

Analysing ICT Investment by Micro-enterprises in the Western Cape

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ABSTRACT

Micro-enterprises solve many socio-economic issues facing developing nations because of their large contribution to economic development and progress. Micro-enterprises have been influenced by the continued globalisation, digitisation and modernisation of business practices. As a result, micro-enterprises' are investing in Information and Communication Technologies (ICT) to enhance enterprise and economic growth, performance, productivity and a competitive advantage. However, the benefits of these investments are not always realised, often because of the ad hoc nature in which micro-enterprises function and a lack of formalised methods and strategy. When these are not realised, micro-enterprise suffer in terms of competitiveness, performance and returns.

Maturity models, are tools that help solve issues relating to an enterprise's current status in terms of its capabilities and resources, and how these issues can be improved. Maturity models may present the ideal solution for micro-enterprise to invest in ICT. Larger enterprises have been able to use maturity models for strategic ICT investments realising benefits. The benefits of using maturity models as a guide to ICT investment include: saving on long-term operational and tactical costs, self-evaluation and linking business and ICT strategy among others.

This research sought to determine how micro-enterprises in the Western Cape can use a maturity model in planning strategy for investments in ICT. Data was gathered from micro-enterprises and their stakeholders to find the best maturity model fit. These model fitness considered the entire internal and external environmental factors influencing micro-enterprise ICT investment decision-making.

The research investigated micro-enterprises, their current practices, focus and strategic, tactical and operational behaviour in terms of business and ICT. Of the 34 micro-enterprises that took part, most them knew of the concept of growth and maturity of the enterprise, they used none discernable metric to measure their internal and external activities regarding ICT investment. It highlighted the alignment of business and ICT as a major issue that needed to be addressed in order for micro-enterprises to be competitive, improve performance and returns. The recommended model from

the research provides a formalised process that covers both the micro-enterprises internal and external matrices when deciding on the ICT investment to be made.

KEYWORDS

Maturity Model

Strategy

Information and Communication Technology (ICT)

ICT Investment

Micro-enterprise

Capability Maturity Model Integration

Dynamic Capabilities

Resource-based View (RBV)

Decision Process



DECLARATION

I declare that “***Analysing ICT Investment by Micro-enterprises in the Western Cape***” is my own work, that it has not been submitted before for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged as complete references.

Nkazimlo Miti : _____

Date : _____



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Abbreviations

ACRONYM	DESCRIPTION
BII	Business Innovation Institute
CBIS	Computer Based Information Systems
CEI	Centre for Entrepreneurship and Innovation
CMM	Capability Maturity Model
CMMI	Capability Maturity Model Integration
ICT	Information and Communication Technology
IS&T	Information Systems and Technology
ISP	Internet Service Provider
IT	Information Technology
IVI	Innovation Value Institute
QDA	Qualitative Data Analysis
RBV	Resource-based View
SLA	Service Level Agreement
SME	Small to Medium Enterprise
SMME	Small Medium and Micro-Enterprise



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Chapter One: Introduction to the Research

1. Introduction and background

The number of Small, Medium and Micro-Enterprises (SMMEs) has grown in the last two decades, which has increased business activity in various industries and markets and also contributed to economic growth (Jamali, Lund-Thomsen and Jeppesen, 2017). Many countries have seen an increase in SMMEs entering the market and competing in industries that were seen to only favour larger enterprises (Kuivalainen, Sundqvist and Saarenketo, 2013).

SMMEs have been able to fill gaps in the market and industry that were undefined, unrecognisable, and immeasurable in the past because of their size, their capabilities and their flexibility (Kreiser et al., 2013; Kuivalainen et al., 2013; Love and Roper, 2015). These characteristics enable SMMEs to adapt and adopt practices and business models specific to the need and preference of the market with little need for drastic overhaul of their current practices and business models (Kreiser et al., 2013; Dutot, Bergeron and Raymond, 2014). These abilities have led to national institutions celebrating and heralding SMME's as the future of the nation's economies and success of the markets and industries. In addition, there has been an increase in investments in SMMEs (Love and Roper, 2015) that include subsidies from governments, and research from tertiary and research institutions that can support their prolonged growth and success (Dutot and Raymond, 2014; Pauli, 2015).

In developing countries, SMMEs are seen as an alternative way of job creation and improving the standard of life for society and citizens (Jamali, Lund-Thomsen and Khara, 2015). In addition, SMMEs are also the alternative to increased competition, increase in services and products produced and the improvement quality of those services and products (Damaskopoulos, Gatautis and Vitkauskaitė, 2008).

Information and Communication Technology (ICT) has given rise to a whole new breed of SMMEs (Paul Jones Dr et al., 2013) that are able to compete in industries and markets that were once monopolised by large and medium enterprises (Charbonneau and Menon, 2013). These SMMEs do not require large incentives and investments to

be conceived, nor do they require prolonged strategic planning and resourcing to be a force in the market (Gelinas and Bigras, 2004; Holátová and Monika, 2013). SMMEs are therefore using ICT in ways that large enterprises could not in terms of speed and precision (Březinová, 2013; Holátová and Monika, 2013).

However, with the continued rise and evolution of these SMMEs, ICT has continued to transform at a pace most SMMEs cannot adapt to (Van de Vrande et al., 2009) in order to maintain and control the opportunities that the continued transformation of ICT presented (Massa and Testa, 2008). SMMEs' survival amidst the changes that occur in technology is dependent on the strategies that they follow (Jones et al., 2014) as ICT has proven, in many instances, to be the bane of an enterprise that does not leverage it strategically (Tan and Eze, 2013). This calls for awareness of the influence ICT has over the future success of SMMEs that also include the need for research and development, strategy and planning on the market and industry as well as on the use of ICT (Tan and Eze, 2013; Adeniran and Johnston, 2014).

Indeed, SMMEs have been known for their ad hoc and informal approach to strategy concerning their business and technology investment practices (Bamiatzi and Kirchmaier, 2014; Jones et al., 2014). Many of the available strategies are geared toward medium to large enterprises which present the ideal capabilities and resources to support and implement these strategies (Hagen et al., 2012; Parnell, 2013). This, however, has changed because of the realisation that a more formalised strategy on technology is needed for survival and growth (Postma and Zwart, 2015). Researchers have also investigated strategy tools SMMEs could use to ensure their survival and growth (Verreynne, Meyer and Liesch, 2014; Postma and Zwart, 2015) (Savlovschi and Robu, 2011; Bose and Uddin, 2014).

By design, these strategies, models, methods, and procedures are draining and time-consuming because of their complexity, resources requirement and cost (Dutot, Bergeron and Raymond, 2014). To achieve success, SMMEs need strategies that are simplified, and that match their nature and structures (Choochote and Nurse, 2012; Kesting and Günzel-Jensen, 2015).

Many models have been presented for SMMEs to use in their strategic makeup that include business and IT strategies (Ab Aziz et al., 2013; Hu et al., 2015), business model frameworks (Lee, Shin and Park, 2012; Lindgren, 2012; Kesting and Günzel-Jensen, 2015) and maturity models (Depaoli and Za, 2013; Bititci et al., 2015). Some of these models have been successful for SMMEs starting up, or those re-engineering their entire business model and value propositions (Bititci et al., 2015). However, the position is different for SMMEs that are seeking to survive, grow and compete within their existing context.

For these enterprises, models exist which can be used to measure and maintain growth and development to compete. These include models similar to the Capability Maturity Model (CMM), the Information Technology –Capability Maturity Framework (IT-CMF) and the Capability Maturity Model Integration (CMMI) which were developed from the CMM (Curley, Kenneally & Carcary 2016).

Maturity models can be attributed to the structure, business and technology alignment they enable through the frameworks and practices they provide. These models are beneficial to enterprises because they allow for the measurement of the enterprises' current state by using the enterprises' processes, infrastructure and capabilities among others to determine growth and maturity (Laudon and Laudon, 2004; Donnellan and Helfert, 2010; Donnellan, Sheridan and Curry, 2011).

Unfortunately, enterprises are operating in a unique economic position. They are seeking to align their business strategy with their technology strategy. This can be attributed to these enterprises' being on the cusp of realising a new technology that can stir change in their industries and the need to reinvent themselves to stay relevant and competitive. To assist with these changes and to manage these factors for competitiveness, there is a need and an opportunity for maturity models. It thus requires a specific and simplified maturity model that is appropriate for SMMEs.

1.1 Defining Key Terms

1.1.1 Information and Communication Technology (ICT)

Information and Communication Technology (ICT) has an evolving definition as many emerging factors influence its ultimate meaning (Holtshouse 2013). ICT supports the transmitting of information in the form of texts, audio, data and images (Beckinsale and Ram, 2006; Jimenez, 2006). For this research, ICT is the hardware, software, networks, telephony, the internet and the technological infrastructure which support transmitting information and managing the enterprise (Kramer, Jenkins and Katz, 2007). Micro-enterprises consider ICT to be personal-use, for example printers and telephony, network infrastructure and internet used for communication and performing various activities within the business (Bras, Alderwereld and Verburg, 2016).

1.1.2 Investment

Investment is using goods (capital) to produce or gain other goods (Hasset, 2008). This research deals with investments in ICT to acquire and implement ICT for business related purposes and operations. The investment needs to come from the resource and capabilities available from the investor or the enterprise (Hasset, 2008; Sornarajah, 2009).



1.1.3 Capability

Capability refers to the ability and competencies required to achieve goals often through collaboration (Robeyns, 2003; Vincent, 2008). In micro-enterprises, capability is the ability for a business to network, collaborate, learn, innovate, reconfigure and decide on strategies for continuous improvement (Inan, Bititci 2015, Shenura, Haile & Negash 2016)..

1.1.4 Decision-making

Deciding is an integral part of investing in ICT. When deciding, one needs to know of the reasons and purpose for the decision (Fülöp, 2005). Considering this, this research defines decision-making as:

“... identifying and choosing alternatives based on the values and preferences of the decision maker. Making a decision implies that there are alternative choices to be considered, and in such a case we want not only to identify as many of these alternatives as possible but to choose the one that best fits with our goals, objectives, desires, values, and so on” (Harris, 1998, p. 1).

In micro-enterprises, decision-making involves choosing, among others, what business investment to make for internal growth, what ICT enablers to use in the business, and what business related path the enterprise must take – as related to its goals and vision.

1.1.5 Maturity Model

Maturity models can be defined through the knowledge gained from the capabilities and resources present in the enterprise (Becker, Knackstedt and Pöppelbuß, 2009). For this research, maturity models may be defined as: *“... artefacts which serve to solve the problems of determining a company’s status quo of its capabilities and deriving measures for improvement therefrom”* (Röglinger, Pöppelbuß and Becker, 2012, p. 2). This is the important concept of the research.

1.1.6 Micro-enterprises

Micro-enterprises are defined worldwide according to their economic impact and value (Kushnir, 2006; Ayyagari, Beck and Demirguc-Kunt, 2007). In past years, research has produced multiple criteria for defining and classifying micro-enterprises. These criteria include the number of employees, industry, assets, income, turnover and capital investment (Kushnir, 2006)..

In the South African context, the National Small Business Act 102 of 1996 and the amended Act 26 of 2004 states the following:

A “small [business] enterprise organisation’ means any entity, whether or not incorporated or registered under any law, [which consists] consisting mainly of persons carrying on small [business] enterprise concerns in any economic sector [or which has been] and established for the purpose of promoting the interests of or representing small [business] enterprise concerns, and includes any federation consisting wholly or

partly of such association, and [also] any branch of such organisation;’ (National Small Business Amendment Act 26, 2004).”

For this research, the following classification was used, under the schedule published in the National Amendment Act of 2004 (Department of Trade and Industry, 2010). This classification includes both micro and very small enterprise:



Table 1: Classification of Micro and Very Small Enterprises

Sector or subsector in accordance with the standard Industrial Classification	Size of class	The total full-time equivalent of paid employees	Total turnover	Total Gross asset value (fixed property excluded)
Agriculture	Very Small	10	R0.50m	R0.50m
	Micro	5	R0.20m	R0.20m
Mining & Quarrying	Very Small	20	R4m	R2m
	Micro	5	R0.20m	R0.10m
Manufacturing	Very Small	20	R5m	R2m
	Micro	5	R0.20m	R0.10m
Electricity, Gas & Water	Very Small	20	R5.10m	R1.90m
	Micro	5	R0.20m	R0.10m
Construction	Very Small	20	R3m	R0.50m
	Micro	5	R0.20m	R0.10m
Retail, Motor Trade & Repair Services	Very Small	20	R4m	R0.60m
	Micro	5	R0.20m	R0.10m
Wholesale trade, Commercial agents & Allied Services	Very Small	20	R6m	R0.60m
	Micro	5	R0.20m	R0.10m
Catering, Accommodation and other trade	Very Small	20	R5.10m	R1.90m
	Micro	5	R0.20m	R0.10m
Transport, Storage & Communication	Very Small	20	R3m	R0.50m
	Micro	5	R0.20m	R0.10m
Finance & Business services	Very Small	20	R3m	R0.50m
	Micro	5	R0.20m	R0.10m
Community Social & Personal Services	Very Small	20	R1m	R0.60m
	Micro	5	R0.20m	R0.10m

(Source: Department of Trade and Industry, 2010)

1.1.7 Resources

In business, resources are the things that allow the enterprise to get and maintain its competitive edge, advantage and value propositions, and its ability to innovate (Barney, 1991). These resources include the knowledge, enterprise attributes, information, and assets are of value to the firm for achieving its desired objectives (Daft and Lengel, 1983). The resources also include physical assets such as hardware, software, networks, infrastructure, knowledge, information and the human capital to support the resources. More specific to micro-enterprises, resources include; the ICT and other hardware used, people who perform the duties required by the enterprise, and the finances. These resources form part of the enterprise's internal environment (Becker, 1964; Daft and Lengel, 1983; Barney, 1991).

1.1.8 Strategy

In most organizations, strategy is one of the most important activities performed by top management (Steiner, 1979). For this research, strategy has been defined as the: *“perspective, position, plan, and pattern. Strategy is the bridge between policy or high-order goals on the one hand and tactics or concrete actions on the other. Strategy and tactics together straddle the gap between ends and means”* (Nickols, 2012, p. 1). For micro-enterprises strategy is the tactics and decisions taken to bridge the gap between the current state of the micro-enterprise and its future, envisioned state.

1.1.9 Capability Maturity Model Integration (CMMI)

The Capability Maturity Model (CMM) is a framework used developing software and related processes (Hnin Thandar et al. 2017). Over the years, the CMM has been refined and improved into the Capability Maturity Model Integration (CMMI). CMMI is used for its ability to give tangible measurement values to an organisation's processes, its improvement, software systems infrastructure development, testing and training (Laudon and Laudon, 2004; Donnellan and Helfert, 2010; Donnellan, Sheridan and Curry, 2011). These measurements and values assist an organisation in determining its maturity and readiness for growth, improvement and investments (Serrano et al. 2013). For this research, the CMMI can be defined and referred to as the model that assists an enterprise in measuring and determining its maturity in terms of its internal resources and capabilities.

1.1.10 Dynamic Capabilities

This research understands dynamic capabilities as; *“the firm ability of development, integration, coordination and deployment of operational capabilities, and it is associated with the ability of the organization to learn, change and adapt to turbulent and complex environments.”* (Wernerfelt, 1984, p. 86). In addition, dynamic capabilities include those internal and external competencies that assist the enterprise in being able to build, operate and reconfigure itself for strategic advancement (Eisenhardt, Martin 2000). Further literature is provided on Dynamic Capabilities in Chapter Two of the Literature Review section of this research.

1.1.11 Resource Based View

An enterprise has a resource based view understands that resources are those tangible and intangible things that assist the enterprise to achieve its goals, and create products and services that generate real value (Kellermanns et al. 2016). These include but are not limited to human, financial and physical resources such as technology and operational assets and infrastructure of the enterprise (Kemmerer et al. 2012).



1.2 Background to the Research

A formalised strategy can assist an enterprise in decision-making, performance management, and future ICT investments (Baird, Lyles and Orris, 1994; Ardilio and und Organisation, 2013). Most large enterprises, in particular, have been successful in their ICT investments and adoption because of their formalised strategies (Leidner, Lo and Preston, 2011; Ardilio and und Organisation, 2013). Having knowledge of an enterprise's current strategic state and its maturity could help determine the internal and external capabilities that can contribute to it investing in ICT for the success of its strategic purposes (Donnellan, Sheridan and Curry, 2011).

Most SMMEs have ad hoc strategies which make testing their maturity and capabilities difficult (Baird, Lyles and Orris, 1994; Kapurubandara and Lawson, 2007; Bednar and Welch, 2011; Kumar and Reinartz, 2012; Jones et al., 2014). Testing such ad hoc strategies presents challenges related to, among others, the origin of the strategy and

the purpose of the strategy (Baird, Lyles and Orris, 1994; Kapurubandara and Lawson, 2007; Bednar and Welch, 2011). The ad hoc strategies of SMME's have been viewed as unclear or undefined (Bednar and Welch, 2011) and often lead to mismanagement and lack awareness of the alignment between business and ICT (Chibelushi and Trigg, 2012; Kumar and Reinartz, 2012).

Maturity models have been used by business to assess and measure improvements in their competitive position, response to change and ICT alignment with business (Bititci et al. 2015). There are several maturity models that stem from the Capability Maturity Model Integration (CMMI) (De Bruin et al., 2005; Becker, Knackstedt and Pöppelbuß, 2009; Curtis, Hefley and Miller, 2009a). However, determining which maturity model best suits an enterprise continues to be a challenge. The reliability of the models is organisation-specific and often the methods and procedures for the maturity models are documented sketchily (Becker, Knackstedt and Pöppelbuß, 2009).

Most maturity model literature has focused on large enterprises which presents a dire need for focus on micro-enterprises because of their unique needs and growth ability (Jones et al., 2014). The context in which an enterprise functions is important when determining which maturity model to use (Becker, Knackstedt and Pöppelbuß, 2009; Pham, 2010; Looy et al., 2013). Maturity models have been known to generalise the realities in which they are posed (Poeppebuss et al., 2011). These maturity models can determine whether a micro-enterprise's strategy toward ICT investment is viable through examining current states of maturity versus the proposed state (Poeppebuss et al., 2011). Hence there is a need for maturity models that consider the context within which micro-enterprises function.

The Western Cape presents a conducive environment for micro-enterprises because of the local, institutional and governmental support afforded to SMME's in recent years. The support has caused an increase in micro-enterprise entering various markets and industries. Within these industries, SMMEs consider ICT investment to gain competitive advantage. Therefore, there is a need for research on micro-

enterprises to determine how they could best use a maturity model for strategic ICT investment.

1.3 Research Problem Statement

Micro-enterprises' approach to ICT investment is not always clear (Ropega, 2011) as they seem to function and invest in ICT without knowledge of their maturity or having a formalised or long-term strategic plan (Jones et al., 2014). Testing their maturity, and having a formalised strategy and implementing it could allow micro-enterprises to realise benefits linked to achieving business objectives, utilising enterprise resources and minimising and mitigating risk in investing in ICT (Gomes, Romão and Caldeira, 2013). Lack of maturity evaluation and formal strategies may lead to mismanagement, lack of effectiveness and efficiency of business and ICT (Kmieciak, Michna and Meczynska, 2012). In addition the micro-enterprises also lack understanding or awareness of business and ICT strategy, internal and external capabilities, technology investment strategy and competitive advantage (Chibelushi and Trigg, 2012). There has been limited research on maturity models for micro-enterprises in developing countries with the bulk of the research focusing on SME and large enterprises in developed nations (Barba-Sánchez, del Pilar Martínez-Ruiz and Jiménez-Zarco, 2007).

This research seeks to address the problem of micro-enterprises' lack of strategic maturity models for their ICT investments. The absence of such models has affected their decisions in investing in ICT.

1.4 Research Question

The primary research question that was addressed in this research is:

How can a maturity model be used by micro-enterprises in the Western Cape to strategically invest in ICT?

This research question will be answered through the use of additional sub-questions that helps the researcher to break down and pinpoint the different aspects involved in the primary research question (Springett and Campbell, 2006):

- *What is the current ICT environment within which micro-enterprises in South Africa operate?*
- *What are the current ICT strategies being utilised by micro-enterprises?*
- *What are the strategic methods used by micro-enterprises to invest in ICT?*
- *What is the ideal maturity model that can be integrated to micro-enterprises in the Western Cape for the purpose of strategic ICT investment?*

1.5 Research Objectives

This research seeks to determine how a maturity model can be used by micro-enterprises in the Western Cape to formulate strategy for investments in ICT.

This aim is achieved by further dividing it into objectives, namely:

- Identifying the ICT environment within which micro-enterprises in South Africa operate.
- Identifying the current ICT investments made by micro-enterprises.
- Identifying the strategic methods being used by micro-enterprises when investing in ICT.
- Determining the ideal maturity model that could be integrated into micro-enterprises in the Western Cape for the purpose of strategic ICT investment.

The aim, together with the accompanying objectives, was accomplished through the use of an in-depth analysis of the micro-enterprises and their stakeholders. Achieving the objectives ensured the primary aim of the research was accomplished.

1.6 Research Methodology

This research sought to determine and develop a maturity model that micro-enterprise can use to make strategic investments in ICT. To achieve this, data was collected from micro-enterprise stakeholders that assisted in the understanding of the micro-enterprises' internal and external resources and capabilities. Understanding their resources and capabilities enabled the researcher to determine the most appropriate model that relates to the micro-enterprises. This assisted the research in suggesting a model customised to the specific needs of the micro-enterprises.

For data collection, a structured questionnaire and interviews were used. First the structured questionnaire was distributed electronically to micro-enterprises functioning in different sectors of the economy within the Western Cape. The structured questionnaire comprised standardised questions that gauged the micro-enterprises current state, strategic practice, ICT, capabilities, and its resources. In addition, it included information regarding the research. The microenterprises were identified through SMME incubators and investment organisations that have access to a broad range of micro-enterprises that could benefit the research that was conducted.

The interviews were conducted after analysing and reviewing the structured questionnaire findings of the micro-enterprises that took part. The interviews assisted by: giving an in-depth analysis into the micro-enterprises to achieve the objectives set out in the research, and providing an understanding of the internal and external environment of the micro-enterprises, the ICT investments they make and the strategies they are using.

1.7 Significance of the Research

In the past, maturity models have been considered to only apply in large enterprises. This has allowed large enterprises to achieve competitive advantage markets that in the past were only accessible to them because of their larger resources and vast capabilities. The emergence of ICT together with varying strategies that can refine existing ones has enabled micro-enterprise to take advantage of opportunities and compete. This is because ICT enables micro-enterprises to compete in markets and economies dominated by large enterprises by expanding the current resources and capabilities available to them.

This research presents a theoretical maturity model that could cater to the needs of micro-enterprises which include: strategic guidance, ICT investment decision-making and growth tracking. This maturity model is adopted from large enterprise specific models but refined to fit micro-enterprise, with particular emphasis on resources and capabilities because of their need for alignment with ICT in the enterprise. This may enable micro-enterprises to test their maturity to make a strategic decision in their ICT investments – remaining competitive and developing and maintaining a share in the markets they function in.

Having achieved the desired maturity model and analysis of micro-enterprises in the Western Cape, this research contributes to the knowledge base of micro-enterprise strategy and micro-enterprise strategy and investments in ICT.

1.8 Scope of the Research

The research has focused on micro-enterprise ICT strategies, the role of maturity models in ICT investment. It covered the economic factors involved with ICT investment including the opportunity cost and theories associated with Real Options. A theoretical approach was taken in determining and developing the maturity model that micro-enterprises could use. The maturity model was based on the Capability Maturity Model Integration (CMMI), Resource-based View Theory (RBV) and Dynamic Capabilities Theory. The proposed maturity model that supports the findings of the data concerning the strategy formulation methods being used by micro-enterprises. The key sources of information came from the micro-enterprise stakeholders, namely the owners and management personnel and literature. The research was limited to micro-enterprises in the greater Cape Town area. These micro-enterprises were selected according to their availability; the influence ICT has on their business and their need to transform due to the industries they function in. Various micro-enterprises took part in the structured questionnaire, though the information used was only of those that consented to take part in the interviews.

The findings of the research, however, were not limited in value as similar research can be conducted in other areas to provide a greater understanding of the different contexts within which micro-enterprise function in.

1.9 Chapter Outline

This research has been divided into five Chapters.

Chapter Two comprises the Literature Review. This Literature Review is divided into sections that highlight the relevant literature that was investigated during the research. This chapter explores the micro-enterprise environment in South Africa and ICT in Micro Enterprises. This is followed by exploring maturity models in enterprises, their role in ICT investment and the use of maturity models in micro-enterprise. Micro-enterprises which shun the use of maturity models are also explored, together with the benefits of maturity models offer to micro-enterprises. This chapter is concluded by exploring the theories in practice relevant to this research. These theories are the Capability Maturity Model Integration (CMMI), the Resource –based View Theory and the Dynamic Capabilities Theory.

Chapter Three comprises the details concerning the Research Design and Methodology that were followed in completing the research. This chapter begins with a brief introduction, followed by a discussion of the research methodology, philosophical perspectives, research design used, and the content analysis technique. Chapter Four focuses on the overall analysis of the findings of the research that was conducted. It begins by introducing the chapter, followed by discussing how the structuring of the key themes produced by the research was done, and concludes by discussing the key themes.

Finally, the research concludes with Chapter Five in which conclusions are drawn and recommendations are made concerning the research and its proposed future.

Chapter Two: Literature Review

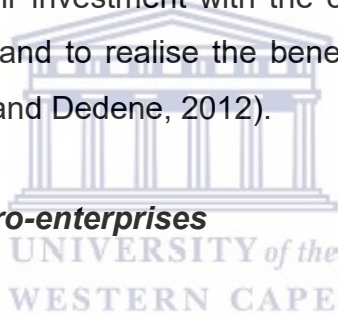
2 Introduction

Globalisation and digitisation brought about by investment and adoption of Information and Communication Technology (ICT) have changed the way enterprises do business (Borghoff and others, 2011; Cumps, Viaene and Dedene, 2012). ICT is altering, among others, the natural and financial resources, economic development, information flow and access, culture, knowledge sharing in the markets, influence of politics and government on business, and technology (Dreher, Gaston and Martens, 2008; Alexandru et al., 2007; Malapile and Keengwe, 2014).

Globalization can be defined as; *“a process of growing interaction and interdependence between economies, societies and nations across large distances.”* (NGI, 2010, p. 5). Globalisation may also be an influencing factor when ICT gives rise to a change in the national's form, organisational and individual domains (Faik and Walsham, 2013). ICT forms a huge part of the globalisation infrastructure and its occurrence further develops and expands the reach, interaction and global activity in the modernisation of countries, organisations, and society (Pieterse, 2015). The importance of ICT and its influence on the globalisation of enterprises decreases the industry sectors, and national level boundaries within which enterprises function by increasing the competition to the global scale (Borghoff, 2011).

Digitisation can be defined as the improvement of efficiency of the enterprise processes through technology (Dutta and Bilbao-Osorio, 2012). Some factors which drive digitisation are information abundance, pervasive connectivity, global supply chains, the emergence of big data, and the growth of cloud computing and perceived performance of IT during implementation (Bharadwaj et al., 2013). A greater need for IT capability, infrastructure and management also play a role in the digitisation of enterprises (Yeh, Lee and Pai, 2014) as ICT brings lots of potential for positive outcomes when implemented within an environment or organisation (Ismail, Jeffery and Van Belle, 2011; Worthington, 2014). These benefits and opportunities include: financial and cost effectiveness in delivering business objectives, improved efficiency

of business processes and practices, growth, innovation and the opportunities for competitive advantage in markets (Consoli, 2012), an increase in productivity, enabling further innovation, improved results in the performance of an organisation (Cardona, Kretschmer and Strobel, 2013), social and organisational cohesion, empowerment and self-esteem of individuals within the organisation (Gomez, Pather and Dosono, 2012). Though these benefits and opportunities are available to many enterprises, not all can capitalise on them (Bazhenova, Taratukhin and Becker, 2012). This may be because of a lack of investments that complement ICT, such as, change management, skills, and capability, research and development and organisational structure associated with human capital (Aduda, Kingoo and others, 2012). Human capital and organisational change are the most important complementary investments that need to be made together with the ICT investment (Biagi, Parisi and others, 2012). This is because they support the enterprise's ability to recognise, determine and integrate ICT (Eisenhardt, Martin 2000, Teece 2014). Enterprises investing in ICT now need to strategically align their investment with the correct level of complementary investment to be successful, and to realise the benefits associated with those ICT investments (Cumps, Viaene and Dedene, 2012).



2.1 Small Medium and Micro-enterprises

2.1.1 Defining of SMEs and Micro-enterprise

There are multiple definitions of SMMEs that adopt criteria that can be inflexible and limiting (Gibson and Van der Vaart, 2008). These criteria include using elements such as employees, revenue or turnover and assets – which are part of the internal nature of SMMEs (Rogerson 2008). In addition, SMMEs definitions have been influenced by the national strategies and policies (Gibson and Van der Vaart, 2008; Berisha Qehaja and Shiroka Pula, 2015). For example, countries have economic strategies affecting the distribution of resources such as funding and allocation of assets and investment (Gibson and Van der Vaart, 2008). The industries within which these enterprises may compete or are exposed to. Any definition of SMMEs should encompass criteria that goes beyond the internal nature of the enterprise (Berisha Qehaja and Shiroka Pula, 2015).

In this research, the SMME framework – as set out in the National Small Business Act of 1996 and 2004 and the Department of Trade and Industry (DTI) define micro-enterprises as having a turnover of less than or equal to the VAT limit of R150 000 per annum. This research classifies micro and very small enterprise as presented in Table 1. According to the Act, micro-enterprises comprise less than 10 employees, with an annual turnover of between R0.20m to R5m and a total gross asset of between R0.10m to R1m, they function independently and are run by individuals or partners who own the majority share. These enterprises often lack formality and use a maximum of 5 employees on average (Department of Trade and Industry, 2001; Abor & Quartey 2010). This is considering the different variations such as turnover, gross assets, and ownership capacity dependent on the industries and markets within which the micro-enterprises function.

Though SMMEs have been defined as having fewer resources and remuneration capability than larger enterprises, it is surprising the role they play in economy and society today. It has been estimated that SMMEs account for 90% of enterprises around the world and have created over 60% of the world's jobs (Munro, 2013; Berisha Qehaja and Shiroka Pula, 2015). In addition, SMMEs have been able to penetrate industries that were long monopolised by the larger enterprises (Smallbone, Leig and North, 1995). This is because of SMMEs ability to be flexible, and adapt to the industry and markets within which they function. This is because of SMMEs ability to be flexible and adapt to the industry and markets within which they function. This is a clear difference compared to large enterprises, in that SMMEs can change production and development which allows for a more robust competitive advantage (Zahra, Sapienza and Davidsson, 2006; Borch and Madsen, 2007).

2.1.2 The Lifecycle and Growth of SMMES

Like any organisation, SMMEs experience growth from inception and creation to expansion or collaboration (Lester, Parnell & Carraher 2003). This growth depends on the micro-enterprises making prudent decisions and investments (Nichter, Goldmark 2009). Like large enterprises, SMMEs invest when there is an opportunity for growth and development with a return on investment (Wright et al., 2015). With all that makes SMMEs special, there is little knowledge to support their exact growth patterns, in

developing nations (Navarro, Casillas and Barringer, 2012). The growth of SMMEs has been linked back to the SMMEs' internal ability the needs and opportunities they are exposed to, employment opportunities created, market share, and revenue generated among others (Davidsson, 1991; Wiklund and Shepherd, 2003; Delmar, 2006). SMME's have been seeking external guidance and advice from leading firms within their industries (Bennett and Robson, 2001). This has allowed them to gain industry perspective and adapt to compete with larger organisations (Muhammad et al., 2010).

2.1.3 Start-up to Maturity

The competition and influence from larger enterprises has instigated SMMEs to develop much faster than before by getting capital and investing in assets that may benefit the enterprise in terms of business opportunities (Muhammad et al., 2010). Compared to large enterprises, SMMEs are perceived to have a lower risk factor, due to their smaller size in operation, and also require less financial collateral and investment (Beck, Demirgüç-Kunt & Martinez Peria 2008). The lower risk factor allows them to enter markets and industries that are dominated by more established and experienced medium to larger enterprises (Pullen et al., 2009). Once in the market, the SMMEs adapt to the landscape which allow them to focus on a niche or on creating substitutes that would otherwise not have been catered for by the current competitors (Parrilli and Elola, 2012; Kramer et al., 2016). This is because many SMMEs realise that being successful in their industries and markets, a certain level of risk needs to be taken (Pullen et al., 2009). The understanding of that risk can be linked to maturity (Dobbs and Hamilton, 2007). Scott and Bruce (1987) state that an enterprises maturity is clear when it has control of its internal resources and capabilities and having formal systems and processes to manage the strategic, tactical and operational aspects of the business. Enterprises are said to be mature when they have a clear sign of their structures, process and development. This is possible because of the enterprise being aware of objectives and aligning them with their business related strategies (Kerzner, 2002; Bruin et al., 2005; Wendler, 2012).

Thus, maturity is a state in which organisations are stable, and have reached full development to where they are optimising their resources and performances in the

industries and markets within which they operate (Pham, 2010). The maturity of micro-enterprises is important because a lack of it may cause a limited ability to take advantage of opportunities that arise. This can be linked back to the lack of awareness of their internal processes and external influences (Wendler, 2012).

The growth toward maturity may be clear in the enterprises which seek additional resources in the form of personnel, assets and financing to continue to operate in the markets into which they have grown into (Wright et al., 2015). There are various growth factors that need to be considered in determining a SMMEs growth. These include among others: the internal capabilities and resources of the enterprise, and the industry or market that the enterprise operates in being the primary factor (Wright et al., 2015). A SMME can exhibit rapid growth from start-up to maturity (Wright et al., 2015). This growth will be based on profits generated from its operations, internal resources and capabilities expansion and external support in the form of a partnership sought or used in operations (Uhlener et al., 2013).

2.1.4 The Causes of SMME failure in South Africa

Though micro-enterprises may grow at high rates and reap benefits, there are also factors that may create stumbling blocks in their progress (Modimogale and Kroeze, 2009). These factors vary according to the industries and markets and the external environment which includes factors such as technology, political, economic, legal and social issues (Maria et al., 2009; Modimogale and Kroeze, 2009). There are however more general factors that are common including but not limited to a lack of formalised strategies, a lack of alignment between the business and ICT strategies and limited knowledge on how ICT can be leveraged and/or used to gain a competitive advantage (Yusuf, 2013). Other factors include insufficient resources such as infrastructure and finance and capabilities in the form of skilled personnel to perform (Gatautis et al. 2014; Tarute & Gatautis 2014).

In addition, it has been found that a lack of initiative in innovating and adopting ICT has also caused micro-enterprises to fail. This can be attributed to the enterprises' fear of change, and fear of embracing new technology (Harindranath, Dyerson and Barnes, 2008). This is often linked back to more general factors such as poor leadership and

management, lack of strategy and forecasting and the lack of skills and training among enterprise personnel (Ahmad and Seet, 2009; Ihua, 2009).

2.2 The Micro-enterprise Environment in South Africa

In South Africa, micro-enterprises create employment opportunities and promote entrepreneurship (Smit and Watkins, 2012; Cant and Wiid, 2013). They are also seen as crucial in contributing to socio-economic growth and development (Cant and Wiid, 2013) because they generate income, create jobs, ease poverty and stimulate technological progress and innovation and a competitive advantage in the industry (Adeniran and Johnston, 2014).

In South Africa, many benefits are available to micro-enterprises in the formal and informal sector. These include but are not limited to, priority in terms of investment and capital funding availability and laws and policy that enable them to operate and develop (Abor, Quartey 2010; Department of Trade and Industry, 2010). In addition, micro-enterprises have entered markets and industries that were dominated by medium to large enterprises, such as, retail, transportation and tourism among others (Department of Trade and Industry, 2010). In entering these markets and industries, micro-enterprises require resources and capabilities. These resources and capabilities can be in the form of people, infrastructure and the tools needed to leverage these together (Mary et al., 2015). Micro-enterprises in South Africa have recognised this and have invested in the resource that is most influential within their industries namely ICT (Afolayan and de la Harpe, 2015; Mary et al., 2015).

2.2.1 ICT in Micro-enterprises

Innovation and the possibilities of enhanced performance for competitive advantages are some many factors that drive micro-enterprises' adoption and investment in ICT (Dibrell, Davis and Craig, 2008). These factors are further supported by the attitudes of the enterprises and the enterprises' strategic approach toward the use of ICT as a value adding tool (Ismail, Jeffery and Van Belle, 2011). The adoption of ICT by micro-enterprises is a crucial aspect that might define the level of performance and the return on investment (Kmieciak, Michna and Meczynska, 2012).

Adoption and investment in ICT can help micro-enterprises to gain a competitive advantage in the industries and markets within which they function (Carcary, 2014) by cost savings, improved competitive positioning, enhanced infrastructure and internal capabilities (Ghobakhloo et al., 2012). This is clear in the growth seen in micro-enterprises in which use service provision and production sectors (Ismail, Jeffery and Van Belle, 2011).

Though these ICT strategies are viewed as being integral to micro-enterprises' internal and external behaviour, not all micro-enterprises can always capitalise in ICT investments. This could be attributed to external factors beyond micro-enterprises' control, such as technology and innovation, politics, the economy among others (Carcary, 2014) and internal factors that include; resource constraints, limited support from private and public sectors and infrastructure (Kapurubandara and Lawson, 2007). Adopting ICT requires that the enterprises align themselves in terms of ICT complimenting its internal capabilities and resources. This would help the enterprise realise benefits of increase in the performance and output of the enterprise (Taruté and Gatautis, 2014).

There is a need to understand how ICT influence micro-enterprises in both the short- and long-term (Consoli, 2012; Bayo-Moriones, Billón and Lera-López, 2013; Taruté and Gatautis, 2014; Taylor, 2015). This influence can be identified through the business and operational activities that the micro-enterprises perform once ICT has been adopted because ICT is an enabler of those activities (Bayo-Moriones, Billón and Lera-López, 2013; Taylor, 2015) which include:

- level of innovation and dynamic capabilities and resources that the enterprise exhibits (Yusuf, 2013);
- improved administration and management of capabilities and resources within the enterprise (Jones *et al.*, 2014); increased visibility in the markets they operate in, gather and leverage information, how they overcome traditional trade barriers as well as perform financial related transactions (Taruté and Gatautis, 2014); d) increased productivity and performance (Bayo-Moriones, Billón and Lera-López, 2013; Gatautis, Medziausiene and Tarute, 2014); and

growth in skills and knowledge that can be used to benefit the running of the business (Skoko, Ceric and Huang, 2008; Wolcott, Kamal and Qureshi, 2008). The influence of ICT on micro-enterprises can be recognised when there is evidence that there are set ICT goals, links between the ICT and the business, constant prioritisation and analysis of ICT, a set of criteria to measure ICT is in place and there are procedures and plans to sustain the alignment of IT and the business within the enterprise (Gutierrez and Serrano, 2007).

2.2.2 *Micro-enterprises Strategic ICT Investment the Decider*

ICT has become a basic resource that micro-enterprises use to function and operate in their industries and markets (Consoli, 2012). Without ICT, micro-enterprises may risk to compete and to remain relevant (Barba-Sánchez, del Pilar Martínez-Ruiz and Jiménez-Zarco, 2007). This has caused a shift in the way enterprises leverage ICT (Consoli, 2012) prompting some to re-engineer their internal structures (if any) to support the usage of ICT (Bayo-Moriones, Billón and Lera-López, 2013; Taruté and Gatautis, 2014).

Investing strategically means having a methodology for decision-making on ICT investments, and aligning that strategy with business and ICT within the enterprise. It also means, building and investing in infrastructure, internal capabilities and resources to support the use of ICT (Higón, 2012; Taruté and Gatautis, 2014). To leverage ICT successfully, it is required that micro-enterprises invest strategically according to their internal components that should be geared toward supporting those investments (Barba-Sánchez, del Pilar Martínez-Ruiz and Jiménez-Zarco, 2007). This will assist the enterprise in better aligning the ICT with its internal strengths and opportunities (Kellermanns et al. 2016).

Micro-enterprises lack resources, finances, access, capabilities and knowledge to invest in long-term projects including ICT (Jones et al., 2014). Therefore, micro-enterprises often focus on their immediate and short-term goals. This makes many micro-enterprises strategic behaviour to remain short-term, with little formalisation in the form of well thought-out, calculated and documented strategy. This has resulted in sporadic and informal ICT investments that are that are seldom linked to any

evaluation or measurement of maturity (Olawale, Garwe 2010). As a result, it is difficult for micro-enterprises to reconcile their investments with potential long-term benefits leading to waste and poor use of their meagre resources (Pham, 2010).

2.3 Maturity Models in Enterprise

A maturity model is a set of indicators, attributes, characteristics and or patterns that measure the internal and external capability of the enterprise (Caralli, Knight and Montgomery, 2012). Enterprises use maturity models to test and assess the enterprises' internal components that include business processes and structures and IT infrastructure components such as software, hardware, telecommunications and networks (Mettler, 2011). These can be viewed as methodologies that vary according to the dimensions that the enterprise is seeking to measure. These methodologies, adopted from the Capability Maturity Model (CMM) include, but are not limited to, project management, quality management, business process management, change management, strategies, information technology, enterprise architecture and supply chain among others (Lahrmann et al., 2011; Staples and Niazi, 2010; Anderson et al., 2011). Maturity models also provide levels in which an enterprise can measure its transition states against the components that are being measured. These levels are pre-defined, and an enterprise can utilise them to scale to determine: a) its current state, b) its future state its most preferred "mature state" and c) the components, capabilities and resources needed to reach the preferred level of maturity (Mettler, 2011; Caralli, Knight and Montgomery, 2012).

The table below details the levels and how they are defined in terms of the maturity of an enterprise:

Table 2: Levels in Maturity Models

Level	Description	Definition
1	Initial	(Chaotic, ad hoc) at this point, nothing is documented in the enterprise and the processes are reactionary at best.
2	Basic & Repeatable	There is a limited strategy utilised within the enterprise as well as very limited documentation. The strategies lack consistency, awareness and accountability.
3	Intermediate & Defined	Standardised metrics and practices are in place within the enterprise. Consistent documentation, as to their strategies, business practices and or processes in place.
4	Advanced & Managed	There is an alignment between business and ICT strategies and practices within the enterprise. Advanced, consistent documentation utilised and maintained.
5	Optimising	Continuous improvement and advancement. Improvements are deliberate and consistent as the enterprise has a holistic understanding of their internal and external influencers.

(Source: Curtis, Hefley & Miller 2001)

Enterprises can plot themselves strategically on the competitive landscape by understanding and utilising maturity models. This allows them to gain a perspective of their processes and business practices and how they can improve to achieve the desired vision, goal and/or aim (Looy and Van Looy, 2014).

2.3.1 Capability Components Measured for Maturity

For every maturity model, there are components against which it measures the enterprise's maturity levels. For instance, the CMMI provides components based on the discipline they implement it for. It has key components characterised as process areas, within which it contains various capability components – with Information Systems and Technology (IS&T) and various supporting resources at the core of them (Brookes and Clark, 2009; Röglinger, Pöppelbuß and Becker, 2012). These process areas include: Causal Analysis and Resolution (CAR), Configuration Management (CM), Decision Analysis and Resolution (DAR), Integrated Project Management (IPM), Measurement and Analysis (MA), Organisational Innovation and Deployment (OID), Organisational Process Definition (OPD), Organisational Process Focus (OPF), Organisational Process Performance (OPP), Organisational Training (OT), Project

Monitoring and Control (PMC), Project Planning (PP), Process and Product Quality Assurance (PPQA), Quantitative Project Management (QPM), Requirements Management (REQM) and Risk Management (RSKM) (Team, 2010).

The process areas form part of the general management practices, information and systems contained and used by the enterprise. Components may vary depending on the maturity model. For example, a CMMI based development model may have components focusing on the products, service and development to name a few (Team, 2010). Though these capabilities components have been relevant and successful when used by large enterprises, to make it easier for micro-enterprises they have been difficult for micro-enterprises to adopt.

Because of this, the CMMI was reworked to suit various disciplines, and developed into the Information Technology Capability Maturity Framework (IT-CMF) (Team, 2010; Donnellan, Sheridan and Curry, 2011). The IT-CMF developed components encompassed four critical capabilities that every enterprise should perform to reach maturation. The capabilities would simplify and replace the process areas of the original CMMI and provide capability building blocks the maturity levels of the model CMMI can characterise that. These capabilities include: managing IT like a business, managing the IT budget, managing the IT capability, and managing IT for business value (Curley, 2007; Donnellan, Sheridan and Curry, 2011).

These critical capabilities are based on IT investment and IT management geared toward creating IT assets that would improve the performance of the enterprise and therefore bring value (Carcary, 2011; Curley, Kenneally and Carcary, 2016).

The capability components consider multiple factors that make up the SMMEs internal structure with the financing capability and ROI at the core (Carcary, 2011). In essence, the critical capabilities and core components are performed with the support of IS&T Infrastructure and Support Capabilities and Resources (Curley, 2007; Team, 2007, 2010; Carcary, 2011). It is therefore important to determine which capability components are best suited to cater for the unique nature of micro-enterprises as the components cannot be the same as those identified for large enterprises.

Micro-enterprise may opt to utilise the IT-CMF or CMMI to gain a perspective of a business and how they manage the various internal components they have, and measure how those components can be improved or leveraged for competitive advantage (Staples and Niazi, 2010). ICT can be a motivator for the use of a maturity model by micro-enterprise, as ICT presents a need for strategic usage and management of resources and capabilities (Skoko, Ceric and Huang, 2008).

2.3.2 Enterprises Using Maturity Models

Enterprises in the developed countries with formalised strategies and maturity models, together with an emphasis on innovation and productivity, could realise impacts from ICT investment in the form of benefits and competitive advantage (Hall, Lotti and Mairesse, 2012). This is because the successful maturity models for ICT adoption and investment were applied in enterprises with formalised strategies in place (Leidner, Lo and Preston, 2011; Ardilio and und Organisation, 2013). Having maturity models and formalised strategy for ICT investment results in positive performance effects in enterprises as there is a roadmap against which the enterprise can measure its ICT investment (Consoli, 2012). In addition, the positive performance effects can be achieved by enterprises having a positive perception of ICT investment for business and the benefits that are involved (Manochehri, Al-Esmail and Ashrafi, 2012).

In order for micro-enterprises to realise the benefits associated with maturity models and formalised strategy, they must have a positive perception of ICT investment, and new work practices that are organised to enhance the positive relationship between ICT investment and enterprise performance (Bayo-Moriones, Billón and Lera-López, 2013).

Every maturity model differs in implementation, but the principles remain the same – measuring the maturity of an enterprise according to a set of criteria determined by the maturity model implemented (Lahrmann et al., 2011). Achieving and ensuring this kind of purpose remains with the enterprise and how they seek to use the maturity model. The internal purpose of an enterprise seeking to utilise a maturity model borders around guidance, measurement, prioritisation and risk reduction (Menezes, no date; Curtis, Hefley and Miller, 2001; Curtis and Alden, 2007). The aspect of guidance focuses on direction and decisions regarding current

processes, procedures and strategies that have not been documented. Measurement relies on utilising IT artefacts, resources and capability components available within the enterprise to benchmark their current state against that of the industry or market standard and that of their competitors (Curtis, Hefley & Miller 2001, Curtis, Hefley & Miller 2009). Measurement allows enterprises to form a baseline how they can improve or increase their competitive advantage. Enterprise must identify key elements that would need to be prioritised over others. By implementing the maturity model, an enterprise gains the perspective of its current state and therefore can make informed beneficial strategic decisions as it moves forward. Risk reduction involves measuring and mitigating the risk of the selected maturity model and proposed investments (Menezes, no date; Curtis, Hefley and Miller, 2001; Curtis and Alden, 2007).

A maturity model may provide a starting point for an enterprise so it can have a point of origin it can use to plot its growth strategy. Maturity models also provide a clear vision of the enterprise, its internal and external counterparts and how they can all be leveraged to provide benefits realisation to the enterprise in the short-term and long-term. In addition, maturity models provide a framework that is clear and enables the enterprise to prioritise according to its vision, goals and objectives as pre-defined at the inception of the enterprise. A clear sign of how the enterprise may reap returns on its investments (ROI) on resources it invested in is also a benefit of a maturity model (Caralli, Knight and Montgomery, 2012; Looy and Van Looy, 2014).

Maturity model integration into an enterprise involves incremental change, learning and development according to the maturity levels – as designed by the Capability Maturity Model (CMM), the universal precursor to all maturity models existing today (Caralli, Knight and Montgomery, 2012).

2.3.3 The Existing Maturity Models

The table below represents examples of the more established and common maturity models that exist within specific disciplines that a micro-enterprise may opt to focus on:

Table 3: Common Maturity Models

Discipline (Area Focus)	of Maturity Model	Purpose
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Project Management	Organisational Project Management Maturity Model	Used to assess and develop capabilities and in delivering the strategy. This is achieved in projects through portfolio, program and project management disciplines. (Crawford, 2007)
	Portfolio, Programme and Project Management Maturity Model	Used by enterprises to develop plans and strategies for improvement and optimisation. (Sowden, 2008)
Business Process Management	Process Maturity Model	Used to guide process improvement and optimisation. (Lee, Lee & Kang, 2007)
	Business Process Maturity Model	Provides enterprise with an improvement roadmap based on their current and future business processes. (Fischer, 2004; Curtis & Alden, 2007)
Strategies	Strategic Management Maturity Model	Used to assess an enterprise's strategies and resulting performances based on those strategies. (Kenny, 2006)
	Risk Maturity Model	Used to assess an enterprise's risk on decisions and investment made, thereby measuring the risk impact and management. (Hillson, 1997)
Information Technology	Capability Maturity Model	Used to define, develop and refine an enterprises software development process. (Paulk, 1993; Paulk 1995 ; Kumta & Shah, 2002)
	Capability Maturity Model Integration	Used to provide the enterprise with a clearly defined roadmap of what needs improving as well as how in terms of behaviours, processes, capabilities and resources – all leading to improved performance. (Majumdar, Ashiqe-Ur-Rouf, Islam & Arefeen, 2011)
	Open Source Maturity Model	A methodology used to assess free and Libre open source software and its processes. (Golden, 2008; Petrinja, Nambakam & Sillitti, 2009)
	Service integration Maturity Model	Used to transform and guide enterprises toward a more service-based business model. (Arjanjani & Holley, 2005; Arsanjani & Holley, 2006)

(Source: Paulk et al. 1994, Hillson 1997, Kumta, Shah 2002, Fisher 2004, Arsanjani, Holley 2005, Arsanjani, Holley 2006, Kenny 2006, Crawford 2007, Lee, Lee & Kang 2007, Curtis, Alden 2007, Golden 2008, Sowden 2008, Petrinja, Nambakam & Sillitti 2009)

Though encouraging in variety, the maturity models that exist are very difficult for micro-enterprises to adopt because they cater for the more established or larger

enterprises with set resources and capabilities (Pöppelbuß and Röglinger, 2011; Fernandez-Medina and Piattini, 2013; Miranda et al., 2014).

Maturity models dealing with project management, business process management, strategies and information technology can assist micro-enterprises in measuring their internal and external resources and capabilities (Crawford 2007). This is because these models focus on measuring components such as procedures, processes, practices and technology (Sowden 2008) which are prevalent in micro-enterprises. However, these models need to be redefined further to cater to the unique nature of micro-enterprises and therefore, apply to them should they be utilised (Orci 2000). This refinement can be achieved by focusing on theories, frameworks and models that can be linked to the components most relevant to micro-enterprises including people, behaviours, business practices, processes and technology infrastructure (Blommerde, Lynch 2016).

2.4 The Maturity Models Relevant to Micro-Enterprises

Maturity models have given large enterprise great success - helping them to remain cognisant of their internal and external factors (Orci 2000, Fisher 2004, De Bruin et al. 2005, Pham 2010, Senff et al. 2015, Curley, Kenneally & Carcary 2016). In addition, these maturity models have advanced as the need for specialised models continues to evolve due to emerging technologies and the volatile markets that large enterprises perform and function in.

Micro-enterprises' unique natures and business practices need to be taken into consideration (Bharati and Chaudhury, 2015) when determining the ideal maturity model for implementation in the micro-enterprise. There has been research on how to leverage established maturity models for micro-enterprises. This has resulted in maturity models being reformulated and re-engineered to cater to the SMMEs unique structure and business practices. Although this is a positive thing for SMMEs, research and concrete frameworks and methodologies into maturity models for ICT investments made by SMMEs have been lacking.

The Capability Maturity Model Integration (CMMI) and IT Capability Maturity Framework (IT-CMF) have provided the basis for many of the maturity models that

have been and are being developed (Laudon and Laudon, 2004; Donnellan and Helfert, 2010; Donnellan, Sheridan and Curry, 2011). This has enabled consistency in the maturity model frameworks, as the use of levels and indexing according to maturity state have remained the same throughout their usage within enterprises (Anderson et al., 2011). In addition, maturity components that an enterprise is matched against remain the same. This, however, depends on the maturity model that is being implemented. For example, when implementing a maturity model in most large enterprises – such as the Business Process Maturity Model, one of the most common among large enterprise – various components are measured for their maturity (Curtis and Alden, 2007). These include all the IT and human artefacts needed to perform a particular process (Curtis and Alden, 2007; Röglinger, Pöppelbuß and Becker, 2012). This can be linked and surmised to the information systems components which include people, procedures, finance, telecommunications and networks, databases, software and hardware (Stair and Reynolds, 2008; Proença et al., 2013; Tran, Le Ngoc Thanh and Phuong, 2013).

The Innovation Value Institute (IVI) has successfully reworked various capability maturity based models into more usable maturity models relevant to the internal and external factors that the SMMEs face (Anderson et al., 2011). Some of the maturity models reworked and used by SMMEs include the SME Information Technology – Capability Maturity Framework (SME IT-CMF) which focuses on the use of IT as an enabler in the enterprise. The SME IT-CMF help gain perspective of its IT capabilities and a competitive advantage (Doherty et al. 2013, Carcary, McLaughlin 2014). In addition, the CMMI has also been reworked to cater for enterprises that would otherwise need a focus on their roadmap and define their position and maturity in terms of their capabilities and existing resources (Majumdar et al. 2011). Other maturity models and frameworks SMMEs can implement that include: Business Process Management, Business and Strategic Planning, Risk Management and Relationship Asset Management (Brodman, Johnson 1994, Ajitabh, Momaya 2003, Hribar Rajterič 2010, Pham 2010).

Any maturity model that fulfils the criteria of evaluating the enterprises internal capabilities and resources – according to the relevant components as present in the

enterprise – would be ideal (Chrissis, Konrad and Shrum, 2003; Fisher, 2004; Curtis, Hefley and Miller, 2009b; Pöppelbuß and Röglinger, 2011).

The volatile markets within which micro-enterprises function require them to have a strategy that enables them to adhere to new industry competition rules, respond to new customer preferences and choices, and adopt a new technology for competitive advantage among others (de Oliveira and Kaminski, 2012). Micro-enterprises have the opportunity to use maturity models as a paradigm in developing strategies associated with investing in ICT (Gomez, Pather and Dosono, 2012).

The prudent use of a maturity model by a micro-enterprise can better align the overall business vision of the enterprise with the ICT vision (De Haes and Van Grembergen, 2012). In addition, this strategic use of maturity models in aligning business and ICT can also result in maturity models being used to identify business value from ICT investments (De Haes and Van Grembergen, 2012).

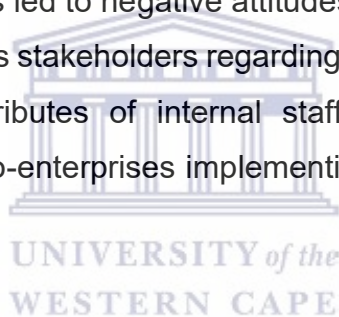
Aside from the strategic implications of the use of maturity models by micro-enterprises, the most basic role of a maturity model for micro-enterprises is to outline the path it has taken in its investments and implementation of ICT (Röglinger, Pöppelbuß and Becker, 2012). Outlining the path is important when deciding relating to its growth and achieving desired objectives (Xu, 2015). A maturity model could be seen as a vital tool that can assist SMMEs when deciding regarding their ICT investments (Gomez, Pather and Dosono, 2012; Yunis et al., 2012).

Maturity models can serve as a benchmark for micro-enterprises both internally and externally (Fath-Allah et al., 2014). Internally the maturity model can play the role of assisting micro-enterprises to decide regarding their investments in ICT and performance measurement and improvement. Externally, maturity models can be used by micro-enterprises for comparison against their competition and industry standards (Becker, Knackstedt and Pöppelbuß, 2009). Micro-enterprises require methods and standards that can help them invest in sustainable ICT. Maturity models provide this sustainability by setting standards that micro-enterprises can follow to ensure that their ICT investment and use within the enterprise is of business and strategic value (Silvius and Schipper, 2015). Maturity models can play the role of

advising leaders and management within the enterprise to prioritise measures that have to do with improvement, control and assessment of ICT before, during and after the investments have been made (Massa and Testa, 2008). This is important in that there needs to be maturity in the strategic leadership and guidance regarding ICT investments, and these are driven by maturity models (Hilton and Sohal, no date).

2.4.1 Barriers to the use of Maturity Models in Micro-enterprises

Though maturity models have been used in enterprises for decades, micro-enterprises are yet to fully realise the benefits that such models could afford them. First, there is a common perception that maturity models were developed for large organisations with better resources than micro-enterprises (Pöppelbuß and Röglinger, 2011; Fernandez-Medina and Piattini, 2013; Miranda et al., 2014). The perception is driven by a lack of understanding and knowledge as to the use of maturity models by micro-enterprises (Pöppelbuß and Röglinger, 2011; Albliwi, Antony and Arshed, 2014; Miranda et al., 2014). This has led to negative attitudes and behaviours being formed within micro-enterprises and its stakeholders regarding adopting maturity models. The attitudes, behaviour and attributes of internal staff and stakeholders of micro-enterprises may prevent micro-enterprises implementing maturity models (Kituyi and Amulen, 2012).



Second, most maturity models do not cater for the unique characteristics of micro-enterprises (Fernandez-Medina and Piattini, 2013). This is because some micro-enterprises are known for mainly functioning in a highly complex and growth intensive industries, therefore the adoption of such maturity models might not be of a strategic advantage, meaning they might not be of benefit and might not yield immediate or future success for the enterprise. Micro-enterprises need to react timely to changes whereas the maturity models are perceived not to allow that flexibility (Pöppelbuß and Röglinger, 2011; Gibb and Blili, 2012). Third, maturity model deployment in micro-enterprises is perceived to be costly and difficult to implement (Fernandez-Medina and Piattini, 2013). The maturity model frameworks require access resources in terms of personnel, capital, infrastructure and technology that are not always available to and within micro-enterprises (Skoko, Ceric and Huang, 2008; Senff et al., 2015). Maturity models should be more configurable as they lack flexibility in their usage and

implementation within micro-enterprises (Pöppelbuß and Röglinger, 2011; Jentsch, Riedel and Mueller, 2012; Kituyi and Amulen, 2012; Fernandez-Medina and Piattini, 2013; Senff et al., 2015).

The subject of a maturity model implementation in enterprises continues to be associated with negative perceptions. This is because of the notions that maturity models present; stage by stage predictions of how enterprises evolve from one state to another – all while forsaking the volatile industries and market they may function in (Pöppelbuß and Röglinger, 2011). This creates a perception within enterprises that maturity models might create a structure that is too rigid for them to react in time to industry and market changes (Fernandez-Medina and Piattini, 2013). However, that is not viewed entirely negatively because of the recognised need within the enterprises for understanding its maturity – which impacts the growth, capability, adoption of resources and technology and therefore the activity of the enterprises internally and externally (Doherty et al., 2013).

2.4.2 The Benefits of Maturity Models to Micro-Enterprises

Since the creation of the Capability Maturity Model (CMM) in the late 80s, a good deal of maturity models have been created based on its core structure (Nenni et al., 2014). The new models addressed specific needs to the enterprises that range from; process improvement, enterprise-wide alignment of resources, performance and quality measurement, productivity and enterprise readiness and ICT adoption and investment among others (Staples and Niazi, 2010).

First, the savings made by micro-enterprises that adopt maturity models outweigh the costs of not having a maturity model for improving and maintaining maturity levels in line with industry standards (Staples and Niazi, 2010; Kituyi and Amulen, 2012). Second, the right maturity models selected can be based on the micro-enterprises evaluation and present them with an opportunity to improve their practices, processes and activities which include a need for a traditional audit (Sinha et al., 2011; Röglinger, Pöppelbuß and Becker, 2012; Fath-Allah et al., 2014). Studies of SMME's in Europe have shown that maturity models measuring the practise, processes and performance of enterprises add great value (Fath-Allah et al., 2014; Bititci et al., 2015). These

includes improved understanding of practices, processes and performance measures, and the facilitation of learning and knowledge attainment within the enterprise (Bititci et al., 2015). Third, linking strategy – whether ad hoc or formalised – to enterprise goals can be achieved through the strategic use of a maturity model (Staples and Niazi, 2010). A maturity model offers micro-enterprises using ad hoc strategic methods a step by step or structured approach to investing in ICT and implementing it in their business practices (Bensiek and Kuehn, 2012). A maturity model used as a strategy can prove vital to a micro-enterprise seeking to address a specific strategic aim (Staples and Niazi, 2010). Strategic use refers to selecting a model that can best support the enterprise's goals (Nenni et al., 2014). It involves such maturity models with projects that can be associated with the investment or implementation of new ICT within the enterprise (Nenni et al., 2014). Micro-enterprises adopting maturity models can experience increases and performance, process improvement and decision-making for investing and utilising ICT (Bensiek and Kuehn, 2012).

Knowing that maturity models have their benefits and shortcomings, it is important that enterprises seeking to adopt and use a model within their internal structures consider its intended purpose. An enterprise would adopt a model in order to:

- determine how well its processes and current business practices are suited when compared to industry and model related best practices,
- identify areas for improvement and opportunity that the enterprise can manipulate to gain a competitive advantage,
- determine the level of maturity at which the enterprise is currently operating and therefore creating a roadmap for future product and or service delivery (Becker, Knackstedt and Pöppelbuß, 2009; Mettler, 2011).

Taking on a maturity model requires calculated thought and purpose as to the short-term and long-term goals of the enterprise (Becker, Knackstedt and Pöppelbuß, 2009). Without these goals, an enterprise would be doomed because of a lack of understanding as to the reason for such a model being implemented. A further consideration for the adoption of a maturity model would be the decision-making (Van Looy et al., 2013). The adoption of a maturity model needs to be made with a result in mind. This result would be the catalyst for the model being adopted, to which decisions

will be made to support the result being successfully reached (Boehm et al., 2014). For example, an enterprise may opt to utilise a model to gauge its position in terms of future and current investments in research and development, product development and ICT among others. Such investments would be geared toward enabling the enterprise to advance in its; business process and general business and ICT-related practices, product and service offering, and gaining a competitive advantage to perform successfully in their markets and industries (Harindranath, Dyerson and Barnes, 2008; Liao and Rice, 2010).

In addition, internal growth involves improving the internal infrastructure and components of the enterprise (Stair and Reynolds, 2008; Jonsson and Lindbergh, 2010). External growth takes place when enterprises expanding their capabilities and resources beyond their internal state. This would involve collaboration and partnerships with other enterprises that may yield mutual benefits that can be leveraged to gain a larger market share and/or competitive advantage (Hussain, Sib and Wangc, 2010; Jamieson et al., 2012).

Finally, competition in Industry is one of the primary factors that SMMEs face when they need to enter and operate successfully within an industry or market. SMMEs use ICT to 'level the playing' field and compete and stay relevant in their industries and markets. This has opened various forms of business practices that can be linked back to ICT adoption and innovation because of the competitive volatile environments within which SMMEs operate. A model may be adopted to better navigate the competitive environments and provide a platform to which strategic decisions may be made to gain a competitive advantage (Irjayanti and Azis, 2012; Amroune et al., 2014; Bharati and Chaudhury, 2015).

2.5 The Theoretical Frameworks

Theories can provide the backbone for literary, methodological and framework development (Anfara Jr et al., 2014). Considering that this research seeks to determine a maturity model micro-enterprises can use to invest strategically in ICT, the following section identifies theories that would inform the use of a maturity model for investing strategically in ICT.

2.5.1 The Capability Maturity Model

Many theories have been developed alongside the use and implementation of maturity models. The Capability Maturity Model (CMM) was developed to deal with analysing data related to the development of software and its related processes (Paulk, 1993). In addition, the CMM was developed as a framework to assess and improve on the maturity of processes and identify issues relating to quality and process alignment within an enterprise (Paulk, 1993).

CMM presented many opportunities that allowed it to apply to diverse fields other than software development. These fields included Project Management, Business Process Management, Knowledge Management, People management and Enterprise Architecture (Team, 2007; Kulpa and Johnson, 2008; The Mendeley Support Team, 2011) which resulted in the CMM evolving into the Capability Maturity Model Integration (CMMI). The Capability Maturity Model Integration (CMMI) has formed the basis of these theories as it creates a framework and staged representation of the maturity levels that an organisation needs to go through in its pursuit of 'maturity' (Staples and Niazi, 2010).

he CMMI provides a greater flexibility as it has been reworked and redeveloped to cater to multiple disciplines – specifically for eliciting change, transformation and taking on complex and challenging problems within the enterprise and its environments (von Wangenheim et al., 2010; Caralli, Knight and Montgomery, 2012). In addition, the CMMI is famed for its capacity to offer enterprises the ability to improve and strategically invest in its processes and supporting resources (Caralli, Knight and Montgomery, 2012). This is because the model provides levels against which it can measure various enterprise components.

2.5.2 The Resource-Based View and Dynamic Capabilities Theory

In order for an enterprise to maintain some competitive advantage and to make strategic decisions, it needs to have resources that add value to the enterprise (Yunis et al., 2012). These resources may include and are not limited to; knowledge, physical assets, infrastructure, culture, human capital and learning (Chew and Gottschalk, 2009). In addition, the resources need to be linked to the framework or model being implemented or utilised to achieve the desired sustainable result (Nobre and Walker, 2012). The resource-based view posits that sustainable competitive advantage and strategy depend on the resources of the enterprise, these being rare, difficult to imitate and not obtainable in the enterprise's industry (Powell, 1992). In this sense, the Resource-Based View Theory has been credited to be ideal for research pertaining to strategy and management in the capacity of gaining a competitive advantage (Barney, 2001; Helfat and Peteraf, 2003).

Dynamic capabilities can be defined as; “the firm ability of development, integration, co-ordination and deployment of operational capabilities, and it is associated with the ability of the organization to learn, change and adapt to turbulent and complex environments.” (Wernerfelt, 1984, p. 86). With a maturity model being utilised as a strategy by a micro-enterprise, a theory such as the dynamic capabilities theory will allow for a holistic view as to the usage of resources together with the enterprise's capabilities in investing in ICT (Yunis et al., 2012). The Dynamic Capabilities Theory extends the RBV Theory that addresses shortcomings of the Resource-Based View Theory that have to do with the theory's conclusion that resources can only be considered in the theory if they are rare and economically valuable (Priem and Butler, 2001). This makes the Dynamic Capabilities Theory ideal because it delves into the enterprise's use of resource such as technology, human capital and related operational assets and infrastructure to perform, gain a competitive advantage and grow (Teece, Pisano 1994, Eisenhardt, Martin 2000, Winter 2003).

2.5.3 Computer Based Information Systems (CBIS) for Maturity Model Capability Components

To determine a maturity model suitable for SMMEs and micro-enterprise investing in ICT, it is important to have knowledge of the most relevant capability components against which the enterprise's maturity levels will be measured.

Although maturity model components may differ depending on the maturity model implemented, the Information Systems and Technology (IS & T) infrastructure and the supporting resources are the source of these capabilities as determined by the model and enterprise internal structure (Brookes and Clark, 2009; Röglinger, Pöppelbuß and Becker, 2012).

Like any other enterprise, SMMEs and micro-enterprise are driven by ICT, information and systems and how this can be utilised to perform and gain a competitive advantage within their industry and market (Foster, Heeks 2010). Due to this drive, enterprises have adopted core components that are geared toward their ability to store manipulate and process data into information that can develop products and services. These core components help them utilise their ICT in a meaningful, effective and efficient way (Black and Lynch, 2001; Dibrell, Davis and Craig, 2008). These core components can be divided into two parts the Information Systems and Technology infrastructure and the Supporting Capabilities and Resources.

The IS & T Infrastructure includes all the components that are technology driven, that is the software, hardware, databases, telecommunications and networks. Supporting capabilities and resources include all the capabilities and resources needed to leverage the Information Systems and Technology Infrastructure, people, procedures and finance (Stair and Reynolds, 2008; Tran, Le Ngoc Thanh and Phuong, 2013; Levy, 2014).

Considering the components, resources and capabilities, the research will posit that the use of CBIS components will be the most relevant course of action regarding micro-enterprises. This is due to micro-enterprises having internal capabilities and resources that match the components provided by CBIS (Zafar et al., no date; Ahmad and Siddiqui, 2013).

2.6 Conclusion

Given the context of the research being conducted and the purpose of the research – determining a maturity model to be used - the research will consider the: Capability Maturity Model Integration (CMMI), the Resource-based View Theory and the Dynamic Capabilities Theory.

The CMMI will provide the foundation and framework of models that enterprises use, which include a comprehensive guide and the best practices that need to be in developing or determining a model (Godfrey, 2004). The CMMI has a good deal of strengths which include providing the user of the model with a common framework and a language that can facilitate the communication process of the enterprise. In addition, consistency through standardisation of processes and management practise cost saving, internal improvement and performance, and a strategic focus are the some strengths that such a model may provide to an enterprise (Hefner, 2005). The CMMI has its shortcomings which include the costs associated with implementation of an enterprise, the duration of implementation being too long and the complexity of implementing the model among others (Serrano et al., 2013). CMMI is suitable for this study as it will provide a solid maturity model framework that can be utilised to propose a redefined maturity model index specific to the taking part micro-enterprises in the Western Cape.

The Resource-based View (RBV) theory is used when developing a strategy for the enterprise, encompassing the identification of resources, capabilities and competitive advantage gained (Grant, 1991). The RBV theory has its shortcomings, such as it being limited in its applicability, meaning it only applies to enterprises functioning in predictable environments, furthermore the theory does not differentiate between input and output resources (Kraaijenbrink, Spender & Groen 2010). In addition, the RBV is known to only focus on the enterprises internal resources, without taking into consideration the role of the resources – whether as an input or output – within the enterprise (Barney 2001).

The Dynamic Capabilities theory will suggest the internal and external capabilities that need to be considered by the enterprise. This theory also focuses on the individuals (Zahra, Sapienza and Davidsson, 2006), from the ICT being invested in, to the enterprise overall capabilities to leverage them – linking them to the Resource-based View theory (Eisenhardt and Martin, 2000). The CBIS will provide the capabilities and resources that are mostly linked to the micro-enterprises internal structure. These will fall within the resources and dynamic capabilities as described and identified by the Resource-Based View and Dynamic Capabilities Theories. Using components from these models will help provide and proposing a more informed and relevant maturity model to micro-enterprises.

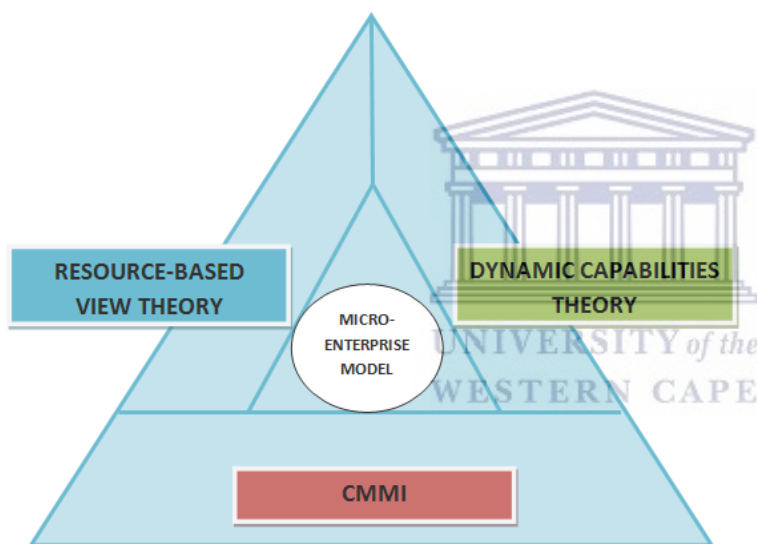


Figure 1: Proposed maturity model will encompass the theoretical framework

(Source: Researcher, 2015)

The proposed maturity model will encompass the theoretical framework of the CMMI, Resource-based View and Dynamic Capabilities theories. The measurement will be accomplished by evaluating the components as appraised from the RBV, Dynamic Capabilities and CBIS theories, against the framework and levels provided by the CMMI.

These components include but are not limited to people, procedures, finance, telecommunications and networks, data and databases, software and hardware.

These components would have to be measured for their maturity based on the maturity levels as provided by the CMMI. The criteria used will depend on whether the enterprise being evaluated for maturity is at its initial level, basic level, intermediate, advanced or optimising level. (Wernerfelt, 1984; Peteraf, 1993; Eisenhardt and Martin, 2000; Chrissis, Konrad and Shrum, 2003; Wade and Hulland, 2004; Zahra, Sapienza and Davidsson, 2006; Team, 2007).



Chapter Three: Research Methodology

3 Introduction

Research methodologies and designs provide systematic ways of solving a problem by forming a detailed step-by-step method of undertaking the research and its intended purpose (Rajasekar, Philominathan and Chinnathambi, 2006). Research methodologies and designs are important in that the researcher needs to have a process, procedure or scheme to guide their journey through accomplishing the desired aim or problem they sought to solve (Patil and Mankar, 2016).

3.1 Research methodology

This section discusses the research methodology adopted.

3.1.1 Research methodology used in this research

In conducting this research, a qualitative method research methodology was used with the support of quantitative methods (Creswell 2013, Brannen 2017). This approach ensured that at least one quantitative method for collecting numerical data and one qualitative method for merging words was used. Using both these methods enabled a broader understanding and consolidation of the distinctions that are available in research and data (Azorín and Cameron, 2010). In addition, it provided the researcher with the option of using different instruments that broadened the perspective of the data and information gathered (Morse 2016). Finally, both qualitative and quantitative approaches offset many of the shortcomings of either of them on their own (Creswell, Clark 2007).

Though these benefits played a big role in using the mixed method approach, some shortcomings were considered. The first shortcoming was the complexity of the research design the researcher mitigated by planning a strategy for collecting and analysing the data (Hesse-Biber 2010). Strategy was the process of formulating a step-by-step plan of action that can give direction and enable quality systematic research to be conducted (Badke 2017).

A second shortcoming was the time and resources needed to implement mixed method research is an issue (Creswell, Clark 2007). This was solved by budgeting

resources and availing extended timelines for collection and analysis taking the pressure off the researcher.

Finally, it may be difficult to strategize around how findings from one method can support another (Morse 2016). This was dealt with by the research instruments being drafted into sections that were linked. This allowed for the researcher to strategize how the data would be categorised when received, making the analysis more manageable.

3.1.2 The research procedure

Structured questionnaire and interview instruments were used for data collection. The structured questionnaire was used to collect data for the analysis of the problem of micro-enterprises' lack of formalised strategic maturity models for their ICT investments and for establishing baselines for comparisons (Glasgow et al., 2005) between the specific objectives or questions the structured questionnaire sought to answer. The interviews were used to gather meanings and themes from participants in order to gain a more in-depth understanding of the micro-enterprises' internal and external environments, of their strategy and methods, and their use of ICT as a resource. The structured questionnaire served as the quantitative research instrument whereas the interview served as the qualitative research instrument.

Prior to selecting the structured questionnaire over other methods of data collection, the key advantages and disadvantages of structured questionnaires were considered. The researcher reduced the possible negative impact of disadvantages by making details and documentation available to all the research participants prior, during and after the research was conducted. This created an open communication forum in which the participants could liaise with the researcher if any queries arose.

Table 4: Advantages and Disadvantages of Structured questionnaires

	Advantages	Disadvantages
Structured questionnaire	Data produced is based on real world observations.	Data can lack details and depth on the research being conducted.
	Large amount of data can be produced in a short space of time.	Significant amounts of data can become neglected due to the researcher's focus being skewed due to a range of theories, issues and or problems arising from the data.
	The potential to cover a large sample size within a population using a structured questionnaire can produce data that better represents the population being investigated.	Ensuring a high response result from a distributed structured questionnaire can be difficult to control and accomplish.
	Enables the participants in the research to remain anonymous if requested.	Anonymity of participants may call into question the validity of the research data produced.

(Source: Fricker, Schonlau 2002, Scheuren 2004, Groves Robert et al. 2004, Fowler Jr 2013)

Using structured questionnaires benefited the research significantly because they produced data that was used to formulate interview questions. The disadvantage of a low response rate was dealt with by follow-ups done with companies to which the structured questionnaire was distributed. The research also provided the option of anonymity, whereby participants could contribute data and information without the need to disclose their identity.

Table 5: Advantages and Disadvantages of Interviews

	Advantages	Disadvantages
Interview	Participants have the option to remain anonymous by the researcher omitting their information details from the research.	Does not allow for participants to remain anonymous, as interviewer liaises face to face (or electronically) with the interviewee.
	Various forms of interviews available such as; Instant messaging, telephonic, face to face and electronic mail.	The level of in-depth data yielded from the different types of interview techniques may vary due to the type of interaction.
	Interviews allow for a better flow of information exchange and therefore more reliable flow of data.	Interview techniques may require a lot more resources to complete.

(Source: Gill et al. 2008, Lorente-Catalán, Lleida 2014)

The interviews allowed the participants to share their insights concerning their enterprises in a free-flow format. The disadvantages of face-to-face interviews were dealt with by providing assurance to the participants through an Ethical Agreement and interviewing in locations where the interviewees were most comfortable. In addition, adequate time was allocated to ensure that interviews were conducted at the best possible time and duration, ensuring that the contributions made were fully recorded (Kelley et al., 2003; Sturges and Hanrahan, 2004; Opdenakker, 2006; Lyon, Lancaster and Dowrick, 2008).

All the participants, namely the micro-enterprises' personnel that took part in the interview were selected after having taken part and completed the structured questionnaire. The benefits of conducting a research using both the structured questionnaire and interview research instruments were a) savings on costs of distributing and collecting data, b) saving on time associated with offline interaction, c) greater anonymity for participants that did not wish to continue to the interview after taking part in the structured questionnaire, and d) numerous participants were reached

with the structured questionnaire, in which a decent sample was made available for participation in the interview phase.

The researcher minimised the costs of the research by distributing electronic structured questionnaires, along with on-site visits for face-to-face interviews that required travelling short distances between locations, and telephonic and networked communication which required minimal resources.

3.2 *The Target Population for the Research*

A target population can be defined as “a complete set of people (or things) with a specialised set of characteristics, and a sample is a subset of the population.” (Banerjee and Chaudhury, 2010, p. 2). Considering this, the research sought to define the micro-enterprise by adopting the amended National Business Act 26 of 2004 (Department of Trade and Industry, 2004). The criteria for identifying the small and micro-enterprises were based on; the total full-time equivalent of paid employees is a five or less and the total gross asset value (fixed property excluded) (National Business Act 26, 2004).

The target population comprised micro-enterprises that have 1 to 5 employees, a total maximum turnover of just under R 150 000 per annum and a total maximum gross asset value of R 200 000. This was based on the average Total Turnover and Gross of micro-enterprises across all sectors as defined by the National Business Act 26 of 2004 (Department of Trade and Industry, 2001; Luiz 2002).

The Business Innovation Institute (BII) in the Centre for Entrepreneurship and Innovation (CEI) provided a platform that enabled access to the target population meeting the criteria. The BII merges, coordinates and synergies entrepreneurship and innovation activities among enterprises in the Western Cape. The centre also leads the University of the Western Cape’s research into enterprises, business and economic development and entrepreneurship. The platform provided by the Business Innovation Institute provided access to over 1000 potential micro-enterprises.

100 micro-enterprises that met the criteria of the research were approached. In addition, these criteria required that all participants had to be owners or primary

stakeholders within the enterprise. All participants must be operational for at least the last 6-months, as this would enable the research to reap data as to the enterprise's current performance and operational, tactical and strategic practices. Finally, all participants had to be generating a turnover in order to provide the research with additional data that could be utilised for the measurement of performance and current strategic practices.

Of the enterprises that showed a desire to take part in the research, there were some that showed that they will take part in both the structured questionnaire and the interview. These requested that an analysis be conducted to assist them regarding the strategies relating to ICT usage and investment.

3.3 The Research Sample

This section discusses the sample used for the research.

3.3.1 The Sampling Method

A simple definition of a sample is a subset or division of the population (Banerjee and Chaudhury, 2010). From a target population, specific criteria can be defined in order to gain the best perspective or result in adhering to the research parameters set to meet the desired goals and objectives.

Once the target population was examined and the research instruments completed, it was decided that it would be ideal to:

- Target a specific sample within the target population to better manage the data required and analysed. Therefore, purposive sampling technique was utilised to ensure that the sample was representative of the criterion of the research (Barreiro and Albandoz, 2001).
- To ensure that the sample that participated in the structured questionnaire also participated in the interview. This would allow for continuity and consistency in the research results (Valenzuela and Shrivastava, 2002).
- To target a sample that could be accessed through a reputable institute – enhancing the possibility of a higher return in feedback. This would also enhance the elements of efficiency and effectiveness.
- To target a sample that was located within clustered areas (located near each other) within the Western Cape. This would ensure a cost-effective approach.

The primary aim of using the purposive sampling technique is to ensure that the ideal sample of the target population is utilised. This will ensure that the aims and the objectives of the research, are investigated and concluded.

3.3.2 The Units of Analysis

Using an inaccurate or unsuitable unit of analysis may cause the research to be uneven or flawed (Silverman, 2004). A sample size of 100 small and micro-enterprises was included in the research. These micro-enterprises took part in the first research instrument distributed which was the structured questionnaire. Thirty-five participants were interviewed to gain a better understanding of the findings gained.

3.4 The Quantitative design – The Structured questionnaire

A structured questionnaire can be defined as a method used for gathering data or information from a sample of a population (Sheuren, 2004). Structured questionnaires can be used as a form of quantitative data and information gathering, with a focus on biographical and demographical data gathering among others (Valenzuela and Shrivastava, 2002). The aim of the structured questionnaire was to gain an understanding of the micro-enterprises present in the Western Cape and their current biographical and demographical status and practices. The structured questionnaire was to form part of the quantitative analysis of the overall research to support the interview.

3.4.1 Generating questionnaire items

The structured questionnaires formed part of the quantitative data collection process within the mixed method approach. The structured questionnaire questions were generated from literature and industry related sources such as research and consulting organisations. The structured questionnaire was conducted in a standardised format was to form part of the interview. A structured questionnaire can be used together with other methods as a strategy to gain a more in-depth description and/or analysis of data (Kelley et al., 2003). In addition, the use of the structured questionnaire allowed for the research to produce empirical data. This was important in that comparisons and relationships could be identified between the structured

questionnaire and the interviews producing data that could add more value to the overall findings of the research.

When planning and conducting a structured questionnaire, the aims and objectives of the research were documented (Sheuren, 2004). In addition, there are elements that need to be considered during the planning of the structured questionnaire. This is because the elements may affect the structured questionnaire being carried out successfully and achieving its purpose. These elements include the production of the structured questionnaire, costs involved in production and distribution, distribution and collection, time-span for collecting the results from participants and the analysis processes involved.

The structured questionnaire was produced in an electronic format (word document and shared drive format) for distribution via electronic mail and hyper-link communication.

3.4.2 The Refinement of the Questionnaire

When designing a structured questionnaire, it is important to avoid the use of long sentences and words that may be difficult to understand (Robert et al., 2004; de Leeuw, Hox and Dillman, 2008). It is important to consider the participant of the structured questionnaire, their ability to comprehend and remain interested in contributing further to the line of questioning (Rosenbaum and Lidz, 2007).

The length of the structured questionnaire depends on the participants the research is aimed at. Creating a long drawn out interview would have risked 'putting off' the participant (Mayer and Piper, 1982; Rosenbaum and Lidz, 2007). In designing the structured questionnaire, the researcher took into consideration the micro-enterprises, its personnel and the questions that could be asked to receive valuable feedback. As a result, the structured questionnaire was direct and not long to deter the participant. There was a mixture of multiple choice, check box and short-answer questions that made the structured questionnaire diverse.

The research used an evaluation method (Rosenbaum and Lidz, 2007; de Leeuw, Hox and Dillman, 2008) in which the structured questionnaire was pre-designed and forwarded to research and enterprise experts. Expert reviews and feedback were

received, which help redesign the structured questionnaire to suit the criteria and relevant participant to where it was to be distributed to (Robert et al., 2004; de Leeuw, Hox and Dillman, 2008). Thus, the structured questionnaire design steps comprised:

- The questions were drafted into categories in line with the data and information requirements in line with the research. These categories included the internal and external environment of the enterprise, the strategy of the enterprises and the ICT as a resource within the enterprise.
- All the questions were carefully examined and expert supervision was given in determining whether questions were relevant, unambiguous, literature and subject based as well as non-confrontational. This improved the structured questionnaire in that it enabled the recipient to contribute information freely and without holding back much information.
- Brief instructions for the completion of the structured questionnaire were then drafted. These were assessed by the research supervisor and two peers to amend any ambiguity and irrelevance in the wording.
- A cover letter with the accompanying official research documentation was then drafted for the distribution of the structured questionnaire. An effort was made to ensure that the structured questionnaire, instructions and accompanying official research documentation were logical, clear and professional as well as pleasant to the participant receiving it.

3.5 Questionnaire validation

This section discusses the validation of the questionnaire.

3.5.1 Construct and Content Validity

Construct validity refers to “the degree to which a research measures what it claims, or purports, to be measuring” (Brown 2005). Whilst content validity can be defined as “the extent to which a measure represents all facets of a construct.”(Brown 2005). The content included in a structured questionnaire was divided into three elements. They were (1) determining the questions to be asked (the issues and focus areas), (2) selecting the question (open or closed), and (3) designing the question sequence (Burgess, 2001). As a result, the research was split into three main sections, each covering sub-sections linked to the topic of discussion. This ensured that the constructs of maturity models, strategy and ICT investment were covered throughout

the research. In addition, the structured questionnaire allowed for the questioning to be structured and therefore categorised into sections that could be linked back to the research questions – which were therefore answered.

3.6 Quantitative data collection

This section discusses how the data for the research was collected.

3.6.1 Determining the Data Collection method and Data collection – The Structured questionnaire

Distributing the structured questionnaire and ensuring that the flow of feedback was reliable and constant required deliberate action. The distribution had to be reliable and efficient in being available to all the desired participants of the research (Fowler 2013).

In ensuring that the structured questionnaire reached the relevant primary enterprise stakeholder, research was conducted into each enterprise to determine the details of the founder and the current key operational person within the enterprise. Once this was determined, the structured questionnaire was advertised on the Centre for Entrepreneurship and Innovation website for the entrepreneurs associated micro-enterprises. The structured questionnaires were sent to the relevant participants via email. This was all done to ensure a high response rate. In addition, the structured questionnaire was provided in an online format via Google Forms. This enabled the research structured questionnaire to be provided in the form of a link to an online form. The structured questionnaire was distributed and remained open for 6 weeks during which 35 people from the population took part. Using the online forms for distributing the structured questionnaire played in speed tracking the response rate. This is due to the ease of access and usability the online form presented.

Once the participant completed the structured questionnaire, a message was provided stating when the results would be published, and how to access them. This went toward building credibility and trust between the researcher and the participant. Upon completing the structured questionnaires, the participants were contacted with a request to be interviewed via the Centre for Entrepreneurship and Innovation. The benefits of the enterprises leveraging the knowledge that would be available for

implementation in their business activities was a big motivator to the enterprises to take part further.

3.7 The Data collection procedure

This section discusses the collection procedure for the research.

3.7.1 Issues and sources of errors in emailed structured questionnaires

There are many advantages to using email communication for the creation and distribution of the structured questionnaire questionnaires in research. These included enabling broader reach and research on a global scale, cost effectiveness of creation and distribution, efficiency due to the instant nature in which communication occurs when utilising web platforms and applications such as email (Illingworth and others, 2001). Though the benefits are appealing, the research considered that there may be issues that would be encountered, which included; ethical concerns to ensure that the user's data is safe and will not be broadcast, perceived an invasion of privacy, technical glitches due to sender or receivers internet services provider (ISP) experiencing issues (Hewson, Vogel and Laurent, 2015).

The research experienced instances where during follow-up, potential respondents claimed to not have received an email, after which the email was discovered to have been flagged as 'spam' due to the potential respondents' internet protocol not recognising the sender's internet protocol.

3.7.2 The Coding of the Data

As the structured questionnaire data were collected with the use of an online document generator using Google Docs, the data were automatically codified as collected. The document generator collected, categorised and assisted in the theming of the data through data statistics output. This enabled the analysis of the data to be more efficient and effective to provide statistical feedback based on the participant's responses in a format easy to understand and decipher.

3.7.3 The Treatment of Data

The following section describes the way in which data for the research was treated.

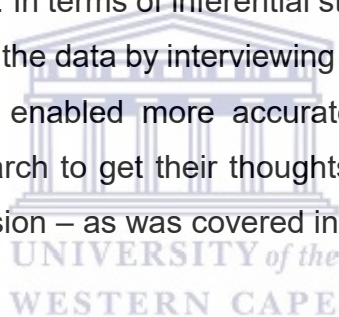
3.7.3.1 Descriptive statistics

Using descriptive statistics enables researchers to gain an understanding of the data through condensing it into more manageable measurements (Hewson, Vogel and Laurent, 2015). Considering this, the use of the structured questionnaire in an electronic document format allowed for the responses to be automatically set into the statistical format. This statistical format allowed for the data to be grouped according to sections, questions and type.

3.7.3.2 Inferential statistics

Inferential statistics can be used to infer what the sample or population might have been thinking or the reasoning behind certain answers they have provided (Ott and Longnecker, 2015).

The content included in the structured questionnaire enabled the researcher to get a general view of what was happening internally and externally within the enterprises in terms of them investing in ICT. In terms of inferential statistics, the research sought to gain a better understanding of the data by interviewing as a form of 'follow up' with the taking part enterprises. This enabled more accurate inferences to be made, as participants allowed the research to get their thoughts, experiences and knowledge regarding the topics of discussion – as was covered in the structured questionnaire.



3.8 Qualitative data collection – The Interview

This section describes the interview data collection process.

3.8.1 Interview Data collection

Interviews are far more personal and interactive than other qualitative data gathering techniques (Valenzuela and Shrivastava, 2002). In designing the interview, the researcher should understand that there are aspects of the interview that need to be covered. The following aspects were covered during the interviews (Gill et al., 2008; Lorente-Catalán and Lleida, 2014):

- Introducing the research by covering the purpose, terms and information with regard to the research.
- Starting the interview by ensuring the interviewees were comfortable and the order that was pre-set for the interview was followed in a flexible way.

- Developing rapport – the researcher utilised various soft skills needed to navigate the flow of the interview.
- During the interview – probing questions were asked, along with interpreting what was being contributed.
- Kind of questions – these included questions that were; introducing, follow-up, probing, specifying, direct, indirect, interpreting and silence.
- Questions to avoid – during the interview the researcher ensured that the interview stayed clear of biased, ambiguous and complicated questions.
- Types of topics – the researcher ensured that the questions extracted the participants' knowledge, demographics and behaviour regarding the topic of discussion.

The questions were examined and expert supervision was given in determining the relevance of the questions, unambiguousness, literature and subject based and non-confrontational. The questions were grouped in a logical format to allow for the participant to gain perspective as they contributed to the research. In addition, the questions were structured to allow for flexibility when conducting the interview. Communication was drafted for the participant to review regarding the research and interview to be conducted. These were assessed by the research supervisor and two peers to amend any ambiguity and irrelevance in the wording and line of questioning to be followed.

Finally, a cover letter with the accompanying official research documentation was drafted for the interview. Effort was made to ensure that the interview, instructions and accompanying official research documentation were logical, clear and professional and pleasant to the participant (Valenzuela and Shrivastava, 2002; Gill et al., 2008; Lorente-Catalán and Lleida, 2014).

3.8.2 Data collection

In conducting the interview, the researcher sought to gain as much data and information as possible within the confines of the ethical considerations regarding research and data gathering techniques (ESRC Framework for Research Ethics, 2012; Zhang et al. 2005). The researcher conducted face-to-face interviews with the

selected participants of the research but only after the participant had taken part in the research structured questionnaire.

All relevant official documentation detailing the purpose of the interview was sent to the participants before their participation in the structured questionnaire. This was done to adhere to ethical requirements, and provide an understanding between the participant and the researcher, and to foster a level of trust and willingness to contribute knowledge to the research.

3.8.3 *The interview protocol*

When planning for of an interview, it is always good to prepare and set the stage for extracting as much information as possible from participants (Lorente-Catalán and Lleida, 2014). Achieving this required that the researcher maintained an interactive and social approach that enabled the interview session to be a learning environment for both the participant and the researcher (Valenzuela and Shrivastava, 2002). The research was planned and conducted according to the following protocol:

- The setting of the interview location and/or area was cleared of distractions,
- The purpose of the interview was explained clearly,
- The Ethical Considerations were explained in detail to the participants,
- The format and duration of the interview was detailed and explained beforehand
- Contact information was made available to the participants before and after the interviewed,
- Various methods for recording the data were made available, such as; a recording device (which was only used with the permission of the participant), and note-taking apparatus.

In addition, a brief document listing the themes were to be covered in the interview was made available to the participants. The themes listed were in line with the structured questionnaire sub-topics that the participant had already been exposed to during the structured questionnaire. This was to ensure that the participants were prepared and equipped to contribute their knowledge to the research as effectively as possible.

The interviews were conducted over two weeks at various locations where the participants operate their enterprises. Before beginning the interview, participants were requested to sign the Research Consent Form and confirm their agreement to the research being conducted. In addition, the researcher sought permission to record the interview with the consent of the participant. The researcher accommodated participants that rejected being recorded by taking notes as the interview proceeded. During the interviews, it was discovered that when participants consented to the recording, the conversation was a much more flexible flow, as there was a little break between reaction and thought processing when administering and answering questions.

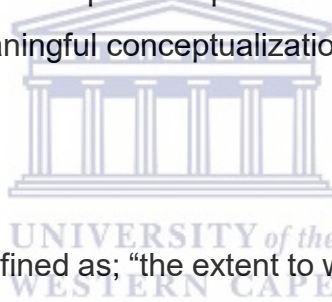
3.9 Data coding and analysis

Qualitative analysis is an ongoing process that occurs during and after the interview has taken place (Smit, 2002). The analysis of the qualitative data obtained from the interview was conducted using qualitative data analysis (QDA) techniques and the Atlas.ti software package as listed below:

- Data were collected, and throughout the collecting of the data impressions, connections, meanings and relationships were reflected upon. This was done to improve the researcher's ability to deal with the compiled data.
- Once all the data were collected, the researcher read through all of the data thereby compiling it into a manageable format. This involved QDA procedures of transcribing the data verbatim, including header information. Once transcribed the document was saved for import into the Atlas.ti software.
- The data went through a QDA process of preliminary screening and exploration to get a sense of what was gathered. The initial ideas were documented as notes into the Atlas.ti as; themes, differences, similarities and concepts. The initial screening implied that the data collected was inductive.
- The data were then segmented according to meanings and interpretations as part of the QDA procedure. Thereafter data were coded in the Atlas.ti in which codes were assigned to Code Families.

- Once coded, the data were sifted for similar code schemes. These similarities were then grouped into themes according to the QDA procedures. These codes were then assigned to Atlas.ti along with relevant quotes.
- The data were then further refined by comparing it to concepts to which patterns were discovered as per the QDA process. On Atlas.ti, the codes were constructed into new positions according to the patterns that were identified and then renamed.
- The result of the interviews and qualitative data presented a descriptive picture that portrayed the perceptions, understanding and contributions of the participants of the data. This was all categorised into themes and substantive theory that formed the basis of the research that was being conducted.

The qualitative data were analysed together with the structured questionnaire data which was Quantitative. This provided a platform in which the quantitative data could be better conceptualised with the help of the qualitative data, as quantitative data is of little value if not based on meaningful conceptualizations (Dey, 2003).



3.10 Reliability and Validity

Reliability Reliability can be defined as; “the extent to which results are consistent and an accurate representation of the total population” (Joppe, 2000, p. 1). With that in mind, no trials were conducted during the research. All data were gathered via structured questionnaires and corresponding interviews. The structured questionnaires served as the precursor for the interview which gave depth and insight into the data collected. The structured questionnaire was also administered once, with enough time given to the participant to respond and provide feedback relevant to the research that was conducted. Finally, all the data were received from the primary sources of the enterprises taking part in the research. The primary sources were the most senior person/s of the enterprises (i.e. Owner, CEO and or Managing Director). This ensured that the data received were accurate and emanated from a reliable and reputable source.

Validity can be defined as “determining whether the research measures that which it was intended to measure or how truthful the research results are” (Joppe, 2000). Considering this, the data gathered were based on the research questions provided in the initial stages of the research. The research questions were based on the research aim and objectives. This was to ensure that the research remained rooted in its primary purpose, which was to determine a maturity model that enterprises could use to invest in ICT. All questions posed during the qualitative interview provided more depth following the structured questionnaire that was conducted. The questions also provided validity in the form of confirmation of answers produced by the participants during the structured questionnaire.

The data were tested using triangulation. Triangulation can be defined as a strategy used for enhancing the reliability and validity of research by using over one method of data collection in unison (Mathison, 1988). The advantage of using triangulation in this research is that the data could be validated by two methods of data collection and analysis, namely qualitative and quantitative (Patton, 2005). To avoid disconfirmation, the qualitative approach built on the quantitative approach, ensuring the reliability of data received and retrieved.



3.11 Challenges Faced

The researcher faced challenges during the data collection process. Firstly, sourcing micro and small enterprises that suited the criteria of the research was an issue. This required that the researcher utilised multiple sources to find the participants. In dealing with this issue, the Centre for Entrepreneurship and Innovation was approached to assist in the sourcing of the small and micro-enterprises. This is because the CEI presented a reputable institute with connections with various enterprises within the Western Cape. Once an agreement was in place, the researcher sourced most its participating enterprises with the help of the CEI.

Secondly, gaining willing participants was an issue. The researcher experienced multiple rebuffs. This could be attributed to the enterprises not being exposed to research studies before. In addition, the enterprises needed convincing on multiple occasions before they will participate. During the stages of convincing and

communication, it was discovered that most of the potential participants feared their competition gaining knowledge of their current practices and causing harm to their business. In dealing with this issue, the enterprises that were approached were presented with documentation stating the Ethical Documentation and Reporting of the research. This was also supported by the Research Documentation which included the Proposals, structured questionnaire questionnaires and research consent forms. In communicating with the enterprises to take part, the benefits of the research were explained together with its purpose. The proposal of a maturity model or index that could support their business strategies going forward played a big role in getting the participating enterprises interested in the research that was conducted.

Finally, feedback from the structured questionnaires required follow-up to the micro and small businesses that were participating. This was because the completing of the structured questionnaire took longer than expected. This was a challenge that was overcome by following-up via the use of telephone and onsite business visits to enterprises. The numbers and addresses of the participating enterprises was obtained via support from the CEI.



3.12 Conclusion

This chapter provided details as to the methodology and design of the research that was conducted. This included discussions and details as to the; research objectives, target population, research sample, measuring instruments and analysis of data. The mixed method approach allowed for the research to get both quantitative and qualitative data. This provided more depth into the data was to be provided by the participants. In addition, the analysis as performed using the Atlas.ti software that help provide content analysis and retrieving themes relevant to the research that was conducted.

The research process was inductive in that the data collected informed the conclusion reached after the research was conducted. This data and analysis will be provided in the following chapter – Chapter 4 – which gives an in-depth analysis of the research and supporting data.

Chapter Four: Findings and Discussion

4 Introduction

The chapter starts with an overview of the flow of content given by structuring it into key themes that were identified after the research results were gathered and analysed. The discussion uses quantitative data representations in the form of graphs and numerical descriptions, and quotations from the participants as obtained during the qualitative data gathering. The quotations used – as obtained during the interviews – in the analysis provides much more detail and depth to the results represented (Corden and Sainsbury, 2006).

Throughout the research analysis and results, the participants' personal details have been omitted and replaced with aliases. The aliases used do not refer to the participants' gender, race, affiliation, or names of the participants. The aliases are recorded as participants with an alphabetical pairing, which resulted in aliases ranging from; "Participant A" through to "Participant AK". In addition, the business related details that specify the products and or services offered by the enterprise being quoted have been omitted as per the agreement with participants. When a quote mentions the products and or service being offered by the enterprise, five asterisks' (i.e. "*****") have been used to ensure that the business detail cannot be linked back to the participating enterprise. This is done to ensure the confidentiality and anonymity of the participants' responses as was agreed upon in the Ethical Considerations Documentation.

4.1 The Key Themes

In structuring the key themes of the research, the research question was taken into consideration, which stated: "*How can a maturity model be used by micro-enterprises in the Western Cape to strategically invest in ICT?*"

The literature and theoretical framework assisted in providing focus points of the research and analysis. The key themes were derived from the results of the quantitative and qualitative data gathered from participating micro-enterprises.

After an in-depth analysis of the data gathered, the following themes were derived and will be discussed: (4.3.) Micro-enterprises' internal and external environments, (4.4.) Strategy and methods, and (4.5.) ICT as a resource, maturity and development for ICT investment.

4.2 Core Theme One: The Internal and External Environment of Micro-enterprises

Understanding the environment within which a micro-enterprises exists and operates is critical before proposing a maturity model they could utilise for their strategic investment in ICT. Without this understanding, the research and findings would become irrelevant and the validity of the research would be called into question.

The research sought to determine and understand the micro-enterprises internal and external environment. These would add value to the research in that the proposed model depends on the information. Questions were posed to the participants during the structured questionnaire to gauge their internal and external environment factors and influencers. In addition, questions were posed which relate to their current resources and capability status. These questions were brief and required short answers in a mixture of quantitative and qualitative data. An in-depth series of questions in the form of an interview that mirrored a follow up to the structured questionnaire followed this exercise. These interviews sought to determine the reasons behind the current status and their current practices and influences within the micro-enterprise.

4.2.1 The Internal Environment

The internal environment of the organisation includes the enterprises' stakeholders, enterprise culture and other elements within the enterprise (Fernández-Olmos, Ramírez-Alesón 2017). The criteria of the research required that the enterprises that take part be operational and generating a revenue from their current operations. The structured questionnaire posed questions to determine whether the enterprises met the criteria of the research. This was important in that the research proposed sought data that are current and relevant. Of the thirty-five enterprises that took part, all met the requirements. This was a good achievement in that the enterprises that took part

represented different industries. These industries and markets included the food sector, hospitality, technology, procurement, delivery, motor and recycling industries. This presented a great opportunity for the research in that the data that would be gathered would be from a widespread population.

In continuing with the research, much was discovered and contributed in terms of the internal environment of micro-enterprises in the Western Cape during the interviews. When asked to describe their enterprise's internal environment and nature, the participants had varying but similar responses:

“... very much all over the place.” – Participant G.

“We are constantly busy, but managed.” – Participant K.

“... a learning environment.” – Participant L.

“It’s a stressful place...” – Participant F.

After further discussion and reflection, this internal environment and nature could be attributed to micro-enterprises constantly having to perform remarkable feats to remain operational. This includes managing limited resources in terms of people, finances and capabilities and leveraging those over a prolonged period.

On average, the participating micro-enterprises were made up of three people. Over 41.2% (N=14 of 34) of the enterprises showed that they employed people permanently while the rest employ people as needed. Participants showed that most their employees knew how to use the basic functionality of ICT – computers, telecommunications and managing of databases should they be online.

“I use computer software like... Microsoft Office and Xero to do our daily operations. The hardware is the laptop computer itself, the printers, telephone, and we store some data and information on Google Drive and other software so that we can access on our phones when we’re on the road.” – Participant X

This, together with the feedback received on what ICTs’ they used for the business, showed that they had capabilities are above those of a beginner, but not yet at the level of an expert.

In terms of finances, the majority's turnover ranged between 100 000 and 150 000.

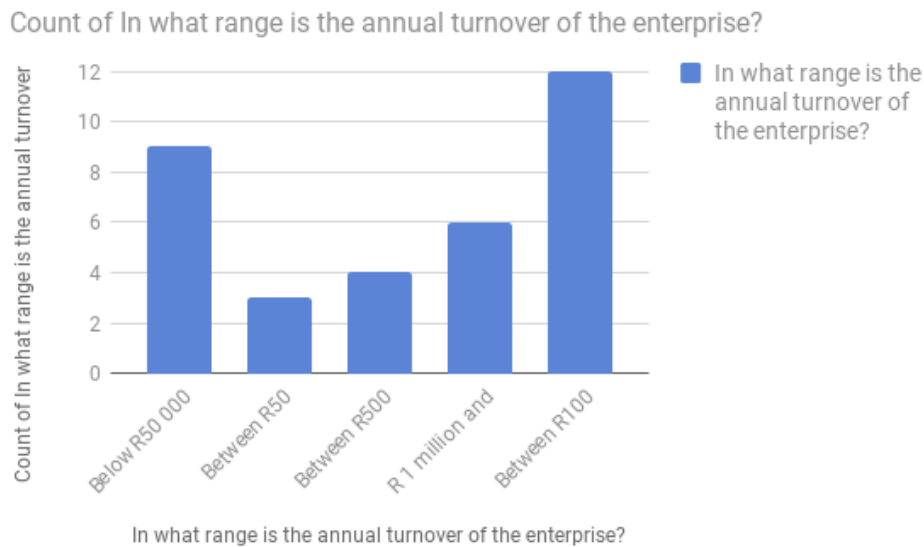


Figure 2: Range of Annual Turnover (N=34 enterprises)

In addition, the participants also mentioned how they constantly had to make critical decisions that affect their enterprise. Some of these decisions include, and are not limited to purchase of ICT and assets and investing funds in new projects.

“For example, we have new business and now we have to invest in getting more people in and maybe more computers. The questions are; how much do we need and for how long.” – Participant Z.

This is because micro-enterprises are small in size and stature, and the decisions made can affect whether the enterprise survives in the market or industry within which it functions. When asked about what internal decisions were made, participants mentioned issues relating to how time and resources should be used for the benefit of the business, and the use of limited finances for investments in telecommunications and networks and related ICT.

4.2.2 The External Environment

The consensus was that the external environment of their enterprise was something was out of their control. On the questions: “What influences does socio-economic

factors (i.e. Political, Economic, Social, Technological Environmental and Legal) have on the enterprise? How would you describe those influences?”

“Very unpredictable, if I may say so.” – Participant G.

“Difficult to describe... I can't say I can (describe it) because it's out of my control at the moment.” – Participant L.

“Its competitors, its laws with the city... It's everything. The prices for things increasing and decreasing, new technology... a whole lot of things.” – Participant F.

Micro-enterprises are influenced by varying external factors are out of their control. These include, but are not limited to economic issues, politics, social behaviours and occurrences, technology advancement and laws and legislation that affect them doing business effectively. The micro-enterprises also mentioned how these external environment factors can have varying effect on their enterprises – both positive and negative. The positive effects they mentioned included the factors bringing about opportunities in the form of business ventures, new services and products driven by demand and trends in markets and industries. The negatives included new requirements for operating in the form of increased finance and resources such as people with skills and knowledge and adhering to new laws and policies. These factors bring about change, and change brings about uncertainty and positive or negative consequences.

*“It's difficult to operate without a large amount of finances in order to import the required amount of products for selling in the ***** market. The more things change, the more you need to have to cater to the change.” – Participant X*

*“I've had to change my business model a few times because of the new things happening in the ***** industry.” – Participant R.*

4.2.3 The Main Factors Affecting of Micro-Enterprise in Market and Industry

Micro-enterprises in the Western Cape have become very much accustomed to having to change due to various reasons. Change in policy and law, best practices, technology and the demand for products and services play a big role in this.

Within these markets and industries, micro-enterprises are faced with constant decisions on how to function in order to remain relevant. In identifying these factors affecting, the enterprises were asked questions to gauge what influences them strategically, tactically and operationally on a daily basis. The answers revealed much.

“We have to try and see what is being done by the medium sized and bigger companies, because when they do something, then it becomes expected that you can also do it.” – Participant B.

Competitors, as well as best practice, plays a big role in influencing micro-enterprises.

*“I remember a local competitor started selling their ***** at a cheaper rate than mine. So I had to go and find how they were able to do that. It turns out, there was a ***** machine that helped them. That way, they could make the ***** themselves, and not buy it from a supplier. – Participant O*

This is because many of the enterprises are developed due to gaps in the market. These gaps however always lead back to the realisation that there are other enterprises providing similar if not identical services and products.

“Too often you have to look and see what other similar businesses in the area are doing. Like us, we go and look at what are they selling there, how much is it, what people go there, what kind of new things they use to do it.” – Participant K

What makes this more critical for micro-enterprises is that they have to ‘follow’ other enterprises that are medium or larger in size as they are the ones that set the standard. This is because the medium to larger enterprises influence the industry standard and end up determining the level of service and product offering. The advantage of this is that micro-enterprises can learn from these other enterprises and have a constant opportunity to rework the system or innovate in ways that are flexible and rapid. The participants shared instances in which competition influenced them and best practice in their markets and industries.

These influences led to them changing their internal structures, business models, services and sometimes products in order to continue competing and remain functional.

4.2.4 Resources and Capabilities

The internal and external environments of the micro-enterprises require them to have resources and capabilities that enable them to remain functional. These resources and capabilities go hand in hand. It was found that they recognised the need for synchronicity in the resources they get and utilise and the capabilities required to leverage them successfully.

“I understand that I can’t just go and buy technology without having the right person or people to use it or benefit from it. So I hold back and see what could work for me then I make the purchase.” – Participant A

When questioned around the current resources and capabilities, participants mentioned resources that included; finances, technology (ICT), infrastructure and personnel. These resources were supported by people and processes that ensured their utilisation within the enterprise.

*“We have a very capable team. We all work on the technology you see here.”
– Participant X*

“We had to get someone in to work this new software for our finances. So we operate, and they come in and every now and then to reconcile our finances and also capture everything for us into the software. We can then see how we are performing as a business which is really great.” – Participant J

4.2.5 People, Processes and Procedures

The participants mentioned how there was a need for people and processes.

“Once we got someone in for our finance software, we needed someone to assist with the operational things online. That way, we can streamline how we do things.” – Participant J.

This included processes to ensure that the enterprise's operations functioned accordingly and having people to perform those processes.

The processes included the day-to-day operational activities that enterprises carried out. In describing some of these processes, some participants mentioned how there was a procedure to how they are carried out, as in a standard operating procedure. This is because certain services which they offered, required it. It was then asked whether these procedures were formalised or documented, to which few participants responded.

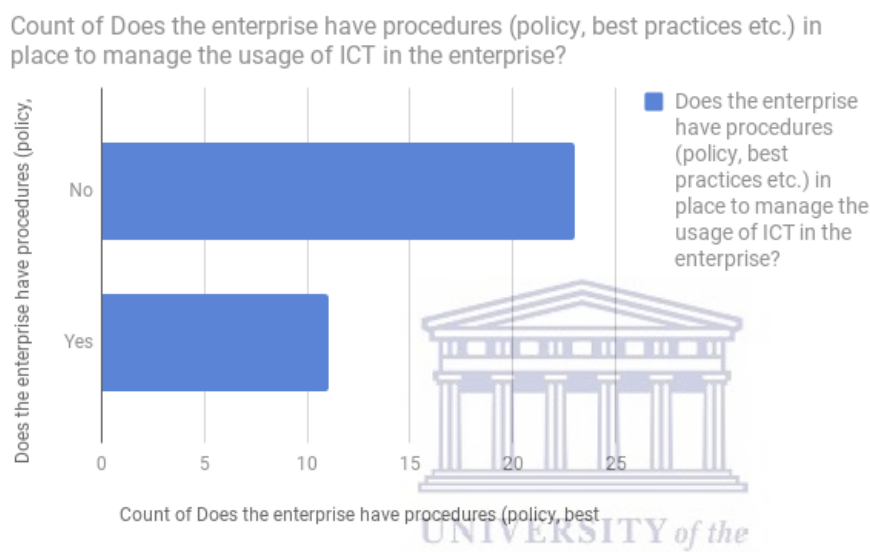


Figure 3: Processes and Procedures formalised in Enterprise (N=34 enterprises)

The consensus was that the processes and procedures are already engraved in the everyday practice of the enterprise, therefore documenting it was not a necessity.

This discovery provided an informed view of the internal practice and culture of the enterprises. This revealed that the enterprises fully know of their processes, procedures and their importance. In becoming more strategic in ICT investments, enterprises would need to embrace a change in how they treat procedure. This is because the good strategy is planned and documented (Gates, 2010).

This is important in that enterprises, whether functioning with one or many personnel, need to have processes and procedures they follow and which are carried out by the personnel.

“I’ve recently employed someone to assist me with the technical side of the business because I’m still learning on the IT side, so it’s good to have someone there who understands it and can assist me in the day to day activities.” – Participant C.

Over 60% (N=21 of 34) of the participants mentioned that they have people employed within their enterprise. These people perform a myriad of duties that pertain to carrying out the processes of the enterprises. Many of the micro-enterprises view people as an investment. This is so because these people having the capability to perform certain tasks due to the skills and knowledge that they have – which are the primary reasons for their being importance.

“I needed a finance person, because I was struggling with the finances. I needed an IT person to help set up my equipment and everything. People with expertise are very important in a business, because I can’t do everything myself.” – Participant B

“I recently got in some interns from a University in Belgium. It’s great. It really helps. The one guy is researching digital marketing and what a God send he is. Now my marketing is sorted.” – Participant D.



However, when asked whether micro-enterprises invested further in their people resources to enhance their capabilities, only 26.5% (N=9 of 34) of them confirmed they did. The reason for this was because micro-enterprises are constrained in investing in resources due to limited finances and priority to invest in what they can reconcile with an immediate return.

4.2.6 ICT Utilised Within the Enterprise

ICT is one of the biggest investments, aside from people, within the micro-enterprises that took part in the research. The diagram below depicts the ICT currently utilised by thirty-five participating enterprises:

Count of Please indicate by ticking next to the appropriate item the technology resource utilised within the enterprise:

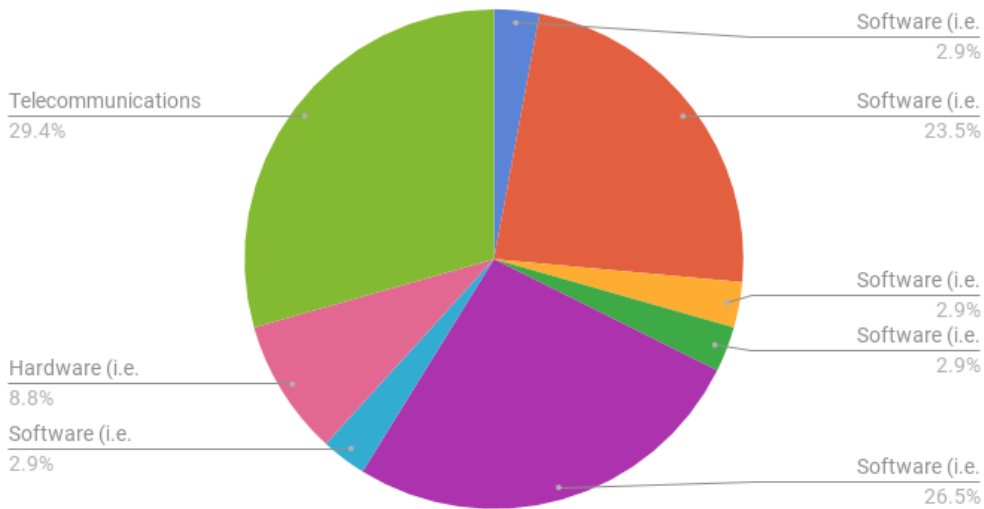


Figure 4: ICT Utilised within the Enterprise (N=34 enterprises)

The enterprises mentioned that they depend extensively on their ICT, and have either made a big investment in purchasing and sourcing ICT to utilise for their business activity. The ICT mentioned was in the form of hardware, software and telecommunications and networks (see figure 4). Hardware included computers, laptops, printers and scanners. These are used for everyday operations within the enterprise such as capturing and inputting data and producing outputs such as paperwork electronically. Software included applications that assist in administration and management of finances and people in the enterprise. The software used included Microsoft Office packages, Sage Pastel and other communications related applications. Telecommunications and networks included the use of telephony, mobile and internet service providers and virtual private networks (VPN). In addition, various machinery and equipment related to the enterprises carrying out their services and development of products were also mentioned.

Questions were posed to the participants on why and how they utilised--- the ICT they had mentioned.

“How will I communicate with my suppliers if I don’t have telecoms and the internet and the laptops and all these things?” – Participants A.

“My business advisor recommended I get new software to manage my finances and inventory. Because of that I had to get in new laptops for the team because we were using old outdated hardware that was slow and unreliable.” – Participant R.

In essence, the ICT is used to perform various activities within the business. These activities are linked to operational and transaction based activities such as; selling, buying, creating products and fulfilling services. In addition, the ICT helps to support all of the micro-enterprises business functions, which include administration, operations, financials, human resources (where it is applicable), technology, and customer relations, marketing and sales.

“I have a database to keep track of all of my customers. I know what they have bought, what they have ordered and their details in general.” – Participant X.

“We had to get a computer just to handle admin because it’s a lot. And I’m trying to do everything softcopy or electronic because we’ve lost some documentation and files in the past, and that’s something I want to avoid at all costs!” – Participant S.

“... I don’t know what I would do if I didn’t have access to the internet! That is where everything is... my customers’ details, my financials, my online marketing...” – Participant T.

Without the use of ICT, many of the micro-enterprises could not operate as they require to in order to fulfil their obligation in terms of product and service delivery. As a result, the ICT is not only an enabler, but a crucial part of micro-enterprises.

The ICT utilised is all interconnected. The micro-enterprises identified needs of hardware in unison with software. For example, some micro-enterprises utilise hardware such as printers and scanners that require certain software in order to run. This was also common in their understanding the need for networks and internet access to utilise certain software. As a result, ICT within the participating micro-enterprises is very important. This is because the micro-enterprises have become dependent on certain ICT to perform critical functions.

“Without the technology I use, I wouldn’t be able to run the business. That’s the scary thing.” – Participant E.

“I had to get a network upgrade to connect all of my computers so that we can share information and connect to the internet.” – Participant U.

Though they recognise the need and importance of the ICT they have, many micro-enterprises seldom invest in new ICT and leveraged what they have. Again this stems from limited resources and capabilities, and the need for the micro-enterprise to invest in import things that can be reconciled to an immediate return. This, as participants mentioned, includes general business overheads such as advertising, accounting, supplies, rent and utilities.

“I don’t have the money to always be buying new technology items for the business – it’s just too expensive. It’s better to know what you need and then to get it knowing that it will be beneficial to you and the business.” – Participant H.

“I once scored a big contract, and ended up buying all sorts of technology equipment. Today, I don’t use that equipment. It was a waste of money at the end of the day. If I had known that maybe I should buy things that can be used again, things would be different.” – Participant Y

“It’s difficult to know when to invest in certain technology or not. Yes, my competitors are doing it, but must I also do it because of that? How do I know that it’s the right time to buy a new computer... besides it breaking of course?!” – Participant T.

The participants spoke of how they did not know how or when to invest or utilise the ICT they had. Considering the above, the proposed maturity model would need to be inclusive of enabling the micro-enterprise to view their business resources and capabilities. This view would provide clarity on what is lacking and where it is lacking.

Since micro-enterprises are influenced by competition, the market and industry practices, having knowledge of the enterprise's internal and external environments can

assist in the formulation of a strategy related to why an investment in ICT is being made.

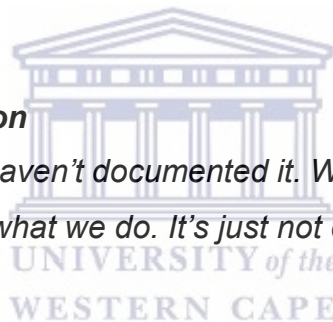
4.3 Core Theme Two: Strategy and Methods

Strategy and methods as discussed in Chapter 2 can make or break an enterprise. During the research, it was discovered that strategy and methods utilised by micro-enterprises were at the core of their ability to succeed and compete within their environments. These strategies and methods are based on the enterprise's ability to plan ahead and identify their internal capabilities. They include strategies and methods for; transactions, operations, financial management and core processes dependent on the enterprise delivering a service or a product in the industry they operate in.

The key to an enterprise solidifying these strategies and methods is recognising and reconciling the strategies and methods with the internal; vision, goals and general decision-making.

4.3.1 Micro-Enterprise Vision

“There is a vision, but we haven’t documented it. We do stick to the vision, though; it’s the reason why we do what we do. It’s just not documented.” – Participant G



This comment could be attributed to many of the enterprises that took part. The vision is present internal, but not documented. This was primarily due to key enterprise personnel having their focuses shifted to the operational aspect of the enterprise because of having to constantly perform in order to remain productive and functional. In addition, having the focus shifted resulted in enterprises operating without a clear sign of the vision. Therefore, the enterprise operates without the ability to align their current practices with a mission that resulted from a vision that was set forth. Ideally, a vision drives a mission, which leads to a purpose (d’Ambiose, 2000).

Through further probing on the reasons for the enterprises’ lack of documentation on the vision, it was discovered that enterprises generally go for the opportunity available in the market to exploit it. For example:

“I have documented the vision. It was when I started the business. But obviously, it changed as I went on.” – Participant D

Though documented, the vision would change due to certain opportunities and or outcomes of certain aspects within the market (external) and internally. As stated in the literature, constantly changing the vision can cause enterprises diverting from their original path and therefore may threaten their performance and sustainability (Bruin et al. 2005; Wendler 2012)

Externally, an enterprise may be forced to revise their current vision due to changes in market behaviour, tastes and or opportunities arising. Internally, maybe the enterprise has identified a skill or offering they could develop to suit a segment the market within which they operate. An enterprise’s vision will be affected. And once affected, the alignment between what the enterprises does, its purpose in the market within which it operates and its documented vision comes into question.

4.3.2 Business Goals

As a result of enterprises not documenting or having to deviate from their originally documented visions, it was discovered that the business goals that were currently in place were more flexible and diverse.

“... So basically, we review every month and set goals for the business, and then we operate toward achieving those goals – be it 1 month and so on...” – Participant B

Business goals can have multiple meanings, depending on the enterprise. Ideally, a business goal could be the roadmap that a business sets to achieve over a specific period. This could be split into segments or objectives that enable the goal to be more Specific, Measurable, Attainable, Rewarding and Timed (SMART) (Grusenmeyer, 2009; Ordóñez et al., 2009). Alternatively, a business goal could be interpreted as an action that needs to be taken by the business in its current or future operations. Either way, a goal is something that has to be done in order to reach a conclusion.

Enterprises have experienced the need for goal setting in their everyday operations. However, these goals cannot always be linked back to the original vision – be it documented or not. This is mainly due to the unique nature of these enterprises that requires them to react to changes in the market and changes internally (Galpin, 2017). For example; some enterprises shared how they have had to remodel their business models to cater to changes in their markets relating to customers' behaviour, competition, laws and policies they have to adhere to. Internal influences ranged from changes in personnel and availability of funds to spend on resources that presented additional opportunities.

“We sell products that are on demand. As the trends change, so does the product and offering. Sometimes it's customers, or the law-makers or the competitors. But once things change, we have to react quickly.” – Participant J.

This links back to the enterprise's vision and also to Core Theme One. Perhaps if the vision was clearly defined, it would provide the ideal basis for an enterprise's mission, purpose and resulting business goals. Seeing that the enterprises are very reactive to occurrences internally and externally, it can be stressed that the vision is of paramount importance in defining before setting any business goals as a result of internal and external occurrences. The question was then raised whether these enterprises felt that the goals were more important than the vision, to which the response was a resounding “they are equally important”. The enterprises identified them as leading from one to the other, the vision can drive the goals of the business.

It was discovered that the vision is at the forefront of the enterprise's ability to function in a manner that promotes alignment throughout the businesses behaviour internally and externally in terms of strategy and operations. If a maturity model for strategic ICT investment were to be developed, the vision must defined from the start in order get the best possible result in terms of the alignment of the enterprise vision, and business goals.

4.3.3 IT Goals

Having IT goals should go hand in hand with having business goals, as IT is an enabler for business (Chang 2016). As such, it can be argued that without IT goals, business may find it difficult to implement strategies and achieve their business goals (Bras et al. 2016). Questions were posed to the participants on whether they set IT goals as part of setting goals for the business

“Well, not exactly. I don’t actually set any IT specific goals. I just use the IT I have to do what I need to do.” – Participant E

“I don’t actually set specific goals for my ICT... do you mean like as part of the project plan? Not exactly. It would be good if I did though I know that.” – Participant U.

“I only focus on setting business goals. I don’t set IT goals...” – Participant H.

*“Because I’m in ****, I have to know what my clients want, therefore I have to have some kind of plan for how I use my ICT.” – Participant K.*

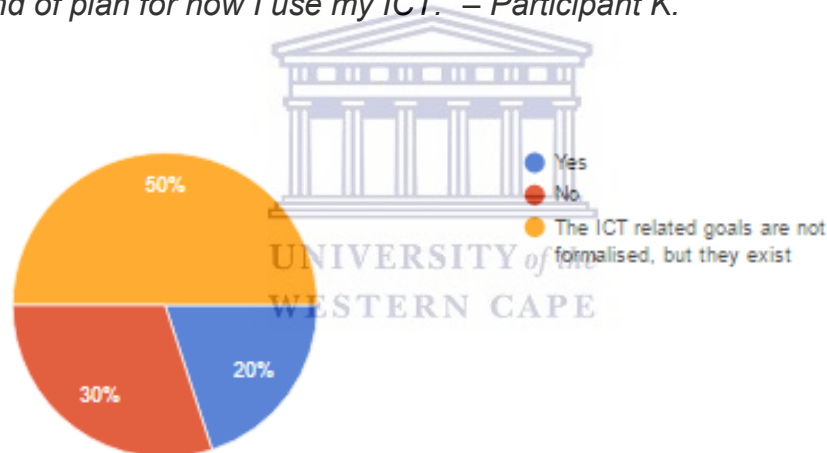


Figure 5: ICT related goal setting and formalisation (N=34 enterprises)

The consensus among many of the enterprises is that the setting of IT goals is not important. This is because enterprises believed that it is the business goals that need to be defined as they help determine what the operational landscape will be, hence the core of their focus being on the business goals. Unlike larger enterprises, micro-enterprises are primarily driven by the need to survive and take advantage of opportunities that arise. This causes a shift in focus, as in ‘what is most important’. Unfortunately, IT is not exactly regarded as being as important as what the business

needs to do – which is what the business goals represent. IT is merely seen as an enabler. Therefore, the enterprise will opt to only focus on IT when it is of paramount importance. For example:

“... The last time we looked at IT was when we were starting out. We needed equipment, laptops, software, and the internet and so on.” – Participant M

Even though IT was part of their core focus at the point of initiation, an assumption developed that IT was expected to perform consistently and be able to adapt to any and every business need that would arise. In essence, it can be argued that IT is seen as an asset that is only relevant should it be of consequence at the point of initiating a new goal.

With this in mind, it has to be stressed that a business goal cannot truly be successful unless IT goals become a part of it. This is so because enterprises are becoming increasingly dependent on the IT that they use. Due to the volatile nature of the environments within which they operate and function, IT has to support the business goals that are set. This will promote alignment, and this alignment will enable a balanced focus thereby increasing the potential for success.

The maturity model to be proposed needs to cater to identifying the business and IT goals. In addition, when utilising the model, the user should be able to align their business and IT goals thereby ensuring success in all their ICT investment and business decision-making. Alignment is important and all the participating enterprises were in agreement. It was largely recognised and conveyed that due to the dynamic nature within which the enterprises operate, IT needs to be one of the core focuses when strategizing. This would enable the enterprises to have a holistic view of their enterprises and how they can operate competitively.

4.3.4 Current Business Strategy

Business Strategy is important in helping the business plan and paves a way forward in realising their goals. Drafting these strategies and making them a fixture for the enterprise to follow and refer back to can make it manageable to achieve the desired

goals. The enterprises were aware and understood the term 'strategy' and why a business would have a strategy in place.

"I understand a strategy is a plan that one has to achieve goals for the business." – Participant I.

"Yes, I know what a strategy is..." – Participant K.

"A strategy is a plan of action? A... plan to achieve a long-term goal." – Participant M.

The enterprises were asked many questions on strategy, and whether they had a business strategy formalised. Some of these questions included inquiries into whether strategies were in place, what methods they used to create these strategies and whether these strategies were documented.

"The business strategy is not formalised, no. But it is recorded somewhere... It's in the business plan, yes." – Participant A

Not all the enterprises had formalised business strategies in place – formalised being strategies that are documented and made official (i.e. included in the standard operating procedures, business planning, action plans among others). The formalisation of strategies was only present in 65% (N=22 of 34) of the enterprises that took part.

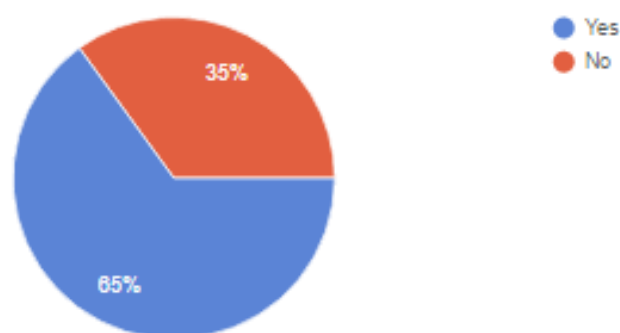


Figure 6: Business Strategy in Enterprise (N=34 enterprises)

It was found out that some of the enterprises have varying foci that are dependent on what the current internal need is. This is largely due to internal and external influences in the form of changes in market behaviour, completion which are examples of external influences, and resources, and capabilities which are internal. Enterprises will formulate a strategy based on what the desired goals are. As the landscape changes, so will their goals, and therefore their strategies. Some participating enterprises mentioned that it is very difficult to follow through on a strategy when the internal and external influences occur.

“The business goals are part of my business strategy. So the business strategy has changed quite a bit because my goals change quite a lot.... It’s a bit complicated. You see, it’s difficult to stick with a goal when you are not seeing an immediate return.” – Participant R

As a result of the varying nature of these enterprises, the most relevant reference point of success of a strategy is based on an immediate return on investment. This determines whether a strategy will be followed through or not. Unlike large enterprises, where there are resources and varying dynamic capabilities; micro-enterprises have limited resources and capabilities, meaning that their strategies will be limited to ‘what is possible, and within their control’. In addition, the reactionary nature of these enterprises plays a big role in whether they stick to their strategies or not. As mentioned before, micro-enterprises usually react more to changes in their external and internal environment – much more so than your larger enterprises. Considering the consensus of the importance of business and IT goals going hand in hand, enterprises were asked various questions whether their goals inform the strategies they set forth, in particular, the business strategies.

“So my strategies are more like action points grouped together at any particular time. And from that, I’ll have a strategy that I can then use.” – Participant F

These strategies are linked back to the business goals the enterprise sets. Once a business goal is set, a strategy is set in motion to support that business goal being realised.

4.3.5 Current IT Strategy

Though the business strategy could be linked back to the business goals that were set, many of the enterprises could not give feedback regarding an IT strategy. This is due to IT not being considered consistently alongside the business. As a result, 76% (n = 26 of 34) of the enterprises that took part stated that they did not have any IT strategies in place. As stated before, IT is only considered when it is of consequence, which is understandable. Micro-enterprises' primary focus is on the business and getting a return on investment. Unfortunately, IT is seen as expensive and intimidating due to the variations of it that may be available.

“I check online to see what IT I can buy for my business, but whenever I go on, I don't exactly know what I'm looking for because there's just too much. But I know that I need a printer and a scanner. I know that I need internet and telecoms.” – Participant C

Micro-enterprises do try toward an IT strategy, but only when there is a real need. IT is expensive and it is difficult for enterprises to reconcile its use with the returns they make. The need for it is evident, and enterprises realise this, however, the rapid changes in IT and associated costs are the stumbling block. In addition, IT can seem like a daunting challenge – especially for micro-enterprises.

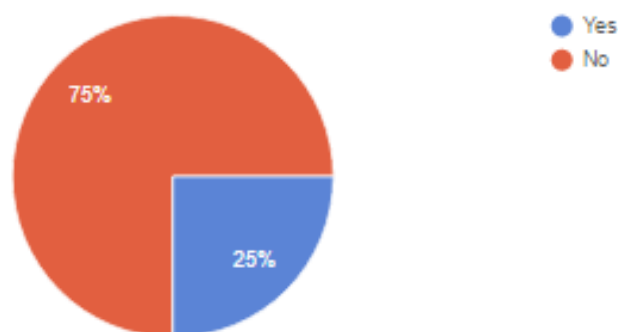


Figure 7: ICT Strategy in Enterprise (N=34 enterprises)

“When I think about IT, I think... what must I do now? What must I get? How much is it all going to cost me? Is it good for my business?” – Participant J

This finding emphasised the need for the understanding of what IT is, and its purpose and value to the enterprise. Considering the aforementioned, the proposed maturity model would have to enable a reconciliation of enterprises spending on IT, its purpose and return to the enterprise. In addition, the model would need to formalise the investment in IT by documenting the IT, its cost, purpose, use and desired return to the enterprise. This would give the enterprise stakeholders more reason and motivation to develop habits of considering their IT when making business related decisions and strategies.

4.3.6 Decision-making

The enterprise's business strategy should always go hand in hand with its IT strategy. This is so because the IT should enable the business to accomplish its desired goals and related strategy. This alignment should enable enterprises to have some semblance of a decision-making method, framework or process. These methods have to do with enterprises being able to make decisions related to strategic, tactical and operational activities.

The participating enterprises were questioned on whether they had any decision-making approach, framework, or process in place to assist them in making decisions concerning their investments in business and IT-related investments.

“Decision-making approach? Not really, no. You see; the decisions that are made are based on what is before me at that moment. So if I need to purchase assets for the business, then I will evaluate what is best in terms of cost and then proceed.” – Participant A

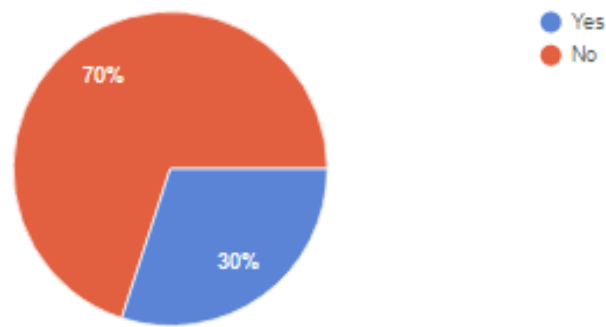


Figure 8: Decision-making Approach / Framework in Enterprise (N=34 enterprises)

A decision-making approach is a methodical approach to making a decision in which there is data that have been collected from observations, processes and systems on which a long-term decision can be based (Saurat, Ritthoff & Smith 2017). Of the enterprises that took part, 24 stated that they have no decision-making approach framework or process in place for their strategic, tactical and operational activities. This is understandable. Many of the enterprises shared information about their current operations and how decisions will only be made when a need arises – usually triggered by competition, opportunity and or innovations that occur within their industries that require the enterprise to react. These needs arising are examples of external influences which, as shared by participants, can be linked back to new uses for technology, a competition offering better products and services and industry related changes concerned with best practice, law or policy.

It must, however, be stated that micro-enterprises realise a need to have such decision-making methods, frameworks and processes in place.

“I understand that I keep changing things like my business model because I have to react to an opportunity or when something is not working for example. If I had something that could guide me in terms of... like how or when to make a decision that benefits my business, then that would be good.” – Participant N

Using such methods, frameworks and processes would significantly enable enterprises in improving levels that can provide a holistic view of their business and IT

and how they can be leveraged together. In addition, decisions that are made from a planned and evaluated state as compared to a reactional state, yield better results and returns (Krantz and Kunreuther, 2007).

This decision-making process would have to take the micro-enterprise user through a journey in which they would be re-evaluating their goals, strategies and current internal and external factors. This would provide a platform for decision-making which is relevant, sensible and based on a complete evaluation and understanding of the business and IT. The maturity model that would be proposed would need to have a decision-making process as its key element. This would enable the micro-enterprise users to go through a process that can help give them a holistic view and insight of the enterprise at a current state. This insight would enable the decision that would be made toward investments in ICT to be informed, non-reactional and aligned to the business and its IT strategy.

4.4 Core Theme Three: ICT as a Resource and Investment

ICT is a key resource for many enterprises. It provides them with the ability to perform everyday tactical and operational activities that drive the business. ICT can be viewed as; software, hardware, databases, telecommunications and networks. These are forms of ICT that provide the enterprise with a tangible source of process and data flow. Enterprises have recognised the need to have ICT at the forefront of their strategic, tactical and operational activities. This is very important for large and medium enterprises where ICT is critical to them achieving their desired business and IT goals.

The participating micro-enterprises were presented with questions around their use of ICT as a resource. This was to better gauge how these enterprises perceive and use ICT strategically, tactically and operationally. Understanding this was key, in that the maturity model that would be proposed would have to take into consideration the current level of use of ICT as a resource. In addition, the model would have to provide micro-enterprises with relevant ways in which they could evaluate how they could use ICT as a resource in line with the business strategies and goals.

This is critical, in that the investments made towards ICT by micro-enterprises needs to correlate with their use of the ICT as a resource. Once that is understood, ICT as a resource is understood within the enterprise. ICT should assist by forming the enterprise stakeholders how, why, when and what to invest in – in terms of ICT.

4.4.1 Innovation and Research and Development

Micro-enterprises function in volatile markets and industries. Many factors cause this volatility.

“I have to think; ‘what are my competitors doing’, ‘what are the new trends’, ‘what do my clients and potential customers want’. That way I am always ready to do and offer what is needed out there.” – Participant K

Many enterprises responded in the same way. Competitors, general market trends and demand are at the forefront of them having to react to the markets and industries within which they function. Considering this, the research posed questions around how the enterprises might innovate in order to deal with volatility they are exposed to. The purpose of this questioning was to gauge whether the participating enterprises were more proactive than reactive to occurrences both internally and externally.

“Innovate, like create new things? Well... It’s hard to be innovative when you have to operate to stay afloat.” – Participant S

The comment above summarised the general consensus among the participating enterprises. What is more important is focusing on what is before the enterprise more than what may be ahead. This is a reasonable way of functioning for micro-enterprises. This is because innovation requires that the enterprise invest time and effort in looking ahead. This may pose a risk in that there are always issues at hand that need immediate and complete focus from enterprise stakeholders, which involve operational decision-making and activity. Innovation within the micro-enterprise takes place at inception rather than during the operations of the enterprise:

*“At the beginning, when I started the business, I tried to come up with a more innovative way to sell *****. That is about the only time I can say I actually innovated because my value proposition needed to be better than that of my competitors. But as time goes on, it becomes less about innovation and more about surviving or breaking even. Some months are good, some are bad.” – Participant T.*

At initiation, more emphasis is placed on innovation as it is the prime time in which the enterprise stakeholder spends time on creating a model that can break into the market successfully. Based on feedback gathered from participants, many would agree with the previous quote. This is so because many of the enterprises exhibited innovation during the initiation of their businesses. As they operated, the focus shifted to ensuring that their initial act of innovation sustained the business for the long-term.

What was interesting was that many of the enterprises recognised that they needed to innovate if they would improve on their current performance and gain a better competitive advantage within their markets and industry.

“I do look at what my competitors are doing, and I see ways in which I could possibly do it better.” – Participant K

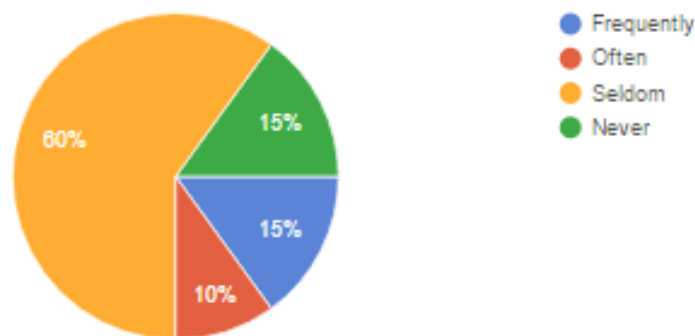


Figure 9: Innovation in Enterprise (N= 34 enterprises)

Figure 9 shows the frequency of innovation within the participating micro-enterprises.

“I don’t do much research on my market, but I try to see where I can do better based on my customers’ feedback.” – Participant J

In addition, when asked about innovations in terms of ICT and investing in ICT that could enable the enterprise to gain a competitive edge, many responded that they would be for it. Respondents gave reasons they currently do not act in this way. Their reasons included the constraints they experience around finance, the skills required to utilise some of the technologies out there, and the lack of knowledge how they would utilise-- the ICT once they gain it. Innovation was seen as something that had to be reached at a point of maturity in which the enterprise recognised what they wanted and how they would fit it into their long-term goals and strategies. The participating enterprises recognised the need to grow through innovation. This growth would spur investments in ICT that would assist enterprises to grow and mature in their internal resources and capabilities. The maturity model to be proposed would need to ensure that the ICT investment being made is in the best interests of the enterprise in terms of innovation for success. This would encompass allowing for a brief evaluation of what the current industry and market trend is, and the enterprise's current internal state and its alignment to the trend requirements.

4.4.2 Growth and Maturity

All the enterprises that took part stated that they wished to grow beyond their current state. This growth implied internal growth of resources and capabilities and external growth in the form of an increase in market share.

“When you start a business you start it with the vision that one day it will become bigger.” – Participant H

With this in mind, the enterprises were asked questions concerning what they understood or perceived by maturity. These questions were raised to enable the researcher to gauge what micro-enterprises in the Western Cape perceived, and what they would associate with maturity within their enterprises. The responses were surprisingly insightful.

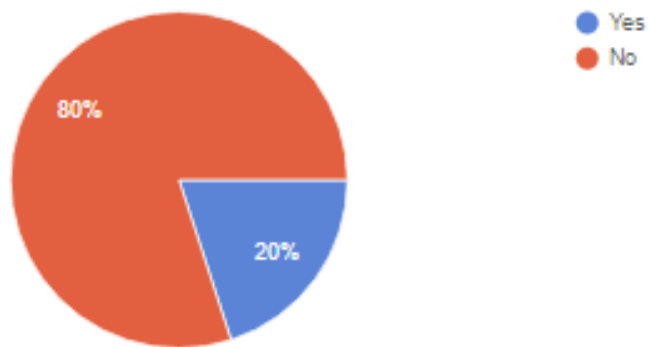


Figure 10: Maturity Measuring within Enterprise (N=34 enterprises)

Of the participating enterprises, only 20.6% (N=7 of 34) stated that they have a procedure and or components against which they use to measure their maturity. This was due to the enterprises functioning in industries and markets that required them to be aware of what is possible in terms of their offering and performance in the markets. The enterprises mentioned multiple key areas of interest that would help formulate the proposed maturity model; this included the mention of the state of various internal components that would determine the maturity of the enterprise which included:

- People. People would need to be recruited to fulfil various roles within the enterprise. The recruiting of people is seen as a sign of growth and maturity in that the business is expanding in size and therefore operations. In addition, it was mentioned by some participants that the people that would be recruited would need to be skilled and have knowledge about the enterprise, its processes and practices.
- Processes and procedures. Enterprises mentioned how processes and procedures being clearly defined and followed would signal a mature enterprise. These processes include operations and management as well as general product and service delivery.
- Finance. Adequate and on-hand finance was mentioned by a majority of the participants. It was shared that finance being available consistently was important in determining whether an enterprise was mature or growing. This might be because micro-enterprises are constantly requiring funding in order to grow or move to the 'next level'.

- Technology. A mature enterprise was identified as one that had extensive knowledge on how to utilise technology strategically. This is because many of the participants recognised technology as a primary factor for success within the enterprise. Some enterprises mentioned that technology such as telecommunications and networks, the internet, software and hardware could be leveraged to assist in the growth and maturing of an enterprise.

Considering the mindfulness of micro-enterprises to what maturity is and the components that would determine it, it is important that the proposed maturity model took this into account. This could be achieved by including the determining factors of maturity into components that would be used in the measuring of maturity of an enterprise to an investment in ICT. This measurement would have to encompass utilising an index that has maturity levels as made available by the CMMI frameworks.

“Maturity is... knowing your businesses strengths and weaknesses and being able to grow from that.” – Participant J.

“It is knowing your business in and out. It is being at a place where you are creating employment, generating finances and developing as the business expands.” – Participant R.

“Maturity is progressing as the company scales.” – Participant H.

“Maturity means knowing your business in and out. I need to know at what level my business is at and if that level is sufficient enough for me to take it forward.” – Participant A

The measurement of the maturity of the enterprise in terms of their components would need to be matched against that of the ICT investment to be made. This is because the enterprise needs to see their level against what is required from the ICT investment per component that supports the successful integration and implementation of the ICT investment. For example; investing in a new PC for operational use would require there to be people with skills to utilise it, finances to purchase it, procedures and processes in place how it will be managed and used. These are all examples of the support that would need to be in place for investing in the PC. In addition, technology such as software, additional hardware, telecoms and networks would need to be

available to enable the use of the PC. The PC would have requirements of its own in terms of the people, procedures and finances needed to support it. It would also have requirements as to what technology should be available to enable it for operational use within the enterprise in terms of software, hardware, telecoms and networks.

Therefore, matching what is available in the enterprise against what is required will be at the crux of how the proposed maturity model or would function within the business. This would enable informed decisions to be made and therefore strategic investment in ICT.

4.5 Conclusion

The research findings, as were contributed by the participating micro-enterprises, were discussed. The contributions made provided an in-depth analysis of 34 micro-enterprises in the Western Cape, their current state and desired state. This was achieved through learning by questioning and observation, by engaging them regarding their internal and external environments, their strategies and methods, the use of ICT as a resource and their maturity and development. The significance of these contributions was that they came from micro-enterprises that are currently operational and utilising ICT to provide services and products.

Micro-enterprises in the Western Cape are very much aware of the need for strategic ICT investment. As was discussed in the chapter, the enterprises have realised that ICT is at the forefront of their ability to function and remain relevant in their markets and industries. It must be stated that proposing maturity models for strategic ICT investment is not an easy task, especially when proposing such a model for micro-enterprise. This is so because many things need to be considered regarding how a micro-enterprise would implement a maturity model. This includes the internal and external environments affecting the enterprises and the unique nature in which these enterprises function. In addition, the proposed model needs to be easy to understand, dynamic, and non-technical and extensive.

The following chapter (Chapter Five) details the proposed maturity model that micro-enterprises can use for strategic ICT investment based on the findings of the overall

research. This chapter concludes the research by reinforcing the answering of the research questions and achieving the aim of the research.



Chapter Five: Conclusion and Recommendation

5 Introduction

This research sought to determine how a maturity model can be used by micro-enterprises in the Western Cape to formulate a strategy for investments in ICT. This was achieved by interacting with micro-enterprises in the Western Cape in order to understand and collate data that could be used toward determining what maturity model could be used, and how it could be used by them in investing strategically in ICT.

The research output from the participating micro-enterprises yielded mainly four core themes discussed in Chapter 4 as Core Themes:

- One – Micro-Enterprise Environments.
Within this core theme, it was discovered that micro-enterprises are affected by their internal and external environments. This resulted in them having to make decisions on their investments in ICT as a reaction to the factors that affect them. These factors include resources, capabilities, people, processes, procedures and the ICT utilised by the enterprises and their competitors.
- Two – Strategy and Methods.
Within this core theme, it was determined that micro-enterprises have visions, business goals, IT goals and various strategies. These are seldom documented, and therefore the enterprises may function in an ad hoc manner. This is most prevalent in how they invest in the ICT they use.
- Three – The Businesses Strategic Goals and Objectives
Within this core theme, it was determined that the need for a roadmap and documentation was of utmost importance. There needs to be a point of reference for micro-enterprises as to why, how and what they are investing in. This is so that a comparison can be made to potentially chart the progress of the enterprise.
- Four – ICT as a Resource and Investment.
Within this core theme, it was revealed that micro-enterprises seek innovation, growth and maturity when running the business. However, there is a lack of the

practice of innovating as enterprises may be hard pressed to survive or focus on current operations due to limited resources and or capabilities. This core theme also signalled the understanding that the micro-enterprises have with regards to growth and maturity. Many identified their drive to grow and become mature, but how that is measured was not clearly defined as they had not yet reached a threshold that could assist them in determining that.

Considering the aforementioned, the need for a maturity model was identified to assist micro-enterprises in decision-making regarding their ICT investments and measure their growth and maturity. The measurement of their growth and maturity would be useful in assisting micro-enterprises to determine where they are located when compared to their internal resources and capabilities and the industry.

5.1 Answering the Research Questions and Meeting Objectives

The research sought to answer the primary question of: *“How can a maturity model be used by micro-enterprises in the Western Cape to strategically invest in ICT?”*

This question was supported by the sub-questions, which were answered under the corresponding themes in Chapter 4, which stated:

- *What is the current ICT environment within which micro-enterprises in South Africa operate? (4.3.)*
- *What are the current ICT strategies being utilised by micro-enterprises? (4.4. & 4.5.)*
- *What are the strategic methods used by micro-enterprises to invest in ICT? (4.4.)*
- *What is the ideal maturity model that can be made available to micro-enterprises in the Western Cape for the purpose of strategic ICT investment? (4.5. & 5. – Recommendation of Proposed Maturity Model)*

It was discovered that micro-enterprise is affected by internal and external environmental factors. As such, they have visions, goals and strategies they use that are either reactional or not always documented. In addition, they are seeking to invest in ICT that can assist them in maturing and gaining a competitive advantage in their industries and markets (See Chapter 4). Considering these, maturity models could be

used to document the internal and external factors affecting the enterprises, and documenting the strategies they utilise in dealing with the factors they have identified. Finally, a maturity model could also map out which ICT applies to the enterprises seeking to invest strategically, and how it is beneficial to the enterprise utilising it in their industry and markets.

5.2 Using a Maturity Model to strategically invest in ICT

This section discusses how a maturity model can be used to invest in ICT.

5.2.1 The Micro-enterprise environments

In Chapter 4, the micro-enterprises environment was identified as an important part of understanding the enterprise as well as the maturity model needed to invest strategically in ICT. The enterprises that understood their internal environment had a better understanding of their ICT needs. The internal environment included their people, procedures and ICT infrastructure (i.e. Software, Hardware, Telecommunications and Networks and Databases). As a result, these enterprises were in most cases aware of the need for ICT investment. This however did not mean they knew how to invest strategically in ICT as they had to. This is due to many reasons such as limited knowledge of what type of ICT is available, where that ICT fits into the overall business, the costs and finances required for it, and the skills or abilities required to leverage it being the most prevalent. The maturity model to be recommended may assist with an investment in ICT. For example, it would allow the micro-enterprises to go through an exercise in which they systematically evaluate their internal capabilities and resources in relation to the ICT which they are interested to invest. This would be a mapping process; helping the micro-enterprise to identify the exact role the ICT would fill and what is required to make that ICT available in their micro-enterprise. A maturity model involves a systematic documenting of an enterprise in order to ascertain the level at which it operates.

During this process, the micro-enterprise using it would then take into consideration their internal environmental needs and the external environment factors that would affect them when investing in ICT. The importance of such an exercise would ensure that an understanding of the environment would be reached by the enterprise.

5.2.2 The Strategy and Methods

Once the environment is understood, the enterprise would need to utilise a strategy and or method to invest in ICT. This means that the enterprises would need to have a vision they are gearing towards. As signalled in the literature and analysis of contributions from participating micro-enterprises, the vision is of utmost importance. The vision of the enterprise should always be stated clearly so that the strategy, goals and objectives may be concise therefore enabling better judgement when making a strategic ICT investment. This is part of the documentation process when utilising a maturity model. There needs to be a clear strategy and method part of the enterprises decision-making, as stated in Chapters 2, and 4 of this research.

5.2.3 The Businesses Strategic Goals and Objectives

Investing strategically in ICT requires understanding the enterprises goals and objectives. As discussed throughout the research, the ICT brought in should be for a specific purpose. This ensures that wastage is reduced and that enterprises make aligned investments. The maturity model can assist enterprises in aligning its strategic goals and objectives with the potential ICT in which it seeks to invest. This is part of the documentation process that maturity models present. In this section of the documentation, the enterprise should document the goals and or objectives, and the reason behind them. This is important because by documenting these, the enterprise is taking the first step in avoiding reactional and misinformed decision-making relating to the business. Once that is completed, the enterprise should then document the exact components that are linked to supporting or realising those goals and objectives. This is to ensure that a comparison can be made between the enterprise's current state and the state of the ICT investments required.

5.2.4 ICT as a Resource and Investment

As discussed in the findings, ICT is an essential part of the enterprise. It is a resource that enables the enterprise to perform its operational functions that are linked to its service and product delivery. It is important that enterprises be able to reconcile the role it will play in the organisation, the level of need at which it is required and the exact ICT that would be best suited to the enterprise. This means reconciling the enterprises components, such as:

- People – what skills are required from the people in the enterprise if the desired ICT is to be invested in?
- Technology – what telecommunications and networks, hardware, software and databases are required in addition to the desired ICT to be invested in?

Finding links between the different components would assist in the investment's accuracy being made, and the feasibility of such an investment. This is important in that micro-enterprises have limited funds if any for investment in ICT. Therefore, if any investment is to be made, it would require a shrewd analysis of the enterprise and its corresponding components.

5.3 *Achieving the Research Objectives*

The research sought to achieve four objectives (Chapter 1, section 1.5.). The table below highlights the four objectives. The table also highlights how and where in the thesis the objectives were addressed.



Table 6: Objectives Addressed

Objectives	Where the Objectives were addressed	How were the objectives addressed?
Identifying the ICT environment within which micro-enterprises in South Africa operate.	Chapter 2, Chapter 4	Chapter 2, section 2.2., laid the foundation of the ICT environment that micro-enterprises operate in by providing literature defining and describing the internal and external environment factors that they are affected by. Chapter 4 provided first hand responses from micro-enterprise participants in terms of their internal and external environmental factors affecting them.
Identifying the current ICT strategies being utilised by micro-enterprises.	Chapter 2, Chapter 4	Chapter 2 identified the strategies and methods utilised by micro-enterprises. Literature provided details as to the kinds of strategies and methods, and how and why the micro-enterprises perform the way they do. In Chapter 4, micro-enterprises provided insights into their strategies and methods used internally as well as how and why they operate and perform the way they do.
Identifying the strategic methods being used by micro-enterprises in investing in ICT.	Chapter 2, Chapter 4	In Chapter 2, section 2.2., the literature provided details as to why and how micro-enterprises invest in ICT. In addition, the literature indicated what ICT means to the enterprises and what kinds of ICT they are investing in as a result. Chapter 4 provided responses from micro-enterprises as to the extent to which ICT affects them, how they invest in ICT and what kind of methods and strategies they have in place to invest in ICT.
Determining the ideal maturity model that could be integrated to micro-enterprises in the Western Cape for the purpose of strategic ICT investment.	Chapter 2, Chapter 4, Chapter 5	Chapter 2, section 2.3., covered the maturity models relevant to micro-enterprises as detailed in literature and how micro-enterprises utilising them could be, or are affected. In Chapter 4, provided feedback from micro-enterprises that would assist in concluding and recommending a maturity model that they could use to invest strategically in ICT.

5.4 Outcomes of the Research

The primary aim of the research was to: “... *determine how a maturity model can be used by micro-enterprises in the Western Cape in formulating strategy for investments in ICT.*” The outcomes of this aim were as follows:

The environment within which micro-enterprises in South Africa operate was discussed in literature, with responses contributed by the micro-enterprises participating in the research.

From the structured questionnaire and interviews, it can be surmised that micro-enterprises operate in sometimes volatile environments that require them to change and adapt constantly. This is due to the internal and external influencers. Having the right resources and capabilities is of primary importance to the internal influencers. These include people, finances, technology and processes. The governmental laws, societal behaviours, innovation and industry competition influence the enterprise externally. In essence, micro-enterprises gain a decent amount of experience from practice within the industries and markets they operate. For example, they have a much more flexible internal structure that allows them to pivot as demand and external activity in the industries and markets require. This flexibility is owed to the size, nature and need of micro-enterprises and can cause reactional behaviour that is not always a positive for the micro-enterprises business practices. It is important to state that though they may need to react to industry and market activity, there needs to be reconciliation of the internal visions, goals, and strategies from a business stand point to ensure the micro-enterprise does not suffer negative impacts as a result of those reactions. This becomes especially important when the micro-enterprises is seeking to invest in ICT.

The current ICT related strategies and methods used by micro-enterprises outlined, along with feedback were provided by micro-enterprises.

Ad hoc strategy and reactional behaviour were common within the micro-enterprises that took part – as was also clear during the analysis of the environments within which they operate in. It can be surmised that these micro-enterprises do not have formalised

strategy methods that they adhere to. However, in their reactional state, they consider how their decisions might affect their internal and mostly operational performance of the business. This is understandable, because it is the day-to-day operations that are the most tangible way in which a micro-enterprise can measure its performance, growth and maturity. In addition, micro-enterprises try and have some kind of plan for the business, however there is no specific or designated plan or alignment to ICT. ICT is simply an enabler of the business and its role is not defined enough to have a strategy for it. The ICT being used only needs to fulfil the basic requirements of the enterprise. An issue arises when the micro-enterprise has to invest in ICT that is required for the business. The micro-enterprises participants showed that they were not always sure how to, or what to invest in when it comes to choosing ICT.

The investment in ICT by micro-enterprises was analysed and discussed.

From this, it was discovered that micro-enterprises seldom made investments in ICT unless it was really necessary to fulfil a specific role in the enterprise. This is due to them having limited resources and capabilities that inhibits them from being fully able to go through a discovery phase of what is required for the micro-enterprise. In terms of ICT, such investments are associated with a high cost to the business, therefore enterprises find a 'work-around' to avoid having to make the investment. Where the investment has to be made, micro-enterprises need help from professionals and or guidance as to what ICT is most appropriate to them.

Maturity models relevant to micro-enterprises were identified in the literature. The addition, the need for a maturity model was discussed in the preceding chapter, with a proposed maturity model and how the maturity models can be integrated into the micro-enterprises for strategically investing in ICT are discussed in this chapter.

Of the maturity models that were identified and discussed, the most salient point was how they could be used to assist the micro-enterprise to evaluate and decide on how and what ICT to invest in. Though these maturity models exist, they are not ideally designed for use by micro-enterprises. This presents an opportunity in which a maturity model could be reworked or designed specifically for micro-enterprises in their investment on ICT. The requirement for such a maturity model would be micro-enterprises adopting practices such as having documented strategies, goals, visions

and processes. This would assist in the evaluation of what ICT investment needs to be made. Based on the micro-enterprises participating in the research, a proposed maturity model has been suggested in the following section of this chapter (5.5. Recommendations – Proposed Maturity Model). This section discusses the potential application of a maturity model within micro-enterprises as well as its relevance in micro-enterprises seeking to invest strategically in ICT.

5.5 Recommendations for a Proposed Maturity Model (The Strategic ICT Investment Maturity Model Index - SIIMMI)

The proposed maturity model would need to provide the micro-enterprise with an alternative to ad hoc, reactionary and informal strategy behaviour concerning ICT investments. This is because strategy together with decision-making is at the core of what would determine the strategic investments enterprises made in ICT. In addition, strategy and decision-making would have to be carried out in the form of a process.

It was found that a limited amount of knowledge was available as to why, how and what to invest in in terms of ICT in the participating micro-enterprises. Having a decision-making process that covers the 'why', 'what' and 'how' would encourage the investments to be better informed and based on an actual evaluation of the enterprise and the ICT in question.

Considering this, the model would need to follow a detailed decision-making process that leads the enterprise stakeholder to an informed and resolute decision-making. The maturity model process would need to include five attributes of decision-making process characteristics, decision-making process diagram, maturity model index, decision-making process rules and process description and documentation as discussed below.

5.5.1 Characteristics of the Decision-making process.

These would provide the users of the model with all of the relevant information regarding the processes; triggers, inputs, outputs, volumes and frequencies. This information is important in that the maturity model needs to be understood fully when utilised.

The triggers would assist in describing what may be causing the need for the investment in the desired ICT. This gives a clear indication of where the investment stems from, and its relevance to the enterprise. This is followed by identifying and documenting the inputs and outputs of the investment to be made regarding the investment. This may include finances and additional skills from people. The volumes would then indicate how many types of the desired ICT would need to be invested in, followed by the frequency of how often the investment would need to be made.

5.5.2 The Maturity Model Index.

The maturity models index would need to signal and detail all of the components that will be measured for maturity, and the levels against which they will be measured. These components would need to be based on the current capabilities and resources most relevant to enterprises linking business and ICT. In addition, the components would need to be in line with the components that play a vital role in micro-enterprises strategic, tactical and operational activities, which include: people, procedures, finance, telecommunications and networks, data and databases, software and hardware.

The levels of the maturity model index would be based on the conceptualisations and current level structure measurements of the CMMI – which provides the standard level measurement for the most of the maturity models available today (Donnellan and Helfert, 2010; Anderson et al., 2011; Donnellan, Sheridan and Curry, 2011).

The proposed model would have to include rules that would form the basis for its use. These rules would have to detail who in the enterprise carries out the decision-making process together with the completion of the maturity model index. Other questions that need to be answered include:

- How it is carried out?
- What documentation and how the documentation is to be completed?
- How a decision is to be reached utilising the decision process and maturity model index?

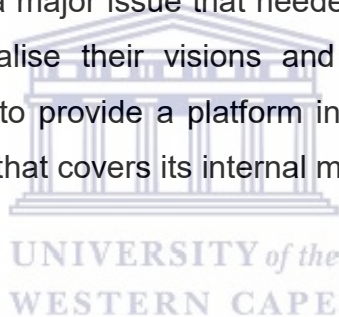
5.5.3 The Documentation.

The model being proposed would have to provide documentation that would complement the decision-making process and strategy formulation that would assist in the strategic decision to be made regarding investments in ICT. This is crucial in

that all maturity models rely on documentation and formalisation of processes and procedure in order to gain the best possible result when measuring for maturity (Miller and Doyle, 1987; Laudon and Laudon, 2004). In terms of an enterprise utilising the model for strategic ICT investment, the model's documentation would need to clearly define what is being measured, how is it being measured and the purpose of it being measured.

The documentation would enable the user to document the internal nature of the enterprise as part of the maturity model implementation process thereby ensuring that the decision to be made concerning the investment is one that is informed and in line with the business.

The research which was undertaken revealed a large amount of information relating to the nature of micro-enterprises, their current practices, focus and strategic, tactical and operational behaviour in terms of business and ICT. The alignment of business and ICT were highlighted as a major issue that needed to be addressed in order for micro-enterprises to truly realise their visions and goals. Considering this, the proposed model would need to provide a platform in which the enterprise is taken through a formalised process that covers its internal matrix when deciding on the ICT investment to be made.



This is important in that the enterprise needs to be encouraged to evaluate not only the tangible ICT investment to be made but how that investment is in line with the enterprise's current vision, goals and objectives. In addition, the benefit that the ICT investment brings to the enterprise strategically, tactically and operationally needs to be documented, along with the risks it may pose. This kind of detail will surely assist the micro-enterprises to make informed decisions that are strategic and beneficial to them both in the short-term and long-term regarding ICT.

5.6 Recommendations

It has to be mentioned that the determination of the model was concluded once all of the data received, was analysed. This resulted in a model being proposed based not only on the findings, but also on the literature and theoretical frameworks, as was

researched through the duration of the research being carried out. This proposed a model, entitled the Strategic ICT Investment Maturity Model Index (SIIMMI), was discussed in this chapter as a recommendation to support the analysis provided (See Appendix C and D). The model proposed assists micro-enterprises to measure their internal capability and resources required to invest in ICT. This is model is recommended to support micro-enterprises in the Western Cape.

In concluding, it must be recommended that a future research is conducted in which the proposed maturity model will be tested and tried among micro-enterprises in the Western Cape. The participating micro-enterprises are the most ideal as their contributions played a role in documenting and formalizing the proposed model.

In addition, future studies conducted could have a specific focus on the multiple factors relating to the strategic investments of micro-enterprises. These include, but are not limited to the following:

- Location – future research could have a focus on location, whether large or small, urban or rural etc.
- Sector or Industry – a research focusing on the use of maturity models for micro-enterprises strategic ICT investments in specific sectors, i.e.; Agriculture, Manufacturing, Electricity, Gas, and Water, Construction as well as Retail, Motor Trade and Repair Services among others.
- Products and Services – a research focusing on the use of maturity models for micro-enterprises strategic ICT investments by specific products and service provided, i.e.; auto-repair, procurement, delivery and HR services, or fast food, auto-parts and home-ware among others.

Such research would prove most beneficial and be able to produce new variations of the proposed model that focus on specific issues concerning strategic ICT investment within micro-enterprises. The benefits would include avoiding information relating to a variation in the proposed model and perspectives as to how to carry out maturity models for strategic ICT investment. This is important in that this would build the body of knowledge around maturity models specific to micro-enterprises, micro-enterprises and ICT investment within micro-enterprise. As the research has shown, the use of maturity models for strategic ICT investment provides a lot of opportunities for strategic

ICT investment. Leveraged creatively, maturity models present a potential source of structure and best practice in terms of strategy and direction.

The SIIMMI will be introduced to the participating micro-enterprises in future to assist them in their investments in ICT. This will be accomplished through organising one-on-one sessions with the micro-enterprises to introduce them to the model, equip them with the content (See Appendix C and D) to use when implementing the model and case studies that they can use to practice the implementation of the model. Doing this would accomplish the purpose for the research, which was to assist micro-enterprises to make strategic investments in ICT.



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Appendices

Appendix A: Structured questionnaire Documentation

1. Research Project Consent Form for Structured questionnaire
2. Information Sheet for Structured questionnaire
3. Research Confidentiality Agreement for Structured questionnaire
4. RESEARCH INSTRUMENT 1: Structured questionnaire

Appendix B: Interview Documentation

1. Research Project Consent Form for Interview
2. Information Sheet for Interview
3. Research Confidentiality Agreement for Interview
4. RESEARCH INSTRUMENT 2: Interview

Appendix C: SIIMMI Business Mapping Documentation



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Appendix A: Structured questionnaire Documentation

Information Sheet for Structured questionnaire

Use of Maturity Models in Strategic Information and Communication Technology Investments in Micro-enterprises in the Western Cape

Dear Participant

Nkazimlo Miti is conducting a thesis research as part of his MCom Information Management. His thesis research involves the utilization of a maturity model as a strategy for micro-enterprises investment in ICT. This letter serves to introduce Nkazimlo Miti as well as request your consent to participate in a structured questionnaire.

Before you decide to participate, it is important for you to understand the purpose of the structured questionnaire and what it would entail. Please take time to read the following information carefully and discuss it with others if you wish. If you are unclear of anything, I would be happy to answer any questions you may have.

Purpose of the Research

To determine how the use of a maturity model could be used as a strategy by micro-enterprises investing in ICT. This will be achieved by determining a maturity model that could be used as a strategy by micro-enterprises and providing it as a solution as proposed to an ad hoc strategy.

Description

The primary aim of the research was to determine how a maturity model can be used by micro-enterprises in formulating strategy for investments in ICT. This research will seek to contribute to the knowledge gathering that will determine what is needed by micro-enterprises using maturity models in strategic ICT investments.

Signed by Nkazimlo Miti:

Signed _____ Date _____



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Research Project Consent Form for Structured questionnaire

Use of Maturity Models in Strategic Information and Communication Technology Investments in Micro-enterprises in the Western Cape

I have read the information presented in the information letter about a research being conducted by Nkazimlo Miti towards the MCom Information Management Programme at the Information Systems (IS) Department at the University of the Western Cape (UWC).

This research has been described to me in a language that I understand and I feel freely and voluntarily agree to participate by providing information for the structured questionnaire. My questions about the research have been answered.

I understand that my identity will not be disclosed and was informed that I may withdraw my consent at any time by advising the student researcher.

With full knowledge of all foregoing, I agree to participate in this research. Signing this consent form documents your agreement to participate as a structured questionnaire subject in this research.

Participant name : _____

Participating Enterprise : _____

Participant signature : _____

Date : _____

Place : _____

Do you consent to being recorded: YES

NO



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Research Confidentiality Agreement for Structured questionnaire

Use of Maturity Models in Strategic Information and Communication Technology Investments in Micro-enterprises in the Western Cape

Confidentiality

Please be advised that the results of the research will neither divulge the organisation's, participant's nor the individual particulars, as to maintain confidentiality at all times. Any information that can connect the responses to an individual or organisation will remain confidential and will be disclosed only with your permission. The researcher shall keep all records and tapes of your participation, including a signed consent form which is required from you should you agree to participate in this research research, and locked away at all times.

Voluntary Participation and Withdrawal

Your participation in this research is entirely voluntary, which means that you are free to decline from participation. It is your decision to choose whether you take part. If you volunteer to be in this research, you may withdraw at any time without consequence of any kind. If you decide to participate in the research, you are free to withdraw at any time – and without reason. You may also choose not to answer particular questions that are asked in the research. If there is anything that you would prefer not to discuss, please feel free to say so.

Payment for Participation

There is no payment for participating in the research.

Informed Consent

Your signed consent to participate in this research research is required before I proceed to structured questionnaire you. I have included the consent form with the information sheet so that you will be able to review the consent form and then decide whether you would like to participate in this research. Alternatively, participating in the electronic structured questionnaire can also be deemed as consent – and all information will still be treated with utmost confidentiality.



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Questions

Should you have any further questions or wish to know more, I can be contacted as follows:

Student Name : Nkazimlo Miti
Student Number : 3015668
Email : 3015668@myuwc.ac.za
Personal Number : 073 754 2890

I am accountable to my supervisor:

UWC Information Systems Department

Name : Dr. James K. Njenga
Telephone : 021 959 3243
Email : jkariuki@uwc.ac.za



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Research Instrument 1: Structured questionnaire

Completed, and distributed via Online Structured questionnaire tool: Google Documents.

Hard copies were mailed and distributed using the official UWC letterhead.

The Enterprise

Internal Environment

- a. Name of the enterprise?

- b. How long has the enterprise been operating? *(Please tick next to the relevant item)*

0 to 6 months (Concept)	
6 months to 1 year (Start-up)	
1 year to 3 years (Credible)	
3 years to 5 years (Sustainable)	
5 years and beyond (Mature)	

- c. Size of the enterprise? *(Please tick next to the relevant item)*

1 to 5 personnel (including founder/s)	
6 to 10 personnel (including founder/s)	
11 to 15 personnel (including founders/s)	
16 and above (including founder/s)	

- d. What is the annual turnover of the enterprise? *(Please tick next to the relevant item)*

Below R100 000pm	
Between R100 000pm and R500 000pm	

Between R500 000pm and R 1 million pm	
Between R 1 million pm and R 5 million pm	
R 5 million and above	

Resources and Capabilities

People

- e. Does the business recruit or have employed staff or personnel?
(Please indicate with a mark on the relevant answer)

Yes	No
------------	-----------

- f. On what basis is the staff or personnel recruited/employed in the enterprise?

	Yes / No	Number of Personnel
Fulltime		
Part-time		

- g. Please indicate whether the staff or personnel recruited or employed in the enterprise are permanent or temporary.

	Yes / No	Number of Personnel
Permanent		
Temporary		

- h. Does the enterprise usually invest in developing staff or personnel through training or internal and external courses? (Please indicate with a mark on the relevant answer)

Yes	No
------------	-----------

- i. Does the enterprise have a dedicated ICT/IT staff or personnel?
(Please indicate with a mark on the relevant answer)

Yes	No
------------	-----------

Information and Communication Technology (ICT)

- j. Please indicate by ticking next to the appropriate item the technology resource utilised within the enterprise: *(Please indicate with a mark next to relevant answer)*

Software (i.e. Application programs etc.)	
Hardware (i.e. Computers, Printers etc.)	
Database (i.e. Data and Information base)	
Telecommunications and networks (i.e. Internet connectivity, telephone line etc.)	

If other, please specify.



Management and Procedures

- k. Does the enterprise have procedures in place to manage the usage of ICT in the enterprise? *(Please indicate with a mark on the relevant answer)*

Yes	No
------------	-----------

Strategy

- l. Does the enterprise have a formalised (structured, written and communicated) vision that it strives toward? *(Please indicate with a mark on the relevant answer)*

Yes	No	The vision is not formalised, but it exists
------------	-----------	--

m. Does the enterprise have formalised (structured, written and communicated) business goals that it strives toward achieving? *(Please indicate with a mark on the relevant answer)*

Yes	No	The business goals is not formalised, but they exist
-----	----	---

n. Does the enterprise have formalised (structured, written and communicated) ICT related goals that it strives towards? *(Please indicate with a mark on the relevant answer)*

Yes	No	The ICT related goals are not formalised, but they exist
-----	----	---

o. Does the business have a Business Strategy in place? *(Please indicate with a mark on the relevant answer)*

Yes	No
-----	----

p. Does the business have an ICT Strategy in place? *(Please indicate with a mark on the relevant answer)*

Yes	No
-----	----

q. Does the enterprise have a decision-making framework or system in place that assists in decisions concerning Strategic, Tactical and Operational activities? *(Please indicate with a mark on the relevant answer)*

Yes	No
-----	----

2. Information Communication Technology (ICT) as a Resource

Innovation

a. Does the enterprise have a designated Research and Development element in its structure? *(Please indicate with a mark on the relevant answer)*

Yes	No
-----	----

- b. How often does the enterprise innovate itself with new ICT (for example: investing in new technologies i.e. hardware, software etc.)?
(Please indicate with a mark on the relevant answer)

Frequently	Often	Seldom	Never
-------------------	--------------	---------------	--------------

- c. Does the enterprise have a specified measurement or procedure to determine the maturity (development) of its ICT? *(Please indicate with a mark on the relevant answer)*

Yes	No
------------	-----------



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Appendix B: Interview Documentation

Research Project Consent Form for Interview

Use of Maturity Models in Strategic Information and Communication Technology Investments in Micro-enterprises in the Western Cape

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This research has been described to me in a language that I understand and I feel freely and voluntarily agree to participate by providing information for the structured questionnaire. My questions about the research have been answered.

I understand that my identity will not be disclosed and was informed that I may withdraw my consent at any time by advising the student researcher.

With full knowledge of all foregoing, I agree to participate in this research. Signing this consent form documents your agreement to participate as a structured questionnaire subject in this research.

Participant name : _____

Participating Enterprise : _____

Participant signature : _____

Date : _____

Place : _____

Do you consent to being recorded: YES

NO



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Information Sheet for Interview

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Description

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Questions

Should you have any further questions or wish to know more, I can be contacted as follows:

Student Name : Nkazimlo Miti
Student Number : 3015668
Email : 3015668@myuwc.ac.za
Work Number : 021 959 2416
Personal Number : 073 754 2890

I am accountable to my supervisor:

UWC Information Systems Department

Name : Dr. James K. Njenga
Telephone : 021 959 3243
Email : jkariuki@uwc.ac.za



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Research Instrument 2: Interview

1. *Micro-Enterprise*

a. Internal Environment

i. *Organisational Culture*

Please describe the Leadership and management style within the enterprise?

Please describe the Organisational structure within the enterprise (i.e. the management or personnel structure)?

b. External Environment

i. *Industry*

Market or industry in which the micro-enterprise operates (i.e. Sector, e.g.: services, manufacturing, retail etc.)? Please describe it.

ii. *External factor Influences*

What influences does socio-economic (i.e. Political, Economic, Social, Technological Environmental and Legal) have on the enterprise? How would you describe those influences?

iii. *Competitive Forces*

What influence does competition have on the enterprise (i.e. New Entrants, Suppliers bargaining power, Buyers bargaining power, Intensity of competitiveness and Substitute products)??

c. Resources and Capabilities

i. *People*

1. Skills and Expertise

What basic skills does the people in the micro-enterprise have?

What are the common ICT related skills and expertise in the micro-enterprise?

What roles do skills and expertise play in the micro-enterprise in terms of resource gathering and

capabilities?

What are the key value-adding skills and expertise in the micro-enterprise?

2. Experience with Technology

What is the relationship between the skills and expertise of the people in the micro-enterprise and the technology utilised?

What influence do the people in the micro-enterprise have over the investment, adoption and implementation of ICT within the micro-enterprise?

3. Perception of ICT

What is the peoples (users/practitioners) perception of ICT in the micro-enterprise?

Does this perception influence the investment, adoption and implementation of ICT within the micro-enterprise (why and how)?

ii. *Technology*

What is the purpose of the use of ICT in the micro-enterprise?

How is the technology being used linked to the resources and capabilities of the micro-enterprise (People, Financial, Procedures and Management)?

Has the usage of ICT brought value to the micro-enterprise, if so, in what way?

iii. Management and Procedures

What strategies are in place for the management of ICT within the micro-enterprise? Please describe them.

What strategies, rules, policies and methods does the micro-enterprise use for the operation, maintenance and security of the ICT currently being utilised?

2. Strategy & Methods

- a. Micro-enterprise vision
What is the enterprises vision statement?
How is the enterprise geared toward realising this vision?
- b. Business goals
Does the micro-enterprise have business goals that it strives towards achieving? If so, please describe them.
What are the micro-enterprises value-driven business goals (i.e. the goals that bring intrinsic or extrinsic remuneration to the enterprise)?
- c. IT goals
Does the micro-enterprise have specified ICT related goals that it strives towards achieving? If so, please describe them.
What are the micro-enterprises value-driven ICT goals i.e. the goals that bring intrinsic or extrinsic remuneration to the enterprise through the use of ICT)?
- d. Current Business Strategy (Ad hoc or Formal)
Does the enterprise have a formalised Business Strategy in place? If so, please describe it.
- e. Current IT Strategy (Ad hoc or Formal)
Does the enterprise have a formalised IT strategy in place? If so, please describe it.
- f. Decision-making
Does the micro-enterprise have a framework or system in place that assists in decision-making concerning Strategic, Tactical and Operational activities? If so, please describe it.
What estimated percentage of the micro-enterprises Strategic, Tactical and Operational decision-making is based on factors concerning ICT (i.e. does ICT as a factor influence the decisions that the enterprise makes)?

3. Information Communication Technology as a Resource

a. Innovation

i. Technological Advances

Does the enterprise invest in research and development

concerning innovation and ICT? If so, please describe how.
What are the key determinants resulting in micro-enterprises investing in ICT (competitive forces, desire to compete nationally/globally, survival)?

How does the Availability of New Technologies affect the enterprise?

How does the Affordability of New Technologies affect the enterprise?

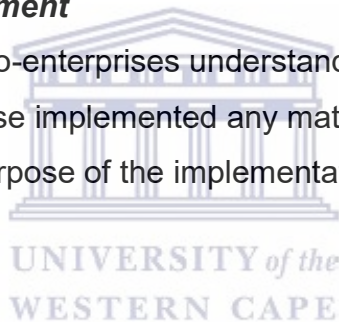
b. *Growth and Maturity*

How is the ICT resources in the enterprise measured in terms of their maturity (development)?

What determinants are in place that contributes toward growth in ICT investment?

4. Maturity and Development

- a. What is the micro-enterprises understanding of “maturity”?
- b. Has the enterprise implemented any maturity models in the past? If so, what was the purpose of the implementation?



***The Strategic ICT Investment
Maturity Model Index
(SIIMMI)***

Business Mapping Documentation

Upon completing this document, the enterprise is to follow the SIIMMI Business Process to continue the finalisation of the ICT Investment decision. It is advised that upon completing this document, the enterprise maintain it for recording and reference purposes.



Business Vision

In this section, state the initial vision of the enterprise (NOTE: the first row detail in the table is an example).

The initial vision is the vision that the enterprise was founded upon.

The revised vision is the vision that the enterprise wishes to follow through going forward. If there is a revised vision, briefly state the reason for the revision of the enterprises initial vision.

If the enterprises vision remains the same as the initial vision, then revised vision and the reason for the revised reason is left blank.

Table 1: SIIMMI Business Mapping Documentation - Business Vision

BUSINESS VISION		
Initial Vision	Revised Vision	Reason for Revised Vision
Become the most reliable paper delivery business in the Goodwood area.	Become the most innovative and reliable paper delivery business in the Goodwood area.	The enterprise is seeking to improve the customer service by implementing new technology.

Business Strategic Goals & Objectives

In this section, state the businesses strategic goals of the enterprise (NOTE: the first row detail in the table is an example).

Goal & Objective ID – give each identified goal and objective a code for reference.

Goal & / Objective – give the identified goal and or objective a clear name.

Reason Description – give a brief reason description for the goal and or objective named.

Link to SIIMMI Components – state which components the enterprise assumes will be most affected by the identified goal and or objective.

Table 2: SIIMMI Business Mapping Documentation - Benefits of ICT Investment

BENEFITS OF ICT INVESTMENT			
Goal & Objective ID	Goal & / Objective	Reason Description	Link to SIIMMI Components
G&O-1	Create a smart and reliable storage facility for clients' information.	The enterprise is servicing over 1000 clients spaced out in the Goodwood area. These clients require a variation of papers to be delivered to them at certain times and days within a specific week.	People, Software, Data, Database.

Proposed ICT Investment

In this section, state the proposed ICT investment that the enterprise has identified (NOTE: the first row detail in the table is an example).

ICT Investment –the identified name the enterprise gives the proposed ICT.

ICT Description – Exact name of the proposed IC.

Price – state the initial purchase price and maintenance price (pm/pa) of the ICT.

Priority – state the level need for the proposed ICT. If urgent, label as “High”. If undetermined, label as “Medium” or “Low”.

Link to SIIMMI Components – state the main component type that the proposed ICT can be identified as.

ICT Component Requirements – state the minimum ICT Component Requirements, with focus on the SIIMMI components as a guide.

It is advised to use online resources and or expert support when completing this section. This is due to the need for accuracy, as this section will assist in determining the levels at which the proposed ICT is placed – according to each SIIMMI component.



Table 3: SIIMMI Business Mapping Documentation - Proposed ICT Investment

PROPOSED ICT INVESTMENT					
ICT Investment	ICT Description	Price	Priority (High/Medium/Low)	Link to SIIMMI Components	ICT Component Requirements
Microsoft Office	Microsoft Access 2013	Initial purchase: R 1 799.99 Maintenance: R 0 (pm)	High	Software	Software Platform required (minimum): Windows 7 (32-bit or 64-bit) or later. Hardware required (minimum): -PC or Laptop Computer Processor 1 gigahertz (GHz) or faster x86- or x64-bit processor Memory (RAM) 2 gigabytes (GB) RAM Hard Disk 3.0 gigabytes (GB) available Telecommunications & Networks (minimum): 2MB line speed modem People Computer literacy, Database management, Intermediate Microsoft Office skills. Procedure Data Management Policy,

Benefits of ICT Investment

In this section, list the benefits that the enterprise can expect to reap from the proposed ICT investment (NOTE: the first row detail in the table is an example):

Benefit ID – give each identified benefit a code for reference.

Benefit – state the benefit by name.

Benefit Description – give a description of how the enterprise actually benefits from the identified benefit.

Link to SIIMMI Component – link the benefit to the components in the SIIMMI to identify the primary component the enterprise will be affecting with the proposed ICT investment

Table 4: SIIMMI Business Mapping Documentation - Benefits of ICT Investment

BENEFITS OF ICT INVESTMENT			
Benefit ID	Benefit	Benefit Description	Link to SIIMMI Component
B1	Data Storage.	The server will enable the enterprise to store all of its client information in one easily manageable format.	Software, Hardware.

Risk Register for ICT Investment

In this section, list the risks that the enterprise can expect to encounter from the proposed ICT investment (NOTE: the first row detail in the table is an example):

Risk ID – give each identified risk a code for reference.

Risk – state the risk by name.

Risk Description – give a description of how the enterprise can be affected by the identified risk.

Benefit Mitigation – state a benefit that may mitigate the identified Risk (i.e. identify by referencing the benefit ID code)

Link to SIIMMI – link the risk to the components in the SIIMMI to identify the primary component the enterprise will be affecting with the proposed ICT investment.

Table 5: SIIMMI Business Mapping Documentation - Risk Register for ICT Investment

RISK REGISTER FOR ICT INVESTMENT				
Risk ID	Risk	Risk Description	Benefit Mitigation	Link to SIIMMI Component
R1	Limited technology in enterprise.	The enterprise has only 1 computer laptop that is utilised for all the administrative and business tasks.	B6	Software, Hardware.

Appendix D: SIIMMI – Indexing

STRATEGIC ICT INVESTMENT MATURITY MODEL INDEX - SIIMMI

Level of Maturity	10														
	9														
	8														
	7														
	6														
	5														
	4														
	3														
	2														
	1														
		ME v ICT Inv	ME	ICT Inv.	ME	ICT Inv.	ME	ICT Inv.	ME	ICT Inv.	ME	ICT Inv.	ME	ICT Inv.	
		People		Pocedures		Finance		Telecommunication		Data & Databases		Software		Hardware	
		Support (Capabilities & Resources)						IS & T Infrastructure (Capabilities & Resources)							
		Maturity Components													

