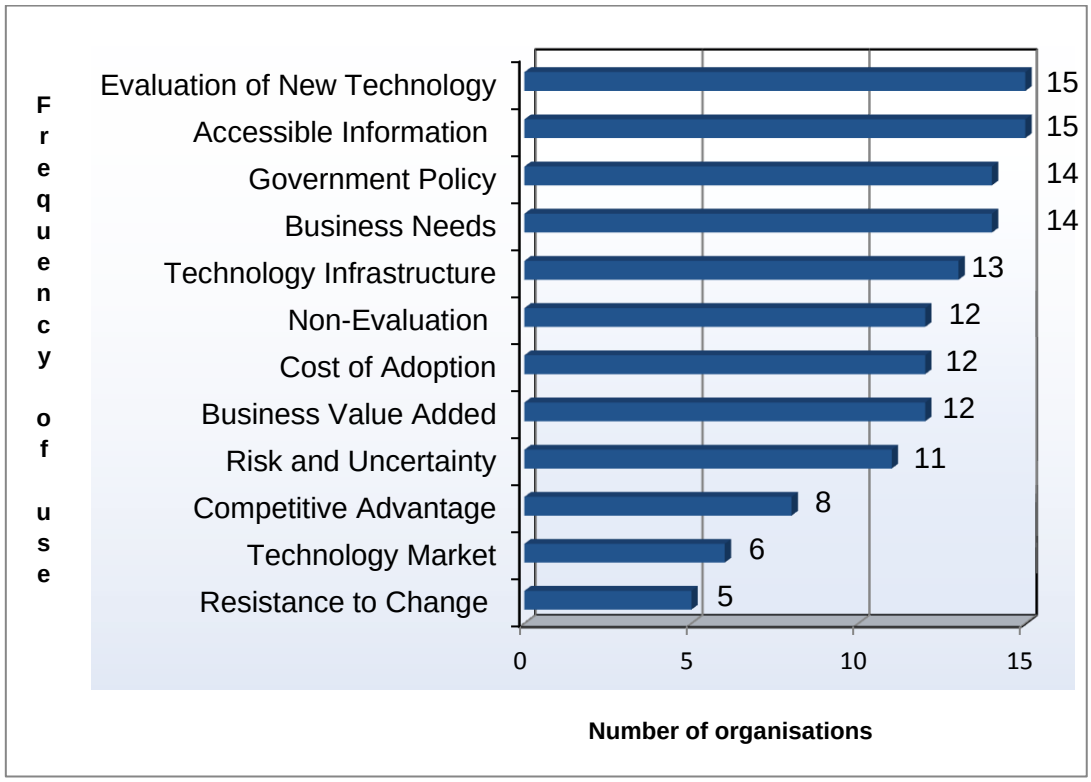

Figure 4.6: Evaluation and adoption categories

In the course of the interview, some interview questions produced and elicited varying answers which were subsequently grouped according to the similarity of the keywords under different categories. For the purpose of clarity, some of the sub-questions appear more than once under different categories of keywords they are aligned to. Some of the categories presented comprise of sub-categories that make up the entire category, with *Evaluation of New Technology* having the highest number of sub-categories (6), while *Accessible Information, Government Policy* and *Business Needs* all have two sub-categories each, with the rest appearing as a single category.

4.2.3.1 Evaluation of New Technology category

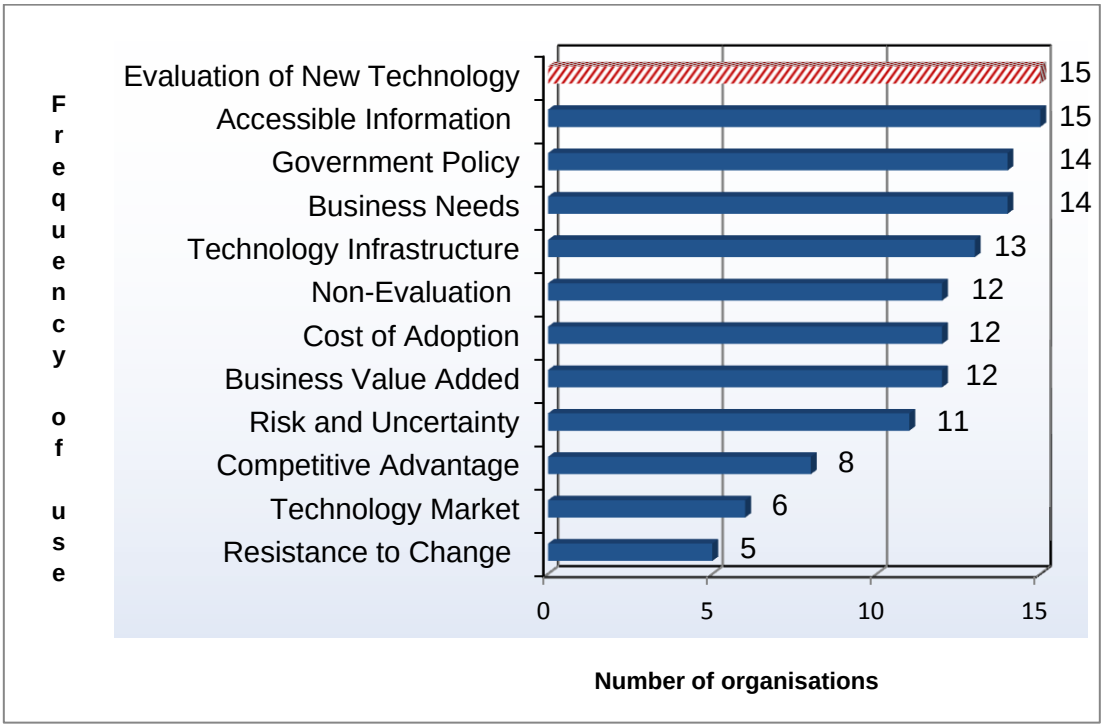

Figure 4.7: Evaluation of New Technology

Evaluation of New Technology emerged in all SMMEs interviewed (Figure 4.7). The comments on evaluation relate to the adoption of new technology, which include the different ways and steps by which SMMEs go about evaluating technology for the purpose of the business. “Evaluation gives you the full knowledge about the functionality of the technology; it guides you in making informed decisions”, as stated by *Respondent 3* (see Annexure G, Section 1).

It is important to note that these specific keywords, *Evaluation of New Technology,* can be misleading because of its multiple occurrences as the entire interview process is about new technology. The value of the question and the high frequency lie within the fact that SMMEs

recognise the importance of evaluating new technologies for the organisation before acquiring and adopting the new technology.

The evaluation of new technology includes researching new technologies, investigating the potential of new technology, suitability (adaptability, affordability, compatibility, applicability scalability, capability) of the technology, the role of evaluation, the need for an evaluative tool to help in decision making and integration considerations in the evaluation process of new technologies. The sub-categories of the *Evaluation of New Technology* category will be subsequently discussed in relation to the research sub-questions.

i) Researching new technologies

Research sub-question 1.2: How do SMMEs initiate evaluation in the process of adopting new technology in business?

From the responses of the interviewees it becomes evident that, in order to evaluate the business potential of new technologies, businesses need to take into account their relative experience, what experts in technology and business industries are saying, ask their peers and colleagues in the industry about the latest developments, and see evaluation as a continuous iterative activity.

The above statement is supported by the following responses from respondents 7, 8 and 9. *Respondent 7* indicates that “experience counts where a lot of people have tried it and you can access their comments”.

Respondent 8 states that, when taking steps to acquire new technology for the business, “I reach out to a network of people I know who know about it”. Reaching out involves consulting people with relevant and useable knowledge about the technology. Respondent 8 continues by saying that “I will seek professional advice through the network of people that I know” and “talk to experts in the business”.

Respondent 9, in his support for researching new technology, admits that “there is need to keep abreast of where the industry is moving” (see Annexure G, Section 1).

Finding 1: SMMEs are aware of the need for continuous research and knowledge acquisition of new available technologies.

Finding 2: Information about new potential technology is gained by consulting colleagues, professionals and experts in the industry.

ii) Investigating potential technology

Research sub-question 2.1: How can SMMEs evaluate the business potential of new technologies?

Determining the functionality and potential of new technology is a necessary prerequisite for the adoption of new technology. *Respondent 1*, who has a strong believe in going through a proper process to identify potential and value offering new technologies have for the business, states the following: “Perform initial proof of features of the offering, what kind of value does it offer and determine value added and role of technology” (see Annexure G, Section 1). He continues by stating that SMMEs should “research to look at best solution before implementing it, compare the features and potentials of what you have with new one, and study the offerings with the best performance”. He posits that there is a “need to understand what technology is designed for”.

The approach to investigating a new potential technology for the business is one of pragmatism and logical deduction from established facts. *Respondent 8* states that her view on determining the potential of a new technology is “…establishing how to maximize the utility of the technology, understanding what the technology is all about, then you are better informed about the technology” (see Annexure G, Section 1).

Finding 3: Most of the interviewed SMMEs seem to understand the importance of investigating the potential value of a new technology, asking questions about the functionality and operability of the new technology when considering different available options.

Finding 4: SMMEs are concerned about understanding the dynamics and operational design of a new technology and level of applicability to the business process.

iii) Suitability of new technology

Research sub-question 2.2: How does the evaluation of new technology affect the decision-making of new technology adoption in SMMEs?

One of the major factors when evaluating new technology is determining how suitable the technology is for the SMME. Every company determines its own suitability according to the specific environment and the business functions therein.

This is best illustrated by the comments of *Respondent 5* when he states that SMMEs should go about:

> ...observing and absolving what is happening around, and then making decisions to see if it is appropriate; there are certain areas where technology fulfils certain criteria, and then it becomes appropriate.
>
> Assessing what is happening and making a conscious decision, combining a computerized solution with good judgment.
>
> I have a hang up on what is appropriate not what is new, and how do you determine what is appropriate.

Appropriateness is a key attribute for *Respondent 5* regarding the adoption of new technology. He posits that relevant questions need to be asked concerning the new technology: "Does the technology work in my environment? Is it appropriate in my environment? What can the technology do for me? What will add value to me is to sieve, distil and break down to essential things useful for the growth of the business".

Respondent 14 notes that, for SMMEs to successfully adopt a suitable new technology for the business, they must "understand the solution bought fully and the value of its ability and capacity, and choose the one that looks most appropriate" (see Annexure G, Section 1).

Finding 5: SMMEs understand that evaluation of technology gives a better understanding of the suitability of new technology, contributing towards an informed decision.

Finding 6: Evaluation of new technology gives a gratifying feeling of enjoying the technology based on the decision made from relevant facts on the technology.

iv) Role of evaluation in adoption

Research sub-question 1.3: What are the perceptions of SMME managers of new technology evaluation?

Evaluation of new technology plays a major role in adopting or rejecting a new technology. The role evaluation plays is emphasised by the perceptions of the SMME managers and owners interviewed. This is represented by *Respondent 1* who states that the role of evaluation is the "ability to evaluate and adopt right value-adding technology at the right time", and that it "increases economic survival potentials". Evaluation enhances the chances of survival of the business, "evaluation plays a crucial role, helps the business to understand risks" (see Annexure

G, Section 1). The ability to understand the risk involved informs better decision making by managers and owners of a company. *Respondent 1* emphasises the importance of evaluation to SMMEs by stating that "evaluation of new technology should be a standard practice to aid the continuous improvement practice of SMMEs".

Respondent 3 makes his impression of evaluation known by stating the role evaluation plays in the adoption process as extremely important: "Evaluation is extremely important; evaluation gives full knowledge about the functionality and components of the new technology". Having full knowledge of the functionality of a new technology helps in making an informed decision on the adoption or non-adoption of the technology (see Annexure G, Section 1).

Finding 7: Evaluation contributes to a better understanding of the risks associated with new technology, which prevents a business from unnecessary exposure to uncertainty.

Finding 8: Evaluation is a key enabler of business; it enables technology to be seen as a means to an end with the ability to be more efficient and productive, which increases economic development and survival of the business.

Finding 9: Evaluation of new technology helps SMMEs to make informed decisions on facts and verifiable information which places the business in a good stead of sustainability.

v) Evaluation tool

Research sub-question 2.2: How does the evaluation of new technology affect the decision-making of new technology adoption in SMMEs?

During the course of the survey, the need for an evaluation tool to assist SMMEs in evaluating new technology and making decisions on technology to adopt for the business, became evident in the interview with *Respondent 7*, who said the following of evaluating new technology with an evaluation tool: "Then you can test it with a set of formal structures and take it off if it doesn't meet the requirements of the rubric" (see Annexure G, Section 1). This response from *Respondent 7* prompted the researcher to ask the question in subsequent interviews; consequently, similar responses concerning the need for an evaluation tool by SMMEs were obtained in subsequent interviews.

These responses were captured by statements from respondents 12 and 14, with *Respondent 12* stating: "There is a need for a tool to help evaluate properly".

Respondent 14 indicates that, “obviously an evaluation tool will help make good decision”, and “then you can test it with a set of formal structures”. The evaluation tool will put SMMEs in good stead to evaluate and adopt new technology for the benefit of the business (see Annexure G, Section 1).

Finding 10: SMMEs have a need for an evaluation assessment tool to help make informed decisions on appropriate new technology for the business process.

Finding 11: SMMEs can also be assisted by guidelines on the evaluation process to identify factors relating to their business environment affecting the evaluation of new technology for the business.

vi) Integration

Research sub-question 2.2: How does the evaluation of new technology affect the decision-making of new technology adoption in SMMEs?

Respondent 5 states that proper implementation/integration is done when new technology is put into effect before the appropriateness to the business process can be established: “You bring the features of the appropriate technology to the user environment to determine if it is appropriate or not” (see Annexure G, Section 1).

Respondent 6 indicates a need for “flexibility of integration” for the new technology to be properly integrated into the system.

In the process of adopting new technology for the business, the implementation and integration of the new technology to the existing or new business process must be planned and provided for, and executed in a manner that will not disrupt the business process. This point is supported by respondents 4, 5 and 6, with *Respondent 4* stating: “Make changes by implementing technology gradually”. The importance is that the integration of the new technology to the business process can be observed and measured according to expected performance, but this stage has a small window of opportunity because of the restrictions of the technology market.

Respondent 6 posits that for a new technology to be evaluated and adopted for a business, it must have the ability of “flexibility of integration”. The more flexible the new technology capability, the better the adaptability and integration to the business process (see Annexure G, Section 1).

Finding 12: Implementation of new technology without a flexible phased-in process leads to complications and uneven integration with the existing business process.

4.2.3.2 Accessible Information category

The accessibility of information was mentioned by all the interviewees (Figure 4.8).

The number of 'mentions' by the organisation shows the priority and importance placed on information accessibility by SMMEs.

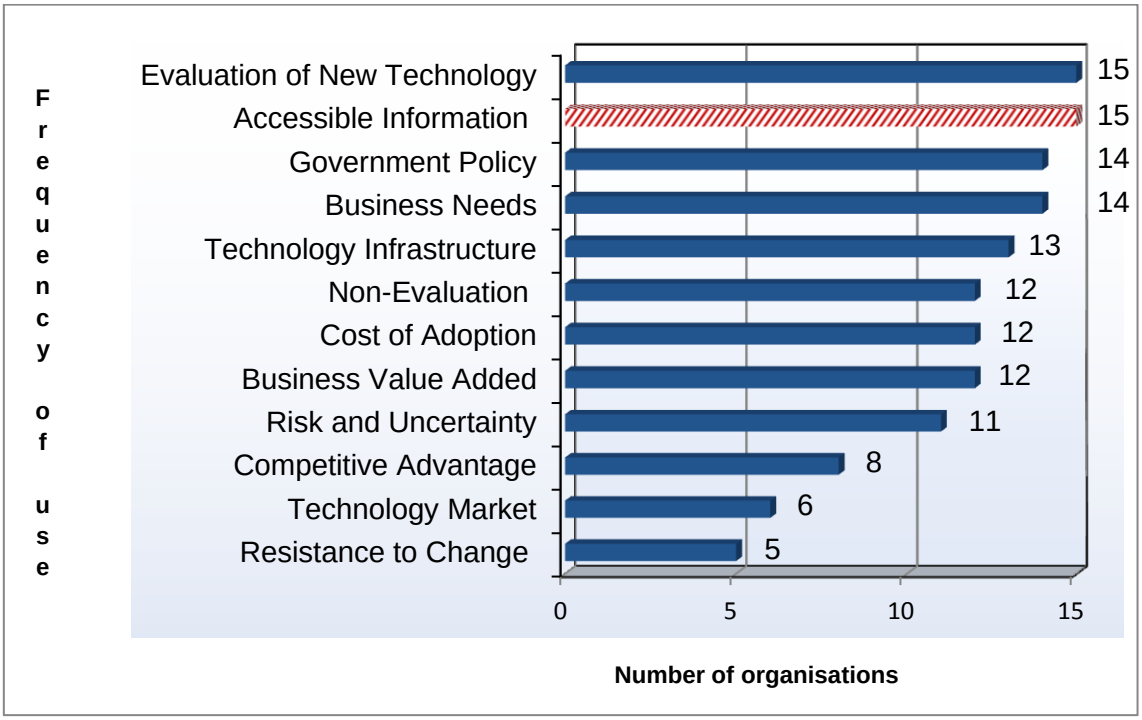

Figure 4.8: Accessible Information

i) Information and knowledge access

Research Sub-question 1.2: How do SMMEs initiate evaluation in the process of adopting new technology in business?

Awareness of opportunities in a business environment and having prior knowledge of new technology before the evaluation process begins is crucial to the successful evaluation and adoption of the new technology for the business. Having relevant information and knowledge before proceeding with new technology evaluation and possible adoption is vital for the continued relevance and survival of the business.

The statements made by respondents 13 and 15 incorporate the general feeling of the respondents on the lack of information availability and accessibility for small businesses. *Respondent 13* argues that information availability is a necessity, "especially sharing knowledge of new technology, the small business can use that".

Respondent 14 states in support of information availability for SMMEs that, "in many small businesses there is no way of getting information". Information accessibility is fundamental to the success of the business, hence information availability and accessibility is important to the successful evaluation and adoption of new technology by SMMEs. He continues by stating that "information flow in a small business is critical; it's about people" (see Annexure G, Section 2).

Access to information is a priority for business development and survival, and SMMEs should be actively assisted and supported by government to gain knowledge and access information they can act on for the benefit of their business.

Finding 13: The lack of accessible information on new technology limits the ability of SMMEs to evaluate and adopt new technology to support the business.

Finding 14: There is no existing centralised information outlet where information about new technology is made available to SMMEs.

ii) Sources of new technology knowledge

Research Sub-question 1.2: How do SMMEs initiate evaluation in the process of adopting new technology in business?

Eight main sources as to how and where SMMEs can obtain knowledge on new technology were mentioned by the respondents (Figure 4.9). These sources include network of people in the same or similar industry, research on currents business practices, internet searching and platforms, business and technology vendors, trends in the society, media advertisement and programs, trading partners and service providers, and seminars.

The main sources of knowledge are represented below in the order it was mentioned, and discussed accordingly.

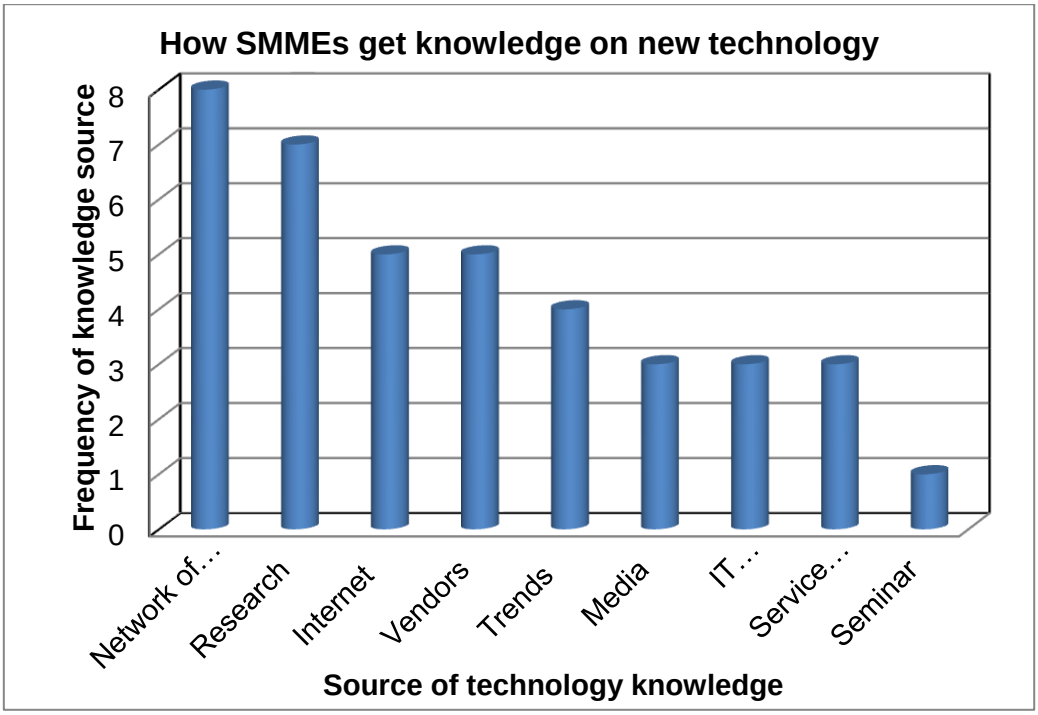

Figure 4.9: Graphical representation of how SMMEs obtain knowledge on new technology

Network of People: The key term *Network of People* is the highest means by which the interviewed organisations obtain knowledge about new technology for their businesses. Speaking to people within and outside the business helps in accessing information and gaining knowledge on how others operate and the technology they use.

Statements are made in this light by *Respondent 4*, indicating that we "talk to people that know what is going on in the industry".

Respondent 8 notes that knowledge on a new technology is gained by a "network of people I know who know about it".

Respondent 10 supports this statement by saying that "association with the right people with good information" gives the desired knowledge regarding peer and sector information.

Respondent 15 posits that "technology information flow is largely driven by your network and the connections that you have" and also by "word of mouth", among others. Networking with the right people with access to credible information on new technology is an advantage a business cannot afford to pass by.

Research: The keyword *Research* is second on the list of means by which SMMEs are informed of technology advancement and relevant new technology available for their business. Researching a new technology involves scanning the market for relevant technology, looking at what other people are using in and around the globe within the scope of the business sector and also looking at the current level of innovation among other competitors in the same market.

Respondent 5 has a cautious approach to research, saying that "doing our research the approach is one of pragmatism".

Respondents 7 is quoted as saying that they "did some researches about what the new technology require, doing research to know what the next thing is", while *Respondent 12* states that "we did quite a lot of research before deciding on the programme". Researching new technology keeps people informed about the latest development and advancement in technological tools that can add value to the business. Keeping abreast of the technology circle provides the ability to be ahead of the game in the market place.

Internet: The internet is a useful source of information for those who seek to be informed about virtually anything, but distinction has to be made between credible and bogus information. Due to the advent of electronic commerce and marketing on the internet, information has become more distorted and ambiguous. Care must be taken to access the right information without being led astray or falling victim to misinformation. Despite the loopholes, the internet has grown to become the most powerful tool for accessing and disseminating information throughout the globe with instant and real-time access to information. Responses about the use of the internet in accessing information on new technology are described by respondents 9, 14 and 15. Their responses are presented consecutively as: "We get some good referrals from the website"; "Subscribe to online publication and website"; and by conducting "Internet researching" (see Annexure G, Section 2).

Vendors: Vendors and suppliers play an active role in informing SMMEs about new and prospective technology to help facilitate the business process. Both vendors and suppliers have a good knowledge of the intricacies of the technology world and can pass such desirable information on to their clients to take advantage of. The issues inherent to the duo are that their drive and desire are usually towards making profits and selling products, and not necessarily giving SMMEs the required information to enable them make informed decisions. Comments made on the use of vendors as information assets include *Respondent 2* who states: "New technology we normally get knowledge about from our suppliers".

Respondent 6 in similar words indicates that information can be solicited by “conferring with IT service providers”.

Respondent 12 states that “we get vendor presentations from recommendations by Compliance Companies”, while *Respondent 13* indicates the following: “From questioning, we tell them the needs we want and see what is available, to making a decision on either buying it or paying for it to be developed from outside”. Information from vendors and suppliers is usually segregated to meet their own objectives which are usually or mostly profit-oriented, leaving SMMEs with abridged versions of information about new products.

Trends: The keyword *Trends* is concerned with following the latest happenings in an environment; it denotes what is presently in vogue in terms of technology. Trends involve looking at what is currently buzzing both locally and internationally as it affects new technology adoption for the benefit of the business. *Respondents 1 and 5* make the following remarks on obtaining information about new developments from trends: “We look at recent trends”, and go about “absolving what is happening around, and then making decisions to see if it is appropriate”.

Respondent 6 states that they obtain knowledge about new technology by “keeping abreast with what is happening domestically and globally”, while *Respondent 14* says they “consider more trends from overseas than locally”. There is a need to exercise caution and restraint when it comes to the issue of trends. Trending technology does not always mean it is suitable for all businesses; rather assess the applicability to the business environment before making a decision, based on factual knowledge and not impulse.

Media: Media is another popular means of dissemination and sharing of information because of its wide reach of audience. The media uses its wide reach through multimedia and print media to penetrate areas where other means of communication might not be possible. Information shared by the media on new technology can be either in the form of reporting or advertising.

Comments made by *Respondents 6, 13 and 14* regarding new technology information through the media indicate that they obtain information by “following newsletters and presentations and discovering things sometimes through the media”. However, owing to the media’s preceding reputation and its business of advertisement and marketing, there is always an issue of trust surrounding the credibility of products advertised on media platforms. People are usually seen to be wary of information and offerings from the media outlet.

IT Professionals: Obtaining information and knowledge on new technology by speaking to IT professionals is also mentioned by the organisations as a way of accessing new technology. IT professionals are renowned for having a keen interest in the latest technologies around the globe, keeping them informed on the latest or potential advancements. This in turn keeps them current and in the loop of high demand for their services. SMMEs can potentially obtain information and knowledge about the current happenings in the technology sector if they avail themselves to the possibility of consulting with IT professionals. *Respondents 8 and 11* thus comment that "we talk to people with information technology (IT) knowledge, we talk to experts with expertise on dealing with the technology", while *Respondent 13* states that "we have an onsite IT professional", these professionals are difficult to access due to the nature of their work, and they usually charge high fees which might deter the SMMEs from consulting them.

Service Providers: Product providers in the insurance sector act as a source of information about new technology availability for FSPs that operate within their purview. FSPs are exposed to new technology by the service providers because of the need to align their business interactions with each other in an effective and organised manner. FSPs are consequently introduced to new technology with information on the benefit and advantages they stand to gain from the use of the technology. *Respondent 9* comments that "insurance product providers like Sanlam and Discovery also have technology they use which are introduced to us", *w*hile *Respondents 10 and 11* state that "we get information about technology from compliance and insurance companies". Product providers can be a way of obtaining knowledge about new developments in the financial services sector; their influence may see the increase in uptake of new technology by the FSPs.

Seminars: Seminars as a way of obtaining information about activities relating to new technology for the business is mentioned by *Respondent 1* only. Seminars are usually confined to a certain audience with similar background or interest. Information on new technology accessed through a seminar might be facilitated by a consortium of technology solutions providers, technology product marketers and technology research associations, or a body with interest in technology and information dissemination which could include an individual or group of persons. SMME associations and unions can make use of seminars to sensitise their members to available technology to complement their business by inviting knowledgeable people to speak about the new technology directly to the audience of small businesses. Information accessibility through seminars is the least mentioned in considerations of avenues where information and knowledge on new technology can be sourced by SMMEs (see Annexure G, Section 2).

Finding 15: Networking with the right people with access to credible information on new technology can be of great advantage to the business.

Finding 16: Keeping abreast of the technology circle gives SMMEs the ability to be ahead of the game in the market place.

Finding 17: Service providers in the insurance sector are sources of information on new technology availability for FSPs.

4.2.3.3 Government Policy category

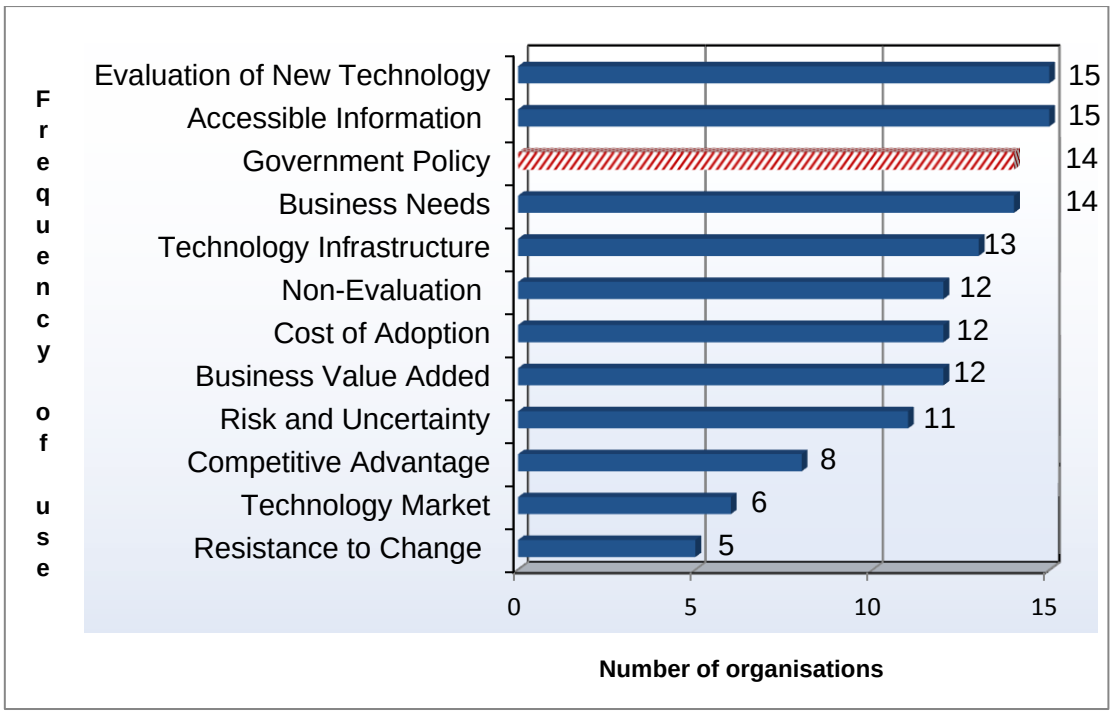

Figure 4.10: Government Policy

The key term *Government Policy* is mentioned by 14 of the 15 organisations as an enabler of, and barrier to, the evaluation and adoption of new technology by SMMEs. The high frequency use of this key term shows it is a point of interest as well as concern for the respondents (Figure 4.10). The responses from this category present the perception and observation of the respondents on the effect and impact of government policies known to them and how it relates to their ability to evaluate and adopt new technology for the business process while also considering the impact of government policies on SMME development and survival.

Figure 4.10 illustrates the rating of priority attached to government policy as a category regarding evaluation and adoption of new technology by SMMEs.

i) Government policies and legislation

Research sub-question 1.4: What is the role of government in actively facilitating and engaging SMMEs proactively in the evaluation and adoption process of new technology?

Government policies have the ability to play a sterling role in the growth and development of SMMEs in a country. The effects and impact of government policies on SMME development and the ability to evaluate and adopt new technologies are highlighted by the following responses from a few of the interviewees, which encapsulate the various responses from the interviewees.

The perception of the interviewees is surmised by *Respondent 5,* stating that government policies are not in line with SMME development. He further argues in support of the statement, saying that "when we talk about SMMEs, the regulatory environment for SMMEs is way too complicated and absurd". He states that "regulations can be simplified in so many ways for the benefit of the SMMEs". Current regulations have a strangle hold on the development and benefits acquirable by SMMEs as stated by the respondents.

A statement made by *Respondent 7* captures the arguments of some other respondents, saying that:

> …government are not evaluating and adopting proper technology to run their affairs. If the government leads in the space of technology, everybody else will follow. The government should evaluate their own technology and make better use of it. If small companies saw the government adopt technology themselves …they will be able to also adopt technology.

He argues further that "they should be more involved in themselves and get their own technology up to speed that will help the adoption of technology by SMMEs" (see Annexure G, Section 3).

The opinion of SMMEs in the financial sector is captured in a statement made by *Respondent 11*, saying that, "with the new FSB legislation we have to have and use technology". He also argues that "the compliance officers need to get up to date with technology".

Respondent 13 states that, "because of the nature of our industry we have to use technology; they put in requirements which forces *[sic]* us to us technology".

This statement is further buttressed by *Respondent 15* who argues that, “in the financial sector they have created a whole set of rules to follow; they have ended up forcing small business use technology”. Complying with FSB legislation makes FSPs adopt new technology to perform their business process in the required way. *Respondent 15* thus argues further that “you must have access to resources to buy equipment, if you don’t you are not in the game”. In retrospect, he states that “there will be a mass migration of older people in this industry out of business” (see Annexure G, Section 3). The ability to comply with new legislations governing FSPs standards will have a measurable impact on the sustainability of a number of FSPs, especially the ones operated by older generations of FSP managers and owners.

Finding 18: Implementation of government policies has little or no effect on SMME development in terms of business development; it is seen to rather favour large organisations according to the interviewees, with conflicting effects of government policies impacting positively and also negatively on SMME development and technology adoption for their business.

Finding 19: Government’s use of old and moribund technology in their processes and interaction with business entities is not encouraging for SMMEs to adopt new technology.

Finding 20: Legislation of FSP practices compels FSPs to adopt new technology to comply with the technology standards of the product providers driving technology uptake by FSPs.

Finding 21: Inability to comply with legislation on the use of new technology for analysis and reporting purposes has inadvertently forced a number of FSPs being run by older cadres of managers/owners, out of the business.

ii) Government support and programmes

Research Sub-question 1.4: What is the role of government in actively facilitating and engaging SMMEs proactively in the evaluation and adoption process of new technology?

In this section, the focus will be on the accessibility of government support programmes and the perception of the SMMEs about government’s contribution to the development of their businesses.

The mode and challenges of accessible information to SMMEs on new technology government support and assistance through the implementation of support initiatives and programmes are

benchmarked conditions for a healthy and vibrant development of the SMME sector. There have been more calls for increase in government participation in promoting the growth and development of SMMEs, especially in developing and less developed countries due to the nature of importance on the economy. The impact and contribution government programmes have are evident in developed and some of the developing countries where the vibrant nature of their economy is manifested through the contributions of SMMEs.

The general attitude of SMMEs to existing government support programmes is hitherto captured the by argument of *Respondent 3* against the presence of government support in business, saying:

> I have never heard of SEDA or what they do, there is no evidence of government responsibility, impact felt or seen. SMMEs are solely responsible for decisions made on new technology, either good or bad. No, I don't know of any help or benefit, you are disadvantaged as SMMEs (see Annexure G, Section 2).

Her response translates to not seeing or experiencing any impact from government programmes. She also states that "there is no forum where information or technology or related issues are made available", which is of major need and concern.

There should be existing platforms where SMMEs can seek and access assistance in the form of information and guidance concerning the evaluation and adoption of new technology for business purposes. *Respondent 3* argues that "government need to show existing support or help for SMMEs if there is".

Respondent 4 also reiterates his opinion of government support for business: "I don't believe they do. I am not aware of them playing that role; from my own experience it is zero". Stating further, he says: "In terms of technologies, there is no information segmentation out there that is easily accessible to us" (see Annexure G, Section 2). The lack of accessible information about new technology availability limits the ability of SMMEs to evaluate and adopt new technology to support the business.

Finding 22: SMMEs have little or no knowledge of available government support programmes, nor have they seen or felt their impact in the course of their business.

Finding 23: There are existing government programmes with mandates to help SMMEs develop especially in technological aspects but there is no visible effect experienced by the businesses.

Finding 24: SEDA is largely an unknown entity to the respondents and there is no knowledge of STP or what they do for small businesses.

Finding 25: SMMEs distrust government agencies who are supposed to assist them in developing their business because they have misgivings about government agencies from prior unproductive experiences with them.

4.2.3.4 Business Needs category

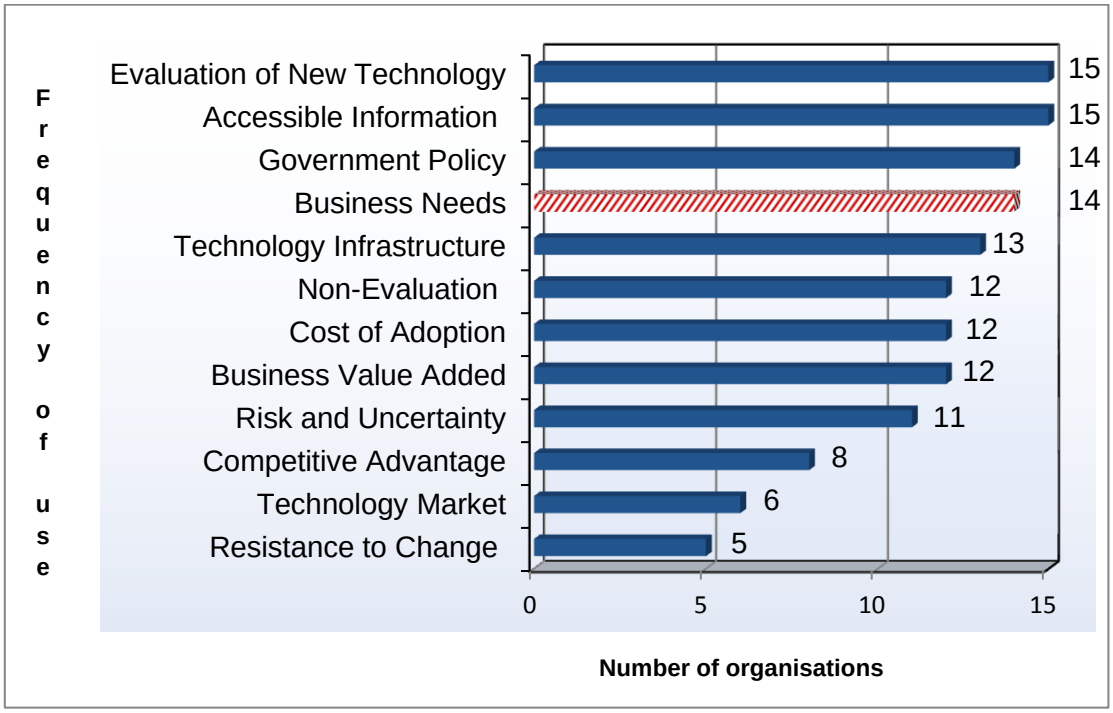

Figure 4.11: Business Needs

Business Needs is identified as one of the key phrases that has a notable impact on the evaluation and adoption of new technology for the business. It is jointly third in order of priority by the respondents with a rating of 93 percent (Figure 4.11). The *Business Needs* category indicates the requirements of the business in relation to new technology potential and the ability to apply the technology to the best of its capability, thus business considerations includes (a) the identification of business needs for new technology adoption, (b) the required skills and knowledge to operate the new technology, and (c) how to get the best out of the productivity of the business process using the new technology.

i) Identifying business need for new technology

Research sub-question 2.1: How can SMMEs evaluate the business potential of new technologies?

In business there is a need to be satisfied, but the challenge most businesses face is identifying the necessary needs, especially the salient ones that requires tacit knowledge of the business process and the areas that require improvement, and how to initiate it at the right time.

The need for establishing business requirements and objectives is highlighted by respondents emphasising a process of initiating a plan to acquire a new technology for the business. *Respondent 3* opinions that SMMEs need to "identify the features available and what is needed". SMMEs need to look at the capacity of the present system in use, identify core areas within the business process that require improvement, determine what the present system offers in that regard, and other applicable technology as well. *Respondent 3* further states that when accessing business needs, you "determine what you want, check what you already have" (see Annexure G, Section 4).

Respondent 12 is also of supporting opinion that when planning to acquire a new technology, it is best that "you start by knowing what your goals are and what you need to achieve; the system must meet your needs and what you want to achieve". Describing their experience in a prior adoption undertaken, he states that "we did extensive research before choosing, we asked all the questions" (see Annexure G, Section 4).

Finding 26: Identifying business needs ensures an understanding of how new technology can meet business objectives and deliver on organisational goals.

Finding 27: Asking the right questions about the business requirements and knowledge of technology capability creates a synergy of business and technology fit and facilitates technology expectation met by suppliers.

ii) Skills, training and experience

Research sub-question 1.1: What are the factors that influence evaluation and adoption of new technology?

In business, there is a need to determine and establish the type of skills required to operate the new technology by the users, so as to derive optimum value from the technology. Such

consideration would involve training the users to effectively acquire the required skills to operate the new technology optimally.

Respondents 1 and 4 epitomise the process of evaluating new technology for the business, with *Respondent 1* arguing that "time, training, resources available and experience" must be addressed by SMMEs. He states that SMMEs need to "determine if training and support is needed, while also considering training people with the right skills to evaluate and implement the new technology" (see Annexure G, Section 4). There is need to establish the type of skills required to operate the new technology by the user for optimum value and use, and provide training to that effect.

Respondent 1 opinions that SMMEs should "ensure people with good skills gets ownership or takes ownership on that evaluation of the environment for that solution". SMMEs require training and upgrading of staff members to competently operate the new technology although they often lack knowledge about the processes involved.

Respondent 4 believes that in the light of adopting of new technology for the business process, SMMEs lack the needed skills and capacity to properly operate the technology to deliver optimum output. He says it is an issue generally in business but when it comes to SMMEs, they "…especially don't have the staff capacity to handle IT effectively" (see Annexure G, Section 4). Inadequacy in the operating staff and skill capability to use newly adopted technology will result in under-performance and a feeling of inadequacy towards the technology by the users.

Finding 28: SMMEs lack the skills, knowledge and required capacity to operate new technology to deliver optimum output from the business process.

Finding 29: Inadequacy in SMME operating staff capability and experience in using newly adopted technology will result in under-performance and a feeling of inadequacy towards the technology by the users.

4.2.3.5 Technology Infrastructure category

Provision of social and business infrastructure returned a high rate of response from the organisations interviewed, ranking 5th (80 percent) in the set of categories. The category covers the business and social needs of SMMEs in terms of internet connectivity and availability to fast broadband access, telephone and other forms of infrastructure for their business operations. Figure 4.12 shows the magnitude of interest that respondents place on the availability and accessibility of technology infrastructure for the business.

Research sub-question 1.4: What is the role of government in actively facilitating and engaging SMMEs in the evaluation and adoption process of new technology?

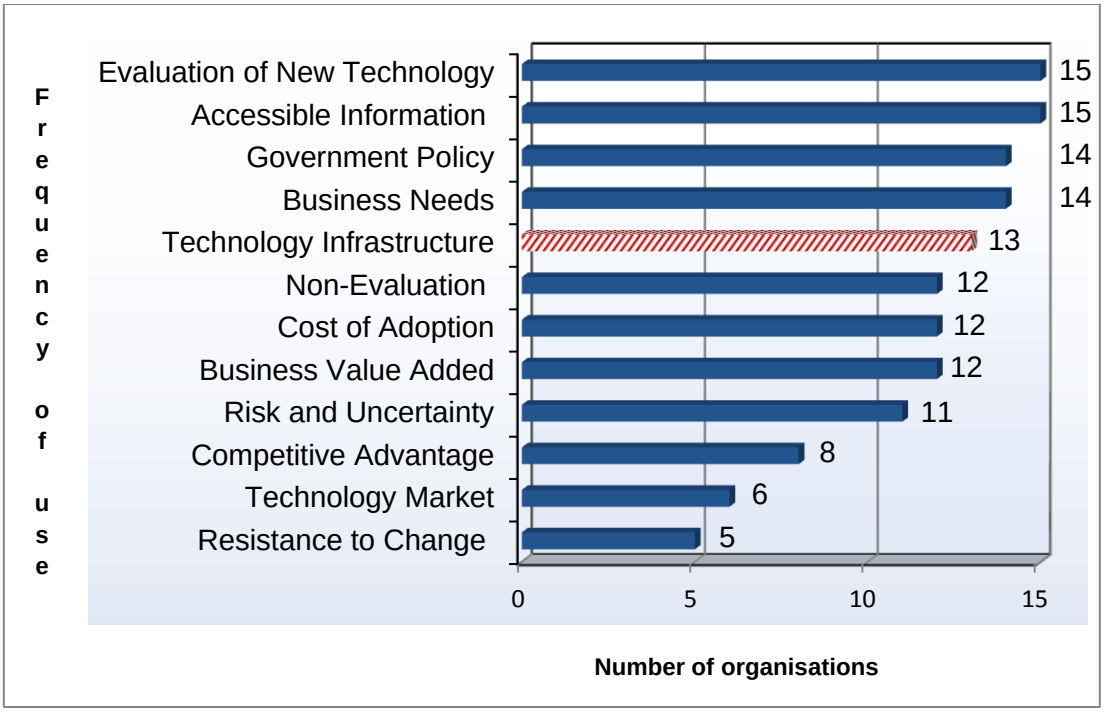

Figure 4.12: Technology Infrastructure

The use of the internet and other forms of ICT infrastructure to facilitate business operation in the modern world is deemed a necessity if businesses are to develop and have the ability to compete with their counterparts on the domestic and international front. Government therefore has a responsibility towards contributing to the availability of technological and social infrastructures to enable businesses to have the ability of operating at a higher level of productivity.

The concern and need for the provision and accessibility of technology infrastructure by SMMEs is captured by statements made by some of the respondents. The following comments are made in terms of government and technology infrastructure by *Respondent 1*, stating: “Yes there is need for more government participation in internet availability and other social services”. The statement is buttressed by *Respondent 4* who says that:

> …government needs to help facilitate fast and accessible internet services for the business; the high cost of infrastructure like telephone and broad band should be addressed (see Annexure G, Section 5).

Respondent 3 further supports the need for government involvement in technology infrastructure, stating emphatically that, “yes they have a mandate in terms of infrastructure and deliverables and environment”.

Respondent 7 supports the claim made by *Respondent 3*, arguing that the “role of government is to provide an infrastructure on which technology can be built and companies can operate within”. Not having access to basic forms of infrastructure could be detrimental to the operations and growth of the business. Stating further, he says: “Being an online business, challenges has *[sic]* been reliable, fast and reasonably priced internet connection”.

Provision of social and business amenities is essential for the government to fulfil to ensure the survival and development of small businesses. *Respondent 11* mentions that “there are problems with [the] internet, telephone line failing, it [is] actually worse off than years back”. He states that in recent times, the level of facilities has not been encouraging because “broad band access and 3G is so slow” (see Annexure G, Section 5).

Respondent 14 opinions that the “level of South Africa’s internet is reasonable; I do understand of course that we lag behind significantly”. He continues by stating that, “I do believe we will get to that point very shortly where our infrastructure will not be able to adequately handle the needs” (see Annexure G, Section 5).

Finding 30: There is an increasing demand for broadband and internet facilities by the activities of the business sector, which might over stretch the existing facilities in place.

Finding 31: According to statements credited to respondents, government has not delivered on the provision of adequate social and business infrastructure to promote the SMME environment.

4.2.3.6 Non-Evaluation category

The following section touches on the issues of non-evaluation of new technology by SMMEs, which includes how non-evaluation affects decision making and adoption of new technology for the business. It also touches on the type of decisions being made by SMMEs concerning new technology and its consequent effect on the business. The non-evaluation category is ranked 6th and highlighted 12 times by the 15 organisations (80 percent).

The ranked prioritisation of the keyword category by the organisation as a factor influencing the evaluation and adoption of new technology is represented in Figure 4.13.

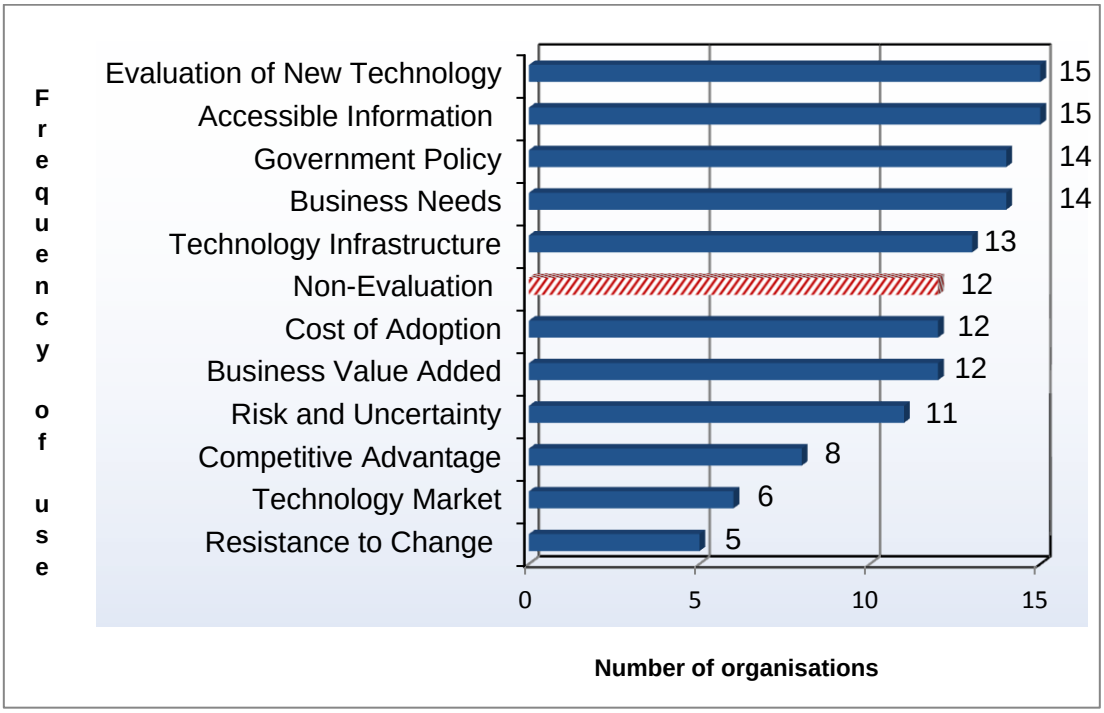

Figure 4.13: Non-Evaluation of New Technology

Research sub-question 2.3: How does evaluation and adoption of new technology affect SMMEs' sustainability and viability of their business interest?

Evaluation of new technology has been said to play an important role in the adoption process, therefore non-evaluation of new technology potential is at the detriment of the business. Non-evaluation poses a problem since decisions taken consequently are uninformed, biased and usually based on little or no information regarding the adoption of appropriate technology for the business.

The general responses from the interviewees on the subject of non-evaluation are resonated by the following statements from respondents 3, 4 and 6, with *Respondent 3* stating: "I don't think small businesses evaluate properly before adoption; business ends up failing due to excessive buying and disregard for evaluation. People often don't make the right choices because they don't evaluate the right choice". She argues further that "managers or owners usually want to exercise their freedom to make decisions without any IT interception; people think they know what they need but are often wrong at the end". She also states that when it comes to doing business, "there is no compulsive, intuitive or instinctive buying in business" (see Annexure G,

Section 6). Her statements show that there exists a need for proper evaluation carried out on new technologies for the business before a decision is made to either adopt the technology or not.

Respondent 4 argues that “SMMEs don’t realise the urgency, risks and benefits of having the technology in the first place. The lack of information and proper knowledge causes little drive towards technology”. SMMEs that fail to identify, evaluate and adopt new technology have no knowledge of the benefits accruable from the use of the new technology for their business, hence losing the ability to have a competitive leverage over their competitors.

Respondent 6 is of the opinion that non-evaluation of new technology leads to “buying the wrong technology”*.* She recounts their experiences and encounters as an organisation in previous attempts to acquire a new technology, saying:

> …we didn’t have the experience or knowledge about the technology. We failed to measure the relevance and significance of the technology at that time. What we thought we needed, didn’t match the requirements of our clients (see Annexure G, Section 6).

The problem faced by the organisation is as a consequence of non-evaluation of the new technology before adopting for their business. *Respondent 6* continues by stating her prior experience regarding non-evaluation: “We were unsuccessful in mapping out what is our desired future in terms of technology (where we want to be)” (see Annexure G, Section 6).

Finding 32: Small businesses end up failing due to impulsive and excessive buying of technology with disregard to the evaluation of technology for the business process.

Finding 33: SMMEs usually act on gut feeling and are easily influenced by current buzzing trends in the environment, without paying attention to the functionality and appropriateness of the technology applicable to their business.

Finding 34: SMMEs are left with a feeling of inadequacy when they adopt the wrong technology and end up losing money, often not knowing the capacity of technology they acquire to solving their problems.

Finding 35: SMMEs have to be aware of the activities of industry players, keeping up with the industry pace to ensure sustainability and viability of the business.

4.2.3.7 Business Value Added category

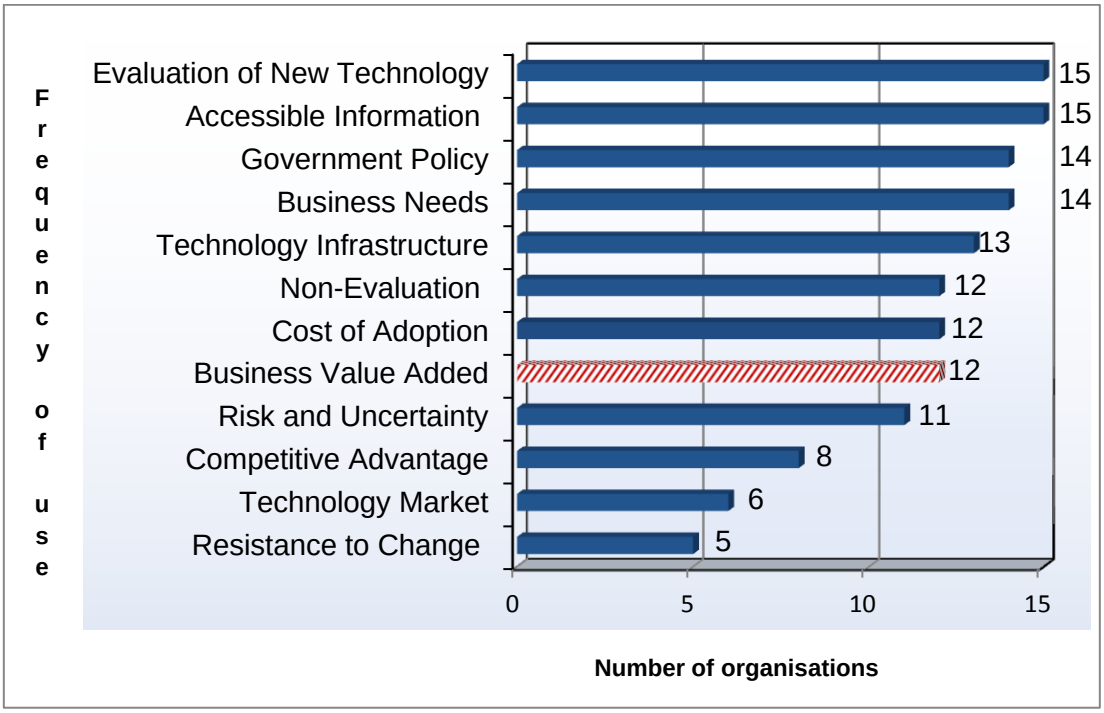

Figure 4.14: Business Value Added

Business value offered and obtainable from the evaluation and use of the technology for the development and growth of the business is presented in this section. Business value added is characterised by the perceived value the new technology will bring to the business. Such values include the benefits and advantages the new technology offers the business in terms of increased productivity, cost and resources savings, increased delivery of product, and services and increased product ratio generated by the use of the new technology. The keyword category, *Business Value Added*, came up 12 times in the course of the interviews with 15 organisations, thus ranking in 8th position of the categories, reflecting the considerations on evaluation and adoption of new technology for the business by SMMEs as shown in Figure 4.14.

Research sub-question 2.2: How does the evaluation of new technology affect the decision making of new technology in SMMEs?

New technology brings added value or an increase in current value to the business process in terms of ability and deliverables. The potential of a new technology to compliment or increase the productivity and service of a business increases the propensity of the business to adopt the technology. The statements below highlight the responses of interviewees on their impression of business value added to the expected capacity required of a new technology by the business.

Respondent 1 is of the opinion that the evaluation of new technology should reveal the value-add of the adoption of the new technology to the business in terms of how to "ensure that it is important to make your business better at the end of the day and increase your efficiency". He further argues that evaluation of new technology must show the ability of potential improvement to the business in relation to "the return on investment on the business, speed of delivery of services". The more potential value is added to and perceived by the SMME, the more interest will be developed in adopting the new technology. *Respondent 1* also posits that the "speed of the modern business necessitates constant evaluation of new technology" (see Annexure G, Section 8).

Respondent 2 views business value of technology as:

> …the things it can do for the company, how it can help us and save us time, which is the reason why we bought it. I usually don't deem it as technology anymore, it is a necessity, and it becomes part of how you run a business.

Respondent 10 posits that the evaluation and adoption of new technology gives the business the ability to survive in a competitive environment. He emphasises that, "for me, I am prepared to adapt to changes, I believe you have to otherwise you might be left behind". He also opinions that *"*I like the technology; it is a chance for me to make my work easier*"*. In furtherance of his argument for the use of new technology with the potential to enhance the business, he states: "Technology for me gives me the opportunity to communicate at all times" (see Annexure G, Section 8).

Respondent 4 argues that technology goes beyond seeing it as cost; rather, it gives an indication of the benefits and value it can generate for the business. He states: "I don't see technology as a cost, but a means to an end". He views technology has a strategic tool to attain business objectives and goals.

Respondent 8 states in similar vein that "I don't mind the cost if it is worth paying for" (see Annexure G, Section 8).

Finding 36: The value new technology offers the business process is a key influence on the decision to adopt new technology for business by SMMEs, as such technology is a strategic tool to attain business objectives and goals with cost being relative to potential benefits and advantages accruable in the long run.

Finding 37: New opportunities for the business are created by new technology which culminates in decreased expenses and increased productivity while ensuring sustenance and relevance in the market place.

4.2.3.8 Cost of Adoption category

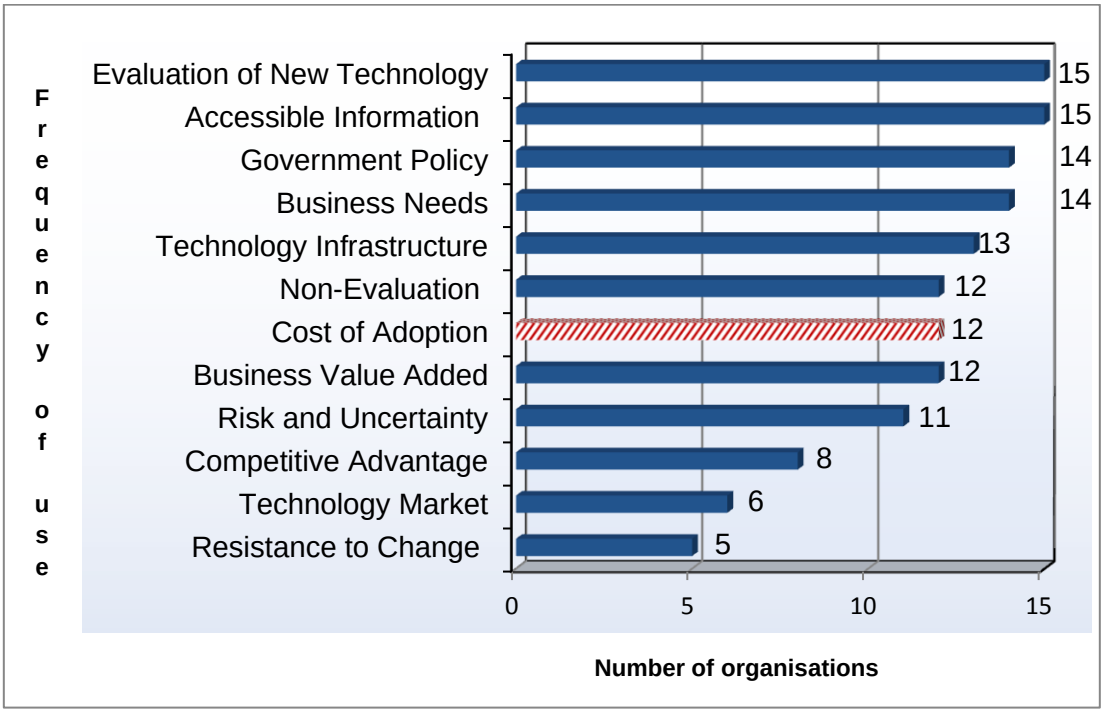

Figure 4.15: Cost of Adoption

Cost relating to adoption of new technology was mentioned by 12 of the 15 (80 percent) organisations as a key phrase in the process of evaluation and adoption of new technology, thus rating 7th in the order of prioritisation (Figure 4.15). The discussion is centred on issues concerning cost of adopting new technology, which involves the actual cost of purchasing the new technology, the cost of compliance with legislation compelling SMMEs to adopt new technology, and also the cost of training and technical support.

Research sub-question 1.1: What are the factors that influence evaluation and adoption of new technology?

Cost is an ever present factor in the course of business activities, especially when it concerns technology matters. It is seen as a major obstacle by some business, particularly when the realisable benefits and advantages are not properly investigated and articulated.

Responses from the interviewees on the cost of adopting a new technology for the business are represented by the following statements from respondents 1, 7 and 13.

Respondent 1 argues that affordability plays a vital role in the ability to evaluate and adopt new technology for the business. He states that while considering adoption of a new technology, they "look at budget and resources, compare cost, time and best price for the available technology capability" (see Annexure G, Section 7). Affordability to acquire is a pertinent issue for him when considering adopting new technology for the business.

Respondent 7 is of the opinion that the cost of evaluation and adoption is relative to the benefits new technology can offer the business. He states that "resources is not too much of an issue; it's not necessarily a hindrance, but you have to be careful you don't over spend too much on it" (see Annexure G, Section 7). If a new technology is properly evaluated and its suitability to the business determined, the benefits accruable usually outweigh the cost of investment over time.

Respondent 13 argues that "the cost of technology is almost a killer for new business. Due to legislative requirements, the cost of running a financial office is astronomical. I think cost is a hindrance for small businesses".

The cost of maintaining the business and the technology has increased since the implementation of the compliance policy guiding FSPs. Respondent 15 states that "cost of running a business has gone up 42% from the previous years". He posits that "the cost of keeping up with technology management" is of major concern to FSPs. The cost of maintenance and keeping the technology and business process up-to-date is a huge worry for FSPs. (see Annexure G Section 7).

Finding 38: The cost of acquisition of new technology and change is a challenge most SMMEs are confronted with.

Finding 39: The cost of compliance using new technology (in the FSP industry) has led to an increase in the cost of conducting business.

Finding 40: The cost of training and acquiring skills to operate new technology not identified by prior evaluation becomes a burden for SMMEs.

Finding 41: According to the view of respondents in the FSP practice, some financial practitioners (in particular the older generation of FSPs) are finding it difficult to cope with changes in cost of administration of the business process due to the legislative compliance act.

4.2.3.9 Risk and Uncertainty category

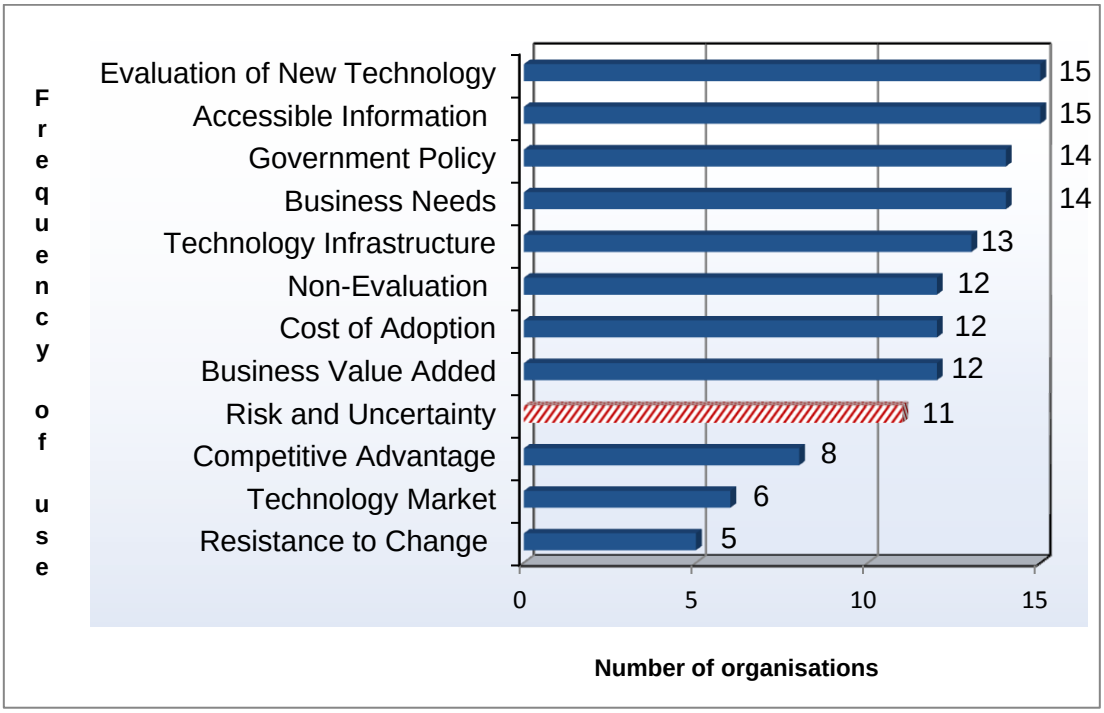

Figure 4.16: Risk and Uncertainty

Risk and uncertainty are similar words that were used interchangeably by the SMMEs when they responded to the interview questions. The *Risk and Uncertainty* category is mentioned by 11 organisations of the 15 interviewed and ranked 9th in order of prioritisation as impacting on the evaluation and adoption of new technology by SMMEs (Figure 4.16). The category addresses risks associated with the new technology, uncertainty about the future relevance of the new technology, and the constant changing nature of new technology in the market place.

Research sub-question 1.1: What are the factors that influence evaluation and adoption of new technology?

Uncertainty and risk associated with new technology is a major concern to businesses. The evolving nature and unpredictable future of new technology present SMMEs with challenges regarding the ability to understand, mitigate and plan for and against any form of eventualities which could result from the adoption of the technology. Concern regarding the evolving nature and associated risks of new technology is supported by representative statements from some of the respondents.

Respondent 3 states that the difficulty is with "understanding the risk associated with new technology" (see Annexure G, Section 9). She is concerned with how to identify and plan against the risk associated with a new technology. She also mentions that the "evolving nature of technology" and the "variety of technology and solutions" are some of the challenges facing SMMEs due to the many solutions in the market place and the constant changes in the appearance of newer versions which do not necessarily reflect any significant change in the capacity or ability over previous versions.

Respondent 5, a conservative ideologist, has a guarded attitude and approach towards new technology evaluation and adoption. He states his opinion and concern as follows:

> One needs to tread carefully, because there is danger being on the edge. It is sometimes good to wait for the teething problems associated with new technology or releases to be sorted out.

He further argues that "the risk of being early in terms of the product or technology is bigger than the risk of losing out…" (see Annexure G, Section 9).

Being pragmatic with the evaluation of new technology is an enabler to making informed decisions even in the midst of constant technology changes and advancement. The ability to discern what is appropriate in terms of operations and investment consideration is made possible by a proper process of evaluation. *Respondent 7* states that "balance[ing] stability with constant change", is a problem they face as SMMEs.

Respondent 9 opinions *that* "It's very difficult in our industry because of the varieties we are faced with" (see Annexure G, Section 9).

Finding 42: The nature of uncertainty surrounding return on investment made on new technology by SMMEs is a major source of concern for business managers because they are not able to discern the possibility and weight of risks involved.

Finding 43: SMMEs take a conservative stance about new technology adoption because of their perception of untried technology and the weight of the risk that might be associated with it.

Finding 44: The constant and frequent changes in technology have an adverse effect on the ability of SMMEs to process the new technology potential and keep up with technological advancement in the society.

Finding 45: Evaluation to a large extent makes it possible for SMMEs to understand the risk and complications associated with new technology before adopting it for the business.

4.2.3.10 Competitive Advantage category

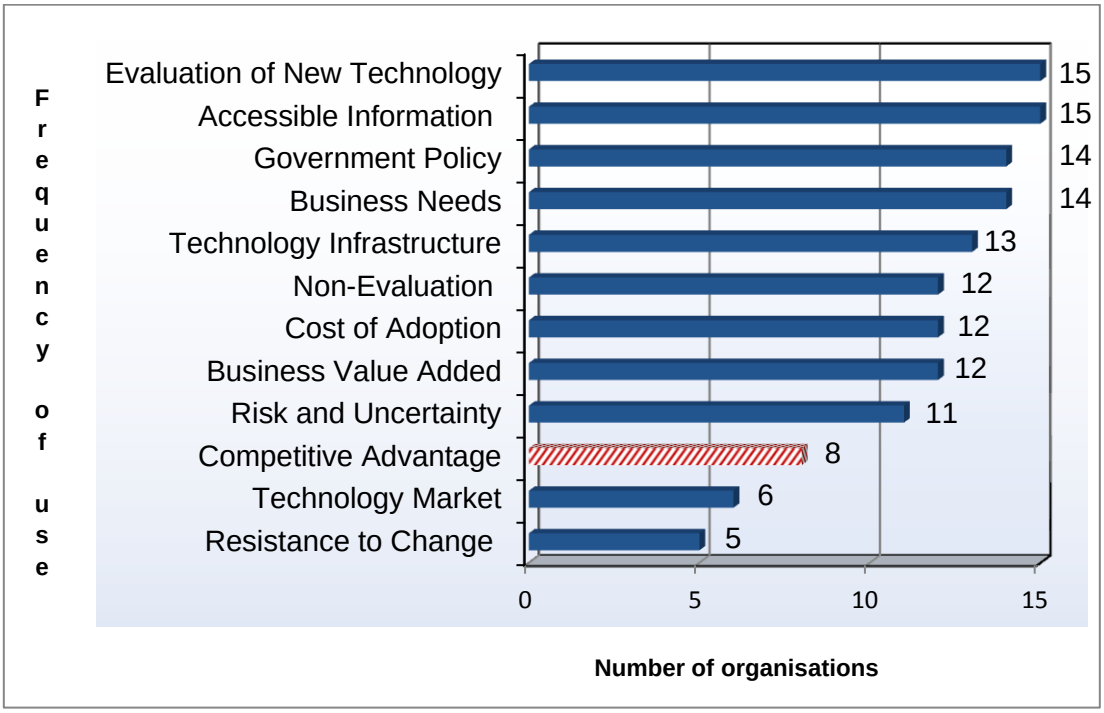

Figure 4.17: Competitive Advantage

Competitive advantage was mentioned 8 times out of a number of 15 (53 percent) participating organisations in the research study. Competitive advantage as a category of keywords is ranked 10th in the order of priority of the responses of the organisations (Figure 4.17). Competitive advantage in terms of evaluated technology gives organisations significant business leverage over its competitors through enhanced productivity and the ability of the new technology to impact positively on the business process. The responses on the *Competitive Advantage* category of new technology perceived by the respondents are presented in this section.

Research sub-question 2.3: How does evaluation and adoption of new technology affect SMMEs' sustainability and viability of their business interest?

Having a competitive advantage in business is often a desirable and highly sought after position in the market place which is greatly coveted by business managers and owners in general.

SMMEs need to understand what benefits they could have when they have a certain degree of competitive advantage over their competitors. The leverage is often achieved with the use of new technology that puts them in good stead ahead of competitors in terms of service delivery, productivity and uniqueness. The need to acquire competitive advantage in business by SMMEs is summed up by the following statements of the respondents.

Respondent 8 argues that "competitive advantage is crucial" to the survival of the business. He posits that competitive advantage is the "ability to deliver to your clients' quality that is superior to quality that a competitor can deliver" (see Annexure G, Section 10).

The advantage over competitors is the core derivable new technology brings to the business. *Respondent 10* is of the opinion that the impact of new technology on the business is crucial: "Competitive advantage is a key benefit". With competitive advantage in a market place, a business will thrive and develop in leaps and bounds above its competitors. The importance of business leverage by SMMEs is denoted further by this statement of respondent 10:

> They have to embrace technology change; you must be prepared to take positive chances. You have to embrace change if you want to keep up otherwise you will be stuck (see Annexure G, Section 10).

Changes made in lieu of evaluation and adoption of new technology can be the key to survival and obtaining business leverage over competitors which will ensure viability of the business. *Respondent 15* argues that "you need to be at the cutting edge of your industry as SMMEs to be able to survive in there". Without a good culture of evaluation and adoption of new technologies, SMMEs are increasingly susceptible to becoming moribund and mediocre in its activities, which will leave them struggling and dropping to the bottom of the business ladder in their business markets if they do not actively adopt and utilise technology using the right process (see Annexure G, Section 10).

Finding 46: The knowledge and application of improved and advanced technology gives business leverage over other competitors in the market.

Finding 47: New technology gives a business ability to deliver superior quality of goods and services over that of competitors, which attracts more customers to the business.

4.2.3.11 Technology Market category

Technology market involves the activities of vendors and suppliers and how it affects the evaluation and adoption process of new technology by SMMEs for their business.

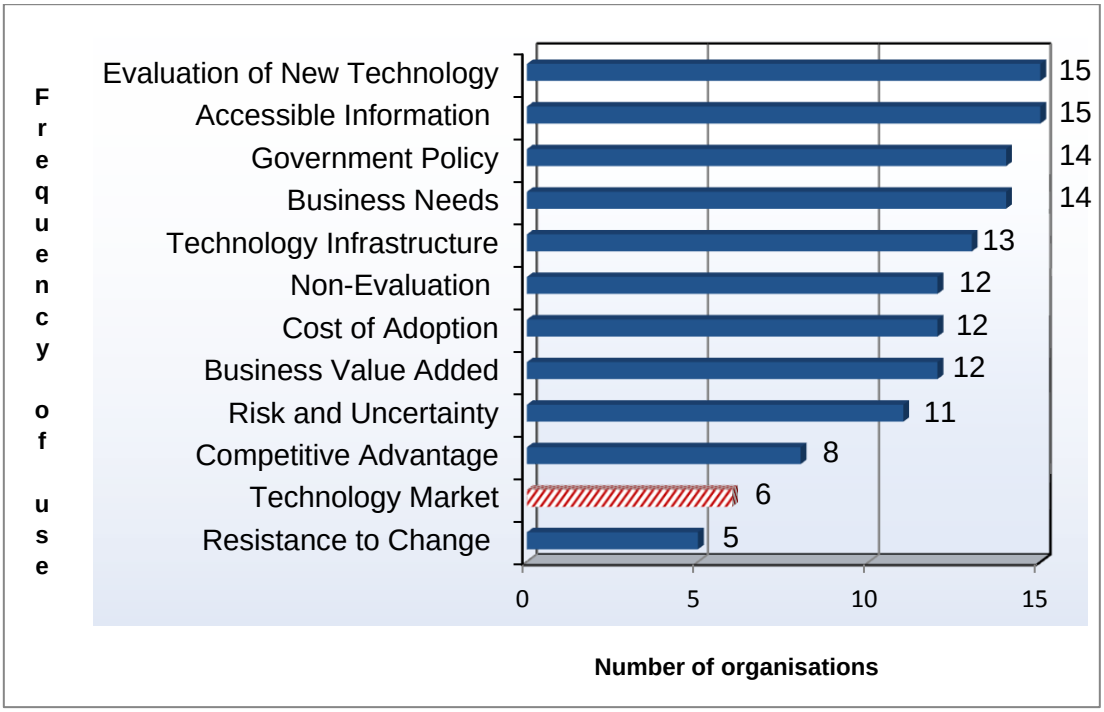

Figure 4.18: Technology Market

The key phrase *Technology Market* is mentioned by 6 of the 15 organisations and it occupies the 11th position in the order of categorised priority and responses by the organisations as shown in Figure 4.18. The following section touches on the nature of the impact of vendors and suppliers on the evaluation of new technology and the adoption process.

Research sub-question 1.1: What are the factors that influence evaluation and adoption of new technology?

The technology market and businesses have often been out of synchronisation when it comes to vendors and suppliers meeting the desired and required needs of businesses. SMMEs are of the impression that the technology market is big part of the problem when it comes to adopting new technology to enhance the business process. This view is consolidated by the some of the responses from respondents 2, 4 and 8.

Respondent 2 is of the opinion that the difficulties they are experiencing can partly be ascribed to the vendors of the technologies in terms of available support and issues surrounding the licensing of their systems. He states that although they try to adopt new technologies, “the problem is you need to license every user; every computer needs to be licensed” (see Annexure G, Section 11). The issues of licensing and copyright have long plagued the business world.

Managers often differ on the rationale behind paying for a single system operating license rather than multiple access on a single code which will minimise their expenses and encourage them to adopt the technology. *Respondent 4* shares his experience on compatibility issues of new technology adopted for their business, stating that "the system works successfully on the stand-alone machine, but it's not working properly in a server environment". Although a proper evaluation could probably detect this problem in the earlier stage, the technology vendors are expected to supply a scalable and customisable technology that can adapt to their working environment as the business requires and dictates, rather than selling a rigid technology with mono forms of applicability to a multivariate business process.

Respondent 6 is also of the opinion that the technology market brings its complications to the business because of "vendors selling unscalable and inappropriate technology" (see Annexure G, Section 11).

Respondent 8 in his take on the impact of solution providers and vendors on the adoption of new technology by SMMEs argues that "they tend to sell the features but not the experience. People selling technology need to focus more on user experience in all aspects". Solutions providers and vendors have to consciously bring the business into play by looking at the needs of the business and what they require the technology to do for them to be able to develop a holistic solution that will meet their business needs and offer the necessary support needed to enhance a smooth operation (see Annexure G, Section 11).

Finding 48: Vendors and suppliers of technology are often in the act of selling unscalable and bogus technology that does not offer a holistic solution to the needs of SMMEs.

Finding 49: Single and mono licensing of certain system applications is a hindrance to the use and adoption of new technology—having to pay to license each system in the business does not sit well with SMMEs.

Finding 50: SMMEs have a limited number of specialised technology applications applicable to their particular business practice.

4.2.3.12 Resistance to Change category

Resistance to change is the last category that came up. The key phrase *Resistance to Change* is mentioned by 5 of the organisations from the 15 interviewed and is ranked 12th in the order of categories mentioned (Figure 4.19).

The category entails issues surrounding the inability of SMMEs and users of technology to adapt to changes required by the system through the adoption of new technology for the business.

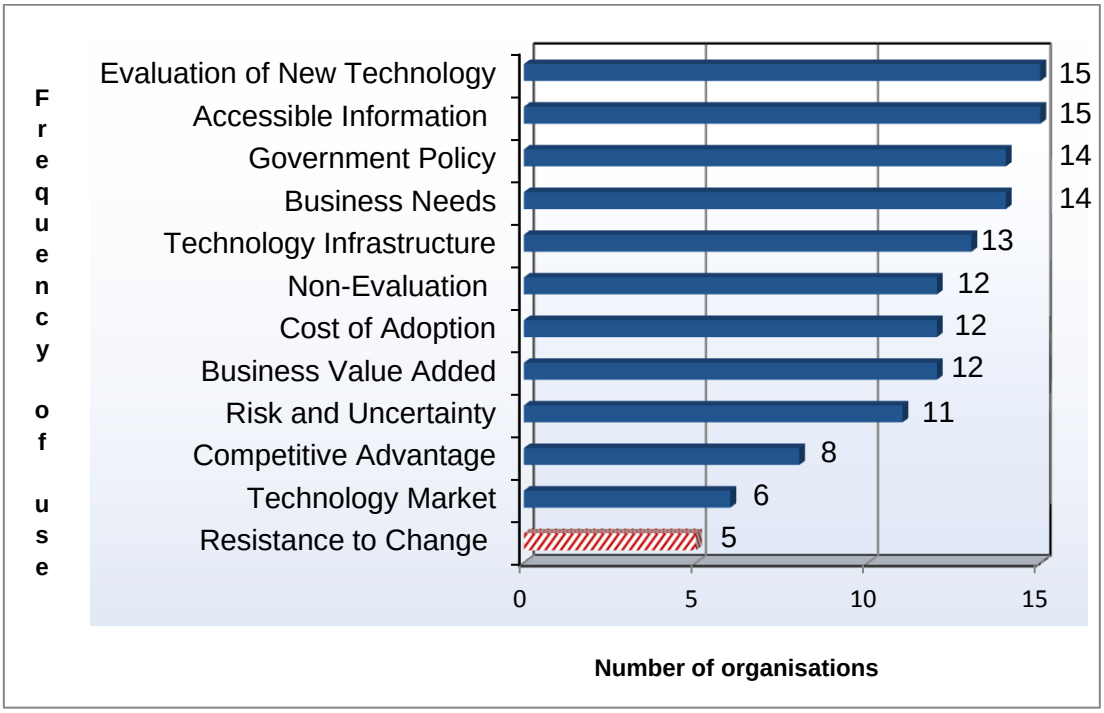

Figure 4.19: Resistance to Change

Research sub-question 1.1: What are the factors that influence evaluation and adoption of new technology?

Resistance to change inhibits the growth and development of the business. People often resist changes that will bring increased productivity and efficiency of service delivery to a business because of their lackadaisical attitude and comfortability with existing processes. The resistance is due to an unwillingness to increase any form of effort other than what they are used to. Such a tendency also stems from their lack of knowledge and understanding of what the new technology or change might have on the business and their work schedule. Respondents 4, 9 and 14 thus make the following statements regarding resistance to change in business.

Respondent 4 argues that resistance to change is an inherent behaviour among most SMMEs. He states that "people are comfortable with what they are doing and not prepared to change" (see Annexure G, Section 12). People who do not envisage change as a constant phenomenon in life usually have a lackadaisical approach to business opportunities and development of the business process. People with such an approach might be the owner/managers of the business or the workers within the business.

Respondent 9 posits that in the process of evaluating and adopting a new technology for the business, “the staff can be a barrier to technology change”. When staff becomes overly comfortable with a process which suits them, they tend to resist any changes which will take them out of their comfort zone and engage them more actively and productively. She states further that in the FSPs business sector, “older cadre of people in business are not adapting” (see Annexure G, Section 12). The older cadres of FSPs are finding it difficult to adapt to new changes brought about by legislation which requires the businesses to use new technology in the course of their operations and reporting, in compliance with the stipulated rules of the legislation. The older generation of owners and managers of FSPs are struggling to adapt, causing a number of them falling off the business ladder at some point, with more expected to follow suit in the near future.

As such, *Respondent 12* feels that pertinent questions and scenarios to be considered by businesses include the following: “Would the agents accept change? It’s quite difficult for people to accept change”. People have to be convinced of the need for change by showing the users the benefit and advantages the potential change will bring and how it can easily make their work less complicated.

Respondent 14 is of the opinion that when faced with an option to adopt new technology for the business, “people are afraid to try new technology”. Being afraid to test new technology is the result of not having been informed of the operational ability and the functionality of new technology. People are often afraid because they do not have the confidence to use the technology, and they are not aware of the ease of use, the potential benefit it brings and possible risks and repercussions that might be involved if the technology malfunctions. Such fears and inhibitions can be readily cleared and put to rest with a proper evaluation of the new technology potential and fit to the business (see Annexure G, Section 12).

Finding 51: Employees can be a barrier to new technology adoption when they become too comfortable with their current business process routine, which makes them afraid of new technology.

Finding 52: There is an exodus of the older generation of FSP businesses because of the inability and resistance to change by the owners/managers due to their incapability to meet legislative requirements.

4.2.4 Sample of technology used by SMMEs

Technology used by the SMMEs interviewed ranged from basic office computing to specialised financial data analysis and management systems (Table 4.4). All the organisations interviewed made use of basic e-mail and internet services in the course of their business.

The majority of SMMEs use a form of customer relationship management (CRM) product to communicate and interact with their customers in an organised and efficient manner. A number of organisations also use a business processing management system, with one of the organisations having a specialised and customised ERP system. The financial services provider have specialised data management systems for their financial planning, analysis and reporting to meet the reporting and data management requirements of the FSB boards. Examples include Spotlite, Xplan, Artwork, Whirlpool and Elite Wealth. Some of the organisations also use telephony and recording systems for their business activities. A number of FSPs use tablets i.e. the iPad, and various types of mobile devices. Other forms of technology being used include accounting solutions, data processing and security applications, virtual communication, mobile and banking applications, and cloud services.

Table 4.4: Sample of technology types used by SMMEs

Company	Type of Technology
1	Variety of technology and solutions S-BPM
2	Pastel (Accounting) Windows 7 Professional
3	Wide variety of technology
4	ERP system for manufacturing Planning system which is also pro-actively used for detailed planning and production flow Microsoft Office with Outlook and cell phones
5	Basic office computing and control
6	Dialler telephony system CRM Business processing systems Virtual consultancy Data security
7	Search engines (Google) Data management software programs Electronic interface with customers Mobile and banking technology
8	3G, Mobile device Technology in car

Company	Type of Technology
9	Spotlite Artwork CRM systems
10	Xplan Cloud services iPad
11	Artwork Recording systems
12	Telephone systems Elite Wealth (CRM and investment data management)
13	Xplan iPad Cloud services In the process of obtaining a telephony system
14	Artwork Spotlite Whirlpool iPad
15	Spotlite

4.2.5 Findings from interviews: Summary

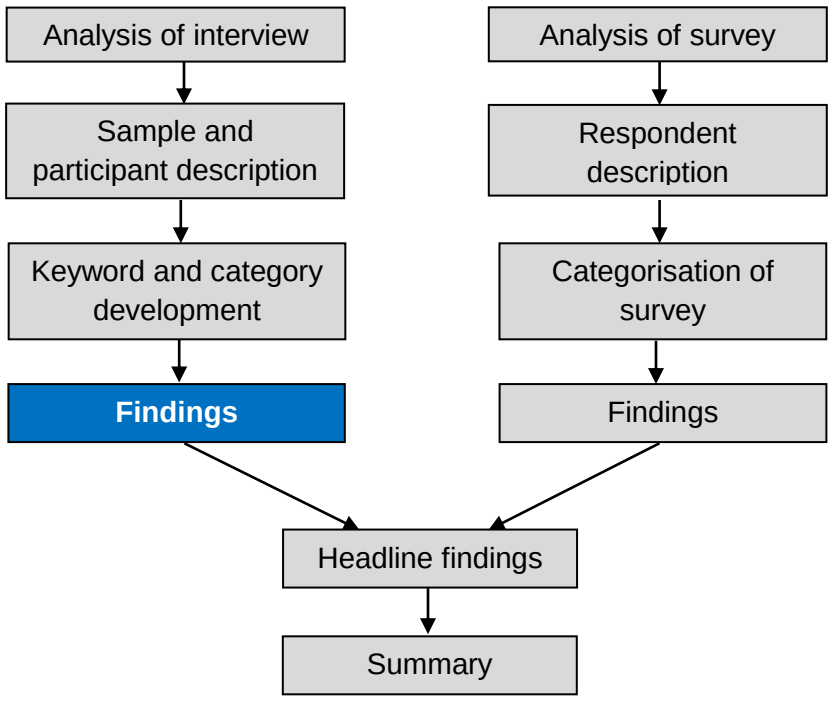

Figure 4.20: Chapter layout: Interview findings

Table 4.5: Findings on the responses from interview respondents

Research questions	Findings
Research Question 1	**What are the adoption challenges for SMMEs in terms of the evaluation of new technology?**
Sub-question 1.1: What are the factors that influence evaluation and adoption of new technology?	**Finding 28:** SMMEs lack the skills, knowledge and required capacity to operate new technology to produce an optimum output from the business process.
	Finding 29: Inadequacy in SMME operating staff capability and experience in using newly adopted technology will result in under-performance and a feeling of inadequacy of the technology by the users.
	Finding 38: The cost of acquisition of new technology and change is a challenge most SMMEs are confronted with.
	Finding 39: The cost of compliance using new technology (in the FSP industry) has led to an increase in the cost of conducting business.
	Finding 40: The cost of training and acquiring skills to operate new technology not identified by prior evaluation becomes a burden for SMMEs.
	Finding 41: According to the view of respondents in the FSP practice, some financial practitioners (in particular the older generation of FSPs) are finding it difficult to cope with changes in cost of administration of the business process due to the legislative compliance act.
	Finding 42: The nature of uncertainty surrounding return on investment made on new technology by SMMEs is a major source of concern for business managers because they are not able to discern the possibility and weight of risks involved.
	Finding 43: SMMEs take a conservative stance about new technology adoption because of their perception of untried technology and the weight of the risk that might be associated with it.
	Finding 44: The constant and frequent changes in technology have an adverse effect on the ability of SMMEs to process the new technology potential and keep up with technological advancement in the society.
	Finding 45: Evaluation to a large extent makes it possible for SMMEs to understand the risk and complications associated with new technology before adopting it for the business.
	Finding 48: Vendors and suppliers of technology are often in the act of selling unscalable and bogus technology that doesn't offer a holistic solution to the needs of SMMEs.
	Finding 49: Single and mono licensing of certain system applications is a hindrance to the use and adoption of new technology—having to pay to license each system in the business does not sit well with SMMEs.
	Finding 50: SMMEs have a limited number of specialised technology applications applicable to their particular business practice.

Research questions	Findings
	Finding 51: Employees can be a barrier to new technology adoption when they become too comfortable with their current business process routine, which makes them afraid of new technology.
	Finding 52: There is an exodus of the older generation of FSP businesses because of the inability and resistance to change by the owners/managers due to their incapability to meet legislative requirements.
Sub-question 1.2: How do SMMEs initiate evaluation in the process of adopting new technology in business?	**Finding 13:** The lack of accessible information on new technology limits the ability of SMMEs to evaluate and adopt new technology to support the business.
	Finding 14: There is no existing centralised information outlet where information about new technology is made available to SMMEs.
	Finding 15: Networking with the right people with access to credible information on new technology can be of great advantage to the business.
	Finding 16: Keeping abreast of the technology circle gives SMMEs the ability to be ahead of the game in the market place.
	Finding 17: Service providers in the insurance sector are sources of information on new technology availability for FSPs.
Sub-question 1.3: What are the perceptions of SMME managers of new technology evaluation?	**Finding 7:** Evaluation contributes to a better understanding of the risks associated with new technology, which prevents a business from unnecessary exposure to uncertainty.
	Finding 8: Evaluation is a key enabler of business; it enables technology to be seen as a means to an end with the ability to be more efficient and productive, which increases economic development and survival of the business.
	Finding 9: Evaluation of new technology helps SMMEs to make informed decisions on facts and verifiable information which places the business in a good stead of sustainability.
Sub-question 1.4: What is the role of government in actively facilitating and engaging SMMEs proactively in the evaluation and adoption process of new technology?	**Finding 18:** Implementation of government policies has little or no effect on SMME development in terms of business development; it is seen to rather favour large organisations according to the interviewees, with conflicting effects of government policies impacting positively and also negatively on SMME development and technology adoption for their business.
	Finding 19: Government's use of old and moribund technology in their process an interaction with business entities is not encouraging for SMMEs to adopt new technology.
	Finding 20: Legislation of FSP practices compels FSPs to adopt new technology to comply with the technology standards of the product providers driving technology uptake by FSPs.

Research questions	Findings
	Finding 21: Inability to comply with legislation on use of new technology for analysis and reporting purposes has inadvertently forced a number of FSPs being run by older cadres of managers/owners, out of the business.
	Finding 22: SMMEs have little or no knowledge of available government support programmes, nor have they seen or felt their impact in the course of their business.
	Finding 23: There are existing government programmes with mandates to help SMMEs develop especially in technological aspects but there is no visible effect being felt by the businesses.
	Finding 24: SEDA is largely an unknown entity to the respondents and there is no knowledge of STP or what they do for small businesses.
	Finding 25: SMMEs distrust government agencies who are supposed to assist in developing their business because they have misgivings about government agencies from prior unproductive experiences with them.
	Finding 30: There is an increasing demand for broadband and internet facilities by the activities of the business sector, which might over stretch the existing facilities in place.
	Finding 31: According to statements credited to respondents, government has not delivered on the provision of adequate social and business infrastructure to promote the SMME environment.
Research Question 2	**How does the evaluation of new technological innovations affect the adoption of new technologies in SMMEs?**
Sub-question 2.1: How can SMMEs evaluate the business potential of new technologies?	**Finding 1:** SMMEs are aware of the need for continuous research and knowledge acquisition of new available technologies.
	Finding 2: Information about new technology potential is gained by consulting colleagues, professionals and experts in the industry.
	Finding 3: Most of the interviewed SMMEs seem to understand the importance of investigating the potential value of a new technology, asking questions about the functionality and operability of the new technology when considering different available options.
	Finding 4: SMMEs are concerned about understanding the dynamics and operational design of a new technology and its level of applicability to the business process.
	Finding 26: Identifying business needs ensures understanding of how new technology can meet business objectives and deliver on organisational goals.
	Finding 27: Asking the right questions about the business requirements and knowledge of technology capability creates a synergy of business and technology fit and facilitates technology expectation met by suppliers.

Research questions	Findings
Sub-question 2.2: How does the evaluation of new technology affect the decision-making of new technology adoption in SMMEs?	**Finding 5:** SMMEs understand that evaluation of technology gives a better understanding of the suitability of new technology, contributing towards an informed decision.
	Finding 6: Evaluation of new technology gives a gratifying feeling of enjoying the technology based on the decision made from relevant facts on the technology.
	Finding 10: SMMEs have a need for an evaluation assessment tool to help make informed decisions on appropriate new technology for the business process.
	Finding 11: SMMEs can also be assisted by guidelines on the evaluation process to identify factors relating to their business environment affecting the evaluation of new technology for the business.
	Finding 12: Implementation of new technology without a flexible phased-in process leads to complications and uneven integration with the existing business process.
	Finding 36: The value new technology offers the business process is a key influence on decision to adopt the new technology for business by SMMEs, as such technology is a strategic tool to attain business objectives and goals with cost being relative to potential benefits and advantages accruable in the long run.
	Finding 37: New opportunities for the business are created by new technology which culminates in decreased expenses and increased productivity while ensuring sustenance and relevance in the market place.
Sub-question 2.3: How does evaluation and adoption of new technology affect SMMEs' sustainability and viability of their business interest?	**Finding 32:** Small businesses end up failing due to impulsive and excessive buying of technology with disregard to the evaluation of technology for the business process.
	Finding 33: SMMEs usually act on gut feeling and are easily influenced by current buzzing trends in the environment, without paying attention to the functionality and appropriateness of the technology applicable to their business.
	Finding 34: SMMEs are left with a feeling of inadequacy when they adopt the wrong technology and end up losing money, often not knowing the capacity of technology they acquired to solving their problems.
	Finding 35: SMMEs have to be aware of the activities of industry player, keeping up with the industry pace to ensure sustainability and viability of the business.
	Finding 46: The knowledge and application of improved and advanced technology gives business leverage over other competitors in the market.
	Finding 47: New technology gives a business ability to deliver superior quality of goods and services over that of competitors, which attracts more customers to the business.

This chapter has been divided into two main sections namely data collected from interviews and data collected from surveys.

Data collected from the interviews were presented by means of a discussion on the analysis of the data, giving the reader insight into the ways the interviews were analysed. The participants (unit of analysis and observation) were then discussed, followed by keyword categories development. From the 22 keywords identified, a total of 12 categories were developed. Linking the keywords and categories, 6 themes were developed. From this, a total of 52 findings were deducted and integrated into the specific research and sub-research questions.

4.3 Analysis of survey responses

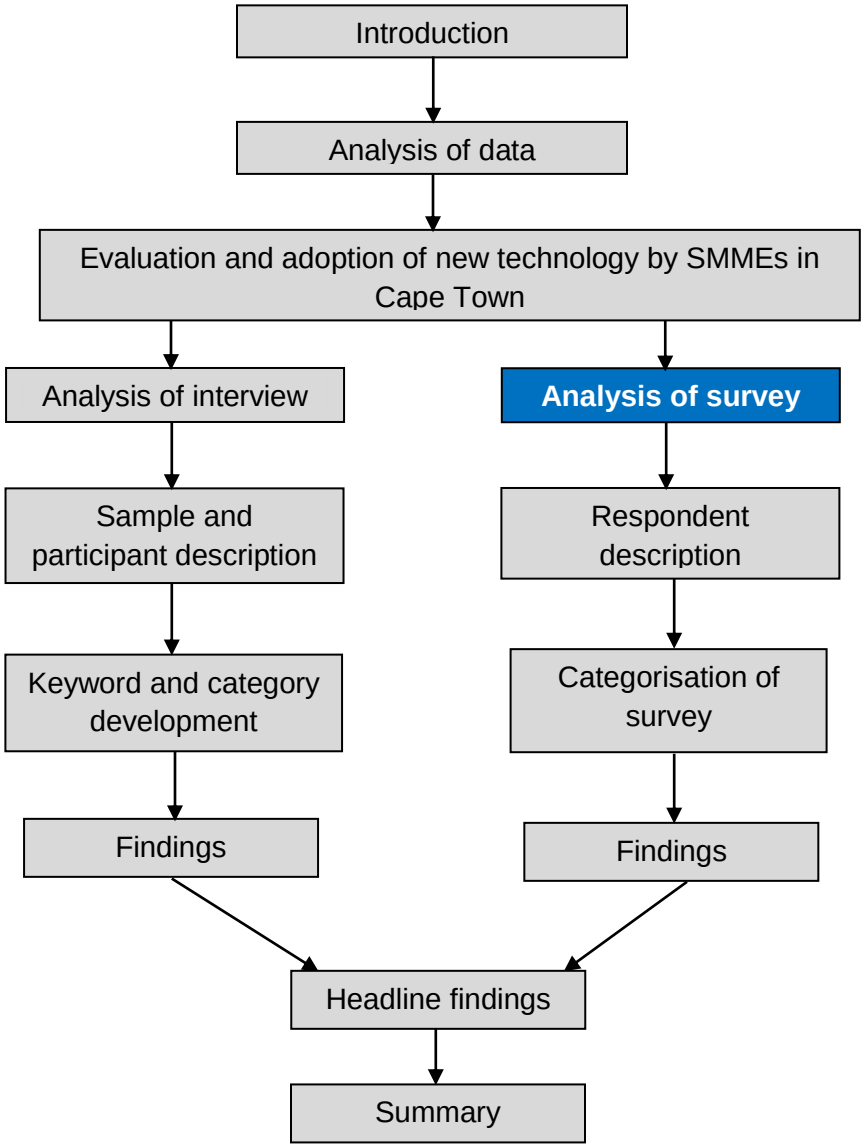

Figure 4.21: Analysis of survey

Figure 4.22: Screenshot of survey analysis options

4.3.1 The respondents

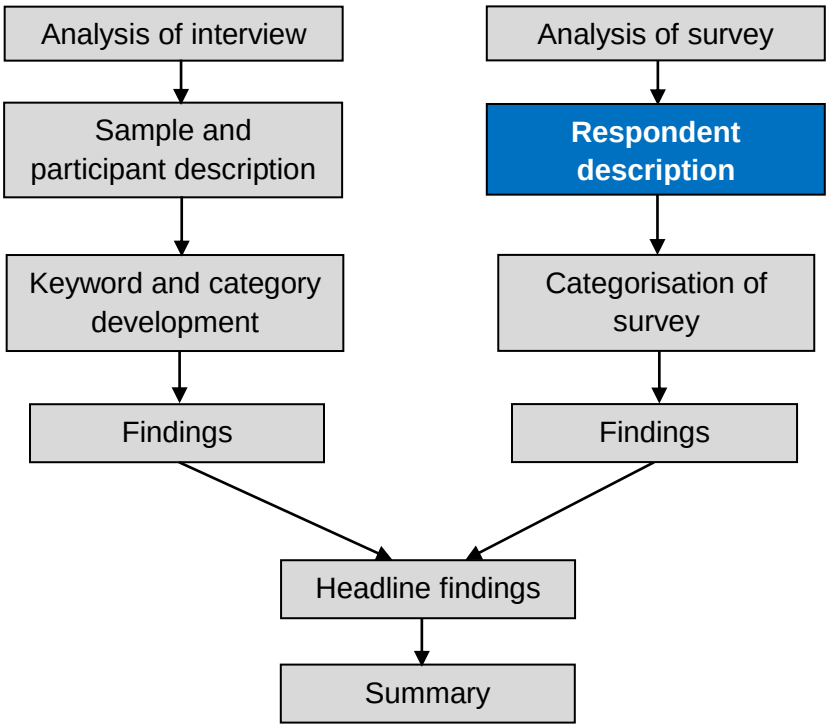

Figure 4.23: Chapter layout: Description of respondents

Twenty six (26) owners and managers of SMMEs operating within the Metropolis of Cape Town responded to the survey. The response of SMMEs to the call for participation in the research by means of the survey was disappointing. More than 2000 SMMEs were contacted by means of email and after follow up on these emails, only 26 SMMEs responded. This made statistical quantitative analysis of the data impossible. Twenty-two (22) of the 26 respondent SMMEs completed the survey in full whilst four (4) did not fully complete the survey. The responses represent 22 industries, with the individual responses ranging from owners of the SMMEs to administrators within the participating organisations. Table 4.6 shows the list of respondent job descriptions and corresponding industrial sectors.

Table 4.6: Description of survey respondents and corresponding industrial sectors

Respondents	Job Title Description	Industry
1	Business Information Officer	Government Agency
2	Owner	Manufacturing
3	Co-owner	Media and Advertisement
4	Owner	Business Services
5	Managing Director	IT Services

Respondents	Job Title Description	Industry
6	Co-owner	Media and Advertisement
7	Owner	Medical Professionals
8	Managing Director	Business Services
9	Managing Member	Business Services
10	Manager/Owner	Industrial Design & Printing
11	Publisher	Media
12	Chairperson Small Business	Government Agency
13	General Manager	Professional Association
14	Branch Manager	Immigration
15	Proprietor	Not specified
16	Director	Engineering
17	Owner	Industrial Design and Printing
18	Chief Executive Officer	Exporters
19	Managing Director	Property Management
20	Business Administrator	Educational Agency
21	Director	Financial Services
22	Administrative Manager	Financial Services

4.3.2 Categorising the survey

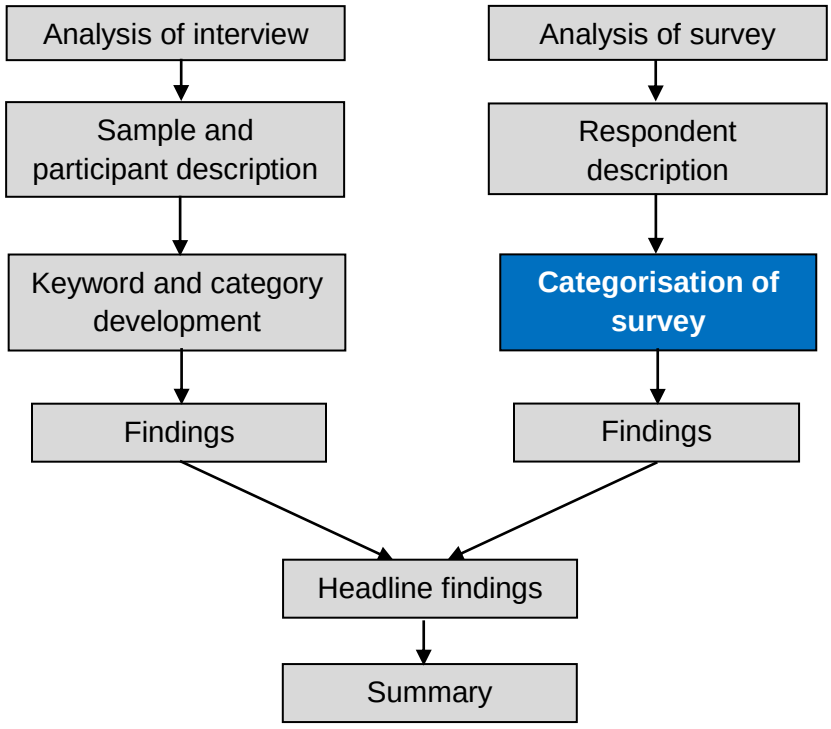

Figure 4.24: Chapter layout: Categorisation of survey

The survey questions are grouped under the 7 research sub-questions and each is linked to the underlying research sub-questions seeking to address the issues associated within each particular pre-defined categorised heading in the survey (Table 4.7). The categories were developed to capture and address data that relates to factors in business affecting SMMEs' evaluation and adoption capacity, evaluation process of new technology in business, issues relating to evaluation and adoption of new technology in SMMEs, evaluation and new technology adoption process in business, effect and impact of evaluation on decision making and its consequences, and potential benefits and advantages associated with the evaluation of new technology. The categories were predefined in relation to each sub-question to streamline the questions towards providing responses that speak to each individual category from the respondent's point of view. The seventh category was also developed to address the role government plays in the evaluation and adoption of new technology by SMMEs. As a result of the very poor response rate to the survey, no attempt was made to carry out any statically analysis of the data. However, the data was analysed using a qualitative approach by attempting to uncover themes and patterns that emerged with similarity in comparison. The emergent findings from the survey were used comparatively to compliment the findings of the interviews that were conducted also during the data collection phase of the research. Presented below are the research sub-questions and the related categories they are placed under.

4.3.2.1 Categorisation of survey questions

Table 4.7: Categorisation of survey questions

Sub-Question	Category
Sub-question 1.1: What are the factors that influence evaluation and adoption of new technology by SMMEs?	**Factors in business affecting SMME evaluation and adoption capacity**
Sub-question 1.2: How do SMMEs initiate evaluation in the process of adopting new technology in business?	**Evaluation process of new technology in business**
Sub-question 1.3: What are the perceptions of SMME managers of new technology evaluation?	**Issues of evaluation and adoption of new technology in SMMEs**
Sub-question 1.4: What is the role of government in actively facilitating and engaging SMMEs proactively in the evaluation and adoption process of new technology?	**Government role in evaluation and adoption of new Technology in SMMEs sector**
Sub-question 2.1: How can SMMEs evaluate the business potential of new technology?	**Evaluation of new technology factors in the adoption process**
Sub-question 2.2: How does the evaluation of new technology affect the decision making of new technology in SMMEs?	**Effect and impact of evaluation on decision making**
Sub-question 2.3: How does evaluation and adoption of new technology affect SMMEs' sustainability and viability of their business interest?	**Potential benefits and advantages associated with evaluation of new technology**

The answers of the respondents from the survey are discussed under each category and represented in graphical form using bar charts, indicating the response percentage to each of the questions and the classification of the different responses.

i) Factors affecting SMME adoption of new technology

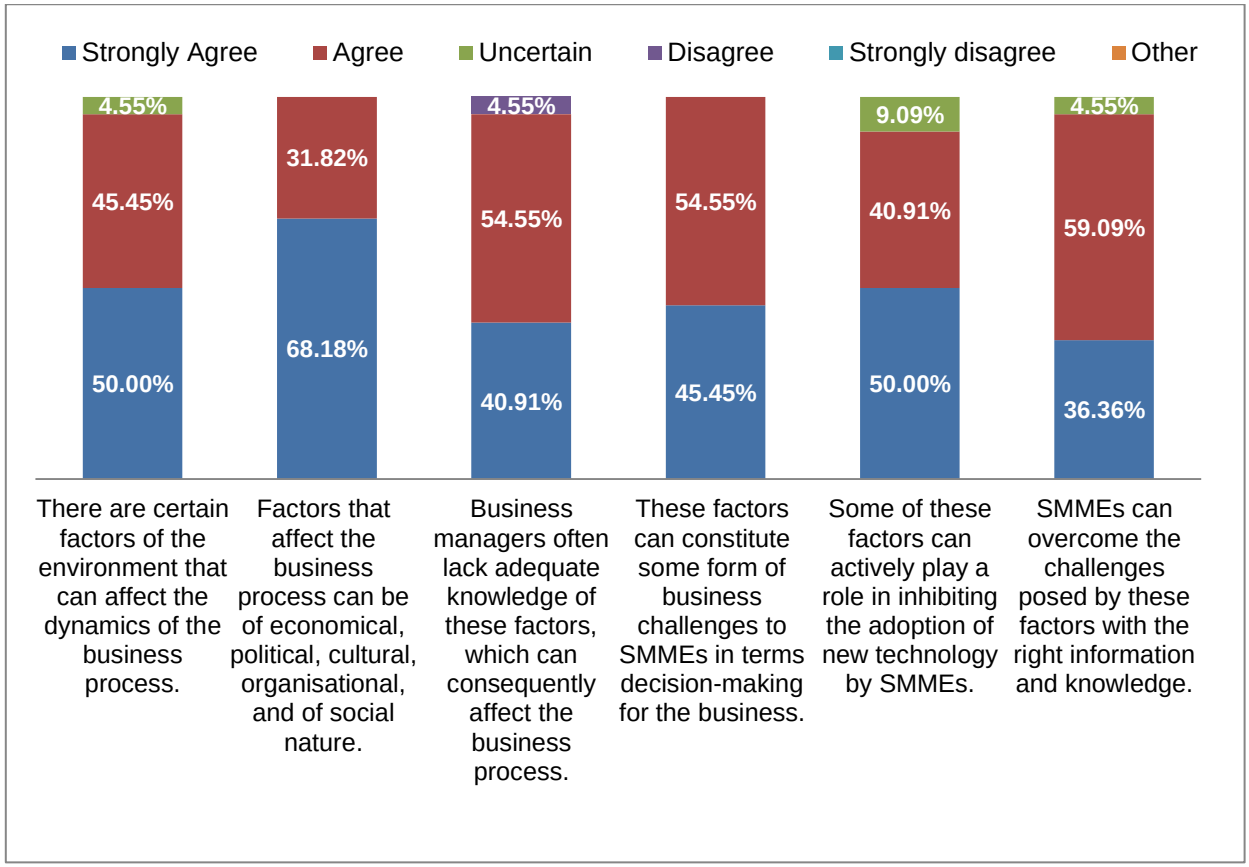

Figure 4.25: Factors affecting SMME business and adoption of new technology

The respondents are in agreement that there are economic, political, cultural, organisational and social factors that affect SMME adoption processes. They also indicate that some business managers often lack knowledge of the factors affecting the adoption process. All the respondents are of the opinion that these factors constitute some form of barrier to SMMEs in the decision making processes in their businesses. The respondents mostly agree that with good information (quality) and knowledge, SMMEs can actively overcome these challenges posed by the factors that hitherto seem to affect their adoption of new technology. Figure 4.25 shows some of the factors that could possibly affect adoption of technology in SMMEs as well as the response of the respondents to the challenges these factors pose and their opinion on how to overcome the challenges.

Finding 1: Business managers and owners recognise the existence of certain factors that affect the adoption process, which hinder the evaluation and adoption of new technology for the business.

Finding 2: SMMEs acknowledge the need for accessible and relevant information to help them deal with varying factors affecting their decision-making and choice of new technology in business.

ii) The evaluation of new technology in SMMEs

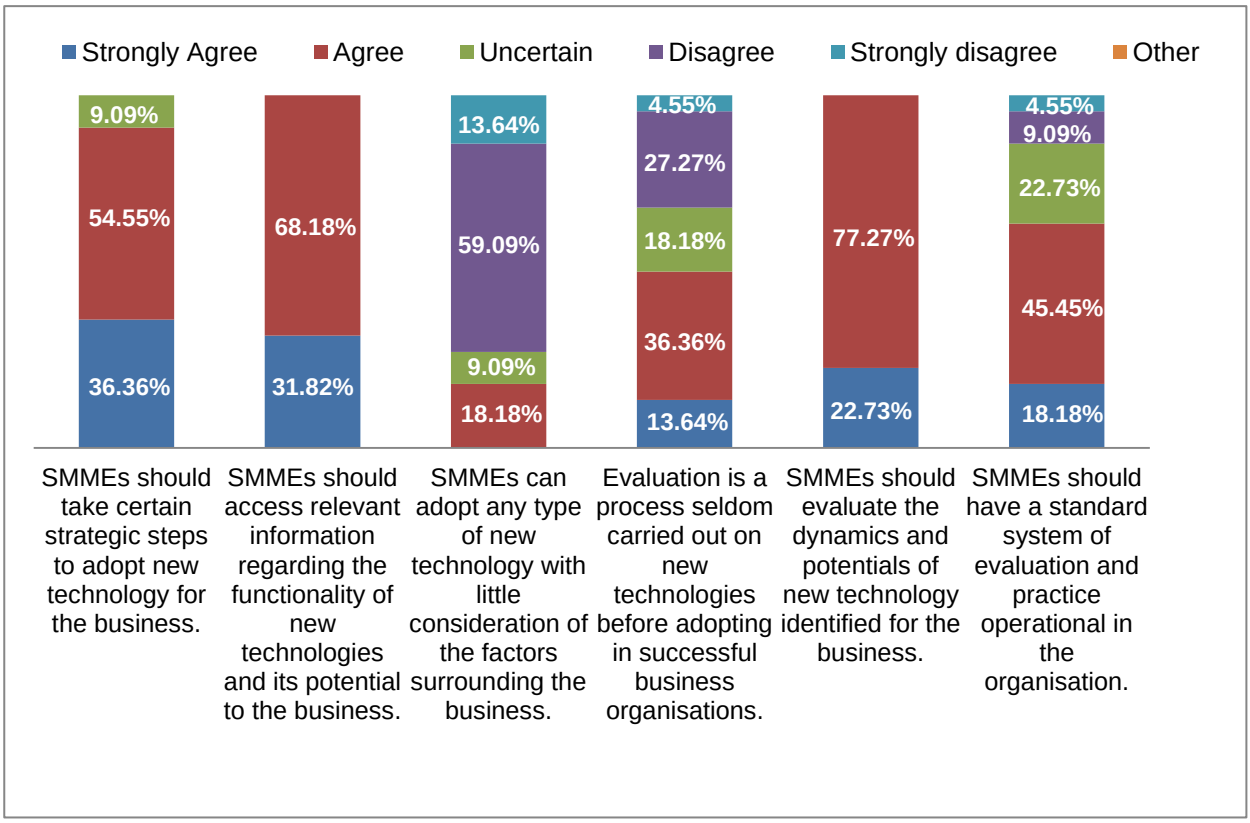

Figure 4.26: Evaluation of new technology in SMMEs

Respondents are of the opinion that a strategic plan for the adoption of technology by SMMEs is needed before commencing with the evaluation process. The strategic plan must include a well-developed evaluation process and procedure to address and capture key information about the new technology under consideration. The respondents state that SMMEs should start with accessing the right information of the functionality to effectively evaluate the business potential of new technology. Although respondents state that the process of evaluation is not clear and creates some uncertainty, the need for a standard system and practice of evaluation in the

business is not viewed as critically important by the SMMEs to assist in having a better evaluation outcome.

Finding 3: SMMEs need to access information to strategically plan for the evaluation of new technology for the business.

Finding 4: SMME decision makers have a need for relevant information about the functional aspects of the technology that is in line with the business needs.

Finding 5: Respondents lack knowledge of the process of evaluation and fail to see the value of incorporating a standard process of evaluation in their business processes.

iii) Issues surrounding the evaluation of new technology

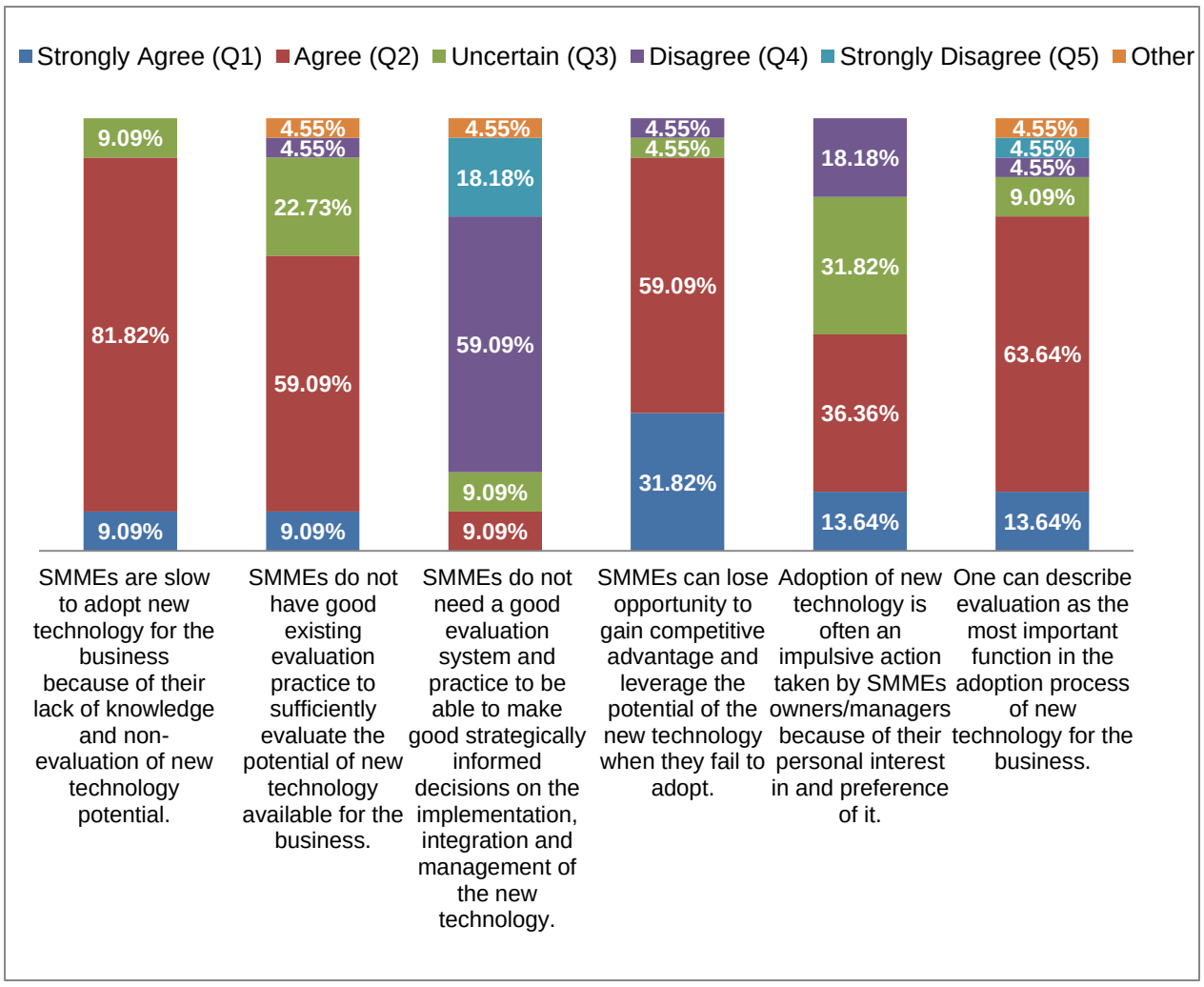

Figure 4.27: Issues surrounding evaluation of new technology

Questions in this category are targeted at understanding the perceptions of SMME managers on new technology and how they determine priorities before evaluating and adopting new technology. Many respondents view themselves as slow adopters because they lack knowledge of technology and the value new technology can add to the business. SMMEs do not have existing evaluation practices to establish the suitability of new technology available to them. Although the SMMEs do not have the technical knowledge to evaluate new technology, they realise that they may lose their competitive advantage when they fail to adopt and utilise potentially advantageous technology. Most of the respondents are in agreement that prioritising business needs to determine the technological needs are important and that an evaluation process should be part of the adoption process of technology in the organisation. In some cases, despite the acknowledgement of the importance of new technology evaluation, SMMEs still go ahead to acquire, purchase and adopt on the immediate need or impulse to obtain the technologies without any particular process of evaluation of the new product.

Finding 6: SMMEs should be able to discover new, potentially useful technology for their business by searching for and researching information themselves; failure to access information on new technology to adopt for the business limits the opportunities for a competitive advantage in the market place.

Finding 7: The lack of awareness and limited knowledge on the availability of technology by decision makers in SMMEs result in non-evaluation of new technology.

Finding 8: Acquiring new technology by owners and managers of SMMEs is often based on personal perception and preference rather than relevant facts based on evaluation.

Finding 9: A significant number of respondents acknowledge the impact and importance of evaluation in the decision making of new technology adoption.

iv) The role of government in the evaluation and adoption of new technology by SMMEs

Across the three questions which address government's role and contribution, government policies and its effect on SMME adoption, the majority of respondents are of the opinion that there has been no significant contribution or particular role being played by the government to date. They also agree unanimously that government policies do not contribute towards the ability of SMMEs to adopt new technology and develop their business. According to the respondents, government provides little or no visible assistance in creating an enabling platform for SMMEs to adopt new technology.

The general view by the respondents is that there is a need for increased government participation in the process of evaluation and adoption of new technology by SMMEs. Very few of the respondents disagree with the statement that government should be more involved in the evaluation and adoption process.

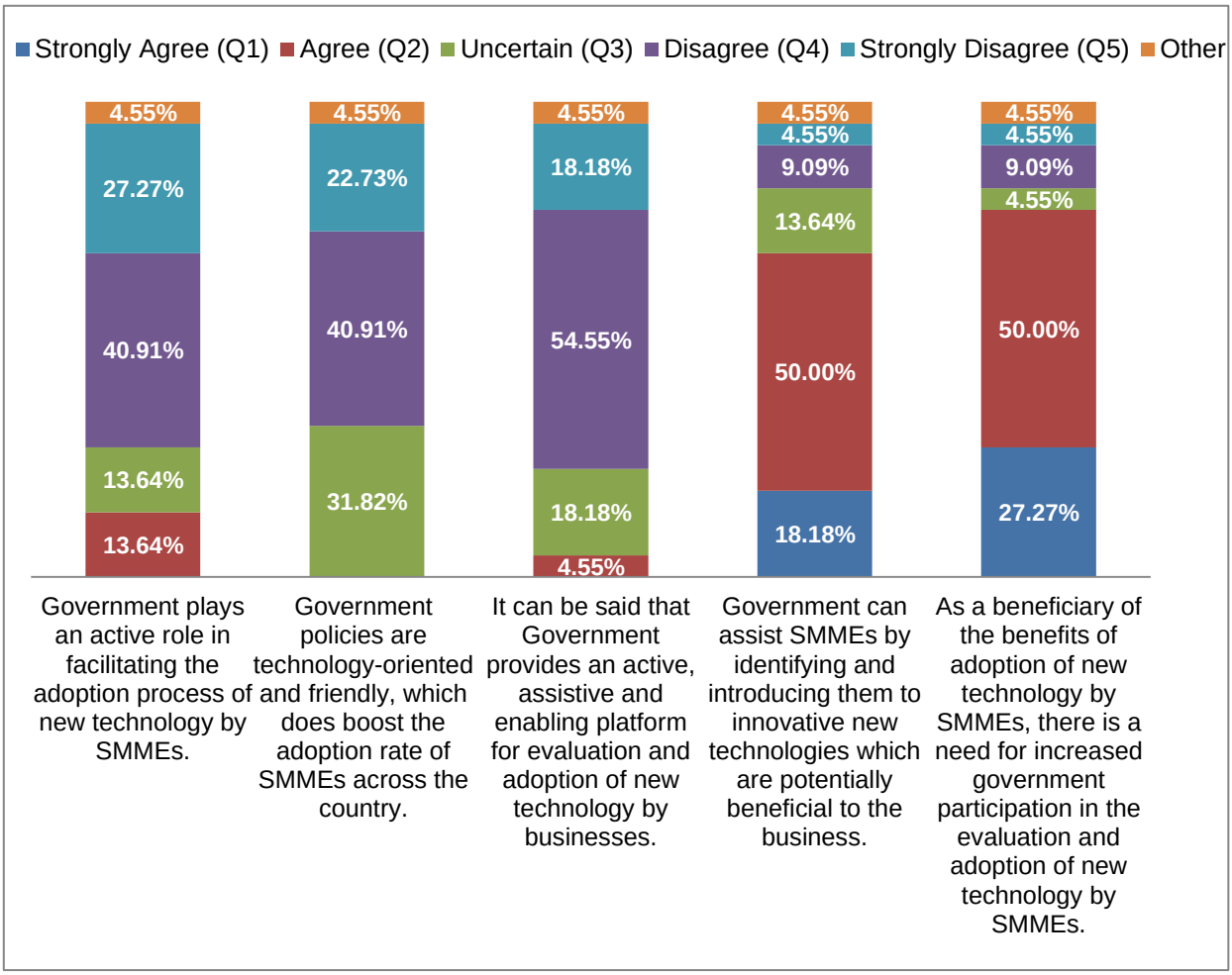

Figure 4:28: Role of government in SMME evaluation and adoption of new technology

Finding 18: There is a lack of government involvement and support in the evaluation and adoption of new technology by SMMEs for the business.

Finding 19: SMMEs are unaware of government policies and programmes that may contribute to, or enable SMMEs to evaluate and adopt new technology for the business.

v) Evaluation of new technology factors in the adoption process

Some SMMEs have an idea on how to identify new technology with potential for the SMME to add value to the business. However, these SMMEs still need to have a standard evaluation

process in place. Most of the respondents agree that evaluation should include measurement of the characteristics and functionality of the new technology as well as the potential effect it could have on the business. Most of the respondents agree that SMMEs should evaluate the applicability, adaptability, compatibility and capability of a new technology before adopting for the business. A large percentage of the respondents believe that a cost-benefit analysis and return on investment (ROI) should be considered in the same light as sustainability, predictability, integration and potential risk when considering factors that influence decision making in the evaluation and adoption process.

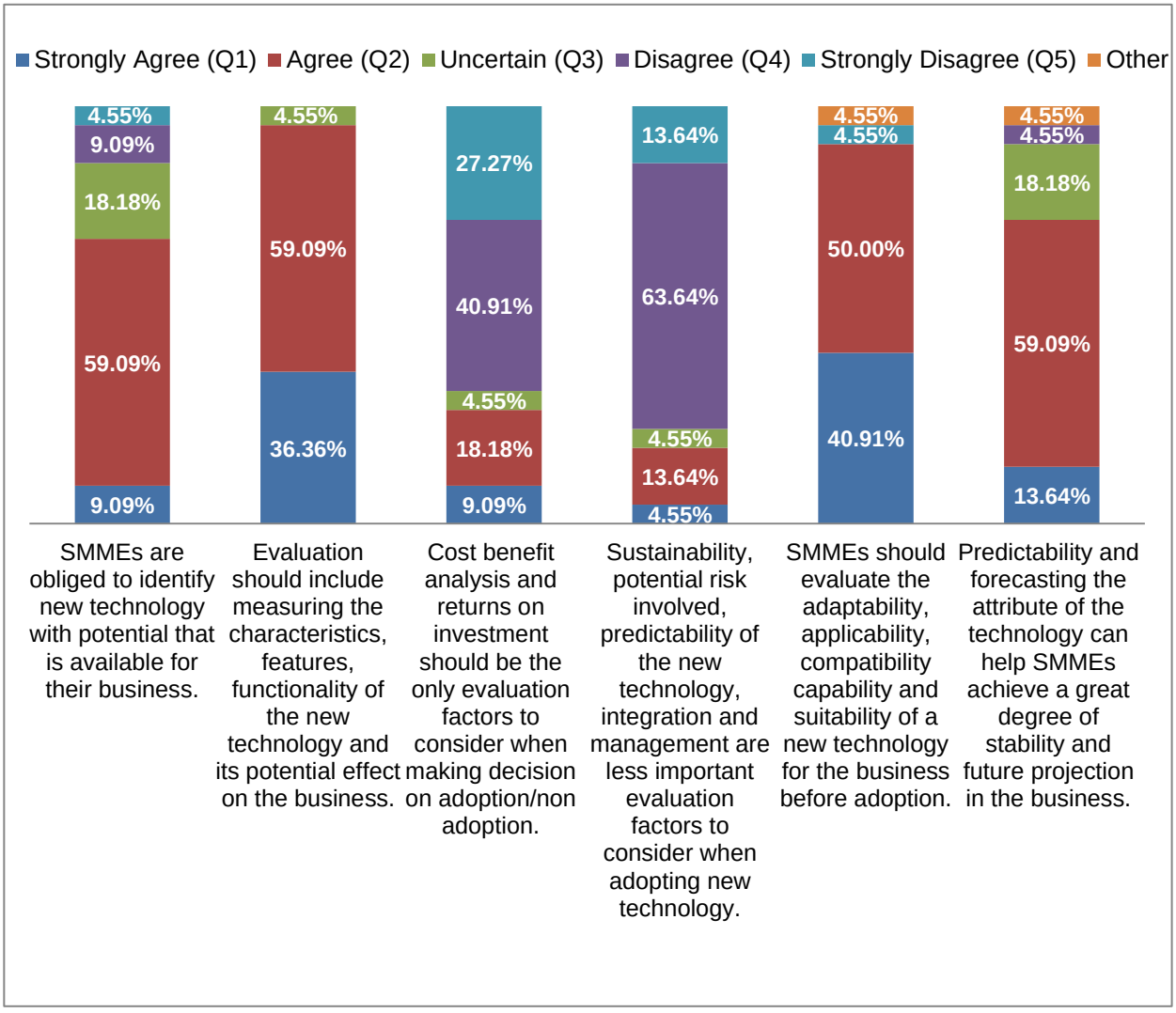

Figure 4.29: Evaluation of new technology factors in the adoption process

The significance and advantage that predictability and forecasting of new technology might have on the business seem not to be fully understood by the SMMEs, with some of them only concerned with the cost-benefit analysis and ROI.

Most of the respondents agree that evaluation should include measurement of these said characteristics as well as functionalities of the new technology and the potential effect it could have on the business. SMMEs need to realise that a cost-benefit analysis and ROI should not be the only factors for SMMEs when considering new technology. Factors such as sustainability, predictability, applicability, adaptability and compatibility are equally important.

Finding 10: Evaluation of new technology should be concerned with measuring new technology functionality and its potential effect on the business, which include determining the applicability, adaptability, compatibility, capability and general suitability of the new technology to the entire business process.

Finding 11: Other factors relating to the business are considered as important as cost-benefit analysis and return on investment (ROI) when evaluating new technology for the business.

vi) Effects and impact of evaluation on the decision-making process for new technology in SMMEs

Most of the respondents agree that evaluation plays a major role in creating an awareness of the potential usefulness and ease of use of new technology. When considering the evaluation of new technology, more than half of the respondents agreed that the factors as described in Section 4 cannot be ignored when it comes to decision making in the business. Some respondents agree that evaluation factors can be considered relative, implying that these factors may or may not be important when it comes to decision making, whilst some respondents are not certain of the effect of evaluation on decision making. The differences in responses show that some SMMEs do not fully understand the advantage of verified facts and information on the adoption process, which ultimately results in uninformed decisions being made by the owners and managers.

Respondents are of the opinion that the failure to properly evaluate the potential and functions of new technology can limit the potential to adopt a new technology. Evaluation processes aid the successful yield on the ROI made on the new technology adopted. Over half of the respondents state that SMMEs are failing largely due to the fact that they do not make informed decisions on adopting technologies with potential benefit for the business. Contrary to the respondents stating that SMMEs are failing due to uninformed decisions, the other half are uncertain whether SMMEs fail because of non-evaluation of new technology.

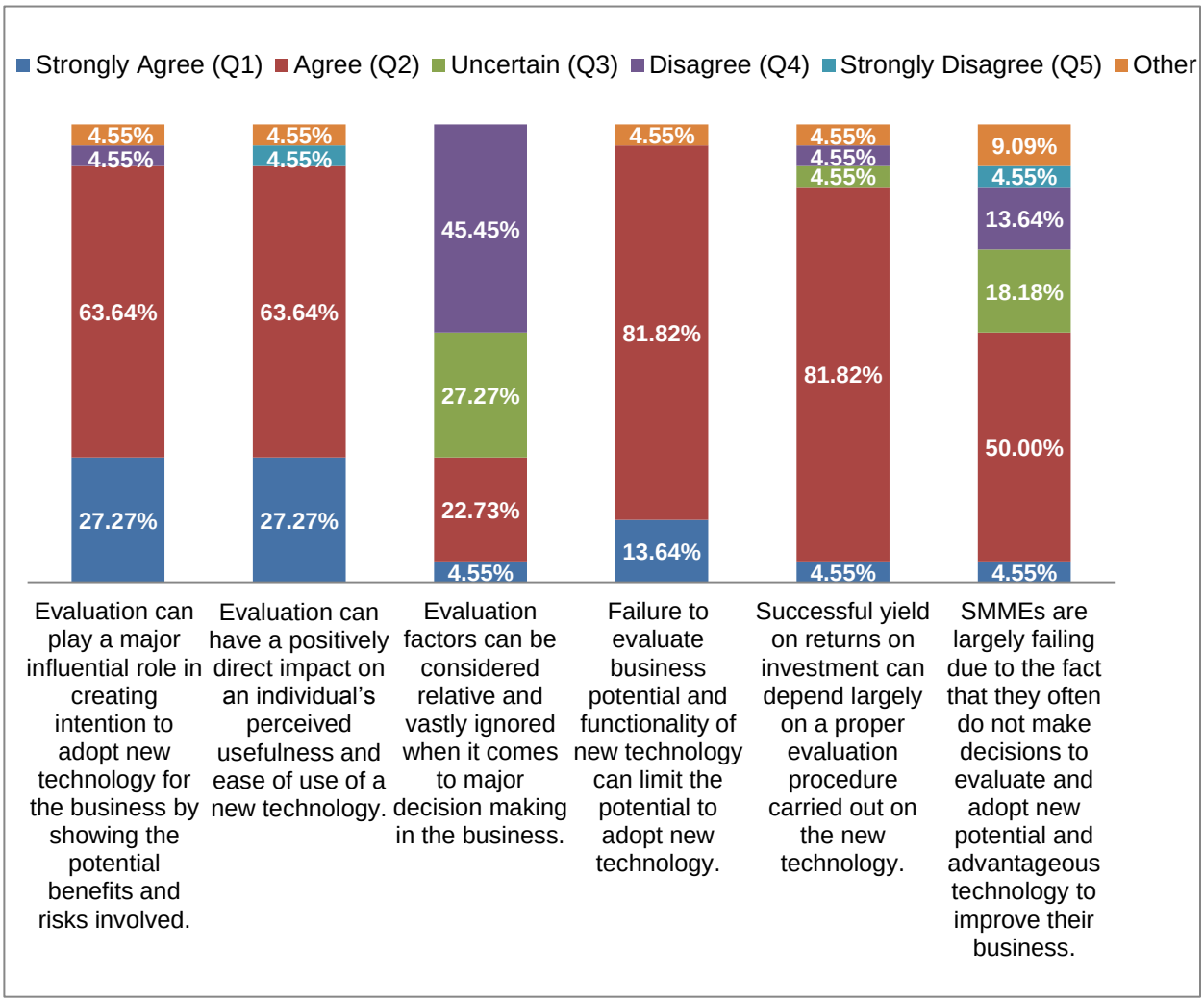

Figure 4.30: Effects and impact of evaluation on decision making

Finding 12: Evaluation of new technology provides relevant information which influences an individual's perception of the various aspects of the new technology, thereby creating or enhancing the intention to adopt based on the knowledge gained from the evaluation.

Finding 13: To successfully realise the yields of investment from the use of new technology, evaluation of the new technology should be carried out.

Finding 14: A large number of SMMEs are ignorant of the impact non-evaluation of new technology can have on the sustainability and viability of the business.

vii) Potential benefits and advantages of the evaluation of new technology

This category, which addresses the potential benefits and advantages of the evaluation of new technology, is aimed at determining if the respondents understand the potential benefit and advantage this can bring to their business. Most of the respondents agree that both evaluation and adoption of new technology are important to SMMEs if they want to gain a competitive advantage in the market. From the responses of the survey, it is clear that evaluation can bring about savings in the cost of implementing and integrating new technology. The cost reduction, combined with prior knowledge of the functionality and components of the new technology, can ensure better management of and support for the technology in the future. The respondents are of the opinion that SMMEs which do not evaluate new technology, forfeit knowledge of the potential of the technology as well as the benefits it holds for the business. Evaluating new technology equips the business with the ability to identify potential risks, thus reducing the occurrence and impact of risks happening.

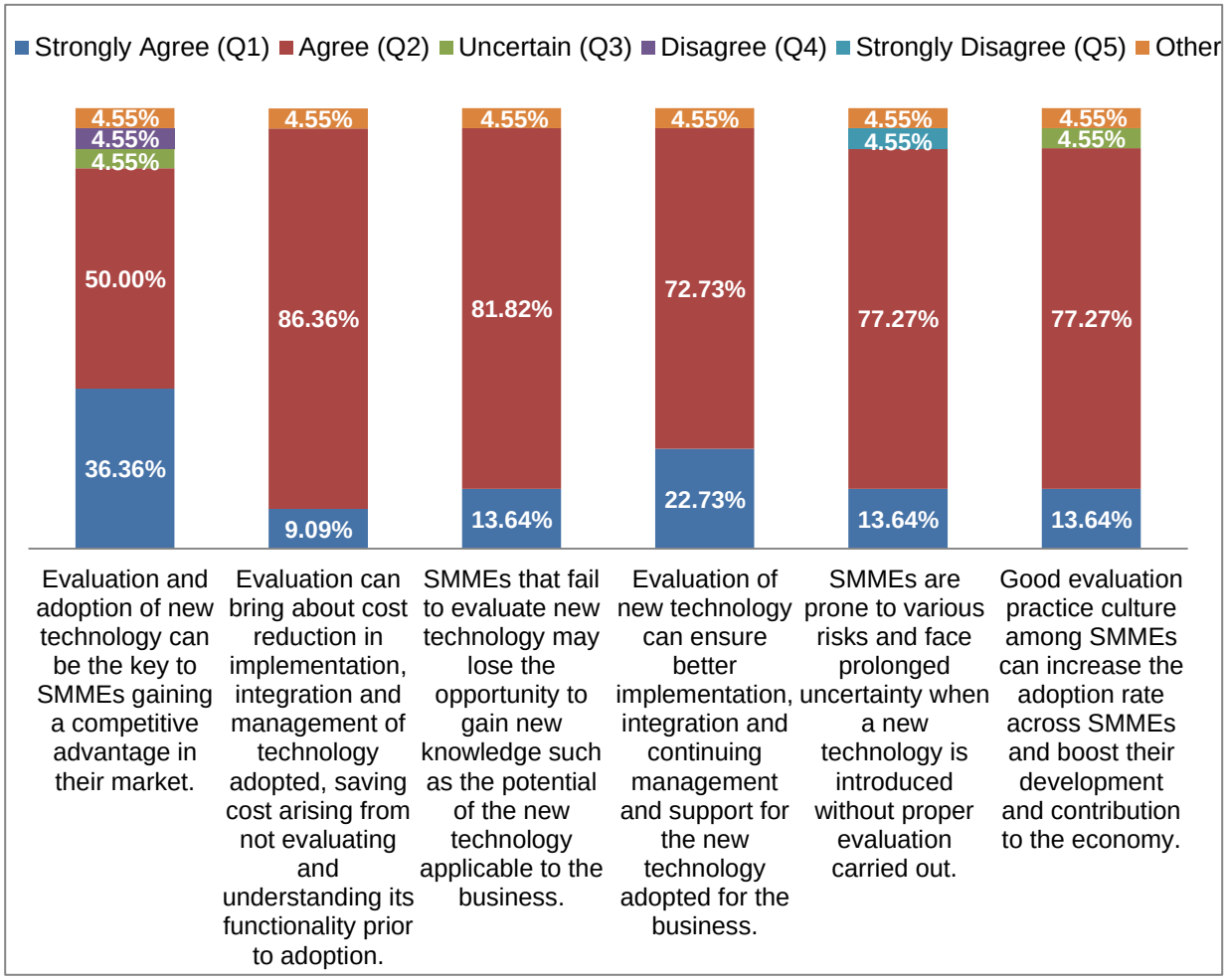

Figure 4.31: Potential benefits and advantages of evaluation of new technology

The majority of respondents (91 percent) believe that SMMEs with an efficient evaluation practice will bring about an increase in the adoption of new technology. In this category, the respondents displays a high level of understanding of the potential benefits accruable from evaluation, and the advantages evaluation of new technology holds for the business. There is a high percentage of agreement and consensus across all the questions, thus demonstrating the respondents' understanding of the advantages and benefits evaluation of new technology brings to the business process.

Finding 15: Evaluation brings about cost savings in the implementation and integration of new technology, while ensuring better management of the new technology within the business process.

Finding 16: SMMEs failing to carry out evaluation tend to forfeit knowledge of the potential and functionality of the new technology, which leaves it open and prone to risks and uncertainty about the contribution of the technology to the business process.

Findings 17: Evaluation improves the ability to gain a competitive advantage in the market, which improves chances of survival of the business.

4.3.3 Findings from survey: Summary

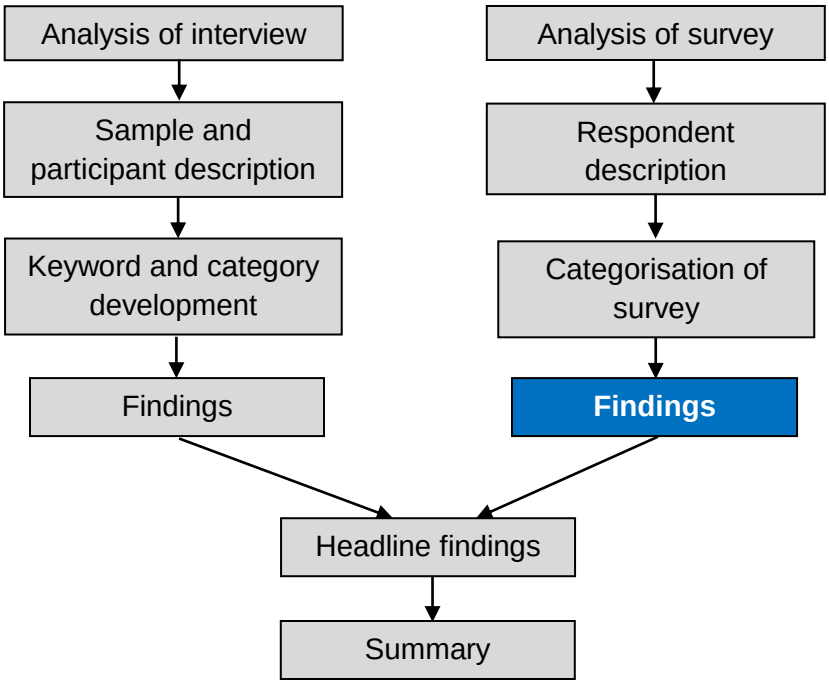

Figure 4.32: Chapter layout: Summary of survey findings

Table 4.8 presents the summary of findings from the responses of the survey. The findings are grouped according to the different research sub-questions they fall under. The relevant findings will be compared and synchronised with interview findings to form a synergy of both findings (called headline findings) which will be further elaborated on and discussed in relation to existing literature in the subsequent chapter.

Table 4.8: Findings of the responses from survey respondents

Research questions	Findings
Research Question 1	**Research question 1: What are the adoption challenges for SMMEs in terms of the evaluation of new technology?**
Sub-question 1.1: What are the factors that influence evaluation and adoption of new technology?	**Finding 1:** Business managers and owners recognise that there are certain factors that affect the adoption process, which hinders the evaluation and adoption of new technology for the business.
	Finding 2: SMMEs acknowledge the need for accessible and relevant information to help them deal with varying factors affecting their decision-making and choice of new technology in business.
Sub-question 1.2: How do SMMEs initiate evaluation in the process of adopting new technology in business?	**Finding 3**: SMMEs need to access information to strategically plan for the evaluation of new technology for the business.
	Finding 4: SMME decision makers have a need for relevant information about the functional aspects of the technology that is in line with the business needs.
	Finding 5: Respondents lack knowledge of the process of evaluation and fail to see the value of incorporating a standard process of evaluation in their business processes.
Sub-question 1.3: What are the perceptions of SMME managers of new technology evaluation?	**Finding 6:** SMMEs should be able to discover new, potentially useful technology for their business by searching for and researching information themselves; failure to access information on new technology to adopt for the business limits the opportunities for a competitive advantage in the market place
	Finding 7: The lack of awareness and limited knowledge on the availability of technology by decision makers in SMMEs result in non-evaluation of new technology.
	Finding 8: Acquiring new technology by owners and managers of SMMEs is often based on personal perception and preference rather than relevant facts based on evaluation.
	Finding 9: A significant number of respondents acknowledge the impact and importance of evaluation in the decision making of new technology adoption.

Research questions	Findings
Sub-question 1.4: What is the role of government in actively facilitating and engaging SMMEs proactively in the evaluation and adoption process of new technology?	**Finding 18:** There is a lack of government involvement and support in the evaluation and adoption of new technology by SMMEs for the business.
	Finding 19: SMMEs are unaware of government policies and programmes that may contribute to, or enable SMMEs to evaluate and adopt new technology for the business.
Research Question 2	**How does the evaluation of new technological innovations affect the adoption of new technologies in SMMEs?**
Sub-question 2.1: How can SMMEs evaluate the business potential of new technologies?	**Finding 10:** Evaluation of new technology should be concerned with measuring new technology functionality and its potential effect on the business, which include determining the applicability, adaptability, compatibility, capability and general suitability of the new technology to the entire business process.
	Finding 11: Other factors relating to the business are as important as cost-benefit analysis and return on investment (ROI) when evaluating new technology for the business.
Sub-question 2.2: How does the evaluation of new technology affect the decision-making of new technology adoption in SMMEs?	**Finding 12**: Evaluation of new technology provides relevant information which influences an individual's perception of the various aspects of the new technology, thereby creating or enhancing the intention to adopt based on the knowledge gained from the evaluation.
	Finding 13: To successfully realise the yields of investment from the use of new technology, evaluation of the new technology should be carried out.
	Finding 14: A large number of SMMEs are ignorant of the impact non-evaluation of new technology can have on the sustainability and viability of the business.
Sub-question 2.3: How does evaluation and adoption of new technology affect SMMEs' sustainability and viability of their business interest?	**Finding 15:** Evaluation brings about cost savings in the implementation and integration of new technology, while ensuring better management of the new technology within the business process
	Finding 16: SMMEs failing to carry out evaluation tend to forfeit knowledge of the potential and functionality of the new technology, which leaves it open and prone to risks and uncertainty about the contribution of the technology to the business process.
	Findings 17: Evaluation improves the ability to gain a competitive advantage in the market, which improves chances of survival of the business.

4.4 Headline findings

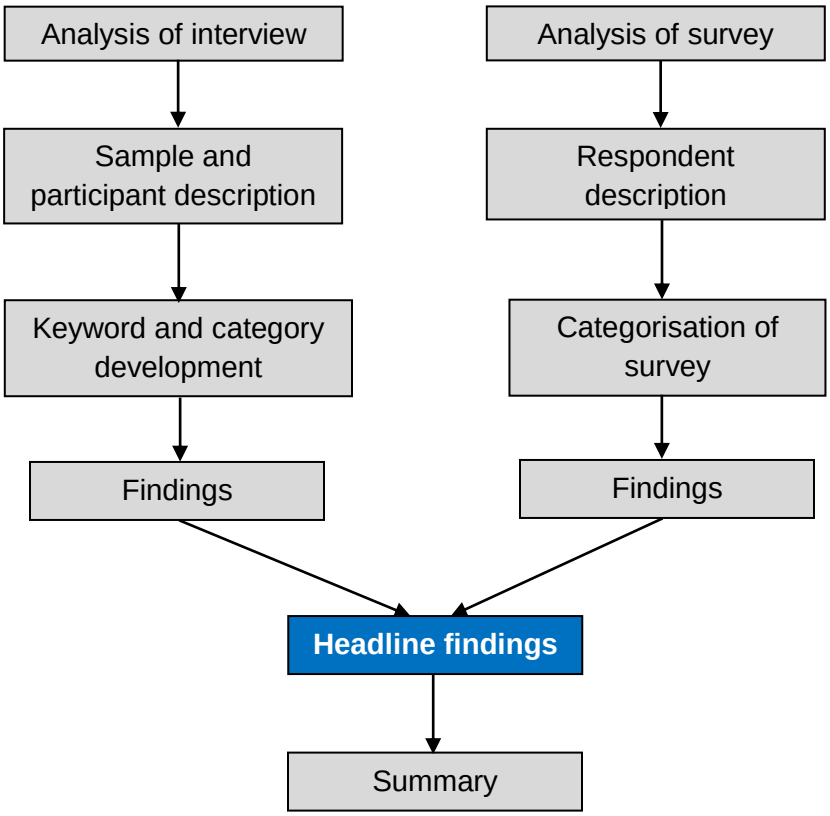

Figure 4.33: Chapter layout: Headline findings

Findings were identified based on subjective characteristics of individuals interviewed, also complimented by findings from survey respondents and the nature of organisational settings. The headline findings make it easier to identify emerging patterns and relationships that exist between the extracted findings. The headline findings represent the summary of the findings based on the similarities of the implication and interpretation of their meanings. The headline findings are used to identify the potential themes based on the similarity of inferred meanings, identified by the relationship and patterns observed between the findings. Presented below are the major headline findings obtained, which later evolved into themes.

- Managers and owners of SMMEs consider factors such as knowledge and awareness of new technology, cost of adoption, risk and uncertainty of the technology, resistance to change, and technology market as major source of impediment that affects the ability to adopt new technology for the business. All respondents unanimously agree on accessibility to information on new technology; such a rating particularly shows their level of concern about the availability of necessary information needed to make decisions and

good judgment concerning their business. Respondents admit to the need for SMMEs to have access to quality and reliable information about available technology with potential, to enable them to make informed decisions on the new technology. Also emphasised is the need for SMMEs to be able to make proper decisions based on good judgment, which they currently lack. SMMEs also require the ability to acquire appropriate knowledge about the functionality of the technology to enable the business to capitalise on the potential benefits of the new technology to enhance the growth of their business.

- The respondents have a positive view and disposition on the evaluation of new technology. The majority of respondents acknowledge the importance of evaluation and the impact on new technology adoption, including the subsequent effect it can have on the business. The respondents are in agreement that evaluation plays a major role in the development and growth of the business of SMMEs because of what it offers. It is seen as a key enabler of business as the impact of technology allows business processes to be proliferated, and the ability to increase productivity and enhance efficiency is evident. Although the importance of evaluating new technology is highly stressed and the impact on the business admitted by the respondents, it is evident that SMMEs do not have an existing structure or formalised way of direction and steps to evaluate new technology for the business.
- None of the SMMEs interviewed are particularly enthused about government support for SMMEs. Only two of the respondents have knowledge of SEDA, of which only one actually interacted with them. The rest of the respondents never heard of SEDA or STP, nor have they ever witnessed or benefitted from any support from government programmes. SMMEs feel that as a direct beneficiary of SMME contribution to the economy, government should be more active and involved in the areas of technology adoption by SMMEs, with provision of the necessary platforms to assist in accessing information and support on new technology to develop and grow as a business.
- The SMMEs that were interviewed have a diverse view of the impact of government policies on creating a good business environment to boost technology adoption. The majority of respondents are of the opinion that government policies have a negative effect on their business. They pointed out that there are existing policies working against each other, thereby rendering a negative impact on the business. In the case of FSPs, legislation was made to compel them to use new technology in their practice, but the effect of compliance with legislation has left many businesses on the side lines (especially old generation managers and owners) and inadvertently increased the cost of

running the business of up to 42 percent. SMMEs also view government policies as favouring large firms more than the small business sector.

- From the information gathered during the study, SMMEs are concerned about understanding the dynamics and design of new technology and level of applicability to the business process. The knowledge required to understand the functionality of a new technology can be accessed by asking the right questions about the business requirements, measuring the adaptability, capability, compatibility and applicability of the new technology, and creating a synergy of business and technology fit in the business process, thus facilitating and fulfilling the impact and resultant expectations the business requires. Furthermore, there is a need for SMMEs to continuously research and acquire knowledge on new technologies available for SMMEs.
- The value new technology offers the business process is a key influence on the decision of SMMEs to adopt as such technology is a strategic tool and key enabler of business objectives and goals. The majority of SMMEs see cost as relative to potential benefits and advantages accruable from the evaluation and adoption of the new technology on their business in the long run. New opportunities for the business are often offered by new technology, which culminates in decreased expenses and increased productivity while ensuring continued sustenance and relevance in the market place. New technology gives a business the ability to deliver superior quality of goods and services over that of competitors, which attracts more customers to the business. The knowledge and application of improved and advanced technology gives businesses leverage over other competitors in the market.
- Making an informed decision is crucial to the continuing survival of the business. Some of the SMMEs interviewed feel that the evaluation of new technology gives them a satisfactory feeling when decisions are made based on relevant facts about the technology. It enables them to perform better and deliver more efficiently in the running of their business. SMMEs need to understand that evaluation of technology provides a better understanding of the suitability of new technology, thus contributing towards informed decision making to make the right and most appropriate choices regarding the business.
- Due to the nature and characteristics of a small business, interviewees are of the opinion that SMMEs have a need for an evaluation assessment tool to help make informed decision on appropriate new technology for the business process. The research study therefore proposes that SMMEs be assisted by guidelines on the evaluation process to

identify factors relating to their business environment which affect the evaluation of new technology for the business. SMMEs need to be equipped to make salient and crucial decisions about new technology that will have a large effect on the business. Getting to evaluate and make proper decisions on a proven and standardised process will ensure that SMMEs continue to grow and avoid making ill-conceived decisions that will expose them to various forms of risks which is detrimental to the business.

- The SMMEs that were interviewed are of the opinion that small businesses risk failing due to impulsive and excessive buying of technology with disregard for the evaluation of new technology for the business process. SMMEs usually act on gut feeling and are easily influenced by current trends in the environment, without paying attention to the functionality and appropriateness of the technology or their business. As a result, SMMEs are often left with a feeling of inadequacy when adopting the wrong technology and ending up losing money for not knowing the capacity of what is required to solve their problems. Thus, SMMEs have to be aware of industry players making informed decisions based on a proper evaluation of new technologies available for the business. This awareness helps in keeping up with the industry pace to ensure sustainability and viability of the business.

4.5 Summary

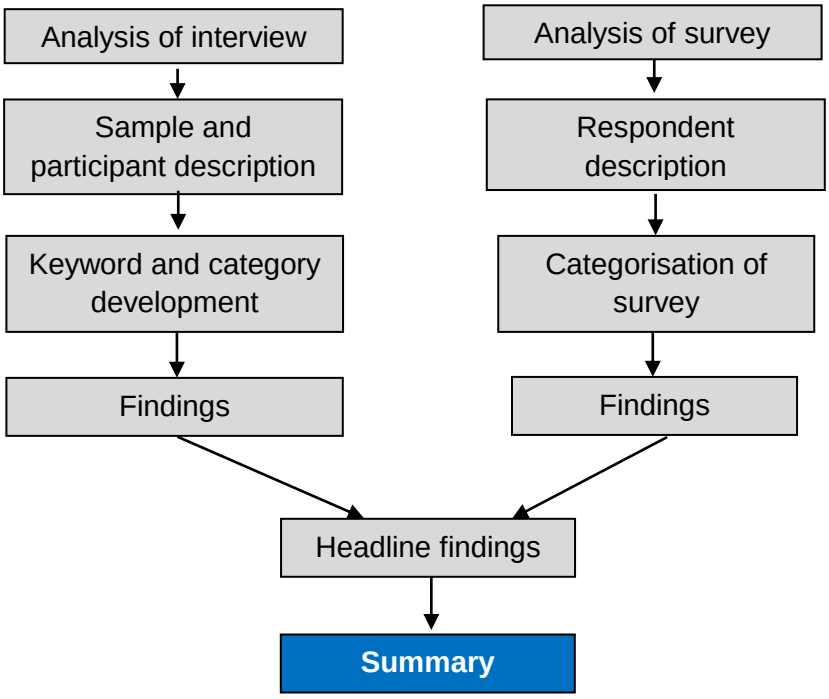

Figure 4.34: Chapter layout: Summary

The findings from the survey and interview analysis show that respondents understand the importance and role that evaluation plays in the adoption process. This includes the sub-category evaluation of new technology, i.e. technology suitability, investigating technology potential, business needs, researching and consulting of technology, evaluation model, and integration of new technology, all at the forefront of the responses of the interviewees. The respondents identify factors such as risks and uncertainty, cost, technology market, resistance to change and technology infrastructure among others as limiting the ability of SMMEs to adopt new technology for the business, while competitive advantage, business value added and government policies play a big role in influencing SMMEs to adopt new technology. Lack of visible government support and a negative impact of government policy on SMME business development are also highlighted, with a call for improved government assistance and participation in areas of technology infrastructure and information accessibility to promote increased SMME evaluation and adoption of new technology. Non-evaluation is a salient issue also discussed in the course of the interview, with responses making particular reference to the general nature of SMMEs in South Africa.

Even though respondents have a basic knowledge of how evaluation should be carried out, there is no evidence of evaluation practices as a strategic plan and/or part of the existing business process in their organisation. The findings are not to be refined to fit all SMMEs, although most of the interviewed organisations have a basic understanding of the usefulness of evaluating and adopting new technology. In evidence is the drive and attraction of SMMEs for new ways of improving the business. The findings are not generally applicable conclusively beyond a similar spectrum of participating organisations; this is as a result of the non-participation of less technology-driven small enterprises, resulting in only a small fraction of contribution from them. Survey results are limited to 22 respondents; therefore the results cannot be generalised to the entire population within the Cape Town Metropolis and South Africa in general. Results have shown the need for SMMEs to actively be aware of their business environment and measure up in terms of technology adoption and active usage to promote development and enhance their sustainability and survival in the market place.

In the course of the categorisation of the emergent keywords phrases and concepts, five themes were developed from the findings from the interviewees supported by survey responses. These are organisation development, evaluation, government, information, and the decision-making process when evaluating the adoption of new technology. These emergent themes will be discussed in Chapter Five.

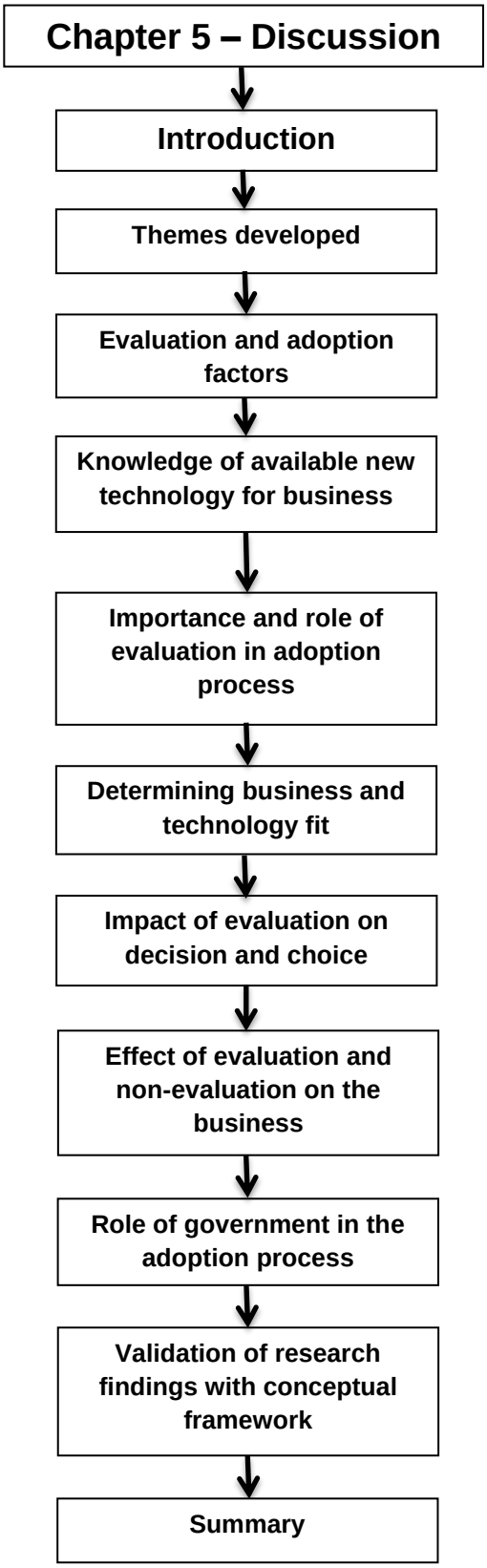

Figure 5.1: Graphical representation of Chapter Five

CHAPTER FIVE: DISCUSSION

5.1 Introduction

In this Chapter, the findings from Chapter Four are discussed based on the analysis of the research data collected from the interviews and survey. The findings are discussed in comparison to related findings from a previous research study. This method connotes triangulation of the interpretations of findings from interviews and survey with prior existing literature to inform better clarity of the findings on the subject matter. The first part of Chapter Five presents the emerging themes from the categorisation of the research data. The second part presents the answers to the research questions and the validation of research findings.

5.1.1 The research problem

SMMEs are constrained by the lack of awareness and knowledge of existing technology and its potential to the business, the cost implication and steps of acquisition, and also the technical skills needed to operate the new technology (Abdollahzadehgan *et al*., 2013).

SMMEs find it challenging to evaluate, adopt and manage new technology innovations due to lack of knowledge of the new technology, its potential, and other significant characteristics to understand the impact of new technology on the business (Kim & Garrison, 2010).

The resultant effect of the failure to evaluate and analyse the business potential of new technology, the application to business systems, perceived benefits, management skills of new technology, risk of unknown future technology and the immediate financial implications, leads to uninformed decisions that might affect the adoption of new technology with potential impact on the sustainability of the business (Palvalin *et al.,* 2013; Olawale & Garwe, 2010).

SMMEs do not sufficiently evaluate the potential, adaptability and applicability of new technology in their business, and as a result lose opportunities to gain a competitive advantage in their market, which can impact on the long-term viability of the business.

The aim of this research is to explore the reasons behind the failure of SMMEs to evaluate new technology for the business. The exploratory study is aimed at gaining a deeper insight into the previously identified barriers and other new factors which might affect and inhibit evaluation and adoption in SMMEs.

The focus of this study is on the evaluation and adoption practices by SMMEs to uncover challenges and constraints faced by small businesses in establishing new technology with potential beneficial impact to adopt for their business.

This chapter examines and seeks to validate the findings to establish and synthesise prior identified factors affecting evaluation and adoption of new technology with the emerged findings from the case study to establish the elements at play. The chapter is organised and presented according to the order of the main questions and sub-questions in concurrent form (see Section 1.3).

Research question 1: **What are the adoption challenges for SMMEs in terms of the evaluation of new technology?**

Research question 2: **How does the evaluation of new technological innovations affect the adoption of new technologies in SMMEs?**

Sub-question 1.1: What are the factors that influence evaluation and adoption of new technology?

Sub-question 1.2: How do SMMEs initiate evaluation in the process of adopting new technology in business?

Sub-question 1.3: What are the perceptions of SMME managers of new technology evaluation?

Sub-question 1.4: What is the role of government in actively facilitating and engaging SMMEs proactively in the evaluation and adoption process of new technology?

Sub-question 2.1: How can SMMEs evaluate the business potential of new technologies?

Sub-question 2.2: How does the evaluation of new technology affect the decision-making of new technology adoption in SMMEs?

Sub-question 2.3: How does the evaluation and adoption of new technology affect SMMEs' viability and sustainability of their business interest?

5.2 Themes developed

5.2.1 Organisational development

The successful adoption and implementation of new technology is dependent on the complexities surrounding technological factors of the new technology in relation to the organisational structure of SMMEs to enhance increased growth and development. Managers and owners of SMMEs consider factors such as knowledge and awareness of new technology, cost of adopting, risk and uncertainty of the technology, resistance to change and technology market as major sources of impediment that affect their ability to adopt new technology for their business.

Tan *et al.* (2010) state that issues concerning cost of adoption, benefits perceived, management skills and fear of the unknown future of technology are usually associated with barriers affecting the promotion of new technology adoption. The statement supports Kumar (2013) who elaborates that prominent factors affecting new technology adoption among SMMEs in developing countries are often related but not limited to technology infrastructure acquisition cost factors, uncertainty and risk on returns on capital investment. SMMEs are faced with many challenges concerning the adoption of new technology because of their peculiar nature and characteristics, with more of the impact of adoption challenges evident in developing countries. In similar view, Tan *et al.* (2010) state that issues concerning cost of adoption, benefits perceived, management skills and fear of the unknown future of technology are usually associated with barriers affecting the promotion of new technology adoption.

Adoption of technology has been touted as a major stimulant to organisational empowerment and growth. In agreement, Volpe *et al.* (2013) state that factors affecting new technology adoption are critical to the business process because it affects the structural change and growth capacity, thus contributing to increased levels of SMME organisational development. The impact of adoption of new technology on small businesses has been strenuously emphasised and the contribution it brings to the business in terms of growth development and sustenance cannot be over emphasised. In support of the above statement, Tarutė and Gatautis (2014) state that implications of new technology in business include a considerable reduction in production and operational cost and a sustainable expansion of potential target markets, which create an avenue for competitive advantage and opening new business opportunities to sustain their growth.

5.2.2 *Evaluation*

The respondents have a positive view and disposition about evaluation of new technology, with the majority of the respondents acknowledging the importance of evaluation, the impact on new technology adoption and the subsequent effect it can have on the business. They are further in agreement that evaluation plays a significant role in the development and growth of the industry because of what it brings forth, and it is seen as a key enabler of business. Love *et al.* (2004) ascribe that evaluation uses a holistic approach to measure and compare new technology in terms of business needs, benefits, costs implications, potential risk, suitability to the business process and implementation and organisational development, ranked accordingly to justify investment decision. The impact of technology allows the business process to be proliferated, and the ability to increase productivity and enhance efficiency is evident. Although the importance of evaluation of new technology is stressed and the impact on the business admitted by the respondents, it is evident that SMMEs do not have an existing structure or formalised way of directions and steps to evaluate new technology for the business. This gap in SMMEs is noted by Landt and Damstrup (2013) who ascertain that the importance of obtaining knowledge and awareness of new technologies and the benefit of infusing it into people and organisational practice has been a challenge, especially in small businesses.

From the information gathered by the study, SMMEs are concerned about understanding the dynamics and design of new technology and the level of applicability to the business process. Palvalin *et al.* (2013) argue that for a business to fully realise the accruable beneficial impact of new technology, the technology must be suitably in synchronisation with the business process and must be utilised in the best manner to perform the appropriate function. The knowledge required to understand the functionality of a new technology can be accessed by asking the right questions about the business requirements, measuring the adaptability, capability, compatibility and applicability of the new technology. The acquired knowledge can create a synergy between business and technology, thus facilitating and fulfilling the impact and resultant expectations the business requires.

SMMEs must endeavour to continuously research and acquire knowledge on new technologies available to them, taking into consideration factors of environment, social, organisational and technological nature (Rantapuska & Ihanainen, 2008). SMMEs should therefore be aware of the innovative activities of industry players, and conduct proper evaluations of new technologies available for the business to keep up with the pace of industry to ensure the sustainability and viability of the business.

5.2.3 *Government*

None of the SMMEs interviewed are particularly enthused about government support for SMMEs. Only two of the respondents have knowledge of SEDA, of which only one actually interacted with this company. The rest of the respondents never heard of SEDA or STP, nor have they ever witnessed or benefitted from any support from government programmes. According to Ndabeni (2014), government is tasked with the objective of providing assistance and support to SMMEs by creating an enabling environment that supports SMMEs in their development to facilitate their ability to compete in the international market. SMMEs feel that as a direct beneficiary of SMME contribution to the economy, government should be more active and involved in the areas of technology adoption by SMMEs, with provision of the necessary platforms to assist in accessing information and support on new technology to develop and grow as a business. Highlighting the need for government presence, Ghobakhloo *et al.* (2011) emphasise that the rapid adoption of new technology by SMMEs is enhanced by access to adequate technological infrastructure and information. This provision is directly bolstered by government participation through policies, support programmes and incentives.

SMMEs interviewed and surveyed have a diverse view on the impact of government policies on creating a good business environment to boost technology adoption, with a consequential effect on their businesses. The majority of respondents are of the opinion that government policies have a negative effect on their business; they point out that there are existing policies that work against each other, thereby rendering a negative effect on the business. In the case of FSPs, legislation compels them to use new technology in their practice, but the effect of compliance with legislation has left many businesses on the side-lines (especially older generation managers and owners) and inadvertently increased the cost of running the business up to 42 percent. SMMEs also see government policies as favouring large firms more than the small business sector. Xavier *et al*. (2012) emphasise that government should direct its focus on creating an enabling environment for SMMEs by targeting policies at improving support and platforms that will boost SMME growth and development, while also reducing the bureaucratic bottlenecks and red tape when dealing with small businesses.

5.2.4 Information

Volpe *et al.* (2013:5) posit that “the adoption of technological innovations is essential to support the improvement and rationalisation of business processes and infrastructure and to enhance the value of extant information and knowledge”.

Respondents are unanimous about the problems of accessibility to information on new technology needed to make decisions and good judgment concerning the business. This supports Wright *et al.* (2013) who state that SMMEs have limited access to information, which prevents them from understanding the implications of new technology, effective ways of managing the pressure and pace of competitors, determining business and customer needs, and also the ability to make strategic and sustainable decisions in the market place.

Managers and owners of SMMEs interviewed and surveyed ascribe knowledge and awareness of information as a major source of impediment that affects their ability to adopt new technology for their business. In support of information access, Weiner (2013) contends that SMMEs need information units and societies with access to ICT connectivity, human and organisational intellectual capacity and capability, and accessible relevant information resources with adequate levels of infrastructure and deliverables, to overcome economic and business challenges. Respondents unanimously agree on accessibility to information on new technology, which shows their level of concern about the availability of the necessary information they need to make decisions and good judgment concerning the business. There is a need for SMMEs to have access to quality and reliable information on available technology in order to make informed decisions on the new technology based on good judgment, which they currently lack. The sentiments are echoed by a statement made by Dalipi *et al.* (2011), indicating that SMMEs are faced with problems in evaluating suitable new technology for their business because of the lack of information. SMMEs also require the ability to acquire appropriate knowledge about the functionality of the technology to enable the business to capitalise on the potential benefits of the new technology to enhance the growth of their business.

5.2.5 Decision making

Making an informed decision is crucial for the continued survival of the business. Some of the SMMEs interviewed feel that evaluation of new technology could give them an advantage when decision are made based on relevant facts about the technology to enable them to perform better and deliver more efficiently in the course of their business. SMMEs need to understand that evaluation of technology gives a better understanding of the suitability of new technology, contributing towards an informed decision and active engagement in the evaluation process. The significance of new technology evaluation on the business is described by Palvalin *et al.* (2013) who stress that failure to evaluate and the lack of proper understanding of the implications of adopting a new technology on the business in entirety, may lead to adoption of inappropriate technology or the non-adoption of a potential new technology.

The value new technology offers the business process is a key influence on the decision of SMMEs to adopt the new technology as such technology is a strategic tool and key enabler of business objectives and goals. The majority of SMMEs see cost as relative to the potential benefits and advantages accruable from the evaluation and adoption of the new technology in the long run on their business.

New opportunities for the business are often offered by new technology which culminates in decreased expenses and increased productivity while ensuring continued sustenance and relevance in the market place. In related manner, Tarute and Gatautis (2014) state that the implications of new technology in business include a considerable reduction in production and operational costs and sustainable expansion of potential target markets, which in return creates an avenue for new business opportunities to sustain their growth. SMMEs therefore need to ascertain if new technology will give the business the ability to deliver superior quality of goods and services over competitors to attract more customers to the business.

Knowledge on the application of improved and advanced technology offers businesses leverage over other competitors in the market, thus giving SMMEs impetus to adopt. Dalipi *et al.* (2011) contend that SMMEs are predisposed to investing and adopting new technology for the business when it offers them a competitive advantage over competitors and enables them to increase their efficiency and productivity rate even though they are constrained by the limitation of resources.

Small businesses risk failing due to impulsive and excessive buying of technology when disregarding evaluation of the technology for the business process. Ghobakhloo *et al*. (2011) weigh in with the argument that SMME managers/owners base their decision to adopt new technology on speculative and empirical knowledge from their personal judgment, communication preferences and individual experiences. The failure to evaluate is attributed to SMMEs acting by gut feeling, being easily influenced by current trends in the environment, and not paying attention to the functionality and appropriateness of the technology to their business. Small business owners/managers often base their decisions on their own perception, intuition, trends, attitudes and experience, without much consideration for evaluation and operational needs (Rantapuska & Ihanainen, 2008). As a result, they are often left with a feeling of inadequacy when they adopt the wrong technology, and end up losing money not knowing the capacity of what they actually need to solve their problems.

The themes discussed above emerged from the categorisation of the interview data, and patterns that were formed, emerged through linking different questions that revealed similar meanings and interpretations contained in the findings.

5.3 Evaluation and adoption factors of new technology

Sub-question 1.1: What are the factors that influence evaluation and adoption of new technology?

Over the years, the literature has established various factors that affect adoption of new technology, both from an individual perspective and business angle (Tan *et al*., 2007; Venkatesh *et al*., 2003; Lefebvre *et al*., 1995). Managers and owners of SMMEs consider factors such as knowledge and awareness of new technology, cost of adopting, risk and uncertainty of the technology, resistance to change, and technology market as major sources of impediment that affect their ability to adopt new technology for their business. Kapurubandara and Lawson (2006) "categorized internal and external barriers that impede adoption of ICT by SMEs in a developing country. The internal barriers include owner/manager characteristics, firm characteristics, cost and return on investment, and external barriers which include infrastructure, social, cultural, political, legal and regulatory". The study supports the arguments of Tan *et al.* (2010) and Kuyoro *et al.* (2013) as their research indicates that SMMEs find it difficult and challenging to evaluate and adopt new technology. These challenges are due to the perceived cost of acquisition, cost of training, and cost of acquiring skills to operate the new technology, as well as the associated cost of risk on investment returns. The challenges faced by SMMEs also include uncertainty surrounding the technology due to frequent changes, unscalable and fragmented technology sold by technology vendors and suppliers, issues surrounding application and computer systems licensing, a limited number of specialised systems applicable to SMMEs, and information accessibility.

Cost is an ever present factor in the course of business activities, especially when it comes to the technology. Cost is always seen to be a major obstacle by businesses, in particular when the realisable benefits and advantages are not thoroughly investigated and articulated. In studies as far back as 1987, Kwon and Zmud (1987) suggested the implication of cost and availability of relevant technical expertise to be major factors that affect the adoption and implementation of new technology in small businesses. The issues concerning cost of adopting new technology involve the actual cost of purchasing the new technology, the cost of compliance with legislation compelling SMMEs to adopt new technology, and the cost of training and technical support.

The influence of cost is reflected in a statement made by *Respondent 1* who argues that the issue of affordability plays a vital role in the ability to evaluate and adopt new technology for the business: “Affordability to acquire is key; look at budget and resources, compare cost, time and best price for the available technology capability”. This statement supports Kumar (2013) who states that prominent factors affecting new technology adoption among SMMEs in developing countries are often related but not limited to technology infrastructure acquisition, cost factors, uncertainty and risk on returns on capital investment.

Cost has been established as one of the important factors that affect the adoption of new technology by small businesses, but when the potential benefit is deemed valuable to the business, cost becomes relative and the accruable benefit exerts more influence on the decision to adopt. The previous statement is in line with the observation of *Respondent 7* that cost of evaluation and adoption is relative to the benefits the new technology can offer the business:

> Resources is not too much of an issue when compared to the benefit; it’s not necessarily a hindrance but you have to be careful you don’t over spend too much on it.

If a new technology is properly evaluated and its suitability to the business determined, the benefits accruable usually outweighs the cost of investment over time. Dalipi, *et al.* (2011) make a supportive statement that, although SMMEs that do adopt new technology are often satisfied with the status of their investment, they usually are more agitated and interested in the cost of acquiring and operating the investment made in new technology in relation to the benefits derivable from it.

> We find that SMEs are generally satisfied with their investment in ICT but they are concerned about the cost of such investments and are uncertain about the business benefits, failing to recognize ICT’s strategic potential to increase business flexibility, to increase productivity and to support globalization (Dalipi *et al*., 2011).

Therefore SMMEs see cost of maintenance as a constraint, with cost of training and acquiring skills to operate the new technology not previously identified prior to evaluation potentially becoming a burden for SMMEs in the course of the business process (Tarute & Gatautis, 2014).

Also of note is the effect of legislation regarding the use of new technology by SMMEs in the financial sector, which has an adverse cost effect on business growth and sustainability. Of concern also is the subsequent resistance to change due to the increased cost of integrating and managing technology, lack of knowledge of the functionality and operability of the new

technology, and non-compliance with the legislative standards which has led to the closure of many FSPs in the industry. With the advent of the new FSB legislation, FSPs have had to upgrade their IT and reporting facilities to conform to the standards and were therefore indirectly compelled to adopt new technology to support their business in other to comply with stipulated legislation.

The impact of compliance on the cost of running the business is evident as *Respondent 13* argues that the "cost of technology is almost a killer for new business; due to legislative requirements the cost of running a financial office is astronomical. I think cost is a hindrance for small business". The cost of maintaining the business and technology has increased since the implementation of the compliance policy guiding the FSPs. *Respondent 13's* comment is resonated by *Respondent 10* who states that "…the cost is always an issue. Generally… legislative policies have an impact on cost and how we do business". Abulrub *et al.* (2012), in support of the above statement, contend that SMMEs see the upgrade, maintenance and support of the system as another expensive additional commitment, which has an effect on the level of intention to use and acquire and further impacts the technology adoption process.

Awareness of opportunities in a business environment and having prior knowledge of new technology before the evaluation process begins is key to the successful evaluation and adoption of new technology for the business. Having relevant information and knowledge before proceeding with new technology evaluation and possible adoption, is vital for the continued relevance and survival of the business. The findings of this study support Wright *et al.* (2013) who posit that SMMEs have limited access to information, preventing them from understanding the implications of new technology.

All respondents, both in the survey and interview, acknowledge the availability of information on technology as a pertinent issue that influences the evaluation and adoption of new technology. Interview respondents are unanimous in their view that the lack of accessibility to information on new technology is a problem when attempting to evaluate the technology, thus showing their level of concern about the availability of necessary information needed to make decisions and good judgment. Abdollahzadehgan *et al.* (2013) contend that for new technology to make a significant impression and impact on the organisational vision and business process, the owners/managers must have access to reliable and sufficient information to form the basis of their decision on relevant, verifiable and objective information.

SMMEs are constrained by the lack of information and require the ability to acquire appropriate knowledge about the functionality of the technology to enable the business to capitalise on the potential benefits in order to enhance the growth of their business. The statement by *Respondent 13* incorporates the position of the respondents on the lack of information availability and accessibility for small businesses:

> Information availability is a necessity, especially sharing knowledge of new technology; the small business can use that.

The rate of adoption of new technology is greatly influenced by knowledge on the new technology, which creates the needed awareness and exposure brought by the degree of observability that is required to inform the spread and increase of the information needed to initiate the evaluation and adoption process. The more the awareness generated by the knowledge of the new technology, the more the interest generated and increase in the rate of adoption. Kumar (2013) argues in support of ICT being a tool of great benefit to businesses in developing countries, provided that existing and pervading problems affecting the awareness and adoption of new technology are addressed by the governments of developing countries in a show of goodwill and taking responsibility. Information accessibility is fundamental to the success of the business, hence information availability and accessibility is important to the successful evaluation and adoption of new technology by SMMEs. *Respondent 14* states in support of information availability for SMMEs that, “in many small businesses there is no way of getting information; information flow is about people and in a small business it is critical”. Access to information on new technology is a priority for business development and survival, and SMMEs should be actively assisted and supported by government to gain knowledge and access information in which they can act on for the benefit of their business. According to Stoneman and David (1986, as cited by Kumar, 2013:41):

> The impact of government policies and initiatives has been shown to have direct and indirect stimulation to the supply of information which produces faster technology diffusion.

Awareness of new technology, according to Rogers (1995), is greatly influenced by how the information is communicated to the society, which often involves different types of communication channels in which the new technology can be diffused. SMMEs need to actively seek platforms where they can access information about new technologies with potential for the business process; acquiring information and knowledge on how to proceed on new technology evaluation and adoption is crucial for a successful adoption.

According to Dalipi *et al*. (2011), the rate of observability and use of new technology is influenced by communication channels which include networking of peers, media, internet, professionals, and societal trends among others. In similar vein, *Respondent 1* is in support of SMMEs being aware of activities in their business environment and having prior knowledge of new technology before evaluation, which is a key factor for the successful adoption of the new technology. *Respondent 1* states that "awareness of environment is a crucial, pre-evaluation awareness of technology". Being aware of the immediate and external surroundings in a business scenario gives a general idea of what is going on in the business industry. In relation, *Respondent 4* argues that SMMEs are struggling with evaluation and adoption of new technology because "people don't know what they don't know; they don't ask questions on how they can do things better".

Businesses need to determine and establish the type of skills required to operate the new technology by the users to gain optimum value from this technology, which could involve training for the users. Love *et al.* (2005) highlight that the inability of operating staff and skill capability to use newly adopted technology will result in under-performance and a feeling by the users that the technology is inadequate. Establishing the type of skills required to operate new technology is essential since it has been noted that SMMEs usually do not possess the required skills and knowledge to handle new technology. In support of the shortcomings of SMMEs, Ghobakhloo *et al.* (2011) reiterate that SMMEs are faced with significant consequences and exposed to risk of insolvency because of the lack of required knowledge and skills to properly adopt and implement a new technology that will appropriately deliver the output required by the business. SMMEs require training and upgrading of staff members to competently operate the new technology, although they often lack knowledge about the process it involves. *Respondent 1* argues that:

> …SMMEs especially don't have the staff capacity to handle IT effectively. They need to determine if training and support is needed, while also training people with the right skills to evaluate and operate the new technology.

According to Abulrub *et al.* (2012), there is a potential need for training and support of staff if the adopted technology requires changes in skills and operational knowledge of the new system, which will require delicate and successful management to integrate the new technology into the business process. Uncertainty and risks associated with new technology are a concern to businesses. The evolving nature and unpredictable future of new technology present SMMEs with challenges regarding the ability to understand, mitigate, and plan for and against any form of eventualities which could result from the adoption of new technology.

According to Nguyen *et al.* (2013), evidence points to risk and uncertainty impacting on a low rate of adoption in small businesses. It appears that there is no clear indication on how small businesses perceive new technology in terms of opportunity or threat to their business. Uncertainty and risks for SMMEs include risks associated with the new technology, uncertainty about the future relevance of the new technology, and the constant changing nature of new technology in the market place. *Respondent 3* echoes the concern of SMMEs that the difficulty lies in "understanding the risk associated with new technology, the evolving nature of technology and the numerous variety of technology and solutions". Serafeimidis and Smithson (2000) state that:

> Uncertainty characterises most organisational contexts and this invariably impacts on the role of an IS and the role of evaluation, the ways that it is carried out, the use of its outcomes and its participants.

Uncertainty presents one of the major challenges being faced by SMMEs due to numerous solutions in the market place and the constant changes in the appearance of newer versions which do not necessarily reflect any significant change in the capacity or ability over the previous version. A new technology must offer something uniquely different to the business process or has the ability to improve the current technology productivity ratio expansively. Nguyen *et al.* (2013) argue that small businesses, especially new start-ups, are prone to uncertainty and ambiguity. SMMEs in general tend to adopt new technology without proper planning which consequently affects the successful adoption and implementation of a suitable technology that supports the business process. Such lack of proper evaluation of significance and appropriateness of new technology often leads SMMEs to practices that endanger their business and place it in a precarious situation.

The constant changes being made to technology have an effect on the ability of SMMEs to process and keep up with the advancements. *Respondent 2* comments as follows on technology changes: "What I do understand is that technology changes all the time; there is little time to get accustomed to it". The constant change and upgrade of technology can present a major challenge to SMMEs in their ability to decide on whether to adopt a new technology because of their general perception of the need to change with ever-changing societal trends. A new version, if not properly evaluated, does not guarantee a significant improvement or bring any radical innovative ability to the business process. Thus, balancing stability with constant change is a problem SMMEs are faced with because of the difficulty posed by the numerous varieties.

The evolving nature of technology often causes SMMEs to develop an overly guarded attitude towards new technology evaluation and adoption. *Respondent 5* makes a conservative statement:

> One needs to tread carefully, because there is danger being on the edge. It is sometimes good to wait for the teething problems associated with new technology or releases to be sorted out. The risk of being early… is bigger than the risk of losing out…

Such a conservative approach leads to being a late adopter according to Rogers (1995), with no ability to leverage the technology or consolidate on its potential. SMMEs should take a pragmatic approach with the evaluation of new technology, which offers the ability of making informed decisions even in the midst of constant technology changes and advancement. The ability to discern what is appropriate in terms of operations and investment consideration is made possible by the process of evaluation.

Technology markets and businesses have often been out of synchronisation when it comes to vendors and suppliers meeting the desired and required needs of businesses. Technology markets involve the activities of vendors and suppliers and how it affects the evaluation and adoption process of new technology by SMMEs for their business, touching on the nature of the impact of vendors and suppliers on the evaluation of new technology and the adoption process. Respondents believe on that the technology industry plays a major part of the problem when it comes to adopting new technology. The respondents are of the opinion that part of the difficulties they face can to a degree be ascribed to the vendors of the technologies in terms of available support and issues surrounding the licensing of their systems when they attempt to adopt new technologies. The technology industry brings complications to the business because of vendors selling unscalable and inappropriate technology. In relation, a statement made by Stockdale and Standing (2006) affirms that SMMEs are facing challenges because vendors fail to understand the uniqueness and needs of SMMEs in terms of required standards, provision of training and maintenance support because their focus is usually on large firms. According to *Respondent 8*, “they tend to sell the features but not the experience; people selling technology need to focus more on user experience in all aspects”. Solution providers and vendors have to consciously bring the business into play by looking at the needs of the business and what they require the technology to do. This will enable the SMMEs to be able to develop a holistic solution that will meet their business needs and offer the necessary support needed to enhance a smooth operation.

Respondent 6 needs vendors and solution providers to develop scalable technologies with the ability to extend their capability to cover future needs of the business. Technology with the capacity and capability to address future needs and adaptation to potential advancement is an asset that can promote the adoption of a new technology. The issues of licensing and copyright have long plagued the business world. Managers often differ on the rationale behind paying for a single system operating license rather than multiple-access using a single code, which will minimise their expenses and encourage them to adopt the technology. *Respondent 2* argues that “the problem is you need to license every user; every computer needs to be licensed”.

Due to the nature of FSBs requirements, FSPs now necessitate specialised systems to accommodate their collective business activities in compliance with stipulated standards. From the type of systems mentioned by the different FSPs interviewed, there appears to be only a few applicable technologies available to them. *Respondent 12* states in line with the limited availability of specialised systems for FSPs, that “there are not many systems in the market that fulfil all our needs”. Hence, there is some form of inadequacy or limited types of technology relevant to their business.

Resistance to change inhibits the growth and development of business. People often resist change that will bring increased productivity and efficiency of service delivery to a business because of their lackadaisical attitude and comfortability with existing processes. The resistance is due to an unwillingness to increase any form of effort other than what they are used to. Al Haderi (2013) suggests that such tendency stems from their lack of knowledge and understanding of what the new technology or change might have on the business and their work schedule. There are various issues surrounding the inability of SMMEs and users of technology to adapt to changes required by the system through the adoption of new technology. *Respondent 4* describes resistance to change as an inherent behavior among most SMMEs, stating that “people are comfortable with what they are doing and not prepared to change”. People who do not envisage change as a constant phenomenon in life usually have a laid-back approach to business opportunities and development of the business process. People with such an approach might be the owner/managers of the business or the workers within the business. Serafeimidis and Smithson (2000) contend that when it comes to small business practice, the practicalities involved require a change in orientation on how evaluation is perceived by business managers, and it requires understanding the concept and value of risk analysis and benefit management practices in business.

According to Al Haderi (2013), people have to be convinced of the need for change by being shown the benefits and advantages the potential change will bring, and how it can easily make their work less complicated. A change agent can be in the form of a manager or managers, directors of other organisations, or government agents within a sector whose decision to adopt a new technology might facilitate other peers to follow suit. Some individuals are seen as change agents in a network because of their propensity to be ahead of others, and they often wield an influence on others because of their connections and power they possess. These results support Nguyen *et al.* (2013), stating that networked communication promotes the sharing and exchange of vital information and knowledge based on interaction with external and internal elements with similar interest or stakes applicable to the organisations within a network.

Rogers (1995) describes the inclination of peers to follow another's recommendation based on the similarities that exist between them as having homophily or heterophily attributes. A person is likely to listen to recommendations or examples of peers that operate in a similar environment with similar attributes (homophily) rather than someone with differing and multiple types of attributes (heterophily). *Respondent 15* states that "technology information flow is largely driven by your network and the connections that you have by word of mouth", *and Respondent 10* confers this statement by saying that *"*we talk to people that know what is going on in the industry". Organisations tend to make decisions about adopting new technology based on the perception and perspective of similar organisations observed within their purview and environment (Abrahamson, 1991).

Respondent 14 states that when faced with an option to adopt new technology for the business, "people are afraid to try new technology". Being afraid to use new technology is the result of not being informed about the operation ability and functionality of the new technology. People often are afraid because they do not have the confidence of using the technology. They are not aware of the ease of use, the potential benefit it brings, and possible risks and repercussion that might be involved if the technology malfunctions. Van Raaij and Schepers (2008) contend that such tendencies of trepidation towards the adoption and use of new technology often limit the usage and benefits accruable through the negative perception and avoidance of new technology. According to *Respondent 9,* "…staff can be a barrier to technology change". When staffs become overly comfortable with a process which suits them, they tend to resist changes which will take them out of their comfort zone and engage them more actively and productively. Failure to close the communication gap might lead to employees not seeing the value of the new technology. This might cause anxiety about their job security and continued relevance, thus creating a negative attitude towards the proposed change (Nguyen *et al*., 2013). Such fears and

inhibitions can be readily cleared and put to rest with the evaluation of the potential of the new technology and fit to the business.

The older cadres of FSPs are finding it difficult to adapt to new changes brought about by legislation. The legislation requires the businesses to use new technology in the course of their operations and reporting, in compliance with the stipulated rules of the legislation. The resistance to change is as a result of the inability to adapt to unfamiliar terrain, according to *Respondent 12*: "Older cadre of people in business are not adapting". Schillewaert *et al*. (2005, as cited in van Raaij & Schepers, 2008:841) describe the older cadre of FSPs as having low Personal Innovativeness in Information Technology (PIIT):

> …a person's predisposition or attitude reflecting his tendency to experiment with and to adopt new information technologies independently of the communicated experience of others...

The older generation of owners and managers of FSPs are struggling to adapt. Many have exited the industry and more are expected to join them in the near future. The exit of the older people creates its own challenges in that experience and know-how is lost.

Government's use of old and moribund technology in interaction with business entities does not encourage SMMEs to adopt new technology. The lack of upgrading of government systems is a concern because of the magnitude of influence it wields, which could result in a negative inactive drive towards new technology by SMMEs. This is evident in the statement of *Respondent 2* who has a major contention with what role government policies play in facilitating evaluation and adoption by SMMEs:

> I don't think government does anything in role of growing of technology, because there is nothing available that I know of. I have seen a lot of government departments; they are still on windows XP which is a much slower version compared to what we use.

The statement is resonated by Respondent 7 who contends that:

> …government are not evaluating and adopting proper technology to run their affairs. If the government leads in the space of technology, everybody else will follow. The government should evaluate their own technology and make better use of it. If small companies saw the government adopt technology themselves …they will be able to also adopt technology.

5.4 Knowledge of available new technology for business

Sub-question 1.2: How do SMMEs initiate evaluation in the process of adopting new technology in business?

Serafeimidis and Smithson (2000) contend that evaluation of new technology is often a challenging task both in theory and practice. The importance of evaluating a new technology has long been identified since the 80's and its impact recognised due to the limited resources available and applicability to achieve organisational objectives. Abdollahzadehgan *et al.* (2013) provide support by saying owners and managers of SMMEs are tasked with the responsibility of conducting a thorough investigation of the potential of new technology, evaluating its functionality, limitations, benefits and risks and critically examining all aspects in relation to the business needs, goals and objective before making an informed decision based on the choice of suitability to the business process.

For SMMEs to understand the dynamics and design of a new technology and its level of applicability to the business process, they require the knowledge to understand the functionality of a new technology. Investigating the functionality of a new technology is done to create a synergy of business and technology fit in the business process, to facilitate the selection of the appropriate and suitable technology to bring about the desired impact and fulfil the resultant expectations the business. Evaluation relates to the process of adoption of new technology, which involves different ways and steps of investigation to determine the business value of a new technology for the purpose of enhancing the business.

The statement, "evaluation gives you the full knowledge about the functionality of the technology, it guides you in making informed decisions", as stated by *Respondent 3*, describes evaluation in essence. It is imperative for SMMEs to recognise the importance of evaluating new technologies for the organisation before acquiring and adopting the new technology. Landt and Damstrup (2013) identify the importance of obtaining knowledge and awareness of new technologies and the benefit of infusing it into people and organisational practice which has been a challenge, especially in small businesses.

The evaluation of new technology includes researching new technologies, investigating the potential of new technology, and suitability (adaptability, affordability, compatibility, applicability scalability, applicability) of the technology to the business objectives and overall goal, before an informed decision can be made based on the evaluation outcome.

To evaluate the business potential of new technologies, businesses need to research and seek information from relevant sources, taking into account their relative state of experience, consult experts in technology and business, ask peers and colleagues in the industry about latest developments, and see evaluation as a continuous iterative activity.

There is need for SMMEs to continuously research and acquire knowledge on new technologies available for SMMEs. *Respondent 1* perceives evaluation as a "continuous activity that studies different options available". Evaluation of new technology usually stems from conducting research on new technology and consulting other people with experience of usage or with technical knowledge about the features and possible offerings. In support of consultation as a way of obtaining knowledge, Hjalmarsson and Johansson (2003, as cited by Nguyen *et al.,* 2013:7) suggest that:

> Advice from professional consultants or IT vendors can be useful for small business management or owner–managers, especially when they do not have sufficient experience or understanding of IT themselves.

The statement resonates with Respondent 8 who states that "I reach out to a network of people i know who know about IT and seek professional advice through the network of people that I know, and also talk to experts in the business". Reaching out for information involves consulting people with relevant and useable knowledge about the new technology.

It is particularly essential to look at the uptake levels of the new technology in each type of business line an SMME operates in to keep abreast of current developments. The need to keep up with the industry pace is crucial to ensure sustainability and viability of the business. *Respondent 9* is in support of the need for constant research and knowledge acquisition on the new technologies available for business in their organisational sector by keeping up with industry development. *Respondent 9* states that "there is need to keep abreast of where the industry is moving. You must be able to do your homework. It takes a lot of ground work before I bought the iPad; i spoke to a lot of brokers. I follow what the industry players are saying". In relation, Hoffmann (2011) posits that:

> …an individual's network links are important determinants of his or her adoption of innovations.

Knowledge of new technology can be advanced through the understanding of the different communication channels, particular actors and social networks involved in the adoption process.

Respondents identified network of people, research, internet, vendors, trends, media, IT professionals, service providers and seminars as sources for obtaining information about new technology. There is no mention of any form of government medium or information shop where SMMEs can access information required on technology and other forms of support. *Respondent 13* is of the opinion that accessible information availability is needed, "especially sharing knowledge of new technology, the small business can use that".

Respondents hold that there appears to be some form of information that SMMEs can use in terms of new technology adoption, but they do not have any available means of getting hold of this information. The UCS (2011) report states that the lack of an information repository and the required quality of such a repository in respect of small businesses' awareness of existing facilities and programmes available to them, is a major source of concern as the information can be of great benefit to them.

Service providers in the insurance sector are sources of information on new technology availability for FSPs. Therefore, networking with the right people with access to credible information on new technology can be of great advantage to the business. A communication network comprises of individuals in a society who are linked and connected by certain patterns by which information flows among them. This has been identified as a good source of information on new technology among businesses with similar and related commitments. Hoffmann (2011:45) defines a networked communication as follows:

> A communication network consists of interconnected individuals who are linked by patterned flows of information.

The ability to network with fellow players in the industry gives an opportunity to remain in touch with the current developments in the industry to help determine the value a new technology may have for the business. Also of significance to the owners and managers is the importance of information and knowledge about existing new technologies applicable to the business. The lack of centralised and accessible information on new technology for SMMEs, thus limiting the ability to evaluate and adopt new technology to support the business, is of great concern to SMMEs.

In support of the statement above, Kumar (2013) notes the absence of integrated national policies on information accessibility and distribution in most developing countries, in particular an extensive information policy applicable across board to businesses due to disoriented government involvement and intervention.

SMMEs fear that the lack of accessible information could have a negative impact on their ability to leverage new technology and make conscious decisions based on facts that will improve their business. According to Weiner (2013), SMMEs need information units and societies with access to ICT connectivity, human and organisational intellectual capacity and capability, accessible relevant information resources, and adequate infrastructure to manage the global economic and business challenges. There is no existing centralised information outlet where information on new technology is made available to SMMEs.

According to Weiner (2013), the *Prague Declaration on Information* policy states that one of the major factors affecting information dissemination is not recognising the relevance of information in economic development, and governments are tasked to develop programmes to facilitate the circulation and accessibility of information, especially in the business sector.

5.5 Importance and role of evaluation in adoption process

Sub-question 1.3: What are the perceptions of SMME managers of new technology evaluation?

SMME owners and managers have the impression that evaluation of new technology is a key enabler of business that provides improved efficiency, higher productivity and an understanding of associated risk of the technology with decisions made on relevant and credible information that ensures business viability. The respondents have a positive view and perception of evaluation of new technology. The majority of the respondents acknowledge the importance of evaluation as well as the impact on new technology adoption and the subsequent effect it can have on the business. The impression of *Respondent 3* is that evaluation plays an extremely important role in the adoption process: “Evaluation is extremely important; evaluation gives full knowledge about the functionality and components of the new technology”.

Having full knowledge of the functionality of a new technology assists in making an informed decision on the adoption or non-adoption of the technology. The respondents are in agreement that evaluation plays a major role in the development and growth of the industry because of what it offers. Evaluation is seen as a key enabler of business as the impact of technology allows business processes to be proliferated, and its ability to increase productivity and enhance efficiency is evident. Although the importance of evaluation of new technology is stressed and the impact on the business admitted by the respondents, it is evident that SMMEs do not have an existing structure or formalised way of directions and steps to evaluate new technology for the business (Abulrub *et al*., 2012).

Respondent 1 relays the importance of evaluation to SMMEs by stating that "evaluation of new technology should be a standard practice to aid the continuous improvement practice of SMMEs". This supports the statement of Serafeimidis and Smithson (2000) that, in order to ensure the transition of SMMEs from a local small business into international markets in dynamic and competitive situations, SMMEs need to rethink and adjust their business orientation, mission, evaluation and adoption culture, and incorporate evaluation practices into their business processes.

Evaluation of new technology plays a major role in adopting or rejecting a new technology. The role evaluation plays is emphasised by the perception of managers and owners of the SMMEs interviewed. *Respondent 1* further emphasises the role of evaluation, saying that the "ability to evaluate and adopt right value-adding technology at the right time increases economic survival potential; evaluation plays a crucial role, helps the business to understand risks". The ability to understand the risks involved leads to better decision making by managers/owners of companies, thus evaluation enhances the chances of survival of the business. In related view, Abulrub *et al.* (2012) posit that evaluation of new technology is paramount to adoption as this shows the inter-related relationship between the benefits, risks and the operational effects. Evaluation contributes to a better understanding of the risks associated with new technology, which prevents businesses from unnecessary exposure to uncertainty. Cowan and Daim (2011) elucidate that evaluation incorporates all angles involved thereby forecasting the impact, future and relevance of the new technology to the business, thus ensuring that the business is on the right path of sustenance. Keeping abreast of the technology circle gives SMMEs the ability to be ahead of the game in the market place, with decisions made on facts and verifiable information which puts the business in a good stead of sustainability.

5.6 Role of government in the adoption process

Sub-question 1.4: What is the role of government in actively facilitating and engaging SMMEs proactively in the evaluation and adoption process of new technology?

The respondents have a diverse view on the impact of government policies on creating a good business environment to boost technology adoption. The majority of respondents are of the opinion that government policies have a negative effect on their business. They pointed out that there are existing policies that work against each other, thereby rendering a negative effect on the business. The position of the interviewees is supported by Ndabeni (2014) who argues that certain government policies concerning small businesses that focus on narrow targets or sectors

tend to impede the overall potential to growth for SMMEs and impact on their contribution to the national economy.

The participants are of the opinion that there are conflicting effects of government policies impacting positively and negatively on the development and technology adoption of SMMEs. The opinions of the respondents reflect negative on government policies and the ability of government to support SMMEs in the evaluation and adoption of new technology.

These policies impact negatively on the development of SMMEs, resonating with a comment by *Respondent 8* that "South Africa's big problem is we have good policies and terrible implementation; government is big on talking and developing plans, but they are not big on implementation". Thus, in view of the situation, Xavier *et al*. (2012) emphasise that government should direct its focus on creating an enabling environment for SMMEs by targeting policies at improving support and platforms that will boost the growth and development of SMMEs while also reducing the bureaucratic bottlenecks and red tape when dealing with small businesses.

SMMEs also see government policies as favouring large firms more than the small business sector. Government agencies and policy makers within the system should actively approach SMMEs instead of the other way round, and identify businesses with high-growth potential to provide customised support to optimise their capability and ability to grow, sustain and contribute largely to the economy (Ngek & Smit, 2013).

Legislation of FSP practices compels FSPs to adopt new technology to comply with the technology standards of the product providers driving technology uptake by FSPs. Consequently, upon the inability to comply with legislation on use of new technology for analysis and reporting purposes, a number of older cadres of FSP managers/owners are now out of business. In the case of the SMMEs in the financial sector, legislation compels them to use new technology in their practice, but the effect of the new legislation has left many businesses on the side-lines (especially old generation managers and owners) and inadvertently increased the cost of running the business up to 42 percent. The legislation put in place by the FSB compels the FSPs to adhere to a certain standard of service delivery and reporting. The condition is implied by *Respondent 13's* statement: "Because of the nature of our industry we have to use technology; they put in requirements which forces *[sic]* us to us technology".

Chiloane-Tsoka (2013) states that the lack of understanding of regulations governing business processes and standards can be linked to the inadequacy of government agencies to disseminate relevant information to SMMEs.

Thus, the inability of SMMEs to understand the benefits of new technology, interpretations and implications of government policies is a major impediment to understand the rationale behind the need for change and compliance with standards. Communication should be made by the managers/owners to the employees to ensure their understanding of the objectives of the adoption, with clear description of their roles and contribution towards the adoption of the new technology duly spelled out (Nguyen *et al.* 2013). Legislation was put in place to endure improved business processes and better customer services and ensure transparency, and the standard is supported by insurance companies who provide cover for the FSPs to meet up with applicable standards of operation.

Respondent 10 is quoted as saying the following: “Technology in use is offered by the different product providers. Product provider technology drives technology uptake by FSPs”. New technology is therefore permeated and influenced by the service providers and insurance companies. Volpe *et al*. (2013) contend that the awareness and exploitation of networked communication or groups can assist SMME managers/owners in understanding the current practices and the need to keep up with the pace setters and competitors, with the ability to comply with new standards or regulations.

The impact of government policies on SMMEs is not easily obtainable due to the absence of a particular mode of assessing the impact, either positive or negative. Xavier *et al*. (2012) stress that many countries express concern about the inadequacy of government and industries to measure, monitor and benchmark the impact of government policies on the progress of entrepreneurship in SMMEs.

According to Ndabeni (2014), government is tasked with the objective of providing assistance and support to SMMEs by creating an enabling environment that enables SMMEs in their development to facilitate their ability to compete in the international market. None of the SMMEs interviewed are enthused about government support for SMMEs. Only two of the respondents knew about the existing programmes and support, of which only one of them interacting with government agencies. This situation is also evident in the responses of the survey which is in support of Timm (2012) who argues that there is no significant impact of government support for SMMEs in South Africa, and the SMMEs awareness of any form of existing programme and schemes is very low.

It is a concern that SMMEs have little or no knowledge of available government support programmes. SEDA is largely unknown to the respondents and there is no knowledge of STP or

what they do for small businesses. Although government programmes with mandates to help SMMEs have been developed especially to assist in technological adoption, the impact of the programmes have not been felt by SMMEs. This may be as a result of the distrust for government agencies who are supposed to assist them.

UCS (2011) reports that the level of promoting SMME development and sustainability in South Africa is low. The result is the disappointing low level of awareness and utilisation of government support programmes for SMMEs. The lack of awareness is evident as nearly all interviewees never heard of SEDA or STP nor have they ever witnessed or benefitted from any support from any other government programmes. Ngek and Smit (2013) contend that government agencies tasked with supporting small businesses need to improve on their value of delivery and impact on SMMEs with high potential for growth. This can be done by raising the level of their competence as well as standard of professionalism and then build on their credibility to ensure an administration of support to SMMEs. SMMEs feel that as a direct beneficiary of SMME contribution to the economy, government should be more active and involved in the areas of technology adoption by SMMEs, with provision of the necessary platforms to assist in accessing information and support on new technology to develop and grow as a business.

SEDA reports that it added five incubators to existing ones to improve its reach in all provinces and seeks to target high-level SMMEs which it previously ignored. The statement is supported by Timm (2012) who confirms that SEDA lacks support for SMMEs with high growth potential and innovative capability to contribute more to the economy. SEDA tends to back low-producing businesses that operate in over-crowded markets with less probability to survive than grow. Timm (2012) goes further and reports that the DTI along with SEDA initiated plans to partner with the private sector to enable the creation of more incubators throughout the country, with more reliance on private sector contribution due to the expensive nature of setting up and operating incubators.

5.7 Determining business and new technology fit

Sub-question 2.1: How can SMMEs evaluate the business potential of new technologies?

The challenge most businesses face is identifying the necessary needs, especially the salient ones that require tacit knowledge of the business process and the areas that require improvement, and how to initiate it at the right time. Fenn and Raskino (2008) relate that constant review and determination of business needs is generally prevalent among proactive

organisations with keen interest shown in monitoring revenue, market performance and growth, cost implications and risk management, and reduction factors and leveraging new opportunities with potential. SMMEs need to identify business needs and requirements the new technology is expected to fulfil by determining the business fit as well as the relevance and significance the technology has with the business objectives, goals and process. Managers are expected to seek and identify the business value and establish concrete evidence of what contribution a new technology will have on the success of the business before adopting it.

In similar view, Landt and Damstrup (2013) contend that business needs are core organisational objectives and targets in which improvement is sought after by the use of an affirmative action with the intent to improve existing performance levels and expectant output.

It is imperative that SMMEs establish business needs to ensure they understand how the new technology can meet their business objectives and deliver on organisational goals by asking the right questions about the business requirements to create synergy of business and technology fit. A good number of the respondents show their understanding of the necessity of identifying business needs and aligning it to what the new technology can offer. *Respondent 3* contends that SMMEs have to "identify the features available and what is needed, determine what you want and check what you already have". SMMEs need to look at the capacity of the present system in use, identify core aspects within the business process that require improvement, determine what the present system offers in that regard, and check on other applicable technology if needed. Nguyen *et al.* (2013) is of the opinion that a distinct and clear purpose for the adoption of the new technology should be established by the managers and owners of SMMEs. Understanding the full implication of the business needs and aligning the needs with the technology features before decision on adoption can be made, is important for SMMEs.

The statement made by *Respondent 7*, "as a business you understand your strategic objectives first before you undertake anything else", resonates with the position of Nguyen *et al.* (2013) on the proper determination of business needs against new technology offers. In similar view, Wright *et al.* (2013) argue that managers and owners of small businesses must ensure the strategic alignment of business needs and new technology towards a common direction to ensure that the objectives and goals of the business is supported by the new technology. This supports the statement of *Respondent 12* which says that, when planning to acquire a new technology, you need to start by:

> …knowing what your goals are and what you need to achieve, ensuring the system meets your needs and what you want to achieve. In our experience of prior adoption we did extensive research before choosing, we asked all the questions.

The statement reflects a good understanding of a key part of what is required of business managers and owners in the adoption process.

SMMEs can evaluate the business potential of new technology by doing research on new technology and consulting with colleagues, professionals and experts, asking the right questions about the business requirements and knowledge of technology capability, functionality and operability of the new technology. There is a need to consider different options available and the potential value of a new technology to the business. Determining the functionality and potential of the technology is a necessary prerequisite for the adoption of a new technology for the business as indicated by *Respondent 1*, stating that SMMEs must follow a proper process to identify the potential and value the new technology has for the business:

> Perform initial proof of features of the offering, establish what kind of value does it offer, and determine the value added and role of technology; importantly, businesses need to understand what technology is designed for.

Chan *et al.* (2012) elucidate that for new technology to be fully adopted and utilised appropriately, an evaluation of the applicability, adaptability, compatibility and capability features and characteristics of the new technology must be fully highlighted. The evaluation must be done in view of the potential benefits, the components of integration procedures into the business system, showing its projected life span and continuing relevance, estimated cost implication over a period and the expected returns on investment projected for the same period.

According to Rogers (1995), the decision stage of adopting a new technology is when a choice is made to either adopt or reject a new technology based on the weight attached to the costs, benefit, advantages, disadvantages and the trade-offs. *Respondent 12* agrees that “if you have a technology you are looking at, you must ask the questions”. While emphasising the need to ask the right questions, he also states the following:

> Yes, we look at all the aspects expected concerning the technology and the business, and we also compared the company offers to each other.

The investigative process is used to determine the value and potential of each new technology, where the technology is put through a ranking process which produces a list of the most appropriate, relevant and top ranked new technology candidates based on the weight attached

to its different features. Landt and Damstrup (2013) assert that the technology must be put through a comprehensive and rigorous process where all aspects of functionality, performance, integration, risk, uncertainty and other relevant elements are all incorporated into corresponding business factors to determine the most suitable option. There is need to properly investigate and analyse the business potential of new technology, the application to business, perceived benefits, skills required, uncertainty of deliverables, and the immediate financial implications of adopting the new technology.

5.8 Impact of evaluation on decision and choice making

Sub-question 2.2: How does the evaluation of new technology affect the decision-making of new technology adoption in SMMEs?

SMMEs are concerned about understanding the dynamics and design of a new technology and its level of applicability to the business process. Evaluation of technology is a strategic tool to attain business objectives and goals and can be applied to gaining a better understanding of the suitability of new technology, contributing towards an informed decision which is a key influence on the decision to adopt the new technology for business by SMMEs.

The value new technology offers the business process is a key influence on the decision to adopt the new technology for business by SMMEs. The majority of SMMEs see cost as being relative to potential benefits and advantages accruable from the evaluation and adoption of the new technology in the long run on their business (see Section 5.3). New opportunities for the business are often created by new technology which culminates in decreasing expenses and increasing productivity while ensuring continued sustenance and relevance in the market place. SMMEs needs to ascertain if new technology will give the business the ability to deliver superior quality goods and services over that of competitors to attract more customers to the business. The knowledge gained by the application of improved and advanced technology gives business leverage over other competitors in the market and may motivate SMMEs to adopt the applicable new technologies.

Making an informed decision on the suitability of new technology is important to the continuing survival of the business. One of the considerations when evaluating new technology is determining how suitable the technology is for the SMME. Every company determines its own suitability according to the specific environment and the business functions. SMMEs that adopt new technologies seem to derive pleasure from making the decision of a suitable technology. *Respondent 3* states that:

> I can't do without evaluating before making decisions; evaluation gives you the full knowledge about the functionality of the technology, it guides you in making informed decisions. I am enjoying the technology based on good decisions; it leaves a gratifying and self-satisfactory feeling.

SMMEs need to understand that evaluation of technology gives a better understanding of the suitability of new technology, thus contributing towards an informed decision and active engagement in evaluation to assist in making the right and most appropriate choices regarding the business. *Respondent 5's* comment captures the case for suitability when he says that SMMEs should go about:

> …observing and absolving what is happening around, and then making decisions to see if it is appropriate. There are certain areas where technology fulfils certain criteria, and then it becomes appropriate.

Serafeimidis and Smithson (2000) argue that unsuitable technology brings "problems of mis-match or mis-fit of new technology to the business process". Such misalignment presents considerable risk to the business in terms of operations and the costly nature of the problem will impact negatively on the business. *Respondent 8* states that:

> I look at suitability, ask people's opinions; I will form an impression and base my decision on that impression of the general suitability of the technology to the business. Evaluation gives you the choice of which decision to make.

Evaluating the suitability of technology will show the business needs against the requirements and potential of the technology to prevent misalignment of both objectives (Serafeimidis & Smithson, 2000). *Respondent 5* asserts in strong terms that an evaluation of the suitability of new technology involves "assessing what is happening and making a conscious decision, combining a computerized solution with good judgment. I have a hang up on what is appropriate, not what is new and how do you determine what is appropriate". He continues by saying that relevant questions must be asked concerning the new technology: "Does the technology work in my environment? Is it appropriate in my environment? What can the technology do for me? What will add value to me is to sieve, distil and break down to essential things useful for the growth of the business".

Due to the nature and characteristics of small businesses, interviewees are of the opinion that SMMEs have a need for an evaluation assessment tool to help make informed decisions on appropriate new technology for the business. It is therefore proposed that SMMEs should be assisted by guidelines on the evaluation process to identify factors relating to their business

environment affecting the evaluation of new technology for the business. The responses of interviewees 7, 12 and 14 reflect that:

> …there is a need for a tool to help evaluate properly… Obviously an evaluation tool will help make good decision… and then you can test it with a set of formal structures and take it off if it doesn't meet the requirements of the rubric.

The evaluation tool will put SMMEs in good stead to evaluate and adopt new technology for the benefit of the business. SMMEs need to be equipped to make salient and crucial decisions about new technology that will have a large effect on the business; getting to evaluate and make proper decisions on a proven and standardised process will ensure they continue to grow and avoid making ill-conceived decisions that expose them to various forms of risks which is detrimental to the business.

In the process of adopting new technology for the business, the implementation and integration of the new technology to the existing or new business processes must be planned and provided for, and executed in a manner that will not disrupt the business processes. *Respondent 5* argues that proper implementation/integration is done when new technology is put into effect before the appropriateness to the business process can be established: "You bring the features of the appropriate technology to the user environment to determine if it is appropriate or not". The importance is that the integration of the new technology into the business process can be observed and measured according to expected performance, but this stage has a small window of opportunity because of the restrictions of the technology market, with changes made in a sequential manner as not to disrupt the existing process.

New technology is usually expected to bring added or an increase in current value to the business processes in terms of its ability and deliverables. The potential of a new technology when shown to compliment or increase productivity, increases the propensity of the business to adopt the technology. Business value added is characterised by the perceived value the new technology will bring to the business. Such values include the benefits and advantages the new technology offers the business in terms of increased productivity, cost and resources savings, increased delivery of products and services and increased product ratio generated by the use of the new technology. *Respondent 1* states that evaluation of new technology:

> …must ensure the new technology shows its importance to make business better at the end of the day, to increase efficiency, guarantee the return on investment on the business, and increase speed of delivery of services, because the speed of the modern business necessitates constant evaluation of new technology.

The more SMMEs have a positive perception of the value added by a new technology, the higher the interest developed in adopting the new technology. Evaluating and adopting technology thus gives the business the ability to survive in a competitive environment. New technology therefore needs to be seen as a strategic tool to attain business objectives and goals.

Respondent 2 views business value of technology as:

> …the things it can do for the company, how it can help us and save us time, which is the reason why we bought it. I usually don't deem it as technology anymore, it is a necessity, and it becomes part of how you run a business".

Respondent 8 states in similar vein that "I don't mind the cost if it is worth paying for".

5.9 Effect of evaluation and non-evaluation on the business

Sub-question 2.3: How does the evaluation and adoption of new technology affect SMMEs' viability and sustainability of their business interest?

Evaluation of new technology has been said to play an important role in the adoption process. Not evaluating new technology and the potential it holds for the business could be to the detriment of the business. The lack of evaluation poses a problem, since decisions taken consequently are uninformed, biased and usually based on little or no information. *Respondent 3* states the following:

> I don't think small businesses evaluate properly before adoption. Businesses end up failing due to excessive buying and disregard for evaluation. People often don't make the right choices because they don't evaluate the right choice.

Lack of proper evaluation of significance and appropriateness of the technology is encapsulated by Palvalin *et al.* (2013), stating that the failure to evaluate and the lack of proper understanding of the implications of adopting a new technology on the business in entirety may lead to adoption of inappropriate technology or the non-adoption of a potential new technology with advantages for business growth. *Respondent 4* argues that:

> …SMMEs don't realise the urgency, risks and benefits of having the technology in the first place. The lack of information and proper knowledge causes little drive towards technology.

SMMEs that fail to identify, evaluate and adopt new technology have no knowledge of the benefits accruable from the use of the new technology for their business, hence losing the ability to have a competitive leverage over their competitors. Maryeni *et al.* (2012) contend that the challenges SMMEs are faced with are linked to the problems that emanated from the non-evaluation of the potential of the new technology before adoption which makes them lose the opportunity to leverage their business growth. The technological problems faced by most organisations are as a consequence of not evaluating the new technology before adopting for their business. *Respondent 6* recounts the experience of non-evaluation in previous attempts to acquire a new technology, thus resulting in buying the wrong technology:

> …we didn't have the experience or knowledge about the technology. We failed to measure the relevance and significance of the technology at that time. What we thought we needed, didn't match the requirements of our clients. We were unsuccessful in mapping out what is our desired future in terms of technology.

The statement shows that there is need for proper evaluation carried out on new technologies for the business before the decision is made to either adopt the technology or not. In spite of the numerous benefits new technology adoption offers to the business, factors of evaluation play a starring role compared to other adoption factors because of the uncompromising necessity to establish and determine the fit between the business and the new technology (Buonanno *et al*., 2005).

SMMEs interviewed are of the opinion that small businesses risk failing due to impulsive and excessive buying of technology with disregard for evaluation of the technology for the business process. This is because SMMEs usually act on gut feeling and are easily influenced by current buzzing trends in the environment without paying attention to the functionality and appropriateness of the technology to their business. Rantapuska and Ihanainen (2008) argue in support of SMMEs' disregard for proper evaluation, saying that small business owners and managers often base their decisions on their own perception, intuition, trends, attitudes and experience, without much consideration for evaluation and operational needs. According to Buonanno *et al.* (2005), the decision–making of new technology adoption by SMMEs is mostly affected by spontaneous actions, social activities and trends rather than established process business objectives and proper technology enquiry and evaluation processes. As a result, they are often left with a feeling of inadequacy when they adopt the wrong technology, and end up losing money not knowing the capacity of what they acquired to solving their problems.

Aleke *et al*. (2011) state likewise that new technology adopted with disregard to the factors and the relationship that exists within the dynamics of evaluating the new technology, jeopardises the potential benefit and realisation of the benefits accruable.

Having a competitive advantage in business is desirable and a highly sought after position in the market place, which is highly coveted by business managers and owners in business generally. Ghobakhloo *et al.* (2011) contend that because of the constant influx of generic varieties of technology in the market, the adoption of highly specialised new technology increases the ability to acquire additional business value which is not readily available to others using generic technologies.

SMMEs need to understand what benefits they could have when they possess a certain degree of competitive advantage over their competitors. The leverage is often achieved with the use of new technology that puts them in good stead ahead of competitors in terms of service delivery, productivity and uniqueness. A competitive advantage entails the ability of the evaluated technology to give organisations business leverage over its competitors through enhanced productivity and the ability of the new technology to impact positively on the business process. According to Dalipi *et al.* (2011), competitive advantage gives a business a leading edge over competitors and is used as a strategic tool to positively bring about organisational change in the business process. The main motive behind most extensive ICT innovation investments in business is the promise and potential of increased competitive advantage that the new technology offers.

The need to acquire a competitive advantage in business by SMMEs is summed up by the following statement of *Respondent 8*:

> Competitive advantage is crucial; it gives the ability to deliver to your clients' quality that is superior to quality that a competitor can deliver.

SMMEs keeping up with the pace of industry players must ensure they carry out proper evaluation and adopt suitable and applicable technology which enables them to gain knowledge and application of improved and advanced technology. Dalipi *et al.* (2011) contend that SMMEs are predisposed to investing and adopting new technology for the business when it offers them a competitive advantage over competitors and enables them to increase their efficiency and productivity rate even though constrained by limitations to accessing resources. Such a stance is taken because SMMEs must understand the value and ramification of such key decisions which can only be guaranteed by the proper knowledge and evaluation of the new technology. Making

an informed decision on appropriate technology gives businesses the ability to deliver superior quality of goods and services over that of competitors to ensure sustainability and viability of the business. Thus, SMMEs have to be aware of the activities of industry players in order to make informed decisions based on the proper evaluation of new technologies available to the business.

Respondent 15 argues that "you need to be at the cutting edge of your industry as SMMEs to be able to survive in there". Without a good culture of evaluation and adoption of new technologies, SMMEs are increasingly susceptible to becoming moribund and mediocre in its activities, which will leave them struggling and dropping out of the market if they do not actively adopt and utilise technology using the right process. Dalipi *et al*. (2011) found that SMMEs are usually observed to be more comfortable with common low-technical technologies such as websites, emails, spread sheets and other forms of less technical applications, but they are found to exhibit lack of understanding and limitations dealing with high-level technologies including enterprise systems and computing, electronic data and others.

5.10 Validation of research findings with conceptual framework

The research follows an inductive approach, therefore findings from the research are inferred to existing theories and construct in the literature. Saldana (2009:11-12) states that:

> …the development of an original theory is not always a necessary outcome for qualitative inquiry, but acknowledge that pre-existing theories drive the entire research enterprise, whether you are aware of them or not.

In particular, the underpinning conceptual framework adopted by the research is used to validate some of the findings, and similar models were also adapted to accommodate the findings. Therefore another model together with the underpinning adopted framework was used to consolidate the findings from the research.

Monette *et al.* (2014:443) state that in qualitative research, effort should be made to verify findings from the research with valid facts and existing theories to justify the implication of the findings. They also posit that to ensure validity and establish "theoretical sensitivity", qualitative research must follow a set of guidelines that increases the quality of results obtained. Eisenhardt (1989) emphasises that theoretical induction:

> is the intimate connection with empirical reality that permits the development of a testable, relevant and valid theory.

The research provides valid findings by following Eisenhardt's process of theory building using a case study research, guided by the steps listed below. The research leads to emergent findings that are synchronised with a combination of prior established research frameworks.

i) Getting started: Defining research questions in relation to existing prior concepts, providing a good base for validating constructs.

ii) Selecting cases: Cases are selected on specific population types, provide theoretical flexibility and focus on external validity to replicate, fill or extend concepts.

iii) Crafting instruments and protocols: Constructs are strengthened by the use of multiple data collection to ensure triangulation of evidence, thus creating a synergic view of different perspectives.

iv) Entering field: Overlapping data collection and analysis enables the researcher to adjust the data collection structure, thereby providing an opportunity to speed up the data analysis.

v) Analysing data: Enables cross-case analysis of patterns by seeing data through multiple views, thus gaining depth familiarity with data and constructs of the theory.

vi) Shaping hypothesis/assumptions: Identifies logic across cases with iterative moulding of constructs internally by establishing a cause which defines, extends, confirms and validates theory.

vii) Comparing constructs with similar and conflicting literature: This improves definition of the construct, develops a higher theoretical level and increases the ability to generalise.

viii) Reaching closure: Achieving possible theoretical saturation; when the contribution becomes marginal, the process should come to an end.

5.10.1 Implication of findings on adopted conceptual framework

The following factors uncovered by the findings concern the evaluation and adoption of new technology by SMMEs in Cape Town, which also compliment the framework on Information Technology Adoption in SMEs—an integrated framework by Nguyen (2009) (see Section 2.8.7, Figure 2.1) adopted as the research conceptual framework. The E-Commerce Adoption Model developed by Chong Yee Ying in 2010 was also later adapted together with the initial conceptual framework to provide support for some emergent findings. The E-Commerce Adoption Model by Ying (2010, as cited in Kumar 2013) was adapted together with the initial conceptual framework

of Nguyen (2009) to accommodate other important findings not included by the initially adopted research framework.

The research revealed the following findings that emerged as external/internal factors and also internal/external drivers that affect and influence the adoption and decision making of new technology by SMMEs. The following describes the factors and drivers established by the adopted theoretical framework.

5.10.1.1 Factors of adoption from theoretical framework

Organisational

- Top management: The PIIT of owners and managers who initiate and make adoption decisions; their views and perceptions are important as they have the propensity to be innovative and employ new technology.
- Employees/people: The knowledge of evaluation and new technology skills of employees and their resistance to change have a significant influence on the business. Training considerations for employees and keeping them involved in the process of new technology adoption gives a sense of ownership and purpose.
- Organisational structure: The presence of evaluation processes in the functioning of the organisation and the contribution of other people towards adoption of new technology.
- Firm absorptive capacity: The ability of the firm to adapt to changes in mode operation to accommodate new technology to meet standards and compliance.

Networking

- Network relationship: Connecting with similar people with common goals to obtain information about new trends and available new technology.
- Knowledge and learning: Using knowledge obtained from networked sources to advance the adoption of new technology and learning new knowledge from the business environment and visible impact made.

External source

- Vendor experience: The vendor's knowledge of the market place and the business environment is of advantage where their knowledge could be called upon to facilitate new technology adoption for the business to support small businesses.
- Professional consultation: Interacting with experts and people with extensive knowledge of technology application provides support for businesses, which enlightens them about the opportunities provided by new technology.

Information Technology resources

- Ability: Determining the ability of the new technology to perform as required within the business process is imperative, together with the ability of the firm to accommodate the needed operational adjustment to yield the required result.
- Capability: Establishing the capability of the new technology to handle different functions and processes efficiently within the business process, with the ability of the firm to ensure that capable handlers are available to operate the technology properly.
- Capacity: The magnitude and volume of activity the new technology can accommodate and process is essential; the capacity of the firm to accommodate production volume is also important.

5.10.1.2 Adoption drivers from theoretical framework

External force

- Market pull: The new technology needs of the business to conform with industry practices. The insurance service and product providers' use of new technology influence FSPs to adopt new technology in order to access and benefit from the services of the provider whose services they employ for their business.
- Industry innovativeness: The current use of specialised technologies by FSPs in conducting their business, move towards use of tablets, mobile devices and telephonic recording by FSPs.
- Technology push: Continuous flooding of the market with new products and the influences exerted by the products in the market.

- Competitive advantage: The realisation of using new technology to stay ahead of other players in the market; delivering uniquely improved and highly sought after services.

Internal force

- Life cycle/firm maturity: The level of a firm's development and progress over the years shapes the ability to accommodate change; the ability to accept the need for change enhances the adoption of new technology.
- Growth: The need for expansion and opportunities to extend business into new potential markets encourages the evaluation and adoption of new technology to enable participation in a bigger and larger environment.

The following factors and drivers were added to extend the adopted framework from the results of the findings, thus complimenting existing theoretical knowledge of evaluation and adoption of new technology dynamics and organisation innovation research in small businesses. The new concepts added, emerged under factors and drivers of ICT adoption and decision-making.

5.10.1.3 Factors of adoption emergent from research findings

Communication

- Sources of information: Actively engaging in sources for information through various channels to uncover existing new technology with potential to benefit the business in an iterative manner.

External source

- Awareness/observability: Being observant of the environment, both immediate and extended, to determine current activities in the business world; observing antecedents and future innovative developments.

Evaluation of new ICT

- Adaptability: Adaptability of new technology to the business process and objectives, and determining the firm's resources to cope with change brought about by new technology adoption.

- Compatibility: The ability of a new technology to seamlessly integrate with existing functions and business processes is an essential consideration; compatibility is necessary to ensure proper integration and deliverables.
- Suitability: The overall suitability of the new technology to the business in terms of functionality of new the technology as well as internal and external factors must be considered in balance with other elements of the business and new technologies to conform to expectations. Suitability is determinant on the quality of evaluation and choice made.

Government

- Level of government support: Provision of support to small businesses is a key responsibility of the government to encourage new technology adoption and create an enabling business environment for small businesses to thrive.
- Level of technological infrastructure: Available technological infrastructure is essential for businesses to grow, and it encourages new technology adoption by small businesses when there is an existing platform that provides adequate support.
- Educational system: It has been found that educational level plays a huge role in forming knowledge to adopt new technology; a vibrant educational system will promote entrepreneurship and increase the potential to adopt new technology.
- Government innovativeness: The level of innovation and use of new technology as a change agent has an influence on the propensity of small businesses to adopt new technology to improve their business.

5.10.1.4 Adoption drivers emergent from research findings

External force

- Government regulation: Statutory compliance to use certain types of new technology to conduct business, evident in the recently structured practices of FSPs, where they are being regulated to use new technology to comply with certain standards.

Internal force

- Sustainability: The desire of the organisation to stay afloat and need to maintain a sustainable enterprise is buoyed by the value new technology can offer the business to increase its ability to survive in the market place.

The above are grouped as drivers and factors affecting new technology adoption and decision making. The drivers are considerations within and outside the organisation that drive the intention and need to adopt new technology, while the factors are elements that impact the successful adoption of new technology. Figure 5.2 shows the drivers of new technology in the form of external and internal drivers, with the factors are indicated as organisational, communication/networking, evaluation of new ICT, governmental and external. These elements are identified and considered as influencing the adoption and decision-making of new technology. The research conceptual model is thus built on concepts and constructs that emerged from the findings and related existing literature. The newly added constructs are indicated in green font colour (Figure 5.2).

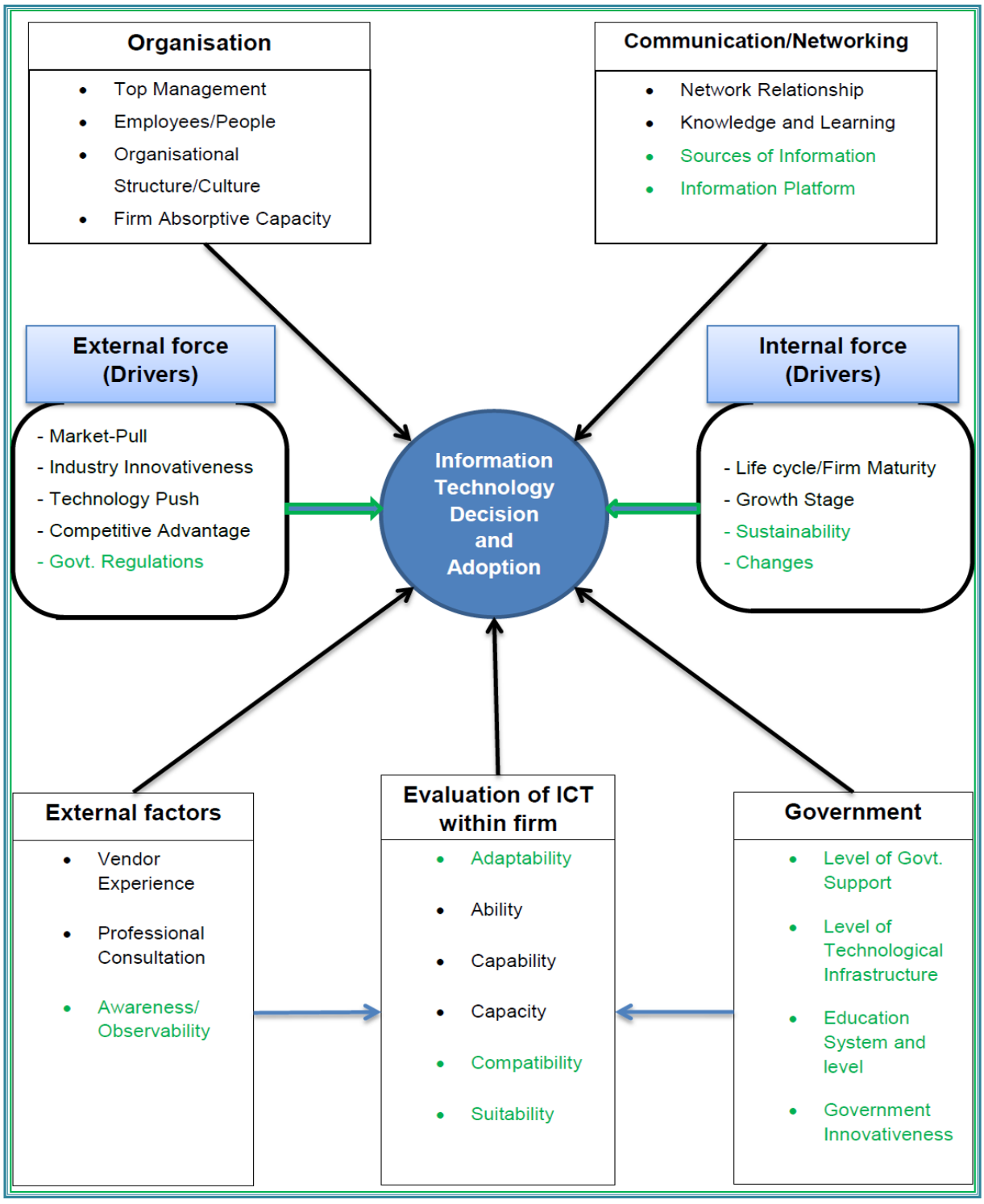

Figure 5.2: Research Conceptual Framework (adapted from Nguyen, 2009) and E-commerce Adoption Model (Ling, 2009)

5.11 Summary

The chapter discussed the themes that emerged from the findings and also answered and discussed the research questions in relation with prior established literature. The emergent themes have been identified as organisational development, evaluation, government, information and decision-making. The findings unveiled cost of adoption, benefits perceived, management skills and fear of the unknown future of technology as factors affecting the promotion of new technology adoption, while elements such as business value, competitive advantage, government regulation and sustainability among others were outlined as drivers to adoption of new technology.

Different channels of information and knowledge such as networking, research, vendors, professional consultation and service provides were among those mentioned. The lack of an accessible platform of information by SMMEs was highlighted as a major concern, with the awareness and impact of government support at a non-existent level. The need for improved technological infrastructure and government policy to support the business was also stressed.

There is a good understanding of the importance and need for evaluation of new technology across the board, with emphasis on the need of an evaluation tool by emerging SMMEs. All respondents acknowledged the need to align business need and technology functionality to ensure suitability of new technology to the business process by making an informed decision. It was established that evaluation of new technology plays a vital in the ability of a business to leverage incremental change and ensure survival in the market place. Findings revealed factors and drivers of new technology adoption decision making which were mapped to two existing frameworks to ensure validity and verifiability of the findings from the research.

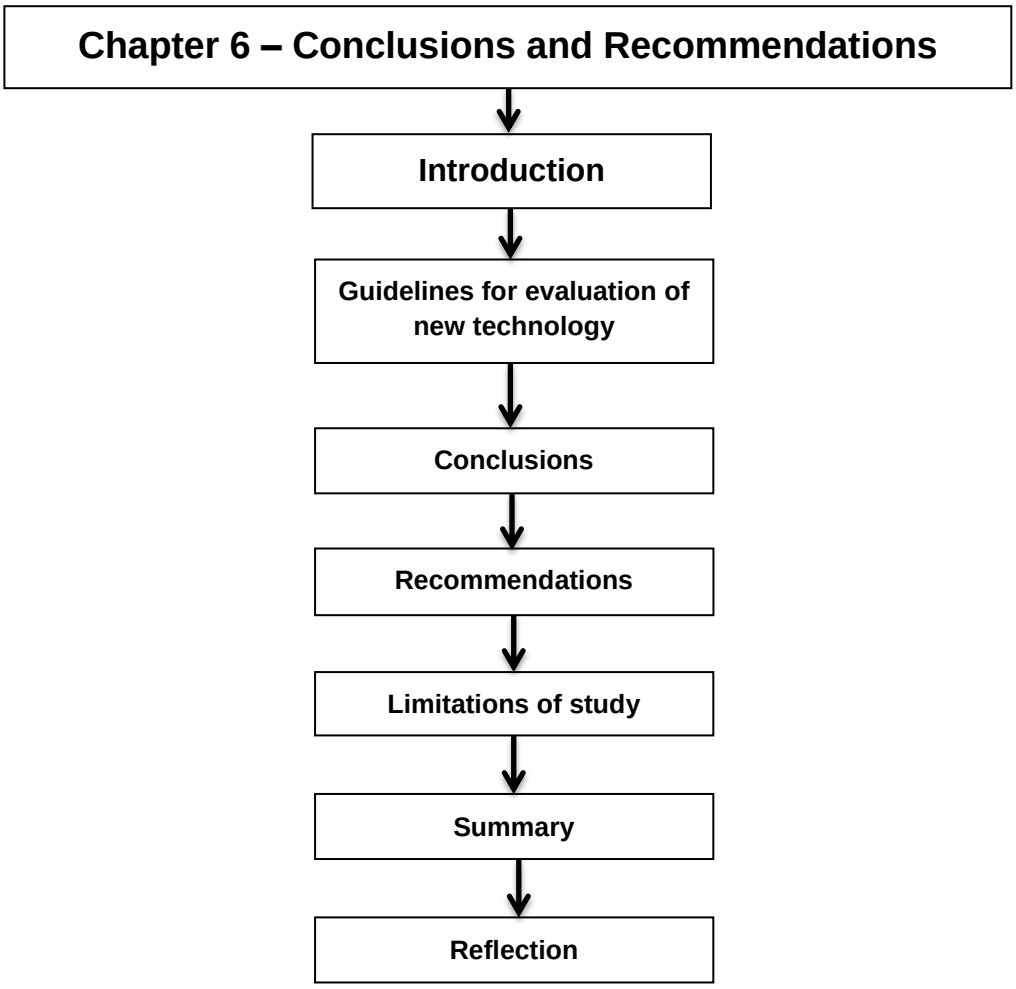

Figure 6.1: Graphical representation of Chapter Six

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

For decades, numerous studies have been done to uncover more knowledge on the phenomenon of the adoption of new technologies. However, despite the many efforts of renowned scholars and dedicated academics all over the world, the situation of slow and low adoption of new technology by businesses still remains pervasive. The study of the phenomenon is evidently lacking in small organisations where the level of adoption of new technology has been observed to be slow over the years.

The study unveils various challenges that hinder SMMEs from evaluating and adopting new technology for their businesses. SMMEs operate in a complex and dynamic environment; as such, they do not have the required knowledge of new technological potential thus lacking adequate information which impairs resources and the ability to invest in the new technology. The lack of vision and informed decisions support is provided by Nguyen *et al.* (2013:2):

> The key to this lack of success appears to be a disconnection between vision and execution: organisations do not do enough research and planning before implementing the new technology, often because management is unclear about how and why their firms are adopting IT in the first place.

The importance of evaluation of new technology is echoed throughout the research findings, even though previous studies have not been focused enough on evaluation as a key influence on adoption. The ability to make informed decisions based on relevant facts is established as a desirable advantage that evaluation offers to the business. Factors such as the accessibility of information, the cost of acquisition and maintenance, government support and technological infrastructure are among those highlighted by the respondents that affect the evaluation and adoption of new technology by SMMEs. The potential value of new technology, coupled with the competitive edge the new technology offers the business, is essential to the continued survival and sustenance.

This chapter provides a conclusion and recommendations to the study. A guideline to assist SMMEs in the evaluation of new technology is also presented. Limitations of the research and a reflection on the study are highlighted in this chapter. The study addresses the issues of evaluation and adoption of new technology by SMMEs, with the aim of developing a set of guidelines from the knowledge gained from the exploratory study to address the incumbent

problems encountered by managers and owners of SMMEs in relation to evaluation and adoption. Recommendations are provided to guide policy and practice in business, and also to promote further research work.

6.2 Proposed guidelines for the evaluation of new technology

Evaluation of new technology should encompass the measurement and establishment of key elements and factors such as effectiveness, cost, quality of functionality, benefits accruable and associated risk, among others. SMMEs must establish compelling and relevant evidence pointing to the appropriateness of the new technology and its effective utilisation as an advantage over existing ones with lesser cost implications.

Evaluation procedures should be carried out in sequential phases to reduce the risk inherent to the adoption of new technology. At the end of each phase, a decision can be made to proceed to the next phase of evaluation to effect adoption of the new technology. The following guidelines are developed for SMMEs to assist in the evaluation of new potential technology for their business. The guidelines presented below are divided into four parts of evaluation considerations, consisting of external resources and organisational, economic and technology elements.

6.2.1 Organisational guidelines

i) Establish an opportunity or need for improvement as well as areas of business functionality that need an intervention.

ii) Activate or establish a procedural plan for evaluation, including all elements and factors pertaining to the new technology.

iii) Secure managerial support and a positive attitude of employees towards the new technology.

iv) Assess the operational functions, deliverables and cost associated with current technology.

v) Determine the current level of employee expertise, technical ability and knowledge of new technology.

vi) Ensure that the rationale for technology improves the management effectiveness and organisational coordination.

6.2.2 Guidelines for using external resources

i) Research new available technologies with potential application to the business by using the internet to determine the use in other parts of the world and country.

ii) Liaise with a network of people in a similar industry and existing users with experience and know-how about technology.

iii) Consult professional technology firms on expertise, technical matters and the latest advancements in the industry.

iv) Identify potential vendors or outsourcing options and an available market for the new technology request for presentation and demonstration.

v) Subscribe to industry information bulletins, news groups and forums on industry-based advancement and development initiatives.

vi) Establish industry demand, the type of technology in use by other competitors, and trading partners.

vii) Identify government business support programmes, technology initiatives and grants on new technology acquisition.

viii) Explore available options recommended by industry associations and unions.

6.2.3 Economic guidelines

i) Determine the cost implications, including cost of acquisition, maintenance, support, operational skills and integration with the existing business process (total cost of ownership).

ii) Analyse the various licensing options, including subscription fees as well as fees based on the number of users, transactions or systems.

iii) Determine the cost of acquiring skills training and knowledge required by employees and management to properly operate the new technology.

iv) Determine the cost of accessing information and evaluation of new technology.

v) Establish the potential benefits in terms of value added to the quality of business services and product delivery.

vi) Determine the difference in the operational level of effectiveness of the productivity and efficiency level on the existing business process.

vii) Measure the ability of new technology to be leveraged in the market place for a competitive advantage.

viii) Identify the potential areas where there is venerability or exposure to risk and the potential impact.

6.2.4 Technology guidelines

i) Identify the key features and functions of the new technology, including new features added to the current version.

ii) Determine the applicability to the business process, industry standards and business environment.

iii) Determine the adaptability to the existing business process, current operations and the ability and skills of employees.

iv) Determine the capability of the new technology to handle and deliver needed outputs at required times.

v) Determine the standard capacity of the new technology to handle required workload, and accommodate an increased production volume while performing at a standard level.

vi) Establish the technical skills and knowledge required to properly operate the new technology to deliver optimum output.

vii) Determine the availability of technological infrastructure needed to support the new technology operation.

viii) Determine the scalability of new technology, i.e. the ability to handle future estimated volume and growth.

ix) When applicable, first test new technology for a period of time in the business environment to determine the technology fit and stability of the business.

It is imperative for small businesses to create an evaluation culture and develop processes as part of the business to ensure the suitability and appropriateness of new technology while also not losing out on potential advantages the new technology could offer. A spider chart can be developed based on the estimation of a numeric value assigned to each factor which is ranked and benchmarked against acceptable values with a cut-off threshold. The ranking of choices can be based on associated benefits, cost, technicality, advantages, disadvantages and risk, to name a few.

A request for proposal and quotation can then be requested for different options. In support of the ranking chart, financial analysis tools can be employed to describe and measure alternatives. After careful analysis, the final decision made on the most suitable option should be based on the weight attached to each factor and its value score.

The implementation step of the new technology is dependent on the choice made, but it is essential to complete all necessary steps before the new technology can become operational. Possible steps to consider will be assembling, configuring to match the business process, testing of functionality, training users, and conversion of data files to match the format required by the new system. Justification is provided for the choice of new technology based on informed decisions made through evaluating relevant facts. The objective of evaluation is to obtain sufficient knowledge to make an informed decision. The evaluation guidelines will potentially lead to SMME owners and managers making a better choice and decision on the adoption of new technology.

6.3 Conclusion

This research set out to explore and broaden the researcher's understanding on evaluation and new technology adoption practices and issues surrounding it. The objectives of the study formulated in the early stages of the research have been achieved to a considerable level. The study discussed factors affecting evaluation and adoption of new technology by SMMEs for their business, how SMMEs obtain knowledge of available new technology for their business, and the importance and role of evaluation in the adoption process.

Determining how business and new technology match the business processes and objectives, accessing the impact of evaluation on decision-making and choice of technology adopted, and the subsequent effect of evaluation and non-evaluation on the business, were also discussed comprehensively. The role government plays in the adoption process of new technology by SMMEs, was deliberated on.

The objectives off the research can be summarised as follows:

To identify and determine how these factors create challenges which SMMEs need to overcome before adopting new technologies: SMMEs consider factors such as information accessibility, associated risk and uncertainty of the technology, cost of acquisition and maintenance, government support and technological infrastructure, resistance to change, and technology market as factors that affect the evaluation and adoption of new technology.

The challenges faced by SMMEs can be addressed substantially by evaluating the potential value of new technology coupled with the competitive edge the new technology offers the business in order to ensure the continued survival and growth of SMMEs.

To determine how SMMEs embark on evaluation and the process involved in acquiring knowledge on how and what to evaluate: The process of adopting new technology involves the different ways and steps of investigation initiated by decision-makers to determine the business value of a new technology for the purpose of enhancing the business. To conduct an evaluation, the business needs to research and seek for information from relevant sources, consult experts in technology and business, ask peers and colleagues in the industry about the latest developments, and view evaluation as a continuous iterative activity with information accessible through various means.

To understand the perceptions of SMME managers on the evaluation and challenges of new technology: SMMEs owners and managers believe that evaluation of new technology is a key business enabler that provides improved efficiency, higher productivity and an understanding of the associated risk of the technology with decisions made based on relevant and credible information that ensures business viability. The majority of the respondents acknowledge the importance of evaluation and the impact on new technology adoption and the subsequent effect it can have on the business. Unfortunately, evidence shows that SMMEs do not have the existing structure or formalised directions and steps to evaluate new technology which has been incorporated into their business. They have therefore suffered various losses, especially in the early stages of their business.

Establish the role of government in providing assistance and participating in evaluation and adoption of new technology by SMMEs: Although government programmes with a mandate to support SMMEs were developed especially to assist in technological adoption, the impact of the programmes has not yet been felt by SMMEs. It is observed that the level of promoting SMME development and sustainability in South Africa is dysfunctional, resulting in low level of awareness and utilisation of government support programmes for SMMEs. The view of respondents on the impact of government policies on creating a conducive business environment to boost technology adoption is that government policies have a negative effect on their business. New legislation compels FSPs to use new technology in their practice, but the effect has left many businesses on the side-lines with the cost of running the business escalating.

Government can assist SMMEs by identifying and introducing them to innovative new technologies which are beneficial to the business, formulating conducive policies, and providing more visible support and assistance.

To understand how SMMEs determine technologies suited for the business and find a process to assist SMMEs in evaluating the business potential of new technology: SMMEs **must** start by identifying (i) the business needs and requirements the new technology is expected to fulfil by determining the business fit; and (ii) the relevance and significance the technology has with the business objectives and goals. SMMEs obtain information by asking questions about the business requirements and gaining knowledge of the capability, functionality and operability of the new technology. Considering different options available and the potential value of a new technology to the business by determining the technology functionality and potential, is a necessary prerequisite for the adoption of a new technology for the business to be successful. The research has proposed a set of guidelines derived from the findings to assist SMMEs in the process of evaluating new technology.

To explore the significance and contribution of the evaluation process towards decision making on adoption of new technologies: Evaluation of technology is a strategic tool to attain business objectives and goals and whether it can be applied to gain a better understanding of the suitability of new technology, thus contributing towards an informed decision which is a key influence on the decision to adopt the new technology for business by SMMEs. SMMEs need to understand that evaluation of technology gives a better understanding of the suitability of new technology, thus contributing towards an informed decision. SMMEs must actively engage in evaluation to make the right and most appropriate choices regarding their business.

To determine how the sustainability and development of SMMEs are influenced by the evaluation and adoption of new technology: Making an informed decision on the suitability of new technology is important to the continued survival of the business. Consequently, the lack of evaluation poses a problem because decisions taken are uninformed, biased and usually based on little or no information. It has been said that most challenges SMMEs are faced with are linked to the problems that emanate from the non-evaluation of the potential of the new technology before adoption which makes them lose the opportunity to leverage their business growth. Therefore, making an informed decision on appropriate technology gives businesses an ability to deliver superior quality goods and services over competitors to ensure sustainability and viability of the business.

In conclusion:

To answer the problem statement that ***SMMEs do not sufficiently evaluate the potential, adaptability and applicability of new technology in their business, and as a result lose opportunities to gain knowledge and competitive advantage in their market, which can impact on the long-term viability of the business,*** two main questions are asked:

i) ***What*** are the adoption challenges for SMMEs in terms of the evaluation of new technology?
   and
ii) ***How*** does the evaluation of new technological innovations affect the adoption of new technologies in SMMEs?

The answers to these research questions are summarised as follows:

i) SMMEs are constraint by numerous factors, including information accessibility, government policies, infrastructure, associated cost and risk of new technology among others, thus hindering conscious evaluation practises amongst SMMEs which culminate into the slow rate of adoption of new technologies.

ii) Evaluation has been shown to be a key influence on decision making, i.e. choice of new technology, with impact on knowledge acquisition and the ability to ensure sustenance of business and future growth based on informed decisions.

6.4 Recommendations

To improve the evaluation and adoption of new technology by SMMEs, a number of issues and considerations must be addressed. Recommendations for the policy business practice industry as well as recommendations for further research study are provided. The focus of the recommendations is on raising the awareness of SMMEs to the need for standard evaluation practices in business and strategic planning for the business in terms of evaluation and adoption of new technology. The recommendations cover the importance of government's need to improve on information accessibility, support to small businesses, and basic infrastructure and formulating proactive policies to advance the small business sector.

6.4.1 Strategic planning

Having a strategic plan that supports the evaluation, adoption, implementation and integration of new technology successfully into the business process ensures stability and viability of the business. It is recommended as a matter of necessity that the business has a plan to strategically incorporate the evaluation and adoption of new technology into the objectives and goals of the organisation. SMMEs should realise that the adoption and use of new technology as a strategic tool assists them and affords the opportunity to compete in the national and international market.

It is therefore recommended that SMMEs plan strategically for the evaluation of new technology for the business, as evaluation of new technology informs what is currently in use and what is available on the market by identifying the features on offer and exactly what is needed by the business process to reach its desired target.

SMMEs need to determine their needs and realise the potential advantages presented by the new technology. They must be able to ascertain the impact of the new technology in terms of cost and benefit, and establish external sources of aid to assist in making an informed decision.

6.4.2 Evaluation practice

Good practice and culture of evaluation among SMMEs will increase the ability and propensity to adopt new technology for the benefit of the business. It is recommended that for SMMEs to successfully realise the yields of investment from the use of new technology, evaluation of the new technology should be carried out as part of the business practice.

SMMEs should be aware that incorrect and arbitrary decisions made on adoption of new technology poses a threat to the business, thus it is of great importance that they do not make impulsive decisions and ensure that they have the capability to derive benefit from the use of new technology.

It is recommended that SMMEs establish a standard evaluation practice in their organisation because of the need to understand what new technology is designed for, and to be better informed of the value of the technology. The practice will ensure that the right questions are asked of the different offerings, comparing the features to determine the level of suitability to the business. SMMEs are expected to carry out a proper requirement analysis, knowing what they have and what is required of the new technology by understanding the problem to be solved by

the new technology. The proper understanding of requirements and expectations from the new technology will ensure that suppliers know exactly what is expected of them, with an understanding between them well articulated and documented.

6.4.3 Proactive policy

Government should be more proactive with policies in matters of SMME adoption of new technology to enhance their contribution to the economy with increased development and growth. There are existing government programmes with mandates to help SMMEs develop, especially in technological areas, but there is no visible effect being felt by the businesses. There is a need for proactive policies that will ensure an increase in technology usage among the generality of SMMEs in South Africa to boost development and growth. More attention should be paid to the small business sector to promote the adoption of new technology by SMMEs and help reduce the barrier of cost.

It is recommended that the development of the Malaysian and Chilean SMMEs sector be emulated, where SMME support is evident in their accessibility to funds and other support which ensure their adoption of new technology for the business. SMMEs need to be at the cutting edge of their industry in terms of technology usage to remain relevant and survive in a highly competitive market place. The adoption process of new technology has been simplified for Malaysian small businesses through the availability of financing and IT adoption support and accessibility to training through creation of supportive policies.

6.4.4 Social infrastructure

Government needs to actively develop and promote affordable and accessible broadband internet bandwidth for business and social activities. Accessibility to quality and affordable technological infrastructure is key to small businesses being able to operate on a seemingly level playing field with bigger firms. The level of the educational system is a crucial part of the social system in countries, especially developing countries which are still lagging behind in terms of developmental and economic stability.

There is need to establish a proactive regulatory framework to address the level of basic education in South Africa. The effect of the low level of standard basic education is evident in the various international reports and observed in the low response and attitude towards research as observed in the course of this study. Finland is an example of country based on a knowledge economy driven by the adoption of ICT which started in the 1990s. The development and

transformation of the country is based on a strong existing educational system and solid conceptually designed institutions which formed a forum for formulating national policy integration and strategy management in the country.

Government needs to show more participation in creating an environment which is broadband active. Private participation should be increased, with encouragement of reduced cost of import duties and subsidised materials. The recommendation is that the above action will ensure a reduction in the cost of equipment and services, making broadband more affordable with increased spread and connectivity. The case of Australia is evident with government's injection of a decisive information policy for a national broadband network. The intervention on infrastructure is set to connect all businesses and households to high-speed broadband network access by 2015. The initiative will be funded by selling to private communication providers the service at a subsidised price for easy and affordable access.

6.4.5 Effecting change and compliance

In the case of FSPs, the change agent who influences an individual or business' new technology adoption decision in a manner deemed fit and desirable for carrying out their business functions, is the government through the regulations promulgated by the FSB to create a standard form of reporting and data analysis for FSPs to follow in the cause of their business activities.

Government, being the change agency responsible for the change, is therefore expected to ensure conformity and realisation of the desired result expected from the change. According to Hoffmann (2011), there exist seven roles of change agents to drive and implement change. The following steps are applicable to the FSB in relation to FSP adoption of new technology, therefore the FSB representing the government interest must:

- Develop and establish a clear need for change on the part of the FSPs
- Establish an accessible information exchange and relationship platform in the industry
- Investigate and diagnose existing problems with the current system of practice
- Positively create or influence an intent or perception to change by the FSPs
- Transform proposed constructive plans into defining action
- Ensure stability of new technology adoption and prevent discontinuance of processes
- Ensure conformity and undertake oversight activities to monitor progress

The adoption of new technology and acceptance of change will provide policy makers with knowledge on how to further understand the implication of the change on the business and provide more assistance and support for the industry and SMME sector.

6.4.6 Information platform

SMMEs need an 'information shop' where they can access information about new technology, and such information should be easily disseminated through this medium to a wide range of SMMEs in a networked environment. Accessible, timely and relevant information is important to organisational development and survival in the market place. The lack of national information integration is affecting the accessibility of information by organisations, especially the small businesses who find it extremely difficult to access information relevant to them.

There is a need for the establishment of a national information platform and policies that will promote information sharing and dissemination among the organisations and industry. Although Kenya does not have an existing information policy to provide guidance, it is focused on making information and professional expertise accessible to businesses to deliver solutions and boost the economic growth. The government needs to look at the United States, Finland and Singapore among many examples of government leading and driving the provision of information infrastructure by the establishment of the National Information Infrastructure (NII) to digitalise information access and the economy.

Industry associations and unions have to actively participate in making information available to their members. Associations should act as the first stop for information and support in terms of latest developments in their sectors. They should liaise with technology providers on behalf of their members to get subsidised and reasonably priced holistic packages for SMMEs to explore for their business.

6.4.7 Government initiatives

As reported in earlier chapters, there is lack of visible presence/knowledge of existing government programmes by the majority of SMMEs. The presence of SEDA and STP has not been felt by SMMEs after so many years of existence, with a limited number of technology incubators sparsely scattered around the country. This is partly attributed of their tendency to focus on low potential firms with a high the probability of failure over the years. Their intention to spread their tentacles however was mentioned in their last report.

Consequently, it is recommended that SEDA learns from the success stories of Malaysian Small and Medium scale Industries Development Corporation (SMIDEC) along with its Brazilian counterpart, who have provided comprehensive ICT support for small businesses through the proactive policies of the government.

SMIDEC, in collaboration with other support agencies, has been able to harness the required support for small businesses in terms of financing, training, information support and provision of professional expertise to help them facilitate their business.

It is also strongly recommended that SEDA creates an interaction with universities to develop technology hubs and incubators where SMMEs can access professional assistance and acquire knowledge. The knowledge can be permeated through the different educative seminars, workshops and technology exhibitions to increase their knowledge and build their competence in technology management.

The technology hubs and incubators set up in universities will be easily distributed in the country because of their presence in every region. Technology hubs and incubators can also serve as avenue for small businesses to have customised solutions developed for their specific business needs. It could also afford the students real-time practical experience on projects as it is currently seen at the Kujali hub in the IT department at Cape Peninsula University of Technology (CPUT). Also, CPUT currently serves as a technology incubator for textile and design for small businesses in Cape Town.

Although government initiatives and support to small businesses are improving in both developed and developing countries, there is a need for developing countries to actively identify what is required by small businesses to help close the gap between them and large firms, and also between the economies of developing countries and the developed world.

6.4.8 Management

It has been established that support from top management is an important consideration that influences the successful adoption of new technology and also ensures a smooth integration with the business process. Managers need to consciously develop themselves in terms of strategic managerial ability and knowledge of technology management. They need to support their existing knowledge by acquiring innovative knowledge which enables them to properly facilitate the evaluation and adoption of new technology for their business based on their exposure to innovative and educative knowledge.

Managers and owners of SMMEs should participate in educative and informing seminars, programmes and workshops targeted at exposing them to new advanced methods of business management and operations in business. Such platforms will afford SMMEs the opportunity of being introduced to new technology and new ideas which has not permeated the business environment and which they can capitalise on to great advantage.

SMME managers/owners also need to engage in networking of different information sources. A communication channel is an important facilitator of new technology knowledge and potential adoption. It is recommended that managers/owners subscribe to various international industrial associations and forums in their field of business. Many of these associations have online forums and blogs where the latest developments and activities in the industry is discussed. SMMEs have the potential to discover cutting edge technology in developed countries far quicker than their competitors in the market if they keep in touch with the latest development and advancement in the developed countries.

6.4.9 Future studies

The research study can be extended to accommodate further exploration and investigation into the dynamics of adoption of new technology with emphasis on evaluation.

Evaluation tool: Evidence in Chapter Two shows an absence of an evaluation tool specially designed for small businesses to assist in evaluation of new technology. To address this gap, an evaluation model can be developed to assist and guide SMMEs in making an informed and justifiable decision on whether to adopt new technology for the business or not. This tool will be advantageous and beneficial to SMMEs, thus reducing much of the complications encountered with evaluation. The tool will be of significance since all respondents who asked about an evaluation tool did assert positively on the need for one.

Expanding the research study: The study units do not form part of all the business sectors, neither does it include all categories of SMMEs, therefore the study only gives a partial view of evaluation and adoption issues by SMMEs. More studies using an extensive quantitative method to ensure generalisability of the results in other regions will be important.

More focus can also be directed at micro enterprises that were in the course of this study discovered to be averse to research commitments. Larger SMMEs that were excluded from the research due to the delimitation the study should be included in further studies on evaluation and adoption dynamics in line with business development.

Government Policy: Government policies on small business support and initiatives, information accessibility and integration, and infrastructure and educational level should be revisited and addressed. These ineffectual levels of the policies are evidently a serious concern to SMMEs as it affects their ability to develop and survive in the market. Government should review the policies concerning small business development from time to time and adopt similar working models from other countries to create an enabling business environment for the small firms and empower them to play in the same field with larger firms. Studies could also look into effects of existing policies on SMME business and technology empowerment, starting by monitoring it from the promulgation, interpretation, acceptance, implementation, impact assessment and improvement or discontinuance.

Practical engagement: The conceptual model developed from the research findings should be engaged critically in other similar contexts to establish if it applies to other environments and regions, especially in developing countries. The guidelines proposed should also be put to the test to determine the level of applicability to the practical experience of evaluating a new technology for the business. Its usefulness in a real-time business environment should be investigated by applying it to organisations in different organisational contexts and sectors to ascertain if it is generic to other organisational types.

6.5 Limitation of study

The companies studied are mostly technology-driven and inclined to change. It is difficult to engage businesses with lesser drive and use of technology because of their unwillingness to participate, partly based on their lack of perception and understanding of the significance of the research to them. Several calls and invitations were extended to them using the Cape Town Chamber of Commerce database on SMMEs, but little positive response was received.

This study is limited to 15 SMMEs operating within and around the City of Cape Town Metropolis in the Western Cape Province, South Africa; hence the generalisation is limited to the immediate environment of study. The themes developed are constraint since it is based on 15 organisations operating in the business, retail, manufacturing and financial sector, thereby excluding other sectors of small business operations. A larger representation of all SMME operating sectors would have been more ideal units of study.

The availability of the managers/owners of SMMEs for interviews constituted a major challenge, especially since larger samples of survey respondents would have been more appropriate compared to the 22 respondents whose results are limited by the size. This would probably have

led to more insight into the dynamics of evaluation and adoption issues in the small business sector.

Although the research sample was not extensive, resonance with data was achieved given the level of saturation evidently obtained in the analysis. Notwithstanding the several emails and invitations sent out by the Chamber of Commerce, which amounted to over 400, to facilitate participation in the survey, response was slow, limited and unconvincing. Over 80 calls were made to SMMEs on the Chamber of Commerce database which produced a frustrating and uninspiring result. Due to the struggle to get enough interview appointments, the research later focused on FSPs which represent SMMEs in the financial sector—facilitated by a compliance agent in the financial sector.

The absence of a medium or software to facilitate the transcription of the data, prolonged the transcription of the interviews averaging 45 minutes, making it a tortuous, laborious and arduous task of 3 months. The services of a professional coder was not solicited because of the sensitivity of the data and price attached, hence the data was coded by the researcher alone and reviewed periodically by the supervisor.

6.6 Summary

Problem Statement

SMMEs do not sufficiently evaluate the potential, adaptability and applicability of new technology in their business, and as a result lose opportunities to gain knowledge and competitive advantage in their market, which can impact on the long-term viability of the business.

SMMEs need to understand the potential of new technology that exists to benefit the business. Having an evaluation culture and practice will enable SMMEs to seek information and knowledge on the new technology to capitalise on its potential to gain a competitive advantage and ensure survival and growth in the market. SMMEs can also be assisted through guidelines on the evaluation process to identify all factors relating to the business environment affecting the evaluation of new technology for the business. The findings offer new insight and understanding of factors relating to evaluation of the new technology, ranging from the issues surrounding availability of information, to the awareness of opportunities and decision-making.

Aim

The aim of the research is to explore the reasons behind the failures of SMMEs to evaluate new technology for the business. The exploratory study is aimed at gaining a deeper insight into the previously identified barriers and other new factors that might affect and inhibit evaluation and adoption in SMMEs. The results of the findings is used to propose a set of ICT evaluation and adoption guidelines for the successful evaluation for/and adoption of new technology innovations in SMMEs.

The aim of the exploratory research was achieved by using a multiple case study design, with interviews, surveys and a literature review forming the sources of the data collection. Data was analysed by thematic methods and evidence was triangulated by comparison of the different sources or data in the discussion. Findings were conceptualised to extend an existing theory from the literature, and also used as the basis of proposing a guideline to assist SMMEs in evaluating and adoption of new technology.

6.7 Reflection

Through this research study it was sought to establish that evaluation is arguably the most important aspect of the adoption process, and its significance is especially bearing on the small business sector. The study started off with the aim to explore the reasons behind the failures of SMMEs to evaluate new technology for the business. The purpose of the research therefore was to establish what challenges are abound in the evaluation of new technology by SMMEs, given that evaluation is a major contributing factor to the successful adoption of new technology, empowering the business and boost its survival chances. The majority of technology adoption literature has been focused on large organisations and the bulk of literature available in the context of small business is considerably concentrated in developed countries, leaving the developing countries lagging and lacking. The literature also showed limitations in research considerations for evaluation as a critical factor in the adoption play. The relevance of this research study is therefore established along with its contribution to existing knowledge.

Data for the study was gathered to determine the factors inhibiting evaluation and adoption of new technology by SMMEs and also to determine the effects and impact of evaluation on the adoption of new technology for the business. It was clear that most of the interviewees had a good knowledge of technology, with some using specialised technology. Of great disappointment was the refusal of micro enterprises to honour invitations and a disinterest in participating in research. The ignorance and disinterest could be linked to the prevalent slow

adoption rate observed in small enterprises. On the other hand, most of the small and medium businesses interviewed were found to be particularly enthusiastic about the study. Their ambience and attitude towards the research show that there are small businesses that see evaluation as an important element of business and are ready to embrace proper processes of new technology adoption. As mentioned earlier, the failure to honour and secure appointments for SMMEs leads to a longer period of data collection, which in turn leads to the transverse of different locations for long hours in a day.

The focus of the study is based on the evaluation and adoption practices by SMMEs to uncover challenges and constraints faced by the small business in establishing new technology with potential beneficial impact to adopt for their business. There is need for further expansion of the research on evaluation and adoption of new technology and its application to business processes by small businesses than currently exist. The research findings emphasise the contribution of evaluation and adoption research field to intricacies of small business development, performance, survival, growth and contribution to the economy.

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ANNEXURE A: LETTER OF INVITATION AND CONSENT TO PARTICIPATE IN INTERVIEW

Department of Information Technology

Letter of Invitation to participate in Research Study

SMMEs are one of the few options that we have left in South Africa to create and maintain jobs. It is important that SMMEs utilise technology innovation in their businesses for growth and development. For some reason this seems not to be happening as it should be. Your contribution and participation in the research will be warmly appreciated; therefore we are requesting your time for participation in a research interview session. We have a questionnaire that we would like to administer in an interview fashion where we will ask you some questions on the topic. Once you have indicated your willingness to participate we will continue by making an appointment not lasting more than an hour on the day of your choice.

Purpose of this study (Objectives)

The study is focused on the reasons behind the failure of SMMEs to properly evaluate and adopt new technology innovations. The aim of this research is therefore to gain a deeper insight into the previously identified barriers and other unidentified factors that affect and inhibit evaluation and adoption in SMMEs. It is also to explore the contribution of the evaluation process before adopting new technologies, determine what factors of evaluation influences the adoption of new technologies, understand the perceptions of SMME managers of new technology evaluation, and to find a process to assist SMMEs to evaluate the business potential of new technologies.

The study will enable the researcher to:

- Gain insight into the barriers and other unidentified factors that affect and inhibit evaluation and adoption in SMMEs.
- Explore the contribution and impact of the evaluation process before adopting new technologies.
- Determine how SMMEs adopting the new technology, evaluate the new technology.
- Understand the perceptions and challenges of SMME managers concerning new technology evaluation.
- To propose an adoptable process to assist SMMEs to evaluate the business potential of new technologies.

Participation in this study (Interviews)

The participation in this study is voluntary; respondents are **free to withdraw at any time. The interview** sessions will be audio recorded, which is subject to the consent of respondents. The audio recording and contents of the interview captured will be strictly used for research purposes only. There will be no risk of personal/emotional/physical/mental harm of any kind inflicted by this study, and discussions on sensitive topics will be avoided. The identities and other personal information of the participants will not be disclosed, and no information collected will be accessible beyond the immediate researchers involved.

By signing the letter of consent, the participant acknowledges his or her informed consent as related to the study.

The contribution of this research will potentially lead to an increase in the levels of evaluation and adoption of new technology by SMMEs. With proper evaluation and implementation procedures of new technology comes a visibly effective and efficient IT system in the SMME industry in the future. This study will help to improve our understanding of the dynamics surrounding the evaluation and adoption of new technology by SMMEs from their unique and different understanding and perception of new technology. Feedback on the research study will also be made available to the participants to increase their knowledge of the subject matter and provide help in future decision making regarding new technology.

Questions about this study and participation

You are welcome to direct any questions about the procedure or participation in this study to the department of Information Technology at the Cape Peninsula University of Technology, or the researchers listed below,

Researcher(s) Contact Information

Dr Andre de la Harpe
Research Supervisor
Centre for CIO Research in Africa (CenCRA), CPUT - Cape Town Campus
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Cape Peninsula University of Technology

Department of Information Technology

Letter of informed consent

SMMEs are one of the few options that we have left in South Africa to create and maintain jobs. It is important that SMMEs utilise technology innovation in their businesses for growth and development. For some reason this seems not to be happening as it should be. Your participation in the research will be warmly appreciated as we request your time for participation in a research interview session. The interview will be in a semi-structured format where a set of questions will be administered in an interview fashion by the researcher. Your participation in the interview requires only an hour of your time.

Purpose of this study (Objective)

The study is focused on the reasons behind the failure of SMMEs to evaluate and adopt new technology innovations. The aim of this research is therefore to gain a deeper insight into the previously identified barriers and other unidentified factors that affect and inhibit evaluation and adoption in SMMEs. It also seeks to explore the contribution of the evaluation process before adopting new technologies, determine what factors of evaluation influence the adoption of new technologies, understand the perceptions of SMME managers of new technology evaluation, and to find a process to assist SMMEs to evaluate the business potential of new technologies.

The participation in this study is voluntary; respondents are **free to withdraw at any time. The interview sessions** will be audio recorded, which is subject to the consent of respondents. The audio recording and contents of the interview captured will be strictly used for research purposes only. There will be no risk of personal/emotional/physical/mental harm of any kind inflicted by this study, and discussions on sensitive topics will be avoided. The identities and other personal information of the participants will not be disclosed, and no information collected will be accessible beyond the immediate researchers involved.

By signing this letter, the participant acknowledges his or her informed consent as related to the study.

On the completion of the research study, feedback on the findings will be made available to the participants to increase their knowledge of the subject matter and help in future decisions making.

Participant	Organisation	Signature/Date
Researcher	Institution	Signature/Date
Supervisor	Institution	Signature/Date

ANNEXURE B: INVITATION AND CONSENT LETTER TO PARTICIPATE IN SURVEY

Dear Member

It is our pleasure to introduce you to a research study in collaboration with the Cape Chamber of Commerce and the Cape Peninsula University of Technology. It also serves as an invitation to participate in a research survey for SMMEs in Cape Town and the Western Cape.

The objective of the research is to explore the reasons behind the failures of SMMEs, to evaluate the potential of new technology innovations. In terms of the findings, a set of ICT evaluation and adoption guidelines for the successful evaluation for, and adoption of, new technology innovations in SMMEs will be proposed.

We therefore request and encourage all our members to participate actively in the survey, which will be of benefit to our understanding of the dynamics surrounding evaluation and adoption of new ICT in the business.

This survey is directed at owners/managers who actively play a role in the decision making of the business, to seek their perception in particular in relation to their SMMEs and the sector in general. Your input will be of great value, and your participation will be highly appreciated towards the course of this research.

The identities and other personal information of the participants will not be disclosed, and no information collected will be accessible beyond the immediate researchers involved.

Feedback on the research study will also be made available to the participants to increase their knowledge of the subject matter, and provide help in future decision making regarding new technology.

Please go to the survey by using the following URL: http://bit.ly/UzrMPE

For more information feel free to contact the researchers as indicated below.

Researcher(s) Contact Information

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ANNEXURE C: INTERVIEW GUIDE

Research Problem Statement	**SMMEs do not sufficiently evaluate the potential, adaptability and applicability of new technology to the business, and as a result lose opportunities to gain a competitive advantage in their market, which can impact on the long-term viability of the business.**
Research Question 1	**What are the adoption challenges for SMMEs in terms of the evaluation of new technology?**
Research Question 2	**How does the evaluation of new technological innovations affect the adoption of new technologies in SMMEs?**
Q.1	**What is new (ICT innovation) technology to you?**
Answer	
Comments	
Q.2	**What type of new technology is applicable to your business?**
Answer	
Comments	
Research Question 1	**What are the adoption challenges for SMMEs in terms of the evaluation of new technology?**
Objective	**To identify and determine how these factors create challenges which SMMEs need to overcome before adopting new technologies.**
Sub-question 1.1	**What are the factors that influence evaluation and adoption of new technology?**
Q.1	**What are the adoption challenges for SMMEs in terms of the evaluation of new technology?**

Answer	
Comments	
Sub question 1.1	**What are the factors that influence evaluation and adoption of new technology?**
Q.2	**What are the difficulties experienced with/in the process of acquiring a new technology?**
Answer	
Comments	
Research Question 1	**What are the adoption challenges for SMMEs in terms of the evaluation of new technology?**
Objective	**The objectives of this study is to establish how evaluation is being practiced generally in business, and identify the type of processes involved in the actualisation of evaluation.**
Sub-question 1.2	**How do SMMEs initiate evaluation in the process of adopting new technology in business?**
Q.1	**How do you get knowledge of new technology?**
Answer	
Comments	
Sub question 1.2	**How do SMMEs initiate evaluation in the process of adopting new technology in business?**

Q.2	**What steps would you take to acquire the use of new technology for the business?**
Answer	
Comments	
Research Question 1	**What are the adoption challenges for SMMEs in terms of the evaluation of new technology?**
Objective	**Understanding the perceptions of SMME managers of evaluating new technology will explain their allocation of priorities and the challenges they face before adopting new technologies.**
Sub-question 1.3	**What are the perceptions of SMME managers of new technology evaluation?**
Q.1	**What do you understand by the term 'evaluation of new technology' and its process?**
Answer	
Comments	
Sub question 1.3	**What are the perceptions of SMME managers of new technology evaluation?**
Q.2	**What role do you think evaluation of new technology plays in the success of the business?**
Answer	

Comments	
Research Question 2	**How does the evaluation of new technological innovations affect the adoption of new technologies in SMMEs?**
Objective	**To understand how SMMEs determine technologies suited for the business and find a process to assist SMMEs to evaluate the business potential of new technologies.**
Sub-question 2.1	**How can SMMEs evaluate the business potential of new technologies?**
Q.1	**How do you identify new technology with business potential that is applicable and adaptable to the business?**
Answer	
Comments	
Sub-question 2.1	**How can SMMEs evaluate the business potential of new technologies?**
Q.2	**What functions (aspect) of the new technology will you be interested in evaluating for the business?**
Answer	
Comments	
Research Question 2	**How does the evaluation of new technological innovations affect the adoption of new technologies in SMMEs?**
Objective	**To explore the significance and contribution of the evaluation process towards decision making on adoption of new technologies.**
Sub-question 2.2	**How does the evaluation of new technology affect the decision-making of new technology in SMMEs?**

Q.1	**How do you make decisions on new technology to adopt for the business?**
Answer	
Comments	
Sub-question 2.2	**How does the evaluation of new technology affect the decision-making of new technology in SMMEs?**
Q.2	**What are the major evaluation factors that influence the choice of new technology for the business?**
Answer	
Comments	
Research Question 2	**How does the evaluation of new technological innovations affect the adoption of new technologies in SMMEs?**
Objective	**To determine how the sustainability and development of SMMEs are influenced by the evaluation and adoption of new technology.**
Sub-question 2.3	**How does evaluation and adoption of new technology affect SMMEs' sustainability and viability of their business interest?**
Q.1	**What are the potential benefits and advantages that evaluation of new technology might have on the business?**
Answer	
Comments	

Sub-question 2.3	**How does evaluation and adoption of new technology affect SMMEs' sustainability and viability of their business interest?**
Q.2	**How can SMMEs leverage evaluation of new technology as a tool for the growth of the business?**
Answer	
Comments	
Sub-question 1.4	**What is the role of government in actively facilitating and engaging SMMEs proactively in the evaluation and adoption process of new technology?**
Objective	**Establish the role government plays as a stakeholder in providing support and assistance to promote active participation in evaluation and adoption of new technology by SMMEs.**
Q.1	**Does the government play an active role in facilitating the adoption process of new technology by SMMEs?**
Answer	
Comments	
Sub-question 1.4	**What is the role of government in actively facilitating and engaging SMMEs proactively in the evaluation and adoption process of new technology?**
Q.2	**What effect do government policies have on creating a technology-oriented and friendly environment to boost the adoption rate amongst SMMEs?**
Answers	

Comments	
Sub-question 1.4	**What is the role of government in actively facilitating and engaging SMMEs proactively in the evaluation and adoption process of new technology?**
Q.3	**How can the government provide an active, assisting and enabling platform for evaluation and adoption of new technology by businesses?**
Answers	
Comments	
Sub-question 1.4	**What is the role of government in actively facilitating and engaging SMMEs proactively in the evaluation and adoption process of new technology?**
Q.4	**Is there a need for increased government participation in the evaluation and adoption of new technology by SMMEs?**
Answers	
Comments	

ANNEXURE D: LIME SURVEY QUESTIONNAIRES

Evaluation and adoption of new ICT innovation by SMMEs in Cape Town, South Africa

Welcome to this sample survey

You should have a great time doing this

A note on privacy

This survey is anonymous.

This research seeks to explore the reasons behind the failures of SMMEs to evaluate the potential of new technology innovations. In terms of the findings, a set of ICT evaluation and adoption guidelines for the successful evaluation for/and adoption of new technology innovations in SMMEs will be proposed.

The study will enable the researcher to:

- Gain insight into the barriers and other unidentified factors that affect and inhibit evaluation and adoption in SMMEs.
- Explore the contribution and impact of the evaluation process before adopting new technologies.
- Determine how SMMEs adopting the new technology evaluate the new technology.
- Understand the perceptions and challenges of SMME managers concerning new word missing here.
- Propose an adoptable process to assist SMMEs to evaluate the business potential of new technologies.

SMMEs are one of the few options that we have left in South Africa to create and maintain jobs. It is important that SMMEs utilise technology innovation in their businesses for growth and development. For some reason this seems not to be happening as it should be. Your contribution and participation in the research will be highly appreciated.

The identities and other personal information of the participants will not be disclosed, and no information collected will be accessible beyond the immediate researchers involved.

By completing this survey, the participant acknowledges his or her informed consent as related to the study**.**

There are 50 questions in this survey

SECTION 1

PERSONAL AND BUSINESS DETAILS

PLEASE COMPLETE THE FOLLOWING: (Name is optional)

1. NAME

Please write your answer here:

2. ORGANISATION *

Please write your answer here:

3. POSITION *

Please write your answer here:

4. E-MAIL ADDRESS *

Please write your answer here:

SECTION 2

BUSINESS, ADOPTION AND EVALUATION OF NEW TECHNOLOGY (CONTRIBUTING FACTORS)

Please select one answer only for each question

5. There are certain environmental factors that can affect the dynamics of the business process.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

6. Factors that affect the business process can be of economic, political, cultural, organisational and social nature.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

7. Business managers often lack adequate knowledge of these factors, which can consequently affect the business process.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

8. These factors can constitute some form of business challenges to SMMEs in terms of decision-making for the business.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

9. Some of these factors can actively play a role in inhibiting the adoption of new technology by SMMEs.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

10. SMMEs can overcome the challenges posed by these factors with the right information.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

11. SMMEs find it challenging to adopt new technology for the business due to factors surrounding evaluation and adoption of the new technology.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

12. SMMEs should take certain strategic steps to adopt new technology for the business.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

13. SMMEs can lose the opportunity to gain competitive advantage and leverage of the potential of the new technology when failing to adopt.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

14. Adoption of new technology is often an impulsive action taken by SMMEs owners/ managers because of their personal interest in and preference of it.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

15. SMMEs are slow to adopt new technology for the business because of their lack of knowledge of and non-evaluation of new potential technology.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

16. SMMEs should access relevant information regarding the functionality of new technologies and its potential to the business.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

17. SMMEs are obliged to identify new technology with potential that is available for their business.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

18. SMMEs can adopt any type of new technology with little consideration of the factors surrounding the business.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

19. Evaluation is a process seldom carried out on new technologies before adopting in successful business organisations.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

20. SMMEs can enhance viability and sustainable growth of their business by waiting for competitors to evaluate and introduce new technologies to their advantage, before introducing new technology for the business.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree

- Other

21. SMMEs should evaluate the dynamics and potential of new technology identified for the business.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

22. SMMEs should have a standard system of evaluation and practice operational in the organisation.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

23. Evaluation should include measuring the characteristics, features and functionality of the new technology as well as its potential effect on the business.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

24. Evaluation factors can be considered relative and vastly ignored when it comes to major decision making in the business.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree

- Strongly Disagree
- Other

25. Cost benefit analysis and returns on investment should be the only evaluation factors to consider when making a decision on adoption/non-adoption.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

26. Sustainability, potential risk involved, predictability of the new technology, integration and management are less important evaluation factors to consider when adopting new technology.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

27. Business potential and benefits should be measured and weighed alongside the unpredictability, sustainability and risk elements of the new technology before making decisions on adoption.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

SECTION 3

ROLE, IMPACT AND ADVANTAGES OF EVALUATION

28. Evaluation shows a broad overview, identifying the relationships and highlighting all major and important inter-relation of the dynamics and attributes of a subject or object.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

29. Evaluation can play a major influential role in creating intention to adopt new technology for the business by showing the potential benefits and risks involved.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

30. Evaluation can have a positively direct impact on an individual's perceived usefulness and ease of use of a new technology.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

31. One can describe evaluation as the most important function in the adoption process of new technology for the business.

Please choose any answer that applies:

- Strongly Agree
- Agree

- Uncertain
- Disagree
- Strongly Disagree
- Other

32. SMMEs should evaluate the adaptability, applicability, compatibility, capability and suitability of a new technology for the business before adoption.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

33. SMMEs do not need a good evaluation system and practice to be able to make good strategically informed decisions on the implementation, integration and management of the new technology.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

34. Predictability and forecasting attributes of the technology can help SMMEs achieve a great degree of stability and future projection.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

35. SMMEs do not have good existing evaluation practice to sufficiently evaluate the potential of new technology available for the business.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

36. Failure to evaluate business potential and functionality of new technology can limit the potential to adopt new technology.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

37. SMMEs are largely failing due to the fact that they often do not make decisions to evaluate and adopt new potential and advantageous technology to improve their business.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

38. Successful yield on returns on investment can depend largely on a proper evaluation procedure carried out on the new technology.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

39. New technology can simply be adopted for the business without evaluating its capability and applicability, because it has no significant effect or implications on the choice for the business.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

40. SMMEs are prone to various risks and face prolonged uncertainty when a new technology is introduced without proper evaluation carried out.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

41. Evaluation can bring about reduction in cost of implementation, integration and management of technology adopted, from cost that hitherto would have been accumulated by not evaluating and understanding its functionality prior to adoption.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

42. Evaluation and adoption of new technology can be the key to SMMEs gaining a competitive advantage in their market.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

43. SMMEs that fail to evaluate new technology may lose the opportunity to gain new knowledge such as the potential of the new technology applicable to the business.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

44. Evaluation of new technology can ensure better implementation, integration and continuing management and support for the new technology adopted for the business.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

45. Good evaluation practice culture among SMMEs can increase the adoption rate across SMMEs and boost their development and contribution to the economy.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

46. Government plays an active role in facilitating the adoption process of new technology by SMMEs.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

47. Government policies are technology-oriented and friendly, which does boosts the adoption rate of SMMEs across the country.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

48. It can be said that Government provides an active, assistive and enabling platform for evaluation and adoption of new technology by businesses.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

49. Government can assist SMMEs by identifying and introducing them to innovative new technologies which are potentially beneficial to the business.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

50. As a beneficiary of the benefits of adoption of new technology by SMMEs, there is need for increased government participation in the evaluation and adoption of new technology by SMMEs.

Please choose any answer that applies:

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree
- Other

Thank you for taking the time to assist us in this important research project.

The contribution of this research will potentially lead to an increase in the levels of evaluation and adoption of new technology by SMMEs. With proper evaluation and implementation procedures of new technology comes a visibly effective and efficient IT system in the SMME industry in the future. This study will help to improve our understanding of the dynamics surrounding the evaluation and adoption of new technology by SMMEs from their unique and different understanding and perception of new technology. Feedback on the research study will be made available to the participants to increase their knowledge of the subject matter and provide help in future decision making regarding new technology.

Submit your survey.
Thank you for completing this survey.

ANNEXURE E: SMME TABLES

Table 1: List of SMME Support Programmes in South Africa (UCS, 2011:39)

Programme category	Number
Key national support programmes	4
Business competitions and awards	5
Credit indemnities/guarantee	2
Exhibitions	3
Export development	2
Finance – national	9
Finance – youth	1
Finance – women	3
Finance – provincial [26]	8
Incentives and grants	5
Incubation	22
Industry – specific programmes	5
Linkage & Partnerships	2
Mentorship	2
Networking	1
Other support programmes	3
Premises	1
Technology advice and transfer	5
Industry specific support	2
Training and technical assistance	5
Venture capital	1
Women enterprise programs	3
Total	90

Table 2: Classification of Small, Micro and Medium Enterprises (UCS, 2011:91)

Sectors or sub-sectors in accordance with the Standard Industrial Classification (SIC)	Site or Class	Total full-time equivalent of paid employees (Less than)	Total annual turnover (Rm) (Less than)	Total gross asset value (fixed property excluded) (Rm) (Less than)
Agriculture	Medium	100	5.00	5.00
	Small	50	3.00	3.00
	Very small	10	0.50	0.50
	Micro	5	0.20	0.10
Mining and Quarrying	Medium	200	39.00	23.00
	Small	50	10.00	6.00
	Very small	20	4.00	2.00
	Micro	5	0.20	0.10
Manufacturing	Medium	200	51.00	19.00
	Small	50	13.00	5.00
	Very small	20	52.00	2.00
	Micro	5	0.20	0.10
Electricity, Gas and Water	Medium	200	51.00	19.00
	Small	50	13.00	5.00
	Very small	20	5.10	1.90
	Micro	5	0.20	0.10
Construction	Medium	200	26.00	5.00
	Small	50	6.00	1.00
	Very small	20	3.00	0.50
	Micro	5	0.20	0.10
Retail and Motor Trade and Repair Services	Medium	200	39.00	6.00
	Small	50	19.00	3.00
	Very small	20	4.00	0.60
	Micro	5	0.20	0.10
Wholesale Trade, Commercial Agents and Allied services	Medium	200	64.00	10.00
	Small	50	32.00	5.00
	Very small	20	6.00	0.60
	Micro	5	0.20	0.10
Catering, Accommodation and Other Trade	Medium	200	13.00	3.00
	Small	50	6.00	1.00
	Very small	20	5.10	1.90
	Micro	5	0.20	0.10
Transport, Storage and Communications	Medium	200	26.00	6.00
	Small	50	13.00	3.00
	Very small	20	3.00	0.60
	Micro	5	0.20	0.10
Finance and Business Services	Medium	200	26.00	5.00
	Small	50	13.00	3.00
	Very small	20	3.00	0.50
	Micro	5	0.20	0.10
Community, Social and Personal Services	Medium	200	13.00	6.00
	Small	50	6.00	3.00
	Very small	20	1.00	0.60
	Micro	5	0.20	0.10

Table 3: DTI Performance Information on **SEDA AND STP Support Goals and Target for 2012/2013 (DTI, 2013:50)**

Goal: Facilitate broad-based economic participation through targeted interventions to achieve more inclusive growth						
Output	Performance Measure/ Indicator	Baseline (2011/12)	Actual Performance against Target		Deviation from planned target	Comment on variance
			Target	Actual		
seda Technology Programme (**stp**)	Number of new incubators established	34 (total)	4	8	4	Availability of additional funding enabled **seda** to establish four more incubators
seda Technology Programme (**stp**)	Number of SMMEs supported (Incubation, Quality and Technology Transfer)	33	842	1 514	672	Availability of additional funding enabled **seda** to support more SMMEs
	Number of SMMEs approved for assistance	295	268	376	108	The portfolio and operations of TBCs has expanded and resulted in over achievement by centres
Recommendation for the SMME Review Report implemented	Approved Action Plan emanating from the SMME Review Report implemented	A final review report was presented to the Select Committee of International Relations and Co-ordination and Trade and Industry	Approved Action Plan emanating from the SMME Review Report	Draft Action Plan developed	Approval of Action Plan not obtained	Approval will be obtained in 2013/14, however, some of the actions in the Draft Action Plan such as the ISP are already being implemented

ANNEXURE F: COLLABORATION LETTER WITH CHAMBER OF COMMERCE

CAPE CHAMBER
OF COMMERCE AND INDUSTRY

14 November 2012

Student Name: A. Afolayan

Agreement between Cape Chamber of Commerce and Industry

and Cape Peninsula University of Technology

Research by Master's Student in collaboration with the Cape Chamber of Commerce and Industry

1. A signed document in place that the information cannot be used by third parties out of the research.
2. The Chamber will be informing its members of the partnership and inform them that they will be contacted by the specific researcher (s).
3. The Student will supply the Chamber with a 50 words on the research and the Chamber will send out an email introducing the research project.
4. On completion, the findings will be shared with the Chamber.

.....

A. Afolayan
Student

.....

A de la Harpe (Dr)
Supervisor

.....

M J Thomas-Johnson
Cape Chamber of Commerce and Industry

ANNEXURE H: SUMMARY OF SURVEY RESPONSES

Summary of survey responses under each category

Sub-question 1.1: Serves to identify existing factors that affect the business process and adoption capability of SMMEs of potentially advantageous technology.

Table 1: Summary of category showing factors in business affecting SMMEs adoption capacity of new technology

Category	Sub-question 1.1	Respondents summary
Factors in business affecting SMMEs' adoption capacity	What are the factors that influence the evaluation, and adoption of new technology by SMMEs?	All but one of the 22 respondents agreed that there were factors in the environment that affect the business; all agreed that the factors came in different forms of economic, political, cultural, organisational and social nature in the business environment; 21 respondents agreed that managers often lack knowledge of the factors affecting their business process while one disagreed; 19 respondents agreed that these factors could hinder the adoption of new technology with 2 of them uncertain about it; 21 respondents believed that with the right information and knowledge, SMMEs can overcome the adoption challenges while 1 respondent was uncertain of his position.

Sub-question 1.2: Aimed at uncovering the understanding of respondents on how the evaluation process of a new technology is carried out in the business world.

Table 2: Summary of category showing how the evaluation process of a new technology with business value potential is initiated within the businesses

Category	Sub-question 1.2	Respondents summary
How evaluation of new technology is done in business	How do SMMEs initiate evaluation in the process of adopting new technology in business?	20 respondents agreed that SMMEs should take certain strategic steps to facilitate adoption of new technology for the business, while 2 were uncertain; all respondents were in agreement of SMMEs accessing relevant information on the functionality and business potential of the new technology to the business; 4 respondents believe business factors do not matter when adopting a new technology, 16 of the respondents differed on the premise that business factors can be ignored, while 2 were uncertain; there was a close divide on the premise

Category	Sub-question 1.2	Respondents summary
		that evaluation is not necessarily carried out in big organisations when adopting new technology, 11 of the respondents agree with this, 7 disagreed, while 4 were uncertain about their positions; all respondents agreed that SMMEs should evaluate the dynamics and potential of a newly identified technology for the business; two thirds of the respondents (14) believed there is a need for a standard evaluation practice in small businesses, 5 were uncertain of the need while 3 were against it.

Sub-question 1.3: Aimed at understanding the major challenges and issues surrounding evaluation and adoption of new technology from the perspective of the respondents.

Table 3: Summary of category showing issues and understanding of evaluation and adoption of new technology in SMMEs by their owners and managers

Category	Sub-question 1.3	Respondents Summary
Evaluation and adoption issues of new technology in SMMEs	What are the perceptions of SMME managers of new technology evaluation?	A majority of 20 respondents agreed that SMMEs are slow to adopt new technology for the business because they do not evaluate and they lack knowledge of its potential for the business, 2 respondents remained uncertain; 15 respondents believed SMMEs do not possess a good evaluation practice to properly evaluate business potential of new technology, 5 were uncertain of their position, 1 disagreed while 1 one other gave an erroneous comment; 2 respondents believed SMMEs do not need a good system of evaluation to make informed strategic decisions on the adoption process, implementation, integration and management of the new technology, 2 were uncertain while 17 disagreed, 1 erroneous comment was made; 20 respondents agreed that SMMEs are liable to lose competitive advantage in business and the ability to leverage the new technology potential for the business when they fail to evaluate and adopt new technology, 1 was uncertain about this, while another 1 disagreed; 11 of the respondents agreed to the premise that managers and owners adopt new technology on impulse which is not necessarily due to business needs but rather their personal interest in it, a total of 7 were not certain of their take on this, while 4 disagreed; 17 respondents agreed to the notion that evaluation is the key function in the adoption process of

Category	Sub-question 1.3	Respondents Summary
		new technology for the business, 2 were uncertain on where they stand with this, 2 disagreed, while 1 other commented in agreement that “OF COURSE one can, but DOES one?”

Sub-question 1.4: Aimed at determining the knowledge of and disposition of respondents to the role government plays in facilitating the evaluation and adoption of new technology by SMMEs.

Table 4: Summary of category determining the impact of government support and the role government plays in the process of evaluation and adoption of new technology by SMMEs

Category	Sub-question 1.4	Respondents Summary
Government role in the evaluation and adoption of new technology in the SMME sector	What is the role of government in actively facilitating and engaging SMMEs proactively in the evaluation and adoption process of new technology?	3 respondents agreed that government plays an active role in the adoption process of new technology by SMMEs, 3 were of an uncertain disposition, while 15 respondents disagreed and one comment was made in error; 7 respondents were uncertain if government policies were technology friendly and able to boost the adoption rate amongst SMMEs nationwide, 15 of the respondents disagreed with this premise, one comment was made in error, while there was no agreement on this; on the notion that government provides and actively assisting and enabling platform for evaluation and adoption processes in business, 1 respondent was in agreement, 4 were uncertain of any such provisions, while 16 respondents disagreed, and one comment was erroneously made; 15 respondents believed that government can assist SMMEs by providing access to information about new innovative technologies with potential benefit to the business, 3 respondents were uncertain of this proposition, 3 disagreed, while one error was recorded in the comment; 17 respondents believed that has beneficiaries of the positive impact of SMMEs on the economy, government should be more involved in the process of evaluation and adoption of new technology beneficial to the growth and viability of the business.

Sub-question 2.1: Aimed at determining the knowledge respondents have of the steps to take when identifying business potential in the evaluation process of a new technology.

Table 5: Summary of category showing the understanding of the respondents on the evaluation process and procedures in identifying technologies with business potential

Category	Sub-question 2.1	Respondents Summary
Evaluation and new technology adoption process	How can SMMEs evaluate the business potential of a new technology?	15 respondents believed SMMEs should identify new technologies with business potential available for their business, 4 of the respondents were uncertain about this, while 3 disagreed; a majority of 21 respondents believed evaluation should measure the characteristics, functionality and features of a new technology, highlighting its potential effect on the business process, while 1 respondent was uncertain of his position; 6 of the respondent though cost benefit analysis and return on investment should be the only considerations for decision on adoption or rejection of a new technology, 1 was uncertain of this stand, while 15 respondents disagreed; 4 of the respondents agreed that sustainability, potential risk factor, predictability function are less important considerations when adopting a new technology for the business, 1 was uncertain of it, while a number of 17 respondents were in disagreement; a majority of 20 respondents affirmatively agreed that SMMEs should evaluate the adaptability, applicability, compatibility and the capability in determining the suitability of a new technology for the business before adopting it, 1 of the respondent disagreed, while the other made an improper comment about it; 16 of the respondents believe that the ability to predict and forecast the performance of a new technology can help bring stability to the future of the business, 4 were uncertain about this claim, 1 disagreed with it, while 1 other made an erroneous comment.

Sub-question 2.2: Aims at determining if the respondents understand the impact evaluation could have on their decision making, particularly when it comes to the choice of a new technology with potential for the business.

Table 6: Summary of category showing how the evaluation process of new technology impacts the decision made and choice of new technology

Category	Sub-question 2.2	Respondents Summary
Effect and impact of evaluation on decision making in new technology adoption process	How does the evaluation of new technology affect the decision-making of new technology in SMMEs?	A majority which includes 20 respondents agreed that evaluation plays a major influential role by showing the potential, risks and benefits of a new technology which helps to create an intention towards the adoption of new technology, 1 respondent disagreed, while the other made a comment that **"**Of course it CAN! But does it?"; 20 respondents were of the believe that an evaluation process has a direct positive impact on the individual's perceived usefulness and ease of use of a new technology, 1 respondent disagreed, while the other made an erroneous input; 6 respondents agreed that factors of evaluation can be largely ignored when making a major decision about the business, 6 others were non-committal in their response, while 10 respondents disagreed with such a notion; 21 of the respondents agreed that failure to evaluate the business potential and function of a new technology limits the ability and potential to adopt if for the business, 1 respondent made an erroneous comment; 19 of the respondents believed that for a successful return and yield on investment, a proper evaluation of the new technology must have been made, 1 respondent was uncertain of this, 1 disagreed, while the other comment was an error; on the premise that SMMEs are failing largely due to a low number of evaluation and adoption of new technology with potential to improve their business, 12 respondents agreed with this, 4 were uncertain of their position, another 4 disagreed, 1 comment was made in error, while the other comment asked the question "What about Cash Flow?"

Sub-question 2.3: Aimed at discovering the knowledge of the respondents about the impact of evaluation and adoption of new technology on the business process and sustainability of the business over the years.

Table 7: Summary of category showing the advantages and benefits of evaluating a new technology, how the evaluation and adoption of new technology contributes to the business acumen and development to foster its growth and long-term viability

Category	Sub-question 2.3	Respondents Summary
Potential benefits and advantages associated with the evaluation of new technology	How does the evaluation and adoption of new technology affect the SMMEs' viability and sustainability of their business interest?	19 respondents believe that evaluation and adoption of new technology is key to gaining a competitive advantage over their competitors in the market place, 1 respondent was uncertain about this, 1 respondent disagreed, while the other made an erroneous input; 21 respondents agreed that cost which could have arose from non-evaluation and not understanding the functions of a technology adopted when implementing and integrating the technology into the system, can be saved when evaluation is properly done and the new technology is managed accordingly, while 1 error was made in the comment; 21 responded in agreement that SMMEs are in danger of losing knowledge about the potential of a new technology applicable to their business when they fail to evaluate the new technology; 1 comment was made in error; 21 respondents believed that evaluation ensures proper implementation, integration and management of the new technology to the existing business process or a new one, while one comment was made in error; a majority of 20 respondents believed that SMMEs are open to risk and liable to uncertainty when a new technology is adopted without proper evaluation done on it, 1 respondent disagreed and the other made erroneous comments; 20 respondents agreed that good practice and culture of evaluation amongst SMMEs will bring about an increased rate of adoption of new technology which helps to boost development, growth and survival, consequently leading to increased contribution to the economy, 1 respondent was uncertain while the other made an erroneous comment.

ANNEXURE I: CATEGORY OUTLINE

Category Label	C 1	C 2	C 3	C 4	C 5	C 6	C 7	C 8	C 9	C 10	C 11	C 12	C 13	C 14	C 15	Freq. count	No of Org.
New technology suitability	6		9	2	7	2	8	2	6	3	3	3	2	3	1	**57**	**14**
Technology potentials	7	1	2	2	4	1	2	5	3	3		3	1	1	1	**36**	**14**
Role of evaluation	4		2	4	2	1	2	2			1		2	1		**21**	**10**
Research new technology	1		2	3			2	3	1	3	2		1			**18**	**9**
Evaluation tool							1	1	1	1	2	1	1	1	1	**10**	**8**
Integration				1	1	1										**3**	**3**
Accessible information	3	8	5	3	6	4	2	3	2	1	3	2	1	3	3	**49**	**15**
Government policy	1	4	1	2	2		10	2	4	3	3	2	4	1	3	**42**	**14**
Business needs	2		2	3		1	1	1	1	2		3	1	1	1	**19**	**12**
Skills training and experience	4	2	3	1	1			1	1					1		**14**	**8**
Technology infrastructure	1	1	3	2			2	1	1	2	2	1	2	2	1	**21**	**13**
Non-evaluation		1	4		1	2		1	1		2			2		**14**	**8**
Uninformed decision		2	3	3	1	3	2	2	2		3	5		1	2	**29**	**12**
Cost of adoption	3	2	1				1	1	4	2			1	1		**16**	**9**
Cost of compliance										1	1	2	1		1	**6**	**5**
Cost of technology support		2		1									1			**4**	**3**
Business value added	4	4		1	1	1	5	1	2	4	2		3	5		**33**	**12**
Risk and uncertainty	1	1	3	1	6		1		1		2	1	1	1		**19**	**11**
Competitive advantage			2			1	3	2	1	3					1	**13**	**8**
Technology market		1		1		1		2				1		1		**7**	**6**
Resistance to change				1					2			1		1		**5**	**4**
GRAND TOTAL	**37**	**29**	**42**	**31**	**32**	**18**	**42**	**30**	**33**	**28**	**26**	**25**	**22**	**26**	**15**	**436**	

ANNEXURE J: INTERVIEW QUESTIONS

1.1.1 What is new (ICT innovation) technology to you?

1.1.2 What type of new technology is applicable to your business?

1.1.3 What are the difficulties experienced with/in the process of acquiring a new technology?

1.1.4 How do you get knowledge of new technology available for the business?

1.1.5 What steps would you take to acquire the use of new technology for the business?

1.1.6 What do you understand by the term evaluation of new technology and its process?

1.1.7 What role do you think evaluation of new technology play in the success of the business?

2.1.1 How do you identify new technology with business potential that is applicable and adaptable for the business?

2.1.2 What functions (aspect) of the new technology will you be interested in evaluating for the business?

2.1.3 How do you make decisions on new technology to adopt for the business?

2.1.4 What are the major evaluation factors that influence the choice of new technology for the business?

2.1.5 What are the potential benefits and advantages evaluation of new technology might have on the business?

2.1.6 How can SMMEs leverage evaluation of new technology as a tool for the growth of the business?

3.1 Does the government play an active role in facilitating the adoption process of new technology by SMMEs?

3.2 What effect do government policies have on creating a technology-oriented and friendly environment to boost adoption rate amongst SMMEs?

3.3 How can the government provide an active, assistive and enabling platform for evaluation and adoption of new technology by businesses?

3.4 Is there a need for increased government participation in the evaluation and adoption of new technology by SMMEs?