



**THE APPLICATION OF PROJECT MANAGEMENT TOOLS AND TECHNIQUES IN  
ICT SME PROJECTS IN WESTERN CAPE**

**By**

**CRECENCIA NAISON CHAUMA**

**Dissertation submitted in partial fulfilment of the requirements for the degree**

**Master of Technology: Business Administration in Project Management**

**in the Faculty of Business and Management Sciences**

**at the Cape Peninsula University of Technology**

**Supervisor:** Stanley Fore

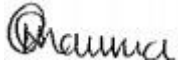
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January 2017

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## DECLARATION

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**Signed**

**Date**

## **ABSTRACT**

### **Introduction**

The research looked at the application of project management tools and techniques in ICT SME projects in the Western Cape.

### **Problem Statement**

Previous literature revealed that small to medium enterprises (SMEs) are vital to developing economies as they provide employment and contribute to overall sustainable economic productivity. Literature further alludes that project management tools and techniques enhance SME's ability to innovate, grow and compete in industry. However, it is unclear if ICT SMEs in Western Cape are applying project management tools and techniques in their projects. Therefore, this study aimed to investigate whether ICT SMEs in Western Cape applied these tools and techniques in their projects.

### **Aims / Objectives**

The primary objective of the research was to determine the extent to which ICT SMEs in Western Cape were using project management tools and techniques. The secondary research objectives were: to determine the extent to which ICT SMEs in Western Cape knew about the project management tools and techniques and how to use them; to establish the extent to which the ICT SMEs knew the benefits of using project management tools and techniques; and to determine the extent to which project management tools and techniques were used by SMEs to achieve success.

### **Methodology**

The research was non experimental. An electronic questionnaire was distributed using Survey Monkey and Mail Chimp to collect responses. Some questionnaires were hand delivered to ICT SMEs based in the Cape Town CBD areas accessible to the researcher. The results presented in the research were based on a survey of ICT SMEs, located in Western Cape. Out of the 341 responses targeted a total of 210 responses were obtained. The results obtained represent 60-70% of the population interviewed. The sample was chosen using stratified random sampling that classified the respondents according to organisational hierarchy, and the amount per strata was noted. The respondents within each stratum were chosen using simple random sampling thus eliminating bias.

### **Ethical Consideration**

Ethical permission was sought and granted by the organisation to conduct research. Before the survey commenced the participants were informed verbally and in writing that they were not

under any obligation to participate in the survey and that there was anonymity in completing the survey.

### **Main Results And Findings**

The results obtained from the research suggest that project management tools affect project success. This in turn affects implications of project delivery and the general health of an organization, for example size and growth, revenue, sustainability and competitiveness. The study also showed that there was a significant number of young professionals in ICT firms. This can be as a result of entry-level jobs with entry-level salaries being offered as a way for companies to cut costs. The most prominent tools used by the ICT firms are free. Should the company owning this free service change, there will be an adverse impact on ICT SMEs. Other findings showed how the size of the firm influenced the use of project management tools. Smaller teams are easier to collaborate and plan. It is wise for project firms to introduce project management discipline at the start of a company. However there is need to mature, and create standards in project management practices which will reduce costs of changes in the long run.

### **Research limitations**

The research presented findings of an initial investigation in ICT SMEs running projects in the Western Cape only.

### **Practical implications**

The findings from the survey suggest that communication is a vital vehicle within an organization for a project to be successful. Success is defined as completion within schedule and within budget, with quality output. The findings revealed that planning of project requirements must include all stakeholders including implementers and sponsors of projects were necessary as these run with the projects. The data also suggest reasonable changes that occur must be accounted for and a certain degree of flexibility must be present to allow adopting the change.

### **Originality/ Value**

While most of the previous research looked into the project management tools, success, and project management aspects, there has been lack of investigation on the impact of project management tools and techniques in ICT firms in Western Cape. This allows, ICT SMEs aspects to be compared with project management tools and techniques.

## ACKNOWLEDGEMENTS

### I wish to thank:

- The Lord Almighty, and Jesus Christ my saviour, for from Him are all things and to Him are all things – He deserves the glory.
- MacDonald Chapwanya, my loving husband for his undying support and encouragement, my biggest cheer leader.
- My family, for believing in me, in moments when I did not know if I would make it. My mother and father, supportive siblings, Nigel, Gerald, Pamelah, Naom, Sandra and Ellen.
- Mr Stanley Fore, my supervisor, whose patience, knowledge, understanding has contributed immensely to my graduation. His foresight in this research cannot go unnoticed – allowing me to still dream and always reigning me in to reality.
- The Cape Innovation Technology Initiative, specifically Mr Chris Vermeulen for approving my research within the organisation.
- The entrepreneurs, their employees, for their willingness to participate in the survey.
- Dr Corries Uys, for her amicable insights and assistance with all statistical issues.
- Prominent Choto, for her patience and guidance.
- Melody Chironga for her unbridled excellence in editing.
- Mr Sera Thlomola, who played a pivotal role in financing and supporting these studies, to him I am eternally grateful

## **DEDICATION**

I would like to dedicate this to my husband, who has been supportive and understanding of my absence to ensure completion of this research. To my mother and father, you always allowed me to dream beyond what I ever imagined. To my sister, Naom, who always made sure I was the best I could be. To my siblings, Gerald, Nigel and Pamelah, who through looking up to me have inspired me to be the person I am today. To my other sisters Sandra, Ellen and Natasha you are amazing. To my late mother, this is for you!

To Mr Stanley Fore, who pushed me beyond my limits and allowed me to grow in the field of project management.

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## GLOSSARY

<b>Terms/Acronyms/Abbreviations</b>	<b>Definition/Explanation</b>
<b>ICT Information Communication and Technology</b>	Information Communication Technology ICT firms have access to information through telecommunications. It is similar to Information technology but its main focus is on communication technologies. Facets of it include the internet, cell phones, wireless networks and other mediums of communication (Agerdal- Hjermind, 2012).
<b>PM Small to Medium Enterprises</b>	Project Management This refers to a business with 50 to 200 employees, with annual turnover ranging from R2 million to R50 million and gross assets, excluding fixed property from R2 million to R18 million (Mahembe, 2011:24-25).
<b>SMEs</b>	Small to Medium Enterprises

# CHAPTER ONE

## CHAPTER 1: INTRODUCTION

### 1.1 Introduction

This chapter presents the background of the study, the research problem, its significance, the scope and delimitation of the study. The chapter also discusses the objectives of the research as well as the statement of the research problem.

### 1.2 Statement of research problem

Palma (2005) reveals that small to medium enterprises (SMEs) are vital to developing economies as they provide employment and contribute to overall sustainable economic productivity. Hayford (2012:v) further alludes that project management tools and techniques enhance SME's ability to innovate, grow and compete in industry. However, it is unclear if Information Communication Technology (ICT) SMEs in Western Cape are applying project management tools and techniques in their projects. Therefore this study aims to examine the extent to which the ICT SMEs in Western Cape apply these tools techniques in their projects.

### 1.3 Background to the research problem

Palma (2005) states that SMEs drive economic growth especially in developing countries. It drives static growth through job creation and increase in output, and drives dynamic growth through provision of a nursery for large firms, expansion to micro enterprises and investments and new technologies. This is supported by Turner, Ledwith, and Kelly (2010:744-755) who made reference to Halleberg (1999) and Floyd and McManus (2005) work, and stated SMEs are engines that drive economic and social growth.

Turner *et al.*, (2008: 282-296) have reported that projects account for approximately one third of the turnover of the business. This translates that SMEs account for one fifth of the economy. This means the application of project techniques and tools in project environment such as Gantt Charts, Critical Path Method (CPM), Project Evaluation and Review Technique (PERT), Microsoft (Project, Primavera and Excel) account for the project successes within SMEs and must be used to ensure sustainable growth and innovation (Turner *et al.*, 2008 and Fortune, White, Jugdev, & Walker, 2011). Previous research alluded that SMEs use of project management tools and techniques prove to be more successful. It was noted that tools that are mostly vital to SMEs are requirements management, resource scheduling, work breakdown structure and quality management (Turner *et al.*, 2008:282- 296). Projects serve in

operations where they provide tailored, bespoke products to customers and they help manage innovation, creation and growth (Turner *et al.*, 2008: 282-296).

Previous literature (Xavier, Kelley, Kew, Herrington, & Vorderwülbecke, 2013:23) has noted the abilities of SMEs in driving growth. A characteristic of the ICT industry is characterized by high growth due to the vast changes that occur over a short span of time (Xavier *et al.*, 2013:22). To best compete and thus survive within such an environment it is vital that SMEs adopt and implement projects through the use of project management tools and techniques.

A Conference paper in Argentina, on the importance of SME's in the economy: International Tax Dialogue revealed that there is an information revolution and ICT industry is a leader in technology advancement (Tax Dialogue:2012). The ICT SMEs in Western Cape have been chosen because in March 2013, the City of Cape Town, Wesgro and PWC released a paper on Digital Gateway to Africa Cape Town Creative Software, Design and Development Sector, (PWC, 2013: ii-iv). In this report, Cape Town ICT sector is one of the priority areas in the Integration Plan. The government's goal is to build an opportunity city that creates an enabling environment that is ideal for economic growth and job creation (du Toit, 2013).

Seeing that a gateway to advancement was opened in Western Cape, it is vital to focus on ICT SMEs and investigate if they are applying project management tools. There has been evidence following research in Ireland that proved that SMES have poor project management practices (Ledwith, 2004). This was mainly due to misalignment of the projects to the strategic goals. The lack of support also proved to be detrimental in ensuring that the firms implement project management culture. The firms inability to focus on the success criteria in organisations as pointed out by Muller and Turner (2007; 299); Turner *et al.*, (2009: 292) and Belassi and Turkel (1996:144) contributes to project failure within SMEs. These factors are under pinned within the project management tools as will be revealed in the literature review of this research. It shows that the success criteria can be achieved through the use of Project Management tools and techniques.

It is vital to investigate SMEs in ICT in Western Cape to establish if they use project management tools and techniques. ICT being at the heart of technology is the backbone of SME success within Western Cape and thus sustainability through management by projects, which is a facet of day to day operations, must be ensured.

The research sought to establish if the SME - ICT firms within Western Cape were indeed taking advantage of these benefits to optimize their businesses to ensure their ability to compete globally.

### **1.3.1 Background of The Cape Information Technology Initiative (The CiTi)**

The author chose the Cape Information Technology Initiative (CiTi) as a pool from which the research sample will be drawn. CiTi, formerly known as the Cape IT Initiative, was founded as a non-profit organisation in 1998 by a broad group of industry stakeholders and inspired citizens.

Their vision is to develop Cape Town and the region as a global technology cluster and a vibrant hub for innovation that is a significant contributor to economic growth. “The CiTi supports ecosystem development, IT enablement and job creation. It executes its mandate through the Bandwidth Barn which provides facilities and eco-systems, CapaCiTi which develops IT skills and thereby creating jobs and the VeloCiTi which offers enterprise development programmes that accelerate the growth of the entrepreneur and their business, CiTi:2015”

“Almost 20 years later, CiTi continues to aspire and work towards this vision, primarily by being the ‘oil’ that connects the many diverse and interested role players regionally and internationally, and the ‘engine’ that develops and implements innovative models to address key industry challenges and blockages. Since 1998:

- CiTi is the flagship organisation for the technology sector in the region and has become a blueprint for industry and public sector collaboration models for sector development;
- The Cape has become globally known as the Silicon Cape, a global technology entrepreneurship hotspot, and compared to Silicon Valley and Silicon Alley;
- The Barn (formerly known as the Bandwidth Barn), a CiTi operated initiative, has been recognized as Africa’s leading and most established incubator and accelerator, incubating hundreds of start-ups generating thousands of new jobs;
- The Barn now has 4 physical co-working and collaboration environments in the Western Cape, and has consulted to regional governments across Africa on establishing similar successful hubs;
- Numerous entrepreneurs and start-ups with their roots in the Cape have become global success stories;
- Global industry titans have been attracted to establish operations and innovation centres in the Cape;

- CiTi's skills initiative, CapaCiTi, has been recognized as a valuable contributor to the development of necessary skills and professionals to the technology sector; and
- Citi's established enterprise development programmes have attracted some of the sectors' leading blue-chips as partners." (CiTi: 2015)

It is because of the positioning of CiTi within the technology industry, its achievements and mandate that the company's entrepreneurial beneficiaries were chosen as a sample size. To date it has supported over 500 entrepreneurs through its initiatives (CiTi:2015). Most of these entrepreneurs and beneficiaries are ICT firms and SMEs. The industry represented by the SMEs is what the author seeks for the purposes of the research.

#### **1.4 Main Research Question**

To what extent are project management tools and techniques being used by Information Communication and Technology SMEs in Western Cape?

#### **1.5 Investigative sub questions**

- To what extent do ICT SMEs in Western Cape use project management tools and techniques?
- To what extent do ICT SMEs know about the project management tools and techniques and how to use them?
- To what extent do the ICT SMEs know the benefits of using project management tools and techniques?
- To what extent are the project management tools and techniques used by SMEs effectively and achieve any success criteria?

#### **1.6 Objectives of the research**

- To determine the extent to which ICT SMEs in Western Cape are using project management tools and techniques

#### **1.7 Secondary research objectives**

- To determine the extent to which ICT SMEs in Western Cape know about the project management tools and techniques and how to use them
- To establish the extent to which the ICT SMEs know the benefits of using project management tools and techniques
- To determine the extent to which project management tools and techniques are used by SMEs to achieve success

## Matching of Research Questions, Objectives and Method/ Technique

Table 1:1 Matching of research questions, objectives and method/ technique

Research Question	Research Objective	Method/ Technique
<p><u>Main Question:</u> Are project management tools and techniques being used by Information Communication and Technology SMEs in Western Cape?</p>	<p><u>Main Objective:</u> To determine the extent to which project management tools and techniques are used by Information Communication and Technology SMEs in Western Cape</p>	<p><u>Questionnaire:</u> Questions 8, 9, 10, 11</p>
<p>To what extent do ICT SMEs in Western Cape use management tools and techniques?</p>	<p>To determine the extent to which ICT SMEs in Western Cape are using project management tools and techniques</p>	<p><u>Questionnaire:</u> Questions 13</p>
<p>To what extent do ICT SMEs know about the management tools and techniques and how to use them?</p>	<p>To determine the extent to which ICT SMEs in Western Cape know about the project management tools and techniques and how to use them</p>	<p><u>Questionnaire:</u> Questions 15,16, 17, 18,</p>
<p>To what extent do the ICT SMEs know the benefits of using management tools and techniques?</p>	<p>To establish the extent to which the ICT SMEs know the benefits of using project management tools and techniques</p>	<p><u>Questionnaire:</u> Questions 11, 12, 15, 16, 17, 18, 19</p>
<p>To what extent are the project management tools and techniques used by SMEs effectively and do they achieve any success criteria?</p>	<p>To determine the extent to which project management tools and techniques are used by SMEs effectively and used to achieve success</p>	<p><u>Questionnaire:</u> Questions 5, 6, 7, 14, 19,</p>

### 1.8 Research process

The research process will clarify how the research was done from the beginning of the research (from proposal) to the end of the research (submission of the dissertation). The researcher formulated a research problem and this involved selecting a topic then writing up a proposal. The proposal was sent for approval. Upon approval of the topic,

the researcher submitted Research Ethics Committee Form 5 for ethical clearance. The researcher then submitted ethical clearance. Upon this approval the researcher submitted a proposal for approval. After the proposal was approved, the researcher then consulted various forms of literature including books, articles, journals and case studies on the research subject. Following perusal of the literature, the researcher identified gaps from which the problem statement, the research design, the sample, research questions and objectives were formulated. The researcher chose a questionnaire as the appropriate data collection method. The questionnaire was sent to the selected sample audience and the responses were recorded in Chapter 4. These responses were presented and discussed in Chapter 5 following an analysis.

The research process is well articulated by Kumar (2005) who articulates eight specific phases in the research process which were implemented in this research. The phases in the process are matched with the current research chapters as follows:

1. Formulating the research problem, Chapter 1
2. Extensive Literature Review
3. Developing the objectives, Chapter 1
4. Preparing the research design including sample data design, Chapter 1
5. Collecting the data through questionnaires, (data provided input to chapter 4)
6. Analysis of data, Chapter 4
7. Generalisation and interpretation (All chapters not referenced)
8. Preparation of the report or presentation of results- Chapter 5

### **1.9 Research justification**

The research is highly important for the SMEs in ICT companies operating with a project management environment. It is crucial for them as it will help outline the factors that are not easily addressed within work environments pertaining to the projects. This research is also crucial to the City of Cape Town. This is because the ICT sector is a priority area in its integration plan. It is crucial to know where Cape Town companies operate in terms of level of implementation of project management tools that will drive sustainability and long term goals. This research is also significant to the companies under the study. They will be provided with feedback following this research as to how they can improve their organisations through the use of project management tools and techniques. The ultimate purpose is to offer them an optimised solution following the research.

This research is also significant to the growth trends of the Western Cape in SME development. Although the focus is on entrepreneurship, the research will add value to other SMEs within other industries to contribute to their strategic decisions following the results that will be published on the use of project management techniques. This research will also bridge a gap in the SMEs in providing a feasible solution that will best address the issues that pertain specifically to SMEs on project management tools which is a shift from the norm of research being leaned towards the large firms. Most importantly, when complete, this will contribute to the body of knowledge in establishing the extent to which ICT SMEs use project management tools and techniques.

Cape Town was chosen as the Design Capital of 2014, where all Design States gathered and exchanged design ideas whilst showcasing design and ICT projects. This was in itself an important project and thus, a culture of project management tools and techniques needed to be implemented to ensure success. The research will also benefit academics as a form of knowledge and reference. The application of recommendations will be vital for the SMES, in the ICT industries, will also assist government and investors within the Western Cape and the City of Cape Town in channelling resources to SMEs to ensure that they acquire the necessary project management tools and training for techniques.

#### **1.10 Delineation of Research**

The research only covered SMEs. This means the focus is determined by the size of the company. The Research therefore only caters for a certain size within the industry.

The industry of focus of the research is ICT firms. This means the type of industry within which the SMEs operate, other industries are excluded. All firms that fall out of the ICT context are not included in the study.

The research will focus on firms in Western Cape, in South Africa. This means it is geographically limited to the Western Cape Province. The respondents were selected from 341 companies.

#### **1.11 Structure and overview of the Chapters**

- Chapter 2 Literature review
- Chapter 3 Research Methodology
- Chapter 4 Results
- Chapter 5 Discussion of results
- Chapter 6 Conclusion

## **1.12 Expected outcomes, results and contributions of the research**

### **1.12.1 An accessible project management system**

The research suggests a study to be done to look into the viability of a new system that will ensure that small entrepreneurs will be able to adopt project management tools that are ideal for their businesses. A set of principles could be suggested that can suit the SMEs in the ICT environment.

### **1.12.2 A solution to a practical problem**

The research will solve practical problems such as lack of use of project management tools and techniques. This will assist in ensuring that they maximise on resource utilisation whilst operating efficiently and effectively, allowing themselves to compete globally. This is a much-needed solution by the SMEs that are in ICT in Western Cape. The Design Capital Event show cased 450 projects that must be at global level to compete and showcase to those in the Global community. The adoption of Project management tools or the implementation or optimisation of the tools by the ICT project managers will have ensured the projects were delivered on time, within standard and with efficient spread of resources.

### **1.12.3 A specific aid to practitioners in a particular field**

The research seeks to aid project managers within the SMEs ICT industry in identifying the need to use project management tools and techniques in implementing their projects and this in turn makes a significant contribution to the economy as they operate at excellence. This is because all their resources will be optimised and they will operate at par excellence.

### **1.12.4 An instrument of use in the ICT SMEs industry**

The use of Project Management tools and techniques can be used to allocate resources, reduce risks and aid in planning and execution of the projects within the ICT industries. The tools such as Gantt Chart, Critical Path Method, Resources Scheduling, Microsoft Project office will ensure that targets are reached and sustainability as risks can be averted or quickly mitigated.

### **1.12.5 Contributions to field of study**

The research will provide guidelines to SMEs on the importance of applying project management tools in their projects. This will also reveal to them that their areas of interest as well as their business goals can be achieved through the use of project management tools and techniques. Contributions can be seen in the academic body where research can be used to expand on larger areas and hence add more significance to the study.

### **1.13 Summary**

In this chapter, the background was given on the state of entrepreneurship and its importance in the driving the economy. The importance of project management tools and techniques, and the use thereof was also given to give the reader more insight into the subject matter. A brief history and a track record of some of the achievements of CiTi were included to give insight into the company. In this chapter, the background of the research was stated and is the foundation on which the literature review in the following chapter is structured. Research objectives were also included and from here, the research questions were formulated. The table was included in this chapter to show the link between the research questions, research objectives and the questions in the questionnaire. The chapter also included the research process that will be followed in the thesis. The author will utilise research techniques that have been utilised and proven effective by multiple researchers. The author included the justification of this research and expected results, and outcomes expected out of the research. The reader was also informed of the delineation of research. The reader in this chapter is able to view the structure and overview of the chapters in this section.

## CHAPTER TWO

### CHAPTER 2: LITERATURE REVIEW

#### 2.1 Introduction

The purpose of this chapter is to critique and review previous research that relate to the topic. It provides an in-depth analysis, summary and in some instances critique and or comparison of the work of other authors previously documented in journals, published books and research papers. This chapter, allows the reader to establish why this research topic was pursued. This is shown in the various variables and factors that are discussed in the chapter. The author has used historical and present text to show similarities in past and present research.

#### 2.2 Literature review

##### 2.2.1 Small and Medium Enterprises

Xavier *et al.*, (2013) in the Global Entrepreneurship Monitor (GEM) Report of 2012 states that there is a high growth in Total Entrepreneurial Activity (TEA) and this is a measure of entrepreneurship presence within the society. Although this can be linked with the increase in need for necessity-based entrepreneurship, there is a high growth rate in many parts of the world (Xavier *et al.*, 2013:8). Although non-entrepreneurial areas are not necessity driven entrepreneurship zones, they reported a 20 + growth margin. Although the classification of SMEs differs in areas of operation, SMEs can be classified as having revenue between R 5 million and 15 million and has between 0 and 250 employees.

The GEM Report of 2012 also states that the Sub Saharan and Southern Africa top the highest level of growth. This is due to high growth potential of the countries. The BRICS is the abbreviation for 5 countries with 5 emerging economies and these include, Brazil, Russia, India, China and South Africa. South Africa, with a TEA of 7.3%, is a country within the BRICS economy, and it is characterized with high entrepreneurial growth and activities due to investments into key productive areas within the nation (Xavier *et al.*, 2013:24). The Western Cape has been identified as the Gateway to South Africa. Cape Town in particular has been appointed as the Design Capital of the World, thereby creating exposure around the ICT sector pertaining to project implementation. ICT SMEs are oriented towards a project based environment rather than functionality and thus the structure of implementation is confirmed to projects (Turner *et al.*, 2008).

The Western Cape boasts 1200 SMEs out of the 3000 SMEs with taxable income within the South Africa. This means that almost 40% of ICT SMEs are operating in

the Western Cape versus other provinces. Of these businesses, only less than 12% have been operating since 1994 as alluded by the ABSA survey (Schussler, 2012). Of this number of successful companies, it has been proven that they have been implementing project management principles. The literature has emphasized the importance of the use of project management tools as a vehicle for success. Turner *et al.*, (2008) emphasize that projects are managed in a coordinated way for added benefits.

### **2.2.2 Importance of Project Management Tools and Techniques**

Further emphasis is placed on the importance of the project management tools and techniques in the description of the concept of project management by stating that project management interfaces between projects, prioritization of resources and balancing of projects that change organisations to achieve benefits that are of strategic importance. The Merriam Webster dictionary defines a tool as “something (such as an instrument or apparatus) used in performing an operation or necessary in the practice of a vocation or profession.” (Merriam Dictionary, 2016). The Business Dictionary (2016) also defines a tool as “an item or implement used for a specific purpose...a technical object such as a web authoring tool or software program. Furthermore, a concept can also be considered a too.” A technique is defined as “a body of technical methods (as in a craft or in scientific research) or a method of accomplishing a desired aim.” Turner *et al.*, (2008) also alludes that failure to balance these factors is detrimental to the growth of any SME and this is evident in the failure rate and the closure rate of the SMEs spanning over a ten year period in South Africa. SMEs Tools and Techniques as stated are keys that drive projects as they assist in dealing with factors core to ICT projects. These tools are revealed below.

Spalek (2014:844) states that project management success is closely linked to the success of an entire organization in both a strategic and operational view thus, increasing the importance of project management adoption in organizations. It is equally important not only to adopt project management practices, but also to continually seek growth and refine project management processes. This in turn results in mature project organizations. Increased project maturity and project management practices reap benefits such as cost reduction, therefore, making project management a viable area of investment in a firm. The firm can benefit from project management tools and techniques in the long term.

The nature of projects as stated by Elonen and Arto (2002:395) who cited Archer and Ghasemzdeh who were further supported by Dye and Pennypacker, stated, “projects compete for scarce resources”. This in itself requires the maximization of the project management tools that will assist in management of such projects to ensure maximum optimization of project management tools. These tools which include but are not limited to Gantt Charts, CPM, PERT, MS Project account for the project successes within SMEs and must be used to ensure sustainable growth and innovation (Turner *et al.*, 2009: 185). This is supported by Elonen and Arto (2002:396) who state the ultimate purpose is to deliver increased benefits whilst maximizing the value of the project, linking the projects to the strategy and ensuring a balanced portfolio.

Jerbrant and Gustavsson (2013:167) argue that, projects have however moved in the direction of improvising, by creating action based spaces. They further argue that strategies are unique to a project. A holistic approach creates an ideal environment in projects, allowing for project collaboration, resources sharing, and time saving. This impacts projects positively by reducing information overload, and allows project managers to move from a narrow focus, to a broad focus adopted by portfolio managers. Holistic environments allow for flexibility and structure, therefore they save companies time, money, and resources.

Dooley, Lupton and O’Sullivan (2005:466) reiterate the importance of holistic environments. Apart from the above mentioned benefits, the projects firms reduce conflict and create greater organization efficiency through the greater structure and understanding of the details of multi project management. Reduced conflict is as a result of staff having a holistic view on the risk of all projects as well as the project’s deployment strategies. This is a positive driver of project collaboration discussed later in this chapter.

Killen, Hunt and Kleinschmidt (2008:334) highlight that organisations with project management capabilities perform better, compete effectively and maintain a competitive advantage. Project management capabilities, allow the company flexibility and adaptability to unique projects, and allows for effective usage of resources, and create a lessons learnt archive pool for project referencing.

Loo (2003:30), also reveals through his research the effects of mature project management process, allows the organization to have effective technical and people practices which include: system, scope management, planning and scheduling,

controlling and contract management, high caliber project teams, stakeholder participation, effective team communication and customer satisfaction. This results in an effective organization that not only succeeds in delivery of projects, but also increases customer and staff retention and effective competitive advantage within the market place.

Turner *et al.*, (2009:187), outline the vital importance of entrepreneurship within economies and their contribution thereof to growth. The high level of contribution to the economy of SMEs thus solicits the need for SMEs to increase both the level of competition and the quality to match or surpass the competitors within the industry. Turner *et al.*,(2009), alluded the importance of project management and outlining how its tools assist in planning, defining and implementing projects.

### **2.2.3 Key success criteria in SMEs**

Even though project tools and techniques have been identified as key to the success of SMEs by several authors (Turner *et al.*, (2009); Eloen and Artto (2002:396)); Cookes –Davies (2002:185) stated that success factors, which are indirect, lead to the success of the project. A case study on high tech SMEs in Ireland conducted by Murphy and Ledwith (2007), identified key factors in projects of SMEs. Enterprise Ireland (2016) state “Ireland is the second largest exporter of computer and IT services in the world. It boasts, a highly creative and talented workforce, an open economy and a competitive corporate tax environment. It has , attracted eight of the top 10 global information technology companies.” SMEs were to follow structured processes, on selecting projects that meet their key performance indicators that contribute to success factors.

The success criteria was also supported by Muller and Turner (2007; 299) and they cited seven factors namely; budget; schedule; quality standards; appreciation by users; stakeholder appreciation; project personnel appreciation; and specification. Turner *et al.*, (2009: 292) further group these factors into six criteria namely: clear goals and objectives; senior management support; allocation of resources; risk management; client consultation and planning; and monitoring and controlling. These factors as pointed out in Turner *et al.*'s (2009) research can vary in terms of significance depending on the organisation. This was supported by Belassi and Turkel (1996:144) who stated that the project manager must know which factors they can control and the success criteria within the projects. Zwikael (2008: 390) also groups project success factors into four areas: project overrun: cost overrun; project performance; and customer satisfaction.

All these factors can be greatly influenced by top management support within an organization, through the processes put in place. The presence of the success criteria assists in driving at project management goals that will be effective and efficient. These authors pointed out that the triple constraints model is not sufficient to cope with the ever changing project environment under which ICT SMEs operate and thus a gap must be built to ensure that the perception of success a firm has, influences the level of performance within the project environment.

Dalcher (2012:650) revisits the work of Morris and Hough (1987) and outlines ways to measure success within projects. All these aspects support the above criterion and can be grouped in 3 segments, project functionality, project management and contractors commercial performance. All these three are vital to any business and with SMEs, and can be ways to measure one's business. Functionality is in this aspect the technical performance or financial performance from an owner / project sponsor or client. Project management as a success factor, is the degree to which implementation has met the budget, technical specification. Lastly, contractor's commercial performance is the commercial benefit to the service provider – in the short or long term. These aspects, tie in with above success criteria alluded to.

It is equally important for SMEs to create projects/ deliver projects that are beneficial to the client, as much as it is important for SMEs to benefit as well in the projects. Hence success will be measured in both ways, the client's eyes that gets the project delivered on time, and within specifications and within the financial limits. It is equally important for the SME to benefit as it creates and long term or repeat business if the projects are within schedule and within budget. The SME success is just as important as the client's success. Working within budget, building client trust and a reputation are crucial to the success of the SME. The SME success in a nutshell is therefore driven by effectiveness (in end value and quality in product delivery), efficiency (in the processes and tools of the SMEs) and having financial outcomes (upon completion of the project).

To achieve these success criteria, a lot of tools and techniques, need to be implemented by an SME to ensure the success is achieved. Sandhu (2004) has similar views in how well one plans, executes, controls tasks, and manages relationships with all project stakeholders, constitutes the success or failure of carrying out the project.

Dalcher (2012:651) also points out the realities that may in fact influence project success within any organisation resulting in project failure or overruns. The author cannot ignore these factors, although identified in 1987, they too can be causes of project failures within organisations. The following areas: project objectives and visibility politics; community involvement; schedule duration and urgency; project implementation; technical uncertainty and innovation; and financial, legal and contractual matters are what the author will look out for in the project responses. Czuchry and Yasin (2003:39) point out that the majority of project failures are as a result of poor execution.

#### **2.2.4 Selection of project management tools for success**

Authors Garg, Goyal and Lather (2010) noted that there are no standards for information systems for SMEs and this was further backed by the Project Management Institute (2010) which stated there was a need to develop PMI tools for SMEs. The project management discipline has evolved over the years and has now seen the advent of PM tools and techniques- made available to SMEs. The downfall is not the access but rather the complexity of identifying which tools to use and how best to use them. Some tools have project management principles underpinned such as Gantify – which changes your project plan into a Gantt Chart. This concept however can only be known by a project management expert and the tools need to be integrated. The paid for tools that have an all in one solution are however out of reach for SMEs in terms of cost and can be underutilized within the business. This reality still stands 5 years after being stated by the Project Management Institute.

Although Project Management (PM) tools are important for the growth of the SMEs, Thomas and Mullay (2008) alluded the importance for the right fit “perfect match” between the nature of the projects under complexity and pace. Although these tools are available, there is no “one size fits all” in the PM environment.

Cooke Davis (2002:188) also pointed one of the factors that lead to successful projects as those that have a suite of project, portfolio and programme metrics with line of sight feedback on present and futuristic success, allowing for alignment within the corporate and projects portfolio decisions. Another key factor pointed out by this author was the importance of the presence of management support within the project environment within SMEs.

Jugdev and Mathur (2013:547) reveal in their research that selection of tools is dependent on the individual using them. This is affected by the project manager’s

view of the tools complexity and the limitations. The project manager, therefore, plays a large role in the use of the project management tools.

Neale and Letza (1996:29), state that top management support to effectively drive adoption of project management tools and techniques is vital to selection and adoption of project management tools. Without support, adopting and selection of project management tools, the firm's team and staff will not adopt the process, and selection of tools effectively.

Selection of project management tools and techniques are also affected by the complexity of the project and the complexity of the systems within an organization. The complexity impacts on the size, variety and interdependencies with the various projects in the systems (Vidal and Marle, 2008:1096-7). Therefore, although a project complexity of a firm may result in adopting one or more tools and techniques for a project. This could mean that, one organization can adopt more than one tool or technique to address the unique project needs, and change the tool for another project.

Application of project management tools is impacted by various issues, including but not limited to the risk associated with the project, firm's policy and strategy, the team and resources availability (Abednego and Ogunlana, 2006). Application of project management tools is impacted by an organisation's maturity. Pasion (2014:206-7) also reveals successful projects in mature organisation are as a result of fostering, customer involvement, adaptability, supporting the team and supporting defined processes. Higher project maturity results in project success (Albercht & Spang, 2014:285). The author believes as project organisations mature, they have more defined project management tools, that have been tried and tested and have lessons learnt to glean from.

#### **2.2.5 Risk and Opportunities management in project management**

Success of organisations is determined by being able to identify the project and portfolio risk and opportunities within a project Olsson (2008:61). Risk and opportunity management are an aspect of project management that are useful in setting an organisation apart in identifying risks and averting them and identifying opportunities and implementing the right ones. The methodology implemented by PM allows a project manager to identify interdependencies within the projects to decrease the risks and identify the opportunities. Risk management within the project is heavily dependant on the project manager identifying the risk in the project management

process, Olsson (2008:61). This is supported by Dey and Ongunlana (2004:345) who allude that knowing project objectives is vital to identifying the projects.

Risk management will not only be done on a project-to-project basis but on an organisational basis thereby giving an organisation a better view in terms of growing their organisation Antoni (2003). The multi project risk management allows for growth in experience in identifying successes and failures and this is supported by Arto, Kahkonen, and Pitkanen (2000). Olsson's research makes recommendations on the impact of risk management that can be adopted in SMEs. Project tool and management will be useful in SMEs when they can better prioritise, view projects at organisational levels, view interdependencies and better planning and coordination and improvement of identifying risks and opportunities.

A key aspect in risk management is acknowledging how interrelated the nature of projects are. Sandhu (2004) concurs that complex projects have different process steps that cannot be separated without affecting overall process performance. This is key to risk management and understanding project dependencies.

The author concurs that risk management is a vital aspect in averting project failure in the beginning of a project. Although, this may seem an onerous task, it is vital to the success of a project and hence automating this aspect and identifying risks before they occur, can save time, money and reputation in the long term. This notion is equally supported and was proven in Besner and Hobbs (2012:243) who from their research discover that risk management increases project performance through increased use. Although, this is not the only method, it is a practical aspect that if maintained, can impact a project positively.

Risk management is simplified by employing a risk management structure (Hillson, 2003:85,95). Some of these tools include Gantt Charts (measure incompleteness risk), PERT, risk plans and excel sheets. This is important and can be used to compare risks between different projects, thereby assisting with lessons learnt structuring. This creates a knowledge base for any organisation that will result in continuous improvement of projects. The risk management process, allows a firm to break down risk into smaller units, that can be addressed easily and avert any risk exposure a firm can have.

### **2.2.6 Project Management Teams and Collaboration**

This is further supported by other research. To ensure projects are successful, research has shown the importance of collaboration amongst the project partners

(Niebecker, Eager, & Kubitzka, 2008:384). All project key performance indicators must be identified at the beginning of the project and shared with the project team. Such collaborative efforts allow for risk management. Stewart (2007) states that the application of the balanced scorecard “ a collaborative risk management tool” resulted in “ high performance improvement in operational, strategic, competitiveness and benefits perspectives provided reliable IT systems that were well supported and user friendly.” The author believes, project management tools and techniques such as JIRA, allow project teams to collaborate and thereby reduce risk. Teams start knowing the goals upfront and work towards achieving the goals, whilst collaborating.

Although this tool can vary in each firm, research has shown that a firm with a holistic view can improve performance (Niebecker *et al*, 2007:384). A high level of transparency and trust needs to be cultivated in organisations to implement this level collaboration to manage risks.

Multiple authors have revealed that risk management is a crucial aspect within project management. Prosbtt and Buchel (1997) in Albrecht, Burandt and Schaltegger (2007:404) noted that the ability to discover errors, correct them and change the values of the organisation to generate new problem solving skills and new capacity for action, is an important part of organisational learning. Learning within projects is also facilitated within an organisation where interaction between project and line organisation is a prerequisite. Project based learning is limited in comparison to organisational learning that is holistic (Olsson (2008:62). Opportunities will be seen at organisational level and it is important therefore to communicate and ensure collaboration on an organisational level.

Although organisational learning is crucial, project managers and their teams have to adapt to changes from a planned perspective and unexpected, coincidental learning that occurs in the workplace (Hallgren & Wilson, 2011:196). This flexibility allows the teams to progress in crisis project situations, which in turn limits disruptions and hindrance to project progress. This creates agile teams, that move quickly and swiftly to solve problems and finish projects effectively. Agile teams, allow for higher quality solutions to problems (Cavaleri, Firestone & Reed 2012:143). Agile teams are enhanced factors such as constructing knowledge basis, comprehensive system support, training in using social technologies, and IT applications implementation to name but a few (Cavaleri *et al*, 2012: 141).

A more open approach in problem solving resulting from collaboration allows teams to reach better solutions in their projects (Cavaleri, *et al* 2012:125). This is because the problem solving process creates opportunities for quality management, organisational learning, knowledge management – which are critical to developing effective solutions and project or firm continuity.

Kerzner (2000:13) argues, that survival of projects impacts project success and allows for creating intelligence and enhances organisational learning. This survival allows for projects to be perfected through continuous practise. People are therefore a crucial part of organisational learning and create the intelligence learning process of the project in pre–planning, implementation, post review, and lessons documentation. Knowledge is created through the creation and documentation of lessons learnt and creating knowledge archive. Kerzner argues that organisational learning is progressing towards knowledge management. This process allows for well-defined performance outcomes. This is supported by Fuller, Dainty and Thorpe (2011:1 118) who in their research reveal that project learning improves output and a learning environment culture. The aspect of creating a learning environment allows for creation of effective project environment through collaborative learning and interaction of project teams (Jugdev and Mathur, 2013:633).

### **2.2.7 Project Collaboration**

Tools within project management such as Asana and Wrike allow employees to implement the tools on social media in the context of work. Concepts such as "liking", "commenting", "following" have been developed from the leanings from social media such as Facebook. Creating teams or groups and the aspect of group management have also been adopted from other media such as Whatsapp. The question in this case is, are SMEs open to adopting tools that not only provide platforms for knowledge sharing but those that stimulate their staff and keep them "entertained and alert in their jobs to increase productivity.

A tool and technique utilized in project management is the set up of teams. However, there is a heavy reliance on trending towards self managed work teams, which in turn affects quality of work, produced (Hoer 1989 in Roper and Philips 2007:22). The aspect of quality of work is further supported by Ahire's (1999:12) components. Among these are management commitment and empowered teams.

Project collaboration and communication are vital to the success of projects, and Morris and Hough (1987:211) states "the definition of what a project really involves

affects fundamentally the way the management of the project is defined and executed.”

Collaboration and involvement is not only a project team effort. There is need for executive management to get involved in the execution of the project thereby striking a balance in operations and strategy Czuchry and Yasin (2003:40). Shying away from projects, disadvantages the executives in decision making processes as the objectives are not aligned with those of the operational team. This involvement although limited, has far reaching positive effects on the project performance as well as team collaboration.

### **2.2.8 Self Driven Teams and Project Management Culture**

A driver of quality is the customer focus as exuded by the self-driven teams. Due to scarcity in projects and limited resources in small enterprises, there is great reliance on this technique for the organisation to thrive. This can only be done well if micro-management exercise is not implemented and this is common to many small companies. Many a time SMEs start off with one person who becomes the jack-of-all-trades in the business. Self reliance on oneself will impact growing an SME and producing quality work, hence there is a need for self management teams to be developed. These teams as stated by Roper and Phillips (2007:22-23) have a Simmons goal and end result, they respond timeously to customer needs and reduce defects where they are most likely to occur.

Ahire's 12 components of quality are further supported by the practice of self managed teams. The main focus is on high performance however, there is need to also focus on the individuals to ensure their needs are met and they are motivated. This type is flexibility in allowing workers to be at centre of organizing, regulating and controlling their environment and other aspects to it to ensure a positive outcome can only increase productivity within an SME. Although not a physical tool, this way of thinking and methodology in forming teams within project management will drive the success factors sought after by many SMEs. This will, not only save costs in cutting out retention, but if used well, can be a motivational tool in allocating responsibilities and allowing the team to grow marginally.

Roper and Phillips (2007) have stated many factors that are at play when dealing with self managed teams. This in the eyes of the researcher positions SMEs as the best point of implementation because the size of ten teams allows for complexities within the teams to be solved and catered for and areas such as trust, group identity and group efficacy are easier to establish where the team is open. In SMEs, the various

roles allow for complete diversity within the technical skills and expertise and thus creates the right ingredient for self management to work. Other aspects such as emotional intelligence and decision making can only be instituted with the support of top management in the organisation. This resounds true as stated by Zwikael (2008:387) that top management and leaders must support the goals of PM within organisations for them to be successful. Fortune (2006) supports this notion and states, top management support is critical and vital to project success. It is therefore the backbone of project success. There is a correlation between project success and top management support. Top management can therefore hinder or support project management success through the processes they have put in their organisations.

Research by Roper and Phillips 2007:33) proves that self management teams have factors like "collaboration, cooperation, talent pool, team goals, High organization performance, togetherness, job security and self regulation. The same teams have less "autonomy, individual skills, single superstar, individual recognition, departmental performance, isolation, instability and supervision. This skill can only be harnessed gradually.

Karlsen (2011:247) states that to build a project management culture, it is important to give clear responsibility to teams. This reiterates the importance of the team in the project management process. Clear responsibilities are crucial in order to reduce uncertainty, time, resources must be committed. This means there will be need for tools that allow for forecasting and scheduling.

It is equally important that project management teams continuously have project training to ensure that their organisations adapt to project changes quickly and effectively (Harpham, 2005:16). These teams are crucial to organisations and the era of project management demands flexibility and adaptability to ensure survival.

Self driven teams are a huge driver in project success, however, Bredillet (2014,548) reveals that ethics are important and a shift from what is my duty, to why I must undertake my duty, or how do I act in this situation create a better ethical environment for increased performance. This means in using the tools, and working in the projects, the project team undertakes to create the best project output for the organization resulting in successful projects.

### **2.2.9 Project Quality**

Apart from implementing quality as a project management tool, quality has to become a tool in itself. Barad and Ras (2000:571) projects are a paramount area in which

quality can be implemented. This area as stated by PMBOK, is one of the important area in PM space to create quality outcomes and flag any areas were possible. In their research, quality management tools were adapted to meet the quality needs of project management. Their reader greaves quality management tools crucial to project management included training, and process control and management commitment influenced quality of the project.

#### **2.2.10 Project Quality and Performance**

As seen from the above researchers, the human aspect is of paramount importance. This varies from management commitment to training to impact the quality and performance within a project team. Both these are equally relevant and underpinning these are the knowledge sharing principles and tools. Sense (2008:33) is clear in his abstract that, project teams must learn on social systems in knowledge and learning practices in projects. More and more professionals are on many social platforms and conforming to that change is imperative for project organisations to do so Sense (2008:43). These "tools " resonate well with employees and make knowledge sharing within teams faster and more effective. Maqsood, Finegan, & Walker (2006:93) affirm that group learning is important in group decision making. This allows team members to be on the same wave length therefore impacting the project quality. Masqood et al (2006:93) states, that knowledge sharing allows a project team to take joint ownership of the problem solving of process. This buy in allows the team to work closely and effectively in delivering project quality.

Performance and project quality are impacted by the manner in which project teams complete their work in relation to time management. Time management has an important bearing on the project quality output produced and an individual's time orientation will result in successful and or unsuccessful projects. (Wu and Passerini, 2013:332). It is therefore equally important for an organization to have effective time management tools and techniques in place to ensure quality and that the project is delivered effectively and timeously.

#### **2.2.11 Project Management Culture impacting performance**

Although project management tools and techniques are important in an organization, what drives project management within an organisation is project management culture. The author believes smaller teams are better at implementing and driving a project management culture, as they are better collaborators, better at coordinating and are agile and flexible to adapt to better practices. There are ever increasing challenges and complexities in project management due to change in the nature of projects and the business environment (Karlsen), 2011). This level of change and

complexity leaves enormous pressure on execution that is precise to ensure time and cost savings, satisfied customers and quality. Karlsen (2011:241) states that projects fail to meet expectations, run late, over budget and underperform and firms do not gain expected benefits at present. Much of this is a lack of support and culture of project management within an organisation to avert these issues from occurring. Ahmed, Kavis and Amornsawadwatana (2007) further supports this by stating that although risk management is vital, the organizational culture within the organisation is crucial to achieving success in implementation of project management. This is built on Hillson (1997) who states the differences in maturity levels within an organisation to manage uncertainty in projects, naïve, novice, normalized and natural. The most desired is natural where uncertainty is expected within a project. In developing a proper project management culture, there is need to commit time and resources such as scheduling and forecasting tools.

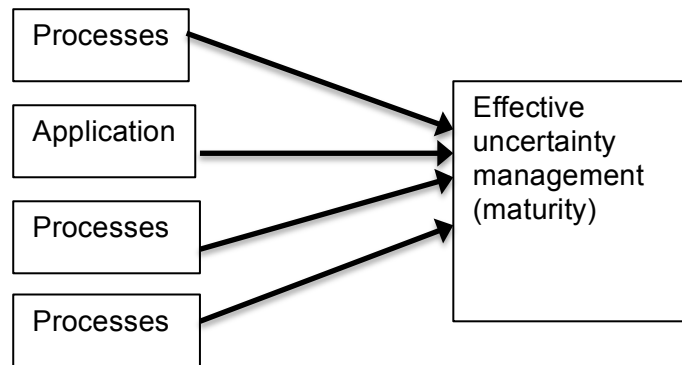
#### **2.2.12 Project Monitoring and Reporting**

Other factors also alluded to in the past literature also highlight the areas that affect project success in the project environment. Elonen and Artto (2003:396) stated that among other factors resources are vital and thus mismanagement and lack of monitoring will have vast implications on the projects. They further pointed out, the availability of the recourse monitoring tools, or scheduling will breed efficiency in multi- project environments in ICT SMEs.

A case in point in this literature is how these factors have reverted back and pointed towards the direction of using project management tools and techniques to addressing the key success factors. Therefore, these other factors after being acknowledged have relationship with the solutions that the project management tools and techniques provide. Among the success factors, are budget and the schedule and these can be better addressed using the project management tools such as the Critical Path Method and Resource scheduling techniques. These tools when implemented can be key to underlying principles of SMEs in ICT. This seldom occurs within the project environment and has been noted by other researchers.

In support of project monitoring and evaluation, Karlsen (2011) in his research points out that it is efficient in improving uncertainty management and this is easily adopted if it is in culture. Kutsch and Hall (2009) touched on this process and the PMI's (2004) risk management process included uncertainty monitoring and control. Hallgren & Manninen- Olsson (2009:54) supports this notion of having monitoring and control because it allows project managers to react when a risk emerges and allows them to use the tools and techniques to control the risks. Although, risk control measures are

in place, Hallgren & Manninen- Olsson (2009:64) from their research illustrates that deviations in projects although detected can fail to be addressed due to time constraints. The tools and techniques and process of managing risks within projects can become one of a bureaucratic nature thus hindering the full use of project management. Below is an image illustrating the uncertainty management in projects.



**Figure 2:1: Uncertainty maturity model**

(Adapted from Karlsen (2011:242))

Apart from setting and defining project vision, much of the work sits in project evaluation, assessing a project manager performance and identifying problems and taking corrective action. The latter is the most important as it leaves room for project improvement and project success. Czuchry and Yasin (2003:39).

Geraldi & Letcher (2012:590) argues that Gantt charts, is still a very popular tool, although it shows schedules. This tool has underlying principles embedded in project management and allows identifying the project failures even before they happen. The tool is analytic, deterministic, time focused, allows for accountability, objective, and sequential. This tool's principles have been adopted and modified in tools such as PERT, and CPM, which allow for in-depth analysis within a project as well as planning. The aspect of planning underpins most project management tools, and the Gantt Charts have now been modified to show dependencies, and time spent per activity. Although, simple to use and interpret, Geraldi & Letcher (2012:591) argues that Gantt charts do not show a holistic view of the project, as it is only visual representation of project flow.

### **2.2.13 The state of project management in SMEs**

In previous years it has been proven that SMES have poor project management practices Ledwith (2004). Ledwith (2004) also states that when projects are managed in an innovative manner, they reflect focus and achieve the expected growth to meet

their key performance indicators whilst curbing risk. Owens (2006) further supports, whilst attributing the lack of systems to track and control projects and the lack of structure definition to roles as contributing factors to poor project implementation of SMEs. Ghobadian and Gallear (1997) stressed that it is vital for SMEs to have tools to assist in monitoring and evaluation as well as reporting, controlling and planning that are adaptable.

Of particular interest is the direction of the research in past. Research on the presence of project management tools and the techniques has been done, but it however focused mostly on the context and application to large corporations (Bresner & Hobbs, 2006). Previous research has focused on project management in large firms than in SMEs due to the limitations of the pre- project management tools that were underpinned by bureaucracy, which is not ideal for SMEs (Payne and Turner: 1999). They further pointed out that projects tools and procedure would only succeed if they were tailored to suit the SMEs. Due to this limitation in the past, White and Fortune (2002), who were supported by Bryde (2003) and Thomas and Mullay (2008) focused on areas affecting larger firms within the ICT project environment focusing on research in project management offices.

To that note, in an effort to direct new research, Turner *et al* (2009) outlined and suggested the possibility of implementing a "lite" version of the tools to be applicable to SMEs environment. The authors also pointed out of paramount importance the success of project management within SMEs will be via the support of the management within the organisation. This is a question answered through our research questions.

From the literature, the author has drawn the following conclusions. Apart from predetermining the success factors that are within the organisation, it is management's responsibility to look into managing projects with the necessary tools, thus to unveil any discrepancies that exist. Murphy and Ledwith (2007:164) alluded that further investigation was required to have a deeper understanding of project management in SMEs. This in their opinion would assist in developing an approach to project management that would increase the probability of project success within SMEs. This is in line with the direction of this proposed research. It is therefore worthwhile to ask questions in South Africa, an emerging economy, and in the Western Cape, that is at the heart of technology and uncover if these tools are implemented, and if not why. The questions seek to reveal a relationship between

implementation of the tool, aligning it to the goals and possibly relook at project success within these ICT companies within the Western Cape.

Cooke Davis (2002:188) also recommended looking for existence of the alignment within the corporate and projects portfolio decisions as a possible point of future research. This will be addressed in one of the questions pointed out by the author.

Dalcher (2012:658) recommended that a study of real project managers and teams in real life contexts focusing on decision making, prioritising within a project could prove invaluable insights. Some of these aspects will be covered in the research as well.

The investigation will thus be conducted to answer the research questions which where previously alluded to in the research questions section. The above literature and recommendations form a basis of these questions:

- To what extent are project management tools and techniques being used by Information Communication and Technology SMEs in Western Cape?;
- To what extent do ICT SMEs in Western Cape use project management tools and techniques?;
- To what extent do ICT SMEs know about the project management tools and techniques and how to use them?;
- To what extent do the ICT SMEs know the benefits of using project management tools and techniques; and
- To what extent are the project management tools and techniques used by SMEs effectively and achieve any success criteria?

### **2.3 Summary**

In this research, project management tools and techniques were defined in depth. Various success factors and variables that define a project's success, and continuity were also discussed and the benefits of some of these factors were included. The chapter also revealed how some factors, tools, and techniques will impact the project success and delivery within any firm. Tools and techniques were not only identified but also linked to each other and the areas that form the basis of project management as defined by PMBOK.

The literature also revealed people (staff, personnel, project managers, leaders) as a common area that interacts with tools and techniques that may impact the project management process and techniques within an organisation.

Although some firms used in the literature were kept anonymous, the tools that were commonly used by the other major and small companies were also identified. There is a big correlation in project success factors, the project areas and the project management tool and technique used within a project. The literature review revealed the importance of addressing the project management areas. These areas were important to selecting the tools. Some of the literature review revealed factors that are crucial in project management tools, and these were outlined and will form an area that will derive recommendations for the research.

## CHAPTER THREE

### CHAPTER 3: RESEARCH METHODOLOGY

#### 3.1 Introduction

The previous chapter critiqued and reviewed previous research areas that related to the topic. The purpose of this chapter is to outline the research methods applied to obtain results to the research questions.

#### 3.2 Research design and methodology

There are 1200 SME ICT companies in the Western Cape (Western Cape Government). Of the number stated by Western Cape Government, a population of respondents were drawn from 500 SMEs that were trained by the CiTi because of possible future time and budget constraints. The firm's chosen are representative of the population at large in that the sample source of the population, are the companies that were trained at some point by the CiTi and have received some assistance in growing their business. The data collection method was accessible to all these SMEs and being ICT firms, they use technology in their businesses. The screening criteria reflected the target population in that all ICT firms, who are SMEs, operating in Western Cape. The support in CiTi is awarded to ICT SMEs firms based in Western Cape. Good survey design and reaching out to the participants assisted in minimising a non-response bias. The survey used was easy to navigate and was visually appealing to the sample selected. Apart from good survey designs, to ensure that all targeted respondents have received the survey, a "bounce" report was recorded to ensure that all 341 participants received the survey. The sample size calculator used was based on work by Morris (2012), which was in the similar region as that of Bartlett, Kotrlik and Higgins (2001: 48).

Calculating minimum sample size

$$n = \frac{N Z^2 pq}{E^2(N-1) + Z^2 pq} \quad (\text{Morris, E, 2012})$$

$$n = \frac{(500) (1.96^2) (0.5)(0.5)}{0.03^2(500-1) + (1.96^2) (0.5)(0.5)}$$

$$n = \frac{(500) (3.8416) (0.25)}{0.0009(499) + (3.8416) (0.25)}$$

$$n = \frac{480.2}{1.409}$$

Sample size = 340,8  $\approx$  341

n= 68% of the total population

**(Adapted from Evan Morris, 2012)**

Where

n is the required sample

N is the population size

p and q are the populations. (if these are not known, they are each set to 0.5)

Z is the value that specifies the levels of confidence wanted for the confidence interval when data is analysed. Typical levels of confidence for surveys are 95% in which case z is set to 1.96.

E sets the accuracy of the accuracy of the sample proportions. With the accuracy of plus or minus 3%, E is then set to 0.03.

### **Equation 3:1: Calculating minimum sample size**

### **3.3 Research Design**

The research design is defined “the overall strategy that you choose to integrate the different components of the study in a coherent and logical way, thereby, ensuring you will effectively address the research problem; it constitutes the blueprint for the collection, measurement, and analysis of data” (De Vaus, 2011). The research was a non-experimental research in which variables apart from the independent variable were the actual source of the observed variation. According to Welman, Kruger & Mitchel (2012) survey designs show the relationship between variables and are ideal when there is no planned intervention. In this research, there was no planned research intervention at any point. The objects of research were examined based on their responses. The research tool included quantitative and qualitative data.

### **3.4 Methods of investigation**

#### **3.4.1 Questionnaires**

A questionnaire was used to collect responses from respondents. The researcher only required participation of respondents that were within Western Cape, who were ICT SMEs. Electronic questionnaires were distributed using Google Forms and physical handouts at ICT firms in Western Cape. The researcher distributed the Google Forms through mass mailing software, and through social media platforms and automatically received responses.

The purpose of the questionnaire was to investigate research questions alluded in chapter one. Please refer to Table 1.1 to see matching the research questions, objectives and method/ technique.

Sections within the questionnaire focused on these areas:

Section A and B of the questionnaire in Appendix A looked at the biological details of the respondents. This assisted in terms of knowing either male or female, their role in projects, their age, the type of company and clientele serviced that is filling out the questionnaire. These were important and were a source of recommendations for further research to examine the relationship between ICT SMEs size, and type of business focus and tools and techniques of project management. Section C looked at the attitude scales, in the form of summated Likert scale in which the respondents rated the degree to which they agreed or disagree to a particular question. The author used a five-point scale, which included strongly disagree, disagree, neutral, agree and strongly agree choices. The questionnaire looked at revealing the opinions of the respondents, their status in their operations and suggestions of the respondents, success criteria, reasons for utilising or not utilising project management tools and techniques.

### **3.5 Sampling methodology**

#### **3.5.1 Target population**

A total of 1200 ICT SME companies exist in Western Cape. (Western Cape Government, 2012). The research covered a population size of 500 companies trained by CiTi. From these 500 companies, a sample of 341 SMEs was selected from that pool of respondents at random using a stratified random sampling.

#### **3.5.2 Research areas**

The research was undertaken in the Western Cape, a province of South Africa. The researcher, due to reach and convenience, conducted the study in Cape Town Central Business District, Northern Suburbs, Southern Suburbs and The West Coast



**Figure 3:1: Map of research population location**

Source: Showme Maps

### 3.5.2 Size of sample

The CiTi is an organisation that has dealt with up to 500 ICT SME companies. With permission from CiTi, research was carried out on these companies. From the total population size of 500, a sample size of 341 was drawn from a population of the companies trained potential SME firms based on the hyper geometry method (Morris, 2012). This sample was representative of the ICT companies and possessed similar characteristics as all companies were trained by the CiTi, based in Western Cape, in ICT and were SMEs. A smaller sample size was manageable in terms of time and resources. Within this sample, relevant strata was identified that worked within projects. The sample size is justified by Turner *et al* (2008), who state that a significant value of sample must be from 30 to 500 depending on the type of population used. This is also based on work by Morris (2012) which was in the similar region as that of Bartlett, Kotrlik and Higgins (2001: 48). Please refer to equation 3.1 for the minimum sample size calculation method was done in Equation 3.1.

### 3.5.3 Prevention of bias

Bias was removed by randomly selecting the companies and thus each of the companies had an equal chance of selection. The assignment of random numbers was done using an excel sheet to automatically assign the values. Each respondent had a chance of selection. Ensuring that the collection method is accessible to all ICT firms, and that all respondents received the survey at the same time averted bias of non responses.

### **3.6 Sample Selection and sampling method**

#### **3.6.1 Stratified random sampling**

From the 500 total population of companies that were trained by CiTi, a sample size of ranging between 79 and 350 (Bartlett *et al*: 2001) was selected from that pool of respondents at random using a stratified random sampling. This is closely aligned with the recommendations made by Morris (2012) who through the use of confidence intervals and error margins using the hyper geometric equation, a sample of 341 respondents was chosen.

This means that within each selected firm, the respondents were divided according to the organisational hierarchy. The sample included project managers, project coordinators, technical, founders or directors and the project team. The sample was stratified as these individuals provided different views from each other. Per hierarchy the amount of people selected ranged between 12 and 32 people to get an overview from all strata.

An email was initially sent to a group of 341 ICT SMEs with over 500 employees based on initial data at inception of the programme. Some respondents agreed to participate in the survey, and some declined participation in the survey. Those that declined were automatically removed from the survey. Those that agreed continued with the survey. The strata was representative of the hierarchy sought, and usually one participant filled in the survey in their company.

#### **3.6.2 Justification of method**

The sampling methods were used due to certain reasons stated by Welman *et al.*, (2012: 67, 70). Stratified random sampling was used because it is accurate, easy to access and divisible into the relevant strata for the sampling frame. It is suitable for the sample size because it is suitable for all sizes. This is also supported by Wamocha, Muliro, Nasongo, and Injedi (2012:105) who allude that the independent, distinct strata, allow researchers to draw inferences about subgroups, that may be lost in a random sample. It provides a relatively low cost because the list of the relevant strata is available. It allows for better comparison across strata and more accurate and efficient statistical estimates. Its downfall however is it will be relatively difficult to explain.

### **3.7 Ethical considerations**

There were ethical considerations in the process. The surveys were administered on a voluntary basis and the respondents were explicitly informed that participation is

voluntary. Ethical permission was sought and was granted by the organisation to conduct research. Refer to Appendix C. However, in publishing the results, the name of the organisation will be excluded from the research paper. Before the survey commenced the participants were informed verbally and in a research cover letter that they are not under any obligation to participate in the survey; that there is anonymity in completing the survey. To ensure anonymity, details such as the name of the individual was not collected and included in the questionnaire. Thus the results of the survey did not include any identification of the respondents thereby allowing the respondents to feel secure whilst answering the questionnaires. (Welman *et al*, 2012). The firm's name was not used in the write-ups of the research and subsequent publications.

### **3.8 Research Design Validity and Reliability**

The research undertaken was none experimental research. This is according to Welman, *et al* (2012) it is difficult to show validity of conclusions when using experimental research. Cooper and Schindler (2006:318-320) reveal the 3 major forms of validity, which are, namely, content, criterion related and construct.

Construct validity measures the degree to which the independent variable, which in this case will be project management tools and techniques, will relate to the dependent variable, which in this case are the small businesses.

The randomisation of the sample assisted in determining the research validity. This is further supported by Golafshani (2003:599), who recommends the researcher asks the simple question, “ Does this research instrument allow me to achieve the best results possible for my research object.” Golafshani (2003:598) alludes that reliability is the extent to which the results maintain consistency and accurate representation of the population under study, and if the results can be reproduced under a similar methodology. This deemed the method and research instrument reliable.

### **3.9 Research assumptions**

The following research assumption pertain to the research study:

- The use of project management tools and techniques in ICT SME's will improve project success;
- Improved project success will increase financial benefits of the firms; and
- Very few ICT SMEs use project management tools and techniques

### **3.10 Research constraints**

The following constraints applied to the research:

- The research covered only ICT SMEs in Western Cape. All other firms' views in Western Cape that are not within this category will be excluded:.
- Availability of employees within selected firms was a constraint that limited response rate; and
- The poor overall responses from respondents, only the deductions from those that responded to the survey could be discussed and analysed.

### **3.11 Summary**

This chapter covered research methodology, data collection method, design, research validity and reliability, assumption and constraints. These areas were described in this chapter to gain input into the questionnaire and to specify what outcomes the next chapter will be measured against.

## CHAPTER FOUR

### CHAPTER 4 : DATA ANALYSIS

#### 4.1 Introduction

The chapter presents the results obtained from ICT SMES firms in Western Cape. The objectives of the research revealed in Chapter 1 was to determine the extent to which ICT SMEs in Western Cape are using project management tools and techniques.

A questionnaire, attached as an annexure, was administered by means of a web based survey, namely Google Forms.

#### 4.2 Research design and methodology

An electronic email was sent to a group of SMEs to over 341 SMEs as mentioned in Chapter 3. The total population was 500. Based on the calculation on Equation in Figure 3:1, a sample size of, 341 respondents was selected. However, only 210 people responded to the survey, which is only 61,6% of the sample required. A 60% to 70% response rate is accepted as adequate because it is expensive to obtain a response rate of above 70% (Nulty,2008). Based on the argument raised by the Nulty (2008), the results can be seen as a true representation of ICT SMES within Western Cape.

The questionnaire consisted of 20 open ended and closed ended questions. The questionnaire (Annexure A) included a questionnaire guide which was divided into 3 sections as follows:

- **Section A:** Demographics, were included to get a breakdown of the respondents within these companies. This helped evaluate if an education level had a bearing on project management roles and tools;
- **Section B:** About the business, was included to know the size of the company, and the amount of revenue. This was also used as a filter for companies that might have grown to a bigger firm; and
- **Section C:** Client and operations, were included to see the operations of the business. This was to see if there was a link between operations and project management tools.

##### 4.2.1 Treatment of missing data

The researcher adopted listwise deletion to deal with missing data to allow for a sound data analysis, as proper handling of missing data is critical. This method allows the author to delete cases with missing data, and exclude them from analysis

(Briggs, Clark, Wolstenholme & Clarke, 2003). However this method has draw backs which include not using all information which in turn reduces statistical power. The advantage is how it allows for accurate comparability in analysis (Humphries, 2010). The author utilised this method as the missing data were not functions of the outcome variable, hence no effect on the results obtained from research.

#### 4.3 The results

The results obtained from the questionnaire were analysed using Statistical Package for social sciences (SPSS). It is a windows based program that can be used as an analytics resource. It allows researchers to gain fast and accurate insights into their data, move from data to decision making, improved decision making with analytics, accelerate and simplify analysis (SPSS, 2016). A summary of analysed results is presented in the form of percentages and is seen from 4.4 to 4.24.

### Section A: Demographics

In this section the demographics of the respondents are discussed, which include respondents' age, gender, highest quaification and their role.

#### 4.4 Question 1: Age

This is a closed end question, which allowed respondents to only choose one answer. This question seeks to determine the age of the respondents within the SMEs. This will enabled the researcher to see if there was an impact of project management tools and techniques based on age.

The answering choices were:

1. < 18
2. 18 – 25
3. 26 – 35
4. 36 – 45
5. 46+

#### Summary of results:

**Table 4:1: Age of respondents**

		Frequency	Valid Percent
Valid	18 – 25	68	32.4
	26 – 35	108	51.4
	36 – 45	28	13.3
	46 or older	6	2.9
	Total	210	100.0

The results in Table 4:1 indicate the majority of professionals involved in ICT fall between 26 – 35, which had, 108 (51,4%); followed by the 18 -25 age group, with a frequency of 68 (32.4%); category 36 – 45 followed with frequency of 28 (13.3%) and lastly category 46 or older was the least with 6 (2.9%). The results reveal that the majority of professionals fall within the age group of 26 – 35, which is over half of the entire population. This is a representation of the South African educational route that one can take as students finish Matric at 18, and graduate from University at 23 or 24. The results show, that the ICT environment professionals were mostly in their youth, between the two ranges between 18 and 35 with 83,8%.

#### **4.5 Question 2: Gender**

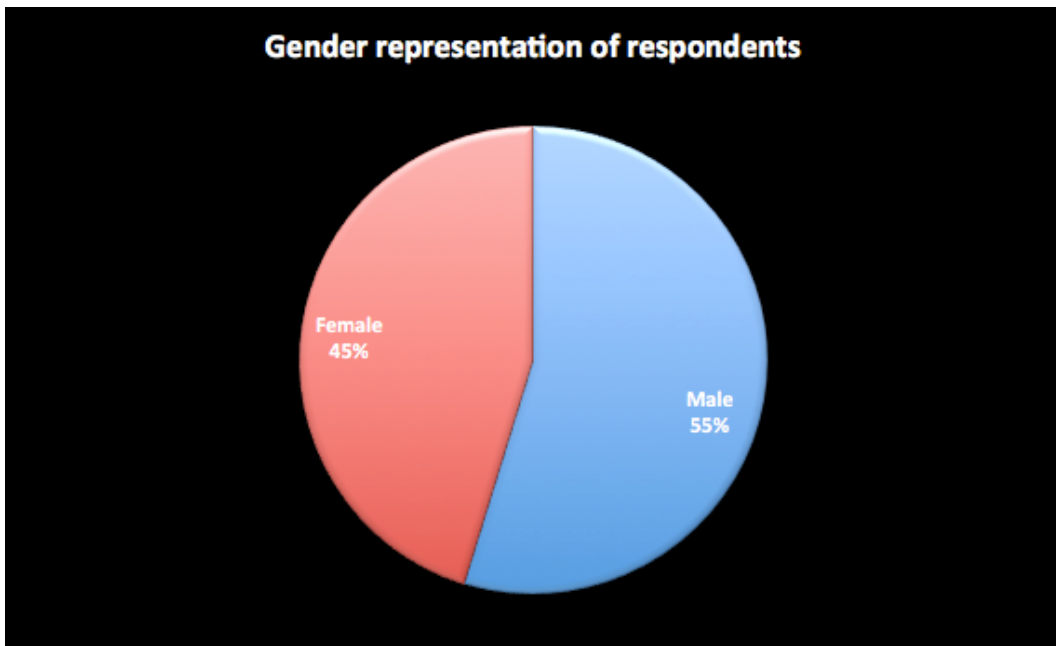
With this closed end question, the researcher sought to determine the gender of the respondents that could use the tools and techniques of project management. Respondents could only choose one answer.

The answering choices were:

1. Male
2. Female

#### **Summary of results:**

Figure 4:2 shows gender representation of respondents. Of the 115 were male and 95 were female. The percentage breakdown of male and female is 54,8% and 45,2% respectively. A study by Crump *et al*, (2007:349) revealed that most women did not actively seek to be employed in the ICT SME's environment. Most of these individuals ended up in the industry. This could be a result of opportunities availed to women before they start their career path. This is supported by Wube (2010:14) who in his research highlighted how women are not presented with the same opportunities as men in other societies. Although there is a leap and improvement in opportunities of education and protection of women, opportunities remain limited for women in economics and politics. This reveals a lag in the female numbers operating and working within the ICT industry.



**Figure 4:1: Respondents gender**

A cross tabulation of results in Table 4:2 was done for the age and gender aspect of the respondents. The results reflected that the majority of females are in the 25 – 36 category. This reflects the norm identified on how women delay on having children in their 20's and rather wait for their 30's to first pursue their careers before settling down Crump *et al*, (2007).

**Table 4:2: Cross tabulation of respondent's age and gender.**

	Age group	Gender		Total
		Male	Female	
	18 - 25	37	31	68
	26 - 35	59	49	108
	36 - 45	15	13	28
	46 or older	4	2	6
<b>Total</b>		<b>115</b>	<b>95</b>	<b>210</b>

**4.6 Question 3: Role**

This is a closed end question that allowed the researcher to see which role or expertise, they used the most (if any) in terms of project management tools and techniques.

The answering choices were as follows:

1. Project Manager
2. Project Coordinator
3. Project Monitor

- 4. Technical
- 5. Director/ Founder
- 6. Other

**Summary of results:**

Table 4:3 reveals the role of survey respondents. The most prominent profession within ICT industry is the technical role, which has a frequency of 99 (47.1%) of the entire respondents. This field include but was not limited to software developers, systems analysts, business analysts, technical support and desktop engineers to name but a few. This frequency was followed by the Director/ Founders of the companies, which made up 29% of the respondents with a frequency of 61. The project managers were 48 (22,9%) and the lastly the project coordinator and other role which had 1 person with a 0.5% each. These results show how much founders in SMEs are still operating within the business and are involved in daily operations to an extent. The high technical respondents could be a reflection of what the businesses services and product offerings are and the educational level of the respondents.

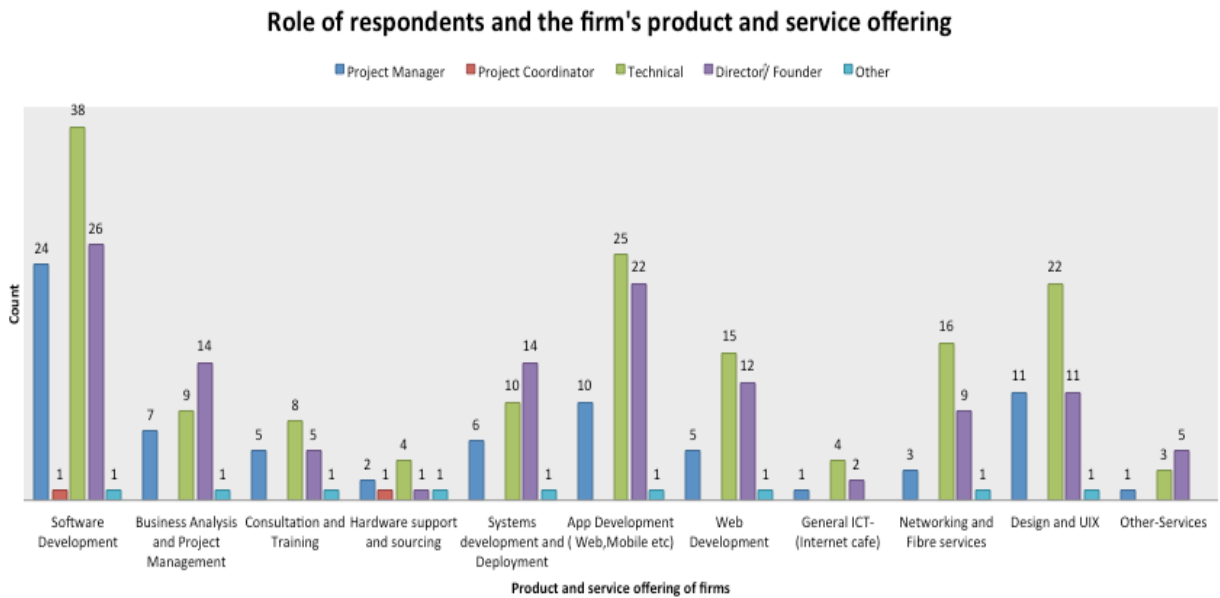
**Table 4:3: Role of survey respondents**

		Frequency	Percent	Valid Percent
Valid	Project Manager	48	22.9	22.9
	Project Coordinator	1	.5	.5
	Technical	99	47.1	47.1
	Director/ Founder	61	29.0	29.0
	Other	1	.5	.5
	Total	210	100.0	100.0

A comparison of the number service offering versus the respondent's role and the results reflect that the roles in this survey are a true reflection of service offerings in companies. This is shown in Figure 4:2 below.

The software development companies show the highest representation of technical professionals, with a frequency of 38. This also translated to the project managers in the firm, which are highest in Software Development companies. The presence of technical professionals has shown a vital presence of the use of project management tools. The researcher believes this is as a result of the need to track progress in technical projects. It is easier to have clear project roadmaps and clear vision and measure projects as they progress. These projects are costly if they are not

monitored. The numbers are reflective of the use of project management tools and techniques. The other technical professionals are high on applications development, design and UX firms, networking and fibre services and web development with frequencies of 25, 22, 16 and 15 respectively. Project Managers follow a similar trend with frequencies of 11, 10, 7 being found in design and UX, App development.



**Figure 4:2: The role of respondents vs. their firm's product and service offering**

#### 4.7 Question 4: Highest Completed Level of Education

This is a closed end question that allowed respondents to only choose one answer.

The answers were as follows:

1. Tertiary level
2. Matriculated
3. High School Grade 10
4. Primary School
5. No Formal Education
6. Other

#### **Summary of results:**

The results in Table 4:4 show a large part of the population with a frequency of 127 (60.5%) completed matric. Following this is the tertiary level of education with a frequency of 70 (33.3%). Grade 10 level and other field, follow with 6(2.9%) and (3.3%) respectively. The respondents with other category, pursued certifications. The results also show, how practical experience adds value to the individuals in ICT SMEs in the presence of project management tools. The impact of the education level on project management , is also seen in the roles within the organisation. This is discussed in detail in the cross tabulation Table 4:5 below.

**Table 4:4: Level of Education of respondents**

		Frequency	Percent	Valid Percent
Valid	Tertiary Level	70	33.3	33.3
	Matriculated	127	60.5	60.5
	High School Grade 10	6	2.9	2.9
	Other	7	3.3	3.3
	Total	210	100.0	100.0

**Table 4:5: Cross Tabulation Role vs. Education vs. Gender**

Gender	Highest completed level of education	Role	Role					Total
			Project Manager	Project Coordinator	Technical	Director/ Founder	Other	
Male	Tertiary Level		3	1	19	23		46
	Matriculated		0	0	28	33		61
	High School Grade 10		0	0	6	0		6
	Other		0	0	1	1		2
	Total		3	1	54	57		115
Female	Tertiary Level		9		10	4	1	24
	Matriculated		32		34	0	0	66
	High School Grade 10		4		1	0	0	5
	Other							
	Total		45		45	4	1	95
Total	Tertiary Level		12	1	29	27	1	70
	Matriculated		32	0	62	33	0	127
	High School Grade 10		0	0	6	0	0	6
	Other		4	0	2	1	0	7
	Total		48	1	99	61	1	210

The results in Table 4:5 clearly indicate that most respondents have matriculated. There are however more females than males that have matriculated with 66 and 61 in favour of females. Males, are however more educated at tertiary level, with 46, and 24 in favour of males. The most educated and most prominent roles for males are technical and director/ founder, with frequencies of 54 and 57 respectively. Males show a frequency of only 3 project managers. This is different, compared to females, who have 45 project managers, 45 technical personnel, and only 4 founders. The results on roles, clearly indicate the most use of project management tools is linked with the roles alluded. This shows, more males use more project management tools than females. These results show, there is a clear link between the education level and the use of project management tools and techniques. Part of project management tools could be driven by intuitive and cognitive ability, which is obtained from studying.

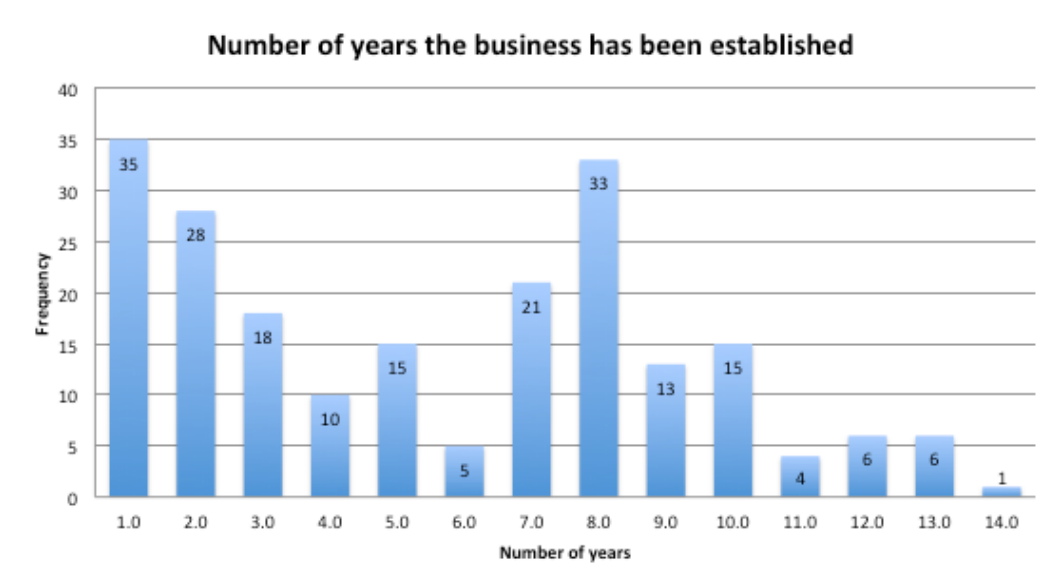
## Section B: About the business

### 4.8 Question 5: How many years ago was the business / company established?

This is a closed end question that was asked to determine the number of years the company was established for. This was asked to establish if there was a relationship between a firm's maturity and the use of project management tools and techniques.

**Summary of results:**

The results in Figure 4.3 show that, most firms have either 1 year, 2 years or 8 years operational experience. The highest is one year with 35 (16,7 %) , 8 years with 33(15,7 %), and 2 years with 28 (13.3). The other years, fall less than 10% including 7, 3, 5, 10, 12, 13, 6 and 1 year(s). Their corresponding frequencies are shown in the graph below.



**Figure 4:3 Number of years the business has been established**

The researcher sought to show a cross tabulation in Table 4:6 of the number of years the company was established and the presence of a project management division and the use, and or non-use of more project management tools.

**Table 4:6: Cross Tabulation: Years of firm establishment vs. Use of project management tools vs. Presence of a project management division**

Count	Would you like to use more project management tools?		Do you have a project management division in your organisation	
	Yes	No	Yes	No
How many years ago was the business / company established?				
1.0	18	17	24	11
2.0	10	18	14	14
3.0	9	9	10	8
4.0	4	6	5	5
5.0	10	5	10	5
6.0	2	3	3	2
7.0	9	12	12	9
8.0	22	11	19	14
9.0	5	8	7	6
10.0	8	7	8	7
11.0	2	2	3	1
12.0	3	3	6	0
13.0	3	3	5	1
14.0	0	1	1	0
<b>Total</b>	<b>105</b>	<b>105</b>	<b>127</b>	<b>83</b>

It is interesting to see how the number of firms that fall within the years of establishment equally reflect the use and non use of project management tools and the presence of a project management division. Although this factor was taken into consideration (i.e. frequency of firms and years of establishment), a close look at the results shows, that about 50% of the respondents, will use more project management tools. However as the companies seemed to have reached maturity in terms of establishment, they will not however use more project management tools. This aspect of organisational maturity and project management use confirms the findings in literature review by Christoph & Spang, (2014:285) that as organisations mature, they refine their project management.

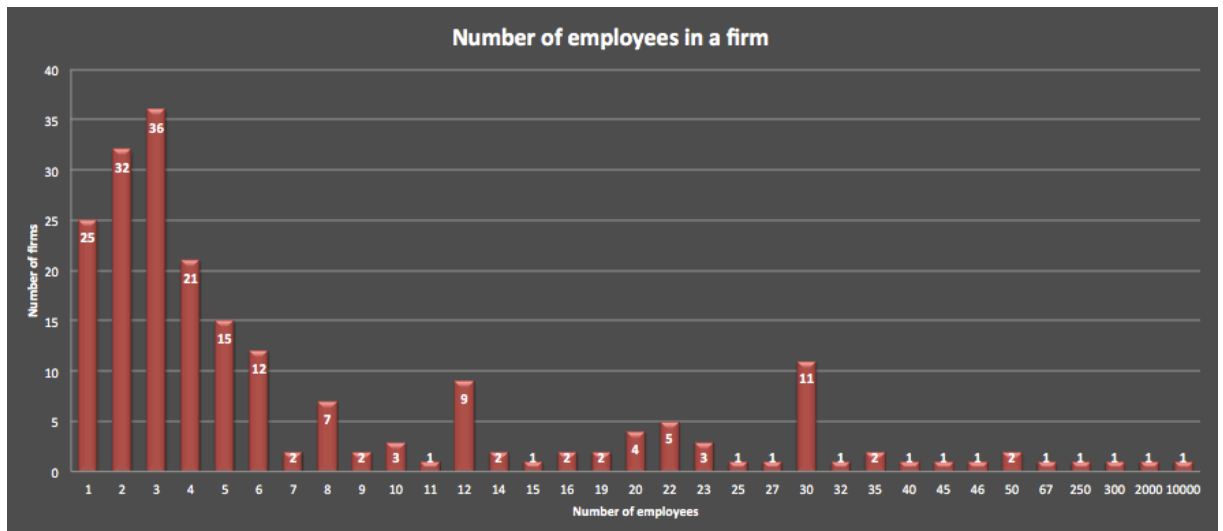
An observation of the data also shows that 60% of the firms have a project management division. The results show similarities between use and non-use of more project management tools and a project management division. The presence of project management divisions reflect literature review in Chapter 2 that projects are drivers of organisations (Turner *et al.*, 2008: 282-296). There is therefore a need for firms to adopt and build their project management competencies. The presence of project management divisions show a positive stride in establishing strong project management in firms.

#### **4.9 Question 6: How many employees does the company have?**

The question sought to establish how many employees the company had. This was asked to determine if there was a relationship between a firm's maturity and the use of project management tools and techniques.

##### **Summary of results:**

The results in Figure 4:4 show, that the majority of the respondents have between 1 to 12 employees. The highest number of employees are 3, with a frequency of 36 (17.1%); followed by 2 employees 32(15.2%), followed by 1 with 25 (11.9%). The highest number of employees is 2000 and 1000. These have a frequency of 1 (0,5%). The number of employees are seen in the graph below. The following graph shows how smaller ICT teams can easily implement project management tools and discipline. This is quite the opposite for bigger firms.



**Figure 4:4: Number of employees of in firms**

#### 4.10 Question 7: How much is your annual turnover

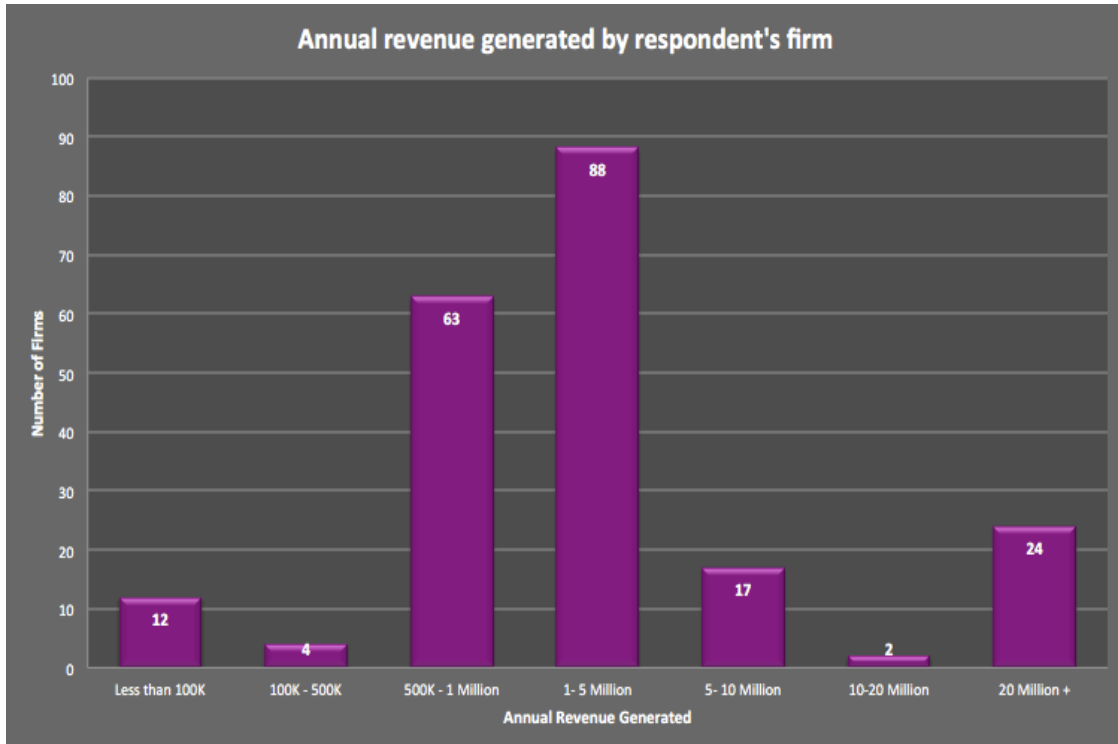
This question was to show how much the annual turnover was. The question was asked to determine if there is a relationship between the growth of the firm and project management tools.

The answers were as follows:

1. >100k
2. 100K – 500K
3. 500K - 1 Million
4. 1 – 5 Million
5. 5-10 Million
6. 10 – 20 Million
7. 20 Million +

#### Summary of results:

Figure 4:5 shows the annual revenue generated by respondent's firms. The results shows that 88 (41, 9%) of the firms were generating revenue within R1 – 5 Million. Revenue of R500K – 1 Million followed with a frequency of 63 (30%). 24 respondents which are 11,4% of the respondents showed a revenue of R 20 Million +, which was insightful to the author. The OECD Information Technology Outlook (2008:63- 65) alludes that internet, telecommunications and IT services and software firms earn high revenues and enjoy spectacular growth” The last revenues (presented in descending order of frequency) had the following: revenue of R5- 10 Million , had 17 (8,1%), revenue of less than R100K was 12 (5,7%), R100 k – 500K with 4(1,9%) and lastly R10 -20 Million with 2 (1%). The graph below shows a visual representation of the data.



**Figure 4:5: Annual Revenue generated by respondent's firms**

A cross tabulation of results in Table 4:7 was done to see if there was a link between the revenue and years the companies had been established. The results in the table show evidence of high end and high tech startups, with high injection of investment funding and cash flow (Venture Burn, 2016). The author believes that the reason for investment apart from growth was the ability to ensure sustainability of the organisation, which included an aspect of their processes and maturity of their project management tools and techniques. The table below also shows that companies established in year one, have the least revenue of less than 100k and also the highest revenue of 20 Million +. This could be attributed to the difference in the product and service offering and investment opportunities awarded to these different firms. The table also shows, that although a company can be established they may however have low revenues. Such is the case in year 13, which also presents an abnormal representation (in comparison to other years) of having also the lowest revenue in the table. However, the table shows how progressive company revenue growth is with the time in which the company is formed. The table, also reflects the importance of the presence of project management tools as alluded in Chapter 2.

**Table 4:7 Cross Tabulation of Revenue Generated and Number of years of firm's establishment**

Count

		How much is your annual turnover						Total	
		Less than 100K	100K - 500K	500K - 1 Million	1- 5 Million	5- 10 Million	10-20 Million		20 Million +
How many years ago was the business / company established?	1.0	4	0	24	4	0	0	3	35
	2.0	3	1	8	12	0	0	4	28
	3.0	1	1	5	10	0	1	0	18
	4.0	0	0	1	8	0	0	1	10
	5.0	3	0	7	4	1	0	0	15
	6.0	0	0	0	2	1	0	2	5
	7.0	0	0	4	11	2	1	3	21
	8.0	0	2	8	14	6	0	3	33
	9.0	0	0	2	5	4	0	2	13
	10.0	0	0	1	11	1	0	2	15
	11.0	0	0	0	2	0	0	2	4
	12.0	0	0	1	3	0	0	2	6
	13.0	1	0	2	2	1	0	0	6
	14.0	0	0	0	0	1	0	0	1
	<b>Total</b>		12	4	63	88	17	2	24

#### 4.11 Question 8: Where are you located

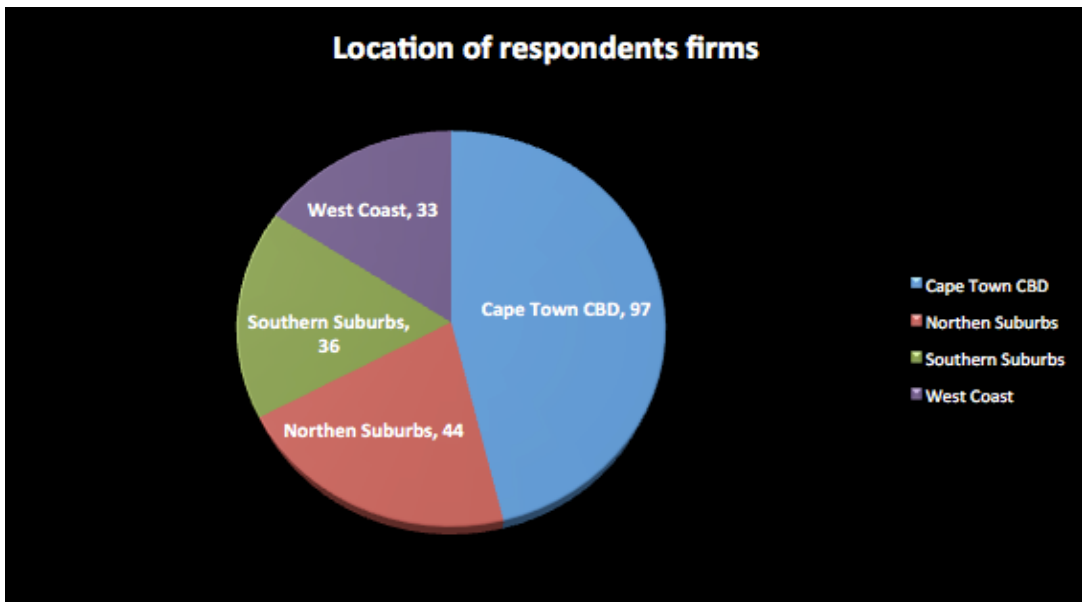
This question sought to determine the location of the businesses within the Western Cape region. It was also asked as a filter for businesses that are outside Western Cape. This question would also help the researchers determine where the clusters of ICT firms that used project management tools and technologies were.

The answers were as follows:

1. Cape Town CBD
2. Northern Suburbs
3. Southern Suburbs
4. West Coast
5. Other- Please specify

#### Summary of results:

The locations of respondent's firms are shown in Figure 4:6 below. The results show that the majority of firms with a frequency of 97 which is 46,2% are located in Cape Town in the CBD area. The Northern Suburbs followed this with 44 (21%). Southern Suburbs was next with a total of 36 (17,1%) and lastly was the West Coast with 33 (15, 7%).



**Figure 4:6: Location of respondents firms**

A cross tabulation in Table 4:8 was done to see which firms have a project management department in relation to their location. The table below is representative of the number of firms based in each location. The table shows, how firms based in Cape Town CBD 53 which is 54% of the respondents, have a project management department and have the highest presence of project management firms in relation to the total respondent population at 25%. This shows that their organisations are driven by project management. The percentage ratio of firms with project management based on their location, is as follows in descending order; Northern Suburbs with 29 has a percentage of 66%; Southern Suburbs at 25 has a percentage of 69 %; and lastly, West Coast at 20, has a ratio of 61%. All these are a positive reflection of the use and implementation of project management in the firms.

**Table 4:8: Cross Tabulation of Location of firm vs. Presence or absence of project management division**

Count		Do you have a project management division in your organisation?	
		Yes	No
Where are you located	Cape Town CBD	53	44
	Northern Suburbs	29	15
	Southern Suburbs	25	11
	West Coast	20	13
Total		127	83

## Section C: Clients and operations

### 4.12 Question 9: What is the selection criteria used to define your target market?

With this question, the respondents were asked reveal who their target market was.

This was asked to determine if there was a relationship between the type of firms clients and the use of project management tools and techniques.

The answers were as follows:

1. Firms must be start up
2. Firms can be already trading but must be above certain size
3. Firms must be involved in a certain type of activities
4. High impact firms
5. Other- Please specify

#### Summary of results:

The following Table 4:9 shows that ICT firms choose their market based on how they focus on a certain niche. These niche based companies, allows the firms to select and utilise valuable project management tools that involve communication tools and methods for project. Firms involved in certain types of activities were 71 (33.8%). The firms that must be trading have the second highest frequency of 54, (25,7%). The closest to this value are firms that must be a start up with 51(24,3%). High impact firms followed with a frequency of 30 (14,23%) and lastly was other with a 4 (1,9)%. There is a significant value of trading firms and start up firms that cannot be ignored. The advent of investment capital has made startups amongst the most lucrative business opportunities. ICT companies offer the technical aspect that most of these firms lack. The ability to identify that firms must be trading, allows the firms, not only to select project management tools that work, but to ensure they derive benefits from the project management process.

**Table 4:9: Selection criteria of target market for firms**

		Frequency	Percent	Valid Percent
Valid	Firm must be a start up	51	24.3	24.3
	Firms can be already trading but must be above a certain size	54	25.7	25.7
	Firms must be involved in certain types of activities	71	33.8	33.8
	High impact firms	30	14.3	14.3
	Other	4	1.9	1.9
	Total	210	100.0	100.0

A cross tabulation in Table 4:10 of the perceived success measure that the respondents have a measure of success that is important to the target market. The success areas have a bearing on the tools and techniques used below. The research clearly shows, that quality is still an important aspect and this is closely followed by customer loyalty and appreciation of product and service with a frequency of 116 and 115 respectively. It is interesting to see, that budget and personal goals of the project team are not as important and they have the least frequencies across different target markets with 64 and 57 respectively. Timeous completion is the 3<sup>rd</sup> highest across the majority of target market, with a frequency of 106.

**Table 4:10: Cross Tabulation of Measurement of success and the criteria for firm selection**

Count	Measurement of success					
	Completi on on time	Delivering High Quality	Loyal customers &appreciation by users	Appreciation of service by stakeholders	Achieving personal goals &specifications in my project or business	Completion within budget of work for clients
Firm must be a start up	27	47	25	30	11	16
Firms can be already trading but must be above a certain size	24	47	32	31	16	16
Firms must be involved in certain types of activities	36	68	41	34	20	22
High impact firms	16	28	15	18	8	8
Other	3	3	3	2	2	2
Total	106	193	116	115	57	64

**4.13 Question 10: What type of services or products do you offer?**

This question was to determine if there was a relationship between the type of products and or services the firm offered and the use of project management tools and techniques. This relationship can be derived from the presence of a project management department in the firm.

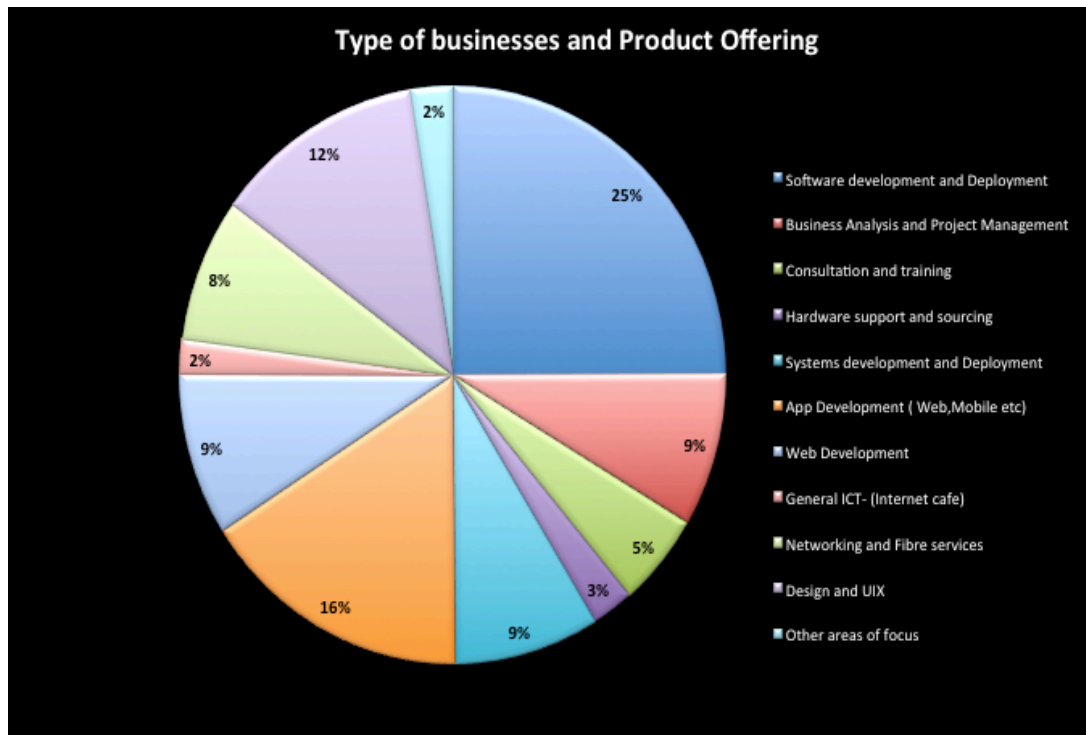
The answering choices were as follows:

1. Software development & deployment

2. Business Analysis & Project management
3. Consultation and Training
4. Hardware support and sourcing
5. Systems development and Deployment
6. App Development (Web,Mobile etc)
7. Web Development
8. General ICT- (Internet cafe)
9. Networking and Fibre services
10. Design and UIX
11. Other –specify

**Summary of results:**

Figure 4.7 shows the type of businesses and product offering. In type of businesses and product offering, a 25% of firms offer software development and deployment; 16% in App Development, 12 % in Hardware Support, 8% Networking and Fibre services, Business Analysis and Project Management, Systems development and Deployment, Systems Development.



**Figure 4:7: Service and Product Offering for respondent's firm**

**4.14 Question 11: What methods are in place to obtain feedback from clients?**

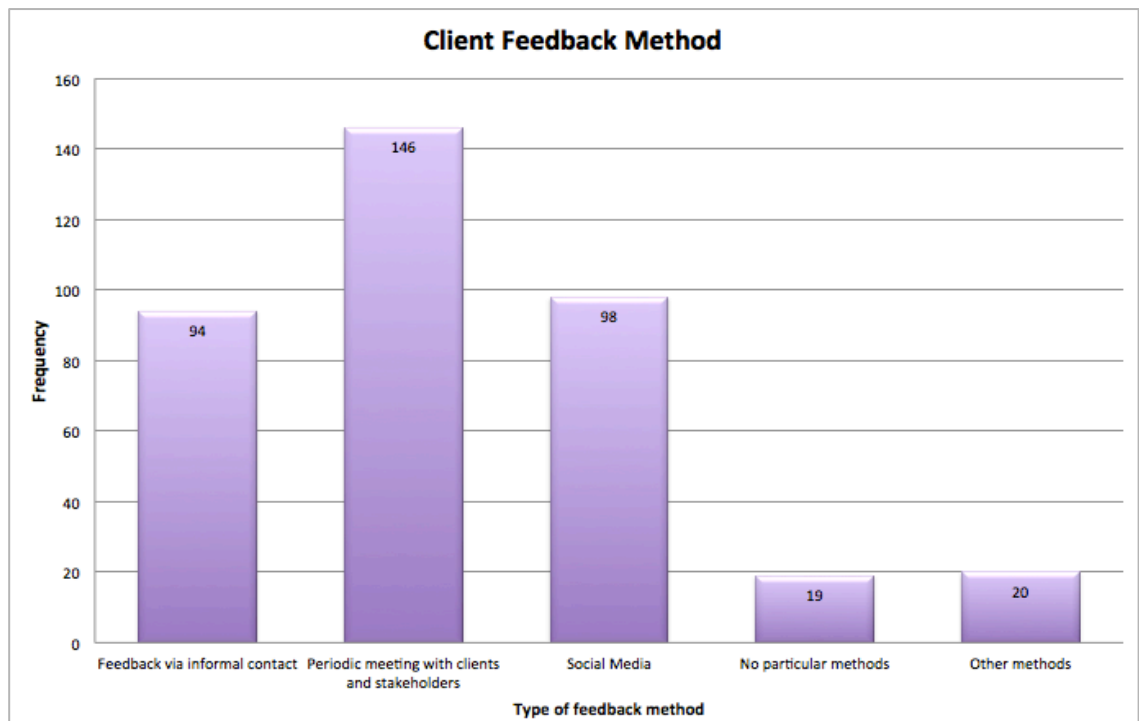
This question was to determine if there was a relationship between the feedback method to clients and the use of project management tools and techniques.

The answering choices were as follows:

1. Feedback via informal contact
2. Periodic meeting with clients and stakeholders
3. Social Media
4. No particular methods
5. Other methods – please specify

**Summary of results:**

The most prominent client feedback method are periodic meetings with a frequency of 146. Social media, has a frequency of 98. Feedback via informal contact follows with a frequency of 94. The last frequencies are for no particular methods and other, with 19 and 20 respectively. The following Figure 4.8 illustrates.



**Figure 4:8: Client feedback method used**

A cross tabulation in Table 4:11 of method of communication shows the aspect of reporting and client feedback, which can be done, using project management tools and techniques. Project reporting is an aspect of project management which when used wisely can benefit the firms. The most common feedback method in each type of market are periodic meetings with clients with a total frequency of 146. These meetings form the backbone of feedback methods employed by the ICT firms. This formalised feedback allows the project teams to share risks, lessons learnt and progress. For these to be measured, they have to be followed using project management tools and techniques. There is evidence that project management tools

and techniques are used. Although, periodic meetings were high, it seemed social media was also a growing trend in feedback with a total frequency of 98. Although the selection criteria of firms, was not always the highest, social media was highly utilised. This shows how quick feedback can be, and the aspect of creating feedback logs with clients is still important. The results of “no particular methods” was the least common, which showed that ICT SMEs do have a structure of communication and client feedback to allow for consistency. This also supports the aspect of quality in processes shown in the literature review in Chapter 2.

**Table 4:11: Cross Tabulation of Target Market selection and Client Feedback Method**

What is the selection criteria used to define your target market?	Feedback method with clients				
	Feedback via informal contact	Periodic meeting with clients and stakeholders	Social Media	No particular methods	Other methods
Valid Firm must be a start up	21	37	22	5	2
Firms can be already trading but must be above a certain size	23	37	27	5	7
Firms must be involved in certain types of activities	33	47	31	6	6
High impact firms	15	22	17	2	4
Other	2	3	1	1	1

**4.15 Question 12: What do you consider success indicators or criteria in your business?**

The success criteria used determines the method or tools of measurement utilised by a firm. The factor of measurement is linked with the tool and technique a firm employs. The respondents could choose as many options as they could for this question.

The answering choices were as follows:

- 1.Completion on time
2. Delivering High Quality
- 3.Loyal customers and appreciation by users
- 4.Appreciation of service by stakeholders
5. Achieving personal goals and specifications in my project or business
6. Completion within budget of work for clients
7. Other – please specify

### Summary of results:

The research showed that, completion of projects on time, which ranked 4<sup>th</sup> with a frequency of 106, was not the only success criteria. This shows, that the output within the process, and not the process time are equally important. The results in Figure 4.9, show delivering high ranks 1<sup>st</sup> with a frequency of 193. Loyal customers and appreciation of service by clients follow with frequencies of 116 and 115 respectively.

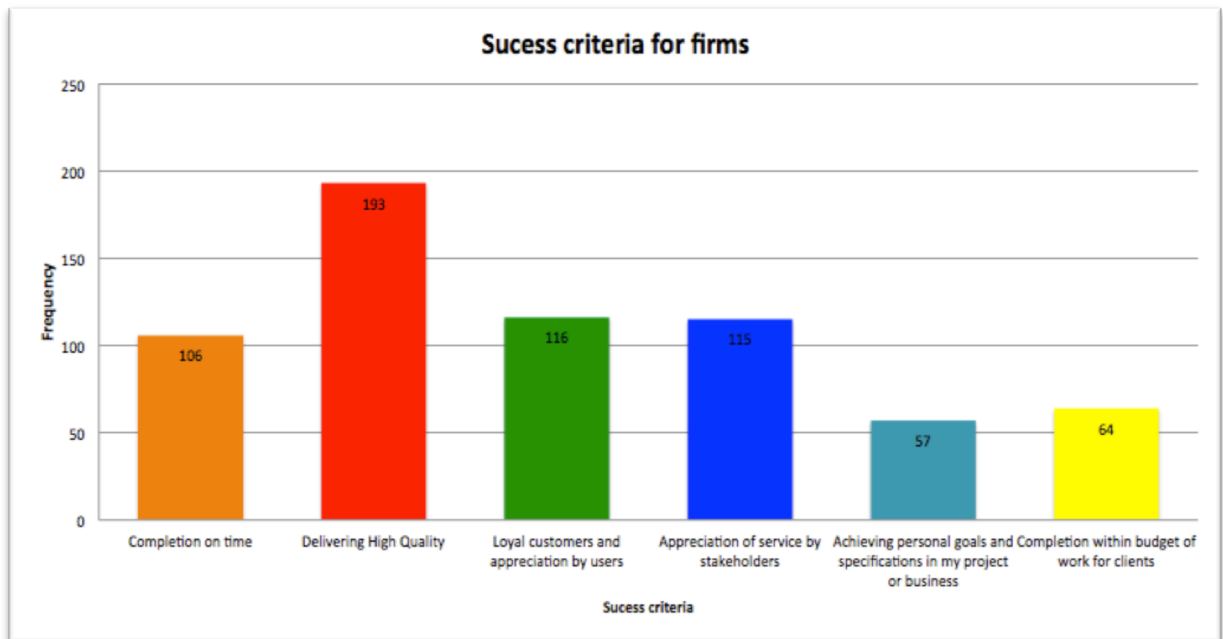


Figure 4:9: Success criteria for firms

A cross tabulation in Table 4:12 was done to look at the success criteria and the presence of a project management division. The results confirm the findings in terms of the frequencies obtained. The frequencies of the success criteria are as follows: delivering high quality, 117, appreciation of service by stakeholder with 72, loyal customers and appreciation with 69; completion on time with 66; completion within budget of work for client with 44 and lastly achievement personal goals and specifications in my project or business.

**Table 4:12: Cross tabulation of presence of project management tool and success criteria**

Count	Do you have a project management division in your organisation		Total
	Yes	No	
Completion on time	66	40	106
Delivering High Quality	117	76	193
Loyal customers and appreciation by users	69	47	116
Appreciation of service by stakeholders	72	43	115
Achieving personal goals and specifications in my project or business	31	26	57
Completion within budget of work for clients	44	20	64

**4.16 Question 13: Do you have a project management division in your organisation?**

The presence of a project management division impacts on the use of project management tools and techniques. Project management divisions drive and lead projects whilst serving the organisation. The answering choices were Yes or No. The results show that 127 (60.5 %) have a project management department and 83 (39,5%) do not have a project management department.

**4.17 Question 14: Which of these clients bring at least 70% of your revenue?**

This question was asked to determine which client brought the most revenue and the use of project management tools and techniques. The type of client that brings revenue determines the structure of processes of project management. The answer choices were as follows:

1. Government and State Agencies
2. Non Governmental Organizations
3. Corporate Clients
4. Non For Profit Organisations
5. Small Businesses
6. Individual consumers (please indicate criteria)
  - 6.1 Working individuals
  - 6.2 University students

6.3 Not sure

7. Other– (please specify)

**Summary of results:**

In general the biggest revenue generators for most of the respondents was Corporate clients with 86 (41%) of the firms. The author believed this is due to agility and flexibility of small firms to complete work within a specified timeframe. Small businesses are the second highest revenue generators for ICT firms with 40 (19%). ICT firms also serve NGO (Non Governmental Organisations) which has the same frequency and working individuals with a frequency of 24 (11,4%) each. State agencies and government follow with a frequency 18 (8,6%). Lastly, there are 3 revenue generators that have the same frequency of 6 (2,9%), being not for profit, individual university students, and an uncertain group.

**Table 4:13: Generators of 70% revenue for firms**

		Frequency	Percent	Valid Percent
Valid	Government and State Agencies	18	8.6	8.6
	Non Governmental Organisations	24	11.4	11.4
	Corporate Clients	86	41.0	41.0
	Not for profit organisations	6	2.9	2.9
	Small businesses	40	19.0	19.0
	Individual consumers-Working individuals	24	11.4	11.4
	Individual consumers- University students	6	2.9	2.9
	Individual consumers - Not sure	6	2.9	2.9
	Total	210	100.0	100.0

It has been seen in the previous results displayed in Table 4:13 that a majority of the firms use project management tools and have project management divisions.

**4.18 Question 15: Please rate how you agree or disagree with the statements?**

This question was asked to determine how many daily aspects of project management activities linked to the tools and techniques. This question of daily activities helps determine the amount of project management work (and or practises) are in place within organisations. A rating 5 point Likert scale was used for each of the activities.

The following table shows variables allocated to each attitude scale and are grouped in the Table 4:14 as follows:

**Table 4:14: Likert Scale Variables**

Attitude	Random Variable
Strongly agree	5
Agree	4
Neutral	3
Disagree	2
Strongly disagree	1

**Summary of results:**

The respondents indicated their attitude pertaining to the project management activities within their respective organisations in Table 4:15. The mean scores for each of these was calculated for each activity and are presented below. This shows that the attitudes of the respondents lean towards a certain area. A positive approach was undertaken in the questionnaire and this prompted the respondents to answer well.

**Table 4:15: Levels of attitudes to statements (five-point Likert scales, mean scores)**

	Mean
I plan my work each day	4,3
I schedule my tasks with my team in mind	4,0
There is clarity of the work breakdown in our team	3,9
I allocate resources to each task/ project prior to the project	3,7
I can quickly change my focus areas when pressed for time to complete critical areas	3,8
I usually have tasks that have dependencies	3,9
I always have sprints and a dashboard when planning my tasks	3,8
I plan my project and scope before I start a project	3,2
I evaluate my projects after completion	3,4
I always seek the help of a project manager to assist in the project	3,9
Each project is planned with the team in mind	3,7
There is someone in the team that keeps us on track and on schedule in our projects	3,7
We always deliver our projects on time	3,6
We always deliver our projects within budget	3,9
We always have resources available to implement work on schedule	3,7
Each team member is accountable for their work	3,7
We have never under delivered on the client specs	3,5
We allow our projects to change direction in execution	3,3
Our clients have a limit to changing their requirements( e.g. time period, number of times)	3,9
I have a project manager / division in the organisation?	3,7
Our organisation is driven by projects?	3,7
I have used some project management tools before	3,7

Standard deviation for the attitude scale is 0.24 and the variance is 0.06. This means that the responses deviate by 0.24 from the mean. A general consensus among the respondents illustrates that there is the use a considerable use of project management tools and techniques that impact project success.

**4.19 Question 16: Do you use any of these project management tools?**

The multiple choice question was asked to determine which tools were actually used within the firm. This is core to the research to view which tools were used by the firms. This reveals the project management methods used in the firm as well.

The following answering choices are as follows:

- 1.Trello
- 2.Project Manager
- 3.Asana
4. Gantify
- 5.Jira
- 6.Smartsheet
- 7.Wrike
- 8.Replicon
- 9.CMiC
10. ManageEngine
11. Zoho
- 12.WorkflowMax
- 13.ResourceGuru
- 14.Other –specify

**Summary of results:**

It is evident that the project management tools that are used are resource scheduling tools. These are seen in Trello, Jira, WorkflowMax and ResourceGuru. These, resourcing tools not only allow for resource tracking but for scheduling of projects and tracking project progress.

Other tools, is the one that was prominent with a frequency of 98. These tools include excel and Bitbucket, which are used to track and monitor projects. The researcher found most project managers use Trello with a frequency of 95. Jira is mostly used, and this reflects the amount of development projects, to track the development life cycle with 25. Asana has frequency of 19. Other tools used include Asana and

Workflow max which equally attribute to 6% each in terms of use. Wrike and Asana followed with 14. The least popular tools were Project Manager with 5 and SmartSheet with 4. Gantify, Replicon, CMIC and ManageEngine are not popular

The size of the firms in terms of number of employees reflects the tools used. The tools used have free licences for teams up to 5 people. Trello is therefore a popular project management tool due to the free license aspect which helps the firm cut costs (Trello, 2016). About 61% of firms have a staff compliment of less than 5 people or less as revealed in the results. The results in Figure 4:10 are an indicator that many firms use more than 1 project management tool to address their project management need.

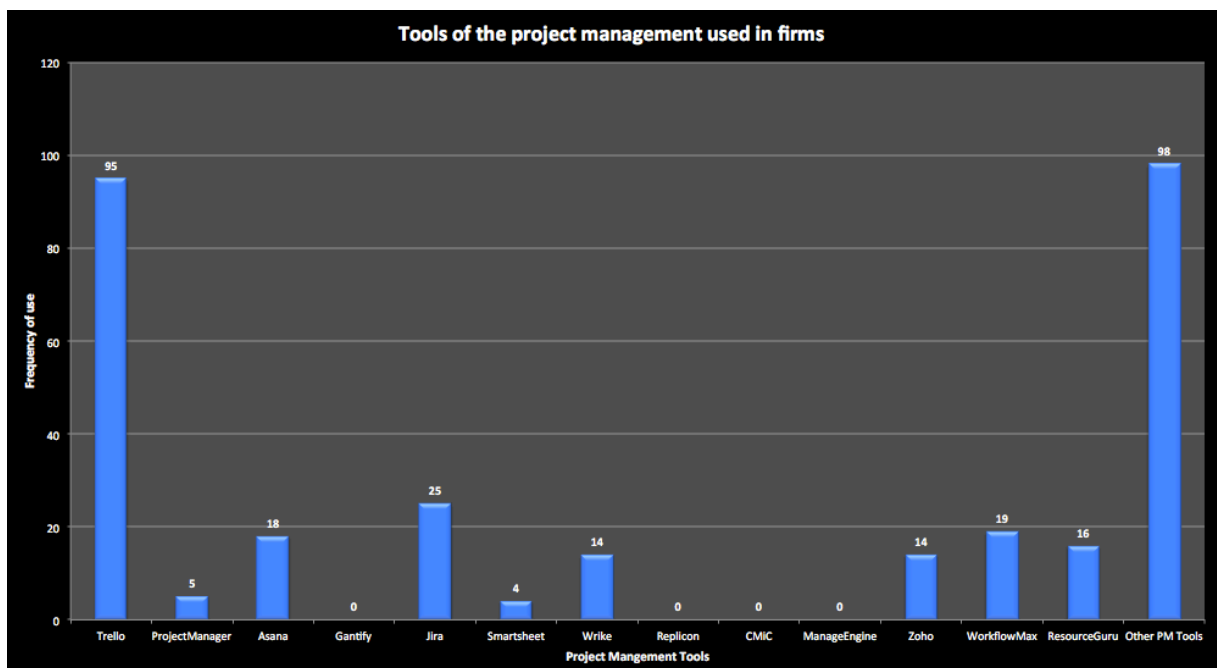


Figure 4:10: Frequency of use of project management tools

**4.20 Question 16: Which of these project management methods and standards do you use?**

This question was asked to determine which methods and standards were used within the firm. This reveals the project management tools used in the firm as well.

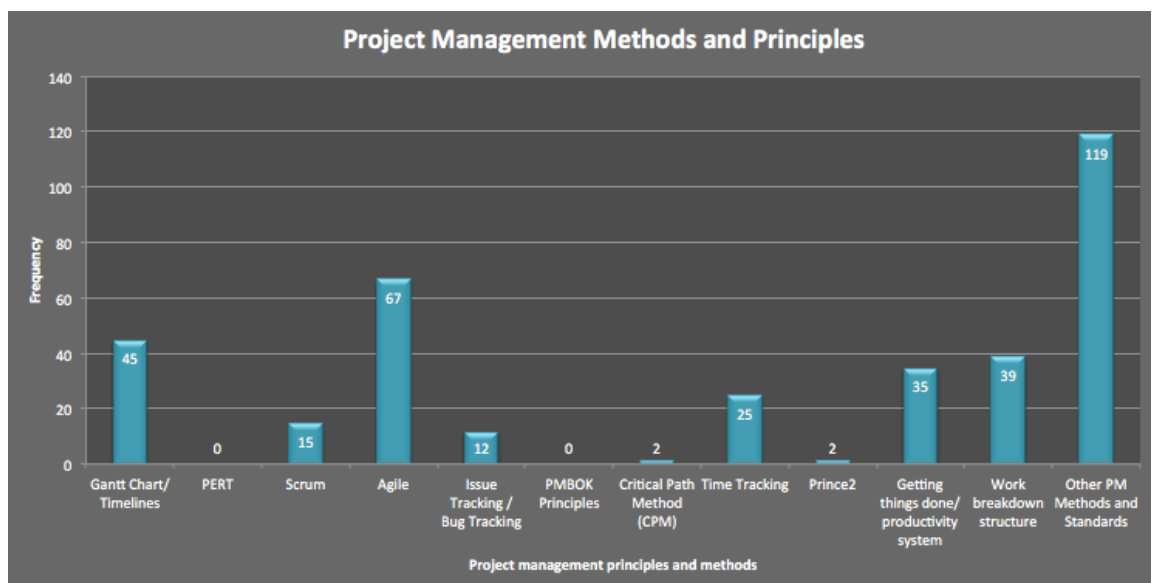
The following answering choices are as follows:

1. Gantt Chart/ Timelines
2. PERT
3. Scrum
4. Agile
5. Issue Tracking / Bug Tracking

6. PMBOK principles
7. Critical Path Method (CPM)
8. Time Tracking
9. Prince2
10. Getting things done/ productivity system
11. Work breakdown structure
12. Other –specify

**Summary of results:**

The results in Figure 4:11 illustrate that respondents used other project management methods and standards with a frequency of 119. Agile methodologies with 67 follow. Gantt Chart/ Timelines follow with 45. Ranking are work management tools and scheduling tools. There is a similarity in the methods and tools use. Work breakdown structure, getting work done, Time tracking and scrum have frequencies of 39, 35, 25, 14 respectively. Issue Tracking /bug tracking have frequencies, 12. Prince 2 and Critical Path Method (CPM) have a frequency of 2. PERT and PMBOK do not have a frequency.



**Figure 4:11: Frequency of use of project management tools**

**4.21 Question 18: Would you like to use more project management tools?**

The question was asked to determine whether respondents were keen to use project management tools. The answering choices were Yes or No.

**Summary of results:**

Table 4:16 reveals if respondents would use more project management tools. Both choices had a frequency of 105 (50%). There was balance between people who

wanted to use and did not want to use more project management tools. This question followed questions where project management tools were availed.

**Table 4:16: Would you use more project management tools**

		Frequency	Percent
Valid	Yes	105	50.0
	No	105	50.0
	Total	210	100.0

Based on the responses in Question 13, it is fair to establish that this was indeed an educated decision on the part of the organisation. The presence of a project management division in the firm showed, how projects within ICT firms are driven by a project management at heart. The table below shows a cross tabulation of the presence of project management division and the use of Project Management tools.

A cross tabulation in Table 4:17 reveals, 64 respondents that have project management division and would like to use project management tools. 41 respondents will use more project management tools do not have project management department. 63, respondents have a project management division but will use project management, 42 respondents, do not have a project management division and will not use more project management tools.

**Table 4:17: Cross tabulation of having a project management division and use of more project management tools**

Count		Do you have a project management division in your organisation		
		Yes	No	
Would you like to use more project management tools?	Yes	64	41	105
	No	63	42	105

**4.22 Question 19: If no, which of the following would describe why you do not use these project management tools?**

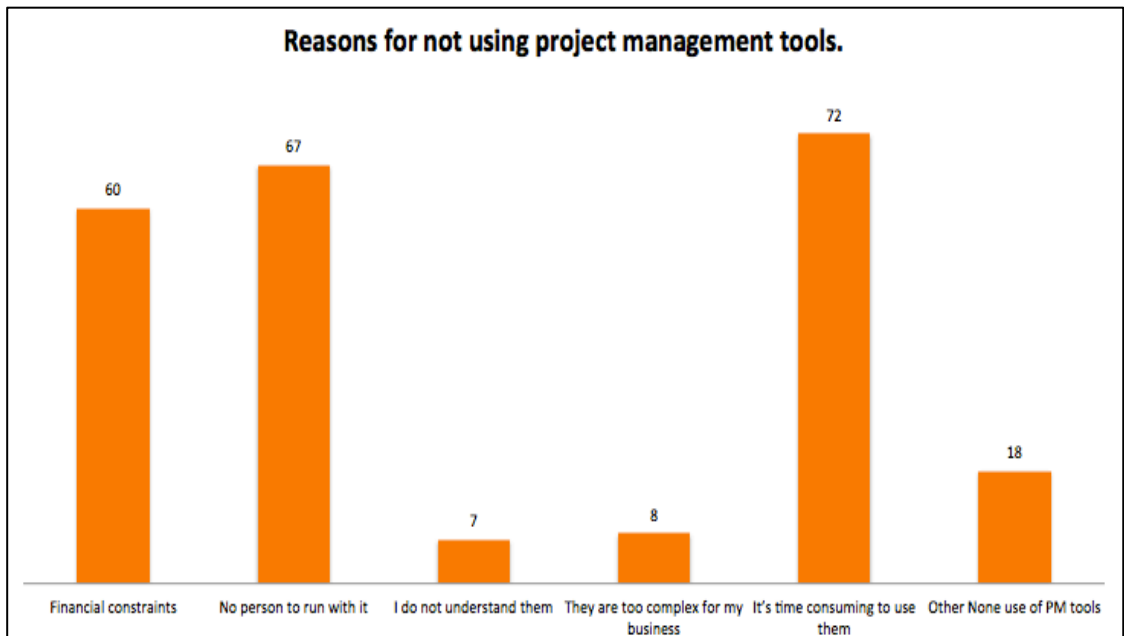
The multiple choice question determines reasons that impact the non-use of project management tools. The respondents can select more than one choice. This question has the following answering choices:

1. Financial constraints
2. No person to run with it

3. I do not understand them
- 4.They are too complex for my business
5. It's time consuming to use them
6. Other –specify

**Summary of results:**

The results show in Figure 4:12, respondents do not use more project management tools. Time consumption had the highest frequency with 72. Followed by “no person to run with it” and financial constraints with 67 and 60 respectively. Other, non use follows with a frequency of 18. Reasons for "they are too complex for my business" and" I don't not understand them" are the least reasons with a frequency of 8 and 7 respectively.



**Figure 4:12: Reasons for non use of project management tools**

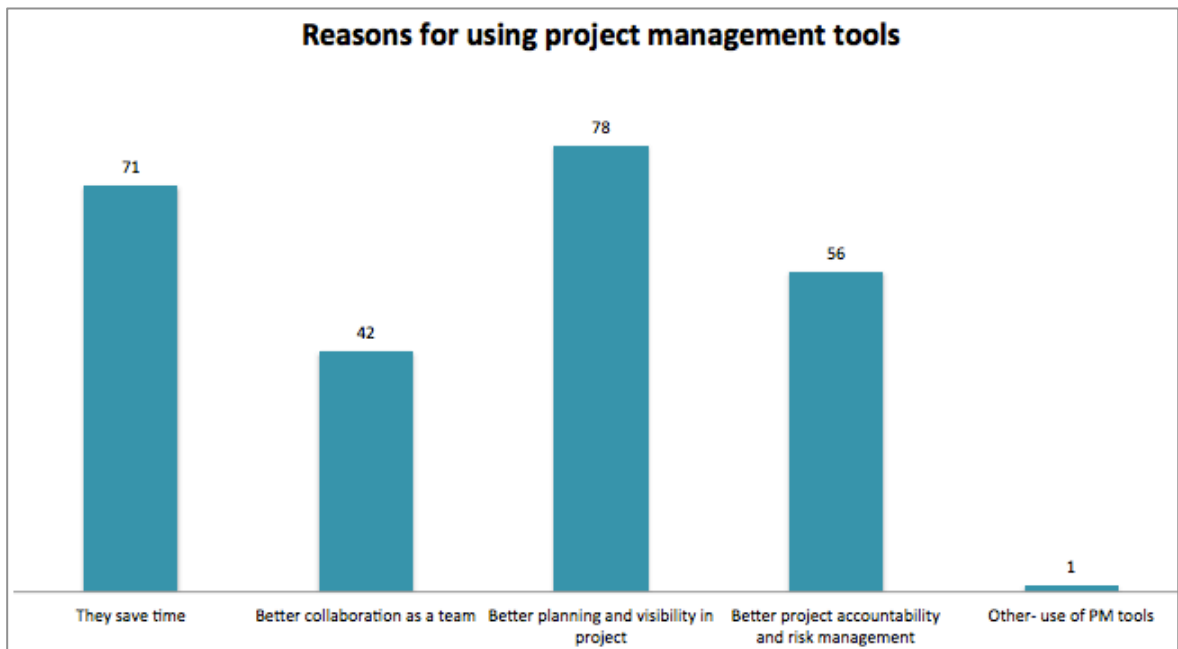
**4.23 Question 20: If yes, which of the following would describe why you use these project management tools?**

The question determines reasons that impact the use of project management tools. The respondents can select more than one choice. This question has the following answering choices:

1. They save time
2. Better collaboration as a team
3. Better planning and visibility in project
4. Better project accountability and risk management
5. Other –specify

**Summary of results:**

The results in Figure 4:13 show the reason for using project management tools is for better increased visibility, with a frequency of 78. The second most prominent reason for using project management tools is because they save time, with frequency 71. Better project accountability and risk management, with a frequency of 56. The other reason for using project management tools is better collaboration as a team with a frequency of 42. Lastly, there were other reasons why respondents did not use project management tools, with a frequency of 1.



**Figure 4:13: Benefits of using project management tools**

**4.24 Question 21: Any other comments?**

The question was placed to capture any insights not captured in the survey itself.

**Summary of results:**

No comments were received from participants in the survey.

**4.25 Summary**

This chapter included discussion of all questions presented in the questionnaire. A cross tabulation of results showed the relationship between other areas and factors in relation to project management.

The effectiveness of these project management is seen in the performance of project management driven ICT firms. The study shows that the majority of ICT firms had a project management division that drives project management.

There were several tools, however, the most popular were the ones that offered free premium services to their clients. Respondents clearly used more tools, to show that not one tool catered to their needs.

The chapter has discussed and presented data that was obtained from questionnaires and which were emailed and hand delivered to ICT SMEs. The aim of the study was to determine the extent to which ICT SMEs in Western Cape are using project management tools and techniques. The results answer the research Questions in Chapter 1, in 1.4. The next chapter summarises and concludes on the study.

## **CHAPTER FIVE**

### **CHAPTER 5: DISCUSSION OF RESULTS**

#### **5.1 Introduction**

The purpose of the research was to determine the extent to which ICT SMEs in Western Cape are using project management tools and techniques. The discussions in this chapter are based on an analysis of results from the previous chapter. The primary and secondary objectives of the research were fulfilled by the results, which will be used by the researcher to draw up conclusions and recommendations.

#### **5.2 Summary of the study**

##### **5.2.1 Chapter 1**

The researcher presented Chapter one, which showed, the background of the research, Research objectives, research questions. The chapter also included the research process that will be followed in the thesis. The author looked into the design and research methodology. The author included the justification of this research and expected results, and outcomes expected out of the research and delineation of research. The researcher also gave a bird's eye view of the structure and overview of the chapters.

##### **5.2.2 Chapter 2**

Chapter two presented project management tools and techniques in depth. Success factors and variables that define a project's success, and continuity were also discussed and the benefits of some of these factors were included. The chapter also revealed how that some factors, tools and techniques impacted the project success and delivery within any firm. Other factors impacting on project management were also included based on theories, adopted for the study.

##### **5.2.3 Chapter 3**

Chapter three focused on research design and methodology, data collection method, design, research validity and reliability, assumption and constraints. The researcher utilised a questionnaire to obtain results presented in Chapter four. Aspects of research were described in this chapter to gain input into the questionnaire and to specify what outcomes the next chapter will be measured against.

##### **5.2.4 Chapter 4**

Chapter four discussed all of the questions presented data that was obtained from questionnaires and which were emailed and hand delivered to ICT SMEs. A cross

tabulation of results showed the relationship between other areas and factors in relation to project management. The results answer the research Questions in Chapter 1, in 1.4. The results showed the presence of project management tools, and the benefits derived by ICT firms. A significant amount of responses, obtained, allowed the data to be reflective of the project management state within Western Cape ICT firms.

### **5.2.5 Chapter 5**

Chapter 5, summarises the study, and discusses the findings.

### **5.2.6 Chapter 6**

Chapter 6, the final chapter of the study, summarises the study, and discusses the findings. This chapter also presents conclusions for the research and proposed recommendations and ends with a conclusion.

## **5.3 Discussion**

### **5.3.1 Theoretical Implications**

The current understanding of ICT SMEs is that they have low annual revenues, and although they are drivers of economies, they serve fewer professionals and corporates. The research done proves otherwise in section 4.10, and it shows, ICT SMEs have high revenues up to R 20 Million +, are big drivers of economies, as they can employ up to 2000 employees, and serve a vast number of target market.

The research in Chapter 4, section 4.17 however, confirms that a significant amount of ICT SMEs revenue, are derived from small businesses as well. The shift in the aspect of revenue shows the aspect of investment capital, and funding drives in technological firms, and high end applications, that are being developed. The change in this dynamic has influenced the ICT environment and has created professionals such as App developers, UX, UI designers and Business Analysts. The impact of this shift has resulted in quick adoption of project management tools, resulting in fresh start ups “leading” the pack in the tools used. The type of services offered has a bearing on the start-ups operated, and a move from conventional business operations has changed. The results, showed, a high presence of project management divisions, which shows, how they are at the heart of organisations.

The literature review in Chapter 2 has also shown that the perspective of the project manager limits or assists in the selection of project management tools. This concept can not be entirely dismissed as Chapter 4 section 4.6 shows how roles and

education levels influence the use of project management tools and techniques. A further study into the types of tools chosen based on the organisational product offerings must be paired with the findings. There is also a significant impact of the presence of project management division and the use of project management tool. This can be seen in section 4.8 and 4.16. It can therefore be argued that the presence of a project management department has a bearing on the use and accurate selection of project management tools. The research also shows that the project managers are limited by the project management tools they use due to their functionality and this can be seen in Chapter 4, section 4.6, 4.13, 4.18, 4.19, 4.20 and 4.21. It is evident in the findings that multiple project management tools were used to serve multiple needs, for example tools for resource planning, reporting, scheduling were used. In the advent of multiple project management tools and techniques, it is evident that some project managers still trust traditional project management tools such as Excel and Microsoft Projects. This further justifies, why almost half of the respondents will not implement the use of new tools within their firms.

The study, in Chapter 4, section 4.4 also showed that there was a significant number of young professionals in ICT firms. This can be a result of entry-level jobs, with entry-level salaries, which is a way for companies to cut out costs. This reveals an aspect of cost savings in ICT SMEs. ICT firms will minimize the cost of staff, whilst building and empowering more youth in the process. Another cost decision made, was in the selection of project management tools. The most prominent tools used by the ICT firms are free and add no costs to the company. If free service offerings are stopped, it will have adverse impact on ICT SMEs budgets and operations. The ICT SMEs will start paying for the service, as non-payment will impact productivity negatively. There is also a need to develop tools that are relevant to the project management process. The split in purpose of tools causes firms to employ more than one project management tool in their organization. There is therefore need to develop a tool that looks at this. Further research can be done to see if one tool can be employed for ICT SMEs.

The results obtained from the research suggest that project management tools affects project success. This in turn affects implications of project delivery and the general health of an organization, for example size and growth, revenue, sustainability and competitiveness.

Other findings showed how the size of the firm influenced the use of project management tools. Smaller teams are easier to coordinate and plan with.

It is wise for project firms to introduce project management discipline at the start of a company, however, there is need for the firm to mature in project management and create standards in project management practices which will reduce costs of changes in the long run.

### 5.3.2 Project Management Tools Implications

Presented in the graphic format below, Figure 5.1 represents the summary of this research study contribution to the body of knowledge. The project management implications of the study are that a tool must be created to ensure they create value added tools. Project management firms must create affordable tools that can be adopted to cater to the project management needs of firms.

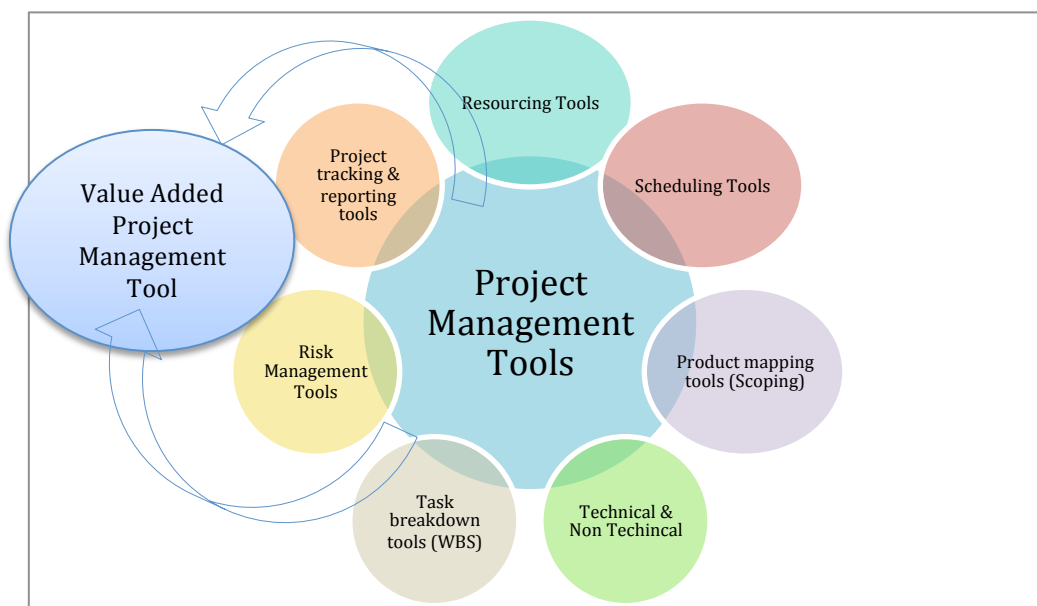


Figure 5.1: New project management tool criteria

### 5.4 Summary

The chapter has discussed the results obtained from questionnaires and which were emailed and hand delivered to ICT SMEs. The purpose of the research was to determine the extent to which ICT SMEs in Western Cape are using project management tools and techniques. The primary and secondary objectives of the research were fulfilled by the results, which will be used by the researcher to draw up conclusions and recommendations in the next chapter.

## CHAPTER SIX

### CHAPTER 6: RECOMMENDATIONS AND CONCLUSION

#### 6.1 Introduction

This chapter outlines recommendations in relation to the findings of the research. In this study, all the research objectives were addressed; the results and concluding remarks are discussed below in relation to each research objectives.

#### 6.2 Conclusion

In conclusion, the research objectives will be used in the concluding remarks. The main research objective and secondary research objectives are in the concluding remarks as follows:

##### 6.2.1 To determine the extent to which ICT SMEs in Western Cape are using project management tools and techniques

Based on the results, one can conclude that ICT SMEs are utilising project management tools. ICT SMEs have also been identified to derive success criteria. The use of project management allows firms to achieve the successes including on time project completion, customer loyalty, high product quality – which in turn drive an increase in revenue. A cross tabulation of existence of project management tools and multiple aspects was done to verify the utilisation of project management tools.

The nature of the clients that the ICT SMEs presented, such as corporates, demanded that the firms had established process, and project management techniques, tools and methods. It is interesting to see, how small teams allow for adoption of tools, which are affordable – in some instances free.

The adoption of tools, was very high, however, this also showed, how the tools didn't address the aspects of project management at once. Hence a large selection of tools was utilised by the firms.

Although the firms use project management tools and techniques, there is a need for organisations to mature their project management aspect, allowing them to refine processes until they effectively utilise the tools.

##### Secondary research objectives

##### 6.2.2 To determine the extent to which ICT SMEs in Western Cape know about the project management tools and techniques and how to use them

The survey revealed, how ICT SMEs knew to a larger extent about project management tools and techniques and how to use them. The questionnaire results,

showed how the benefits of project management, the aspect of project management feedback, and the selection criteria of target market were closely related.

A cross tabulation, of the nature of business products and services and project management tools was done. The results reflected that the types of tools utilised in firms, reflected the nature of business. This confirms that the firms knew the project management tools and their use.

A correlation of selection criteria and feedback methods was also done. The presence of formal feedback methods, is a reflection and embeds multiple aspects of project management tools and techniques, such as maintaining quality, timely completion and accurate scheduling.

The majority of tools utilised and identified by the project managers, reflect the resource management, scheduling and planning, which are crucial to the project management process.

### **6.2.3 To establish the extent to which the ICT SMEs know the benefits of using project management tools and techniques**

ICT SMEs identified the benefits of using project management tools. The results have allowed the researcher to conclude that ICT SMES are aware of the benefits derived from using project management tools and techniques.

The firms, identified benefits that were relevant to their businesses including the aspect of saving time, risk management, increased accountability, better team collaboration and management. The tools selected by ICT SMEs allowed them to achieve the above benefits.

We can conclude that although ICT firms, were rapidly growing, there is a need to establish project management tools and techniques culture that is mature. Firms will only maximise on the benefits, if they have established a mature project management culture.

### **6.2.4 To determine the extent to which project management tools and techniques are used by SMEs to achieve success**

The study reveals the major success indicator to be quality. This affects the return of customers, customer loyalty. To a large extent, the use of project management tools has allowed SMEs to successfully achieve their success goals and criteria. However,

some organisations, consider the customer adoption of offering as a significant aspect of their success.

The research therefore concludes, that ICT firms will be impacted more, if they understand their success criteria, and have the right tools and techniques for these. There are barriers to obtaining project management tools which includes financial constraints. Project management firms lean towards the free offering tools. As these firms grow and maximise their benefits, a shift in their free services may change which will heavily affect the ICT firms. There is therefore a need for sustainable, solution for SMEs as projects will drive economic growth.

### **6.3 Recommendations**

The recommendations for the study are based on the findings of this research. The researcher proposes the following recommendations:

1. It is clear that project management is driving small organisations. There is therefore a need to create a more sustainable way of utilising project management tools. This can be done, by creating a tool, that is “free for a certain number” of users, to allow firms to stick to one tool. This will result in a more sustainable model, and tool as firms grow, ensuring not tools and historical data for projects does not “fall through the cracks”.
2. ICT firms must create project management departments and divisions. Much of the benefits, communication and measure of success, reflects the need for a balanced project management division. Project management divisions will help drive project management decisions such as methodology, selection of tools. It will also help in refining of project tools and selecting the project management process and techniques.
3. ICT firms, must maintain a more formal feedback method, that will allow them to archive lesson’s learnt in the projects. Historical data and methods will allow organisation to maintain a baseline for projects, which can be adopted for future projects.
4. ICT firms must develop their project management aspect to allow for maturity and creating a blue print of processes and systems used. This will drive efficiency, and allow them to fully enjoy the benefits of project management in all aspect of the business.

5. Following up on the baseline study conducted and the gaps identified more research has to be conducted using a larger sample in Western Cape as well as other provinces to establish the pattern of SMEs in those areas.
6. For the study to be made available to relevant stakeholders and the Western Cape Government and to enable the implementation of the recommendations of this research and also for the government to achieve its goal.

#### **6.4 Scope for further research**

Based on the limitations identified in Chapter 5, the researcher proposes the following areas for future research, are outlined and presented below.

Future research should include the entire Western Cape Suburbs. The findings in this research can be used as a baseline study to compare the findings in outside Western Cape. There are many ICT SMEs in areas outside the identified suburbs that can be surveyed. As alluded in the literature review and background, Western Cape is a gateway province that attracts foreign investments in ICT SMEs. There is need to look at the state of ICT SMEs and further offer support to those, that are not at par with the rest of the ICT SMEs. Further research will allow for further recommendations on a provincial level.

There is also a need to conduct a similar investigation on a much larger scale, which allows for a comparison of Western Cape findings with other provinces. Such a focus would mean expanding the sample size to include more ICT SMEs, in Western Cape and outside Western Cape. Furthermore, it may also be necessary to expand the study beyond ICT SMEs.

Another interesting area for future research might be to consider which firms attract the use of project management tools and project management teams, in and outside Western Cape.

#### **6.5 Summary**

This chapter has closed off the research by outlining recommendations in relation to the findings of the research. The concluding remarks show that all the research objectives were addressed. The author has also outlined scope for further research as part of the closing remarks.

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## **APPENDICES**

# APPENDIX A: QUESTIONNAIRE

## Questionnaire Guide

Dear Sir/Madam,

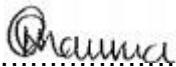
The purpose of this survey is to gain your views regarding the topic “**Application of project management tools and techniques in ICT SME projects in Western Cape**”.

Please note that your views/responses will be dealt with respect, honesty and confidentiality. Furthermore, you can withdraw at any time during this questionnaire, should you feel so. Your responses, your name and the name of your organization will be kept anonymous.

I would like also to indicate that your views are important and would be a real contribution towards the role of the use of project management tools and techniques in ICT SMEs, especially in the Cape Metropolitan Area. Moreover, on the basis of this is an academic research being undertaken by a University student, other research ethical code of conduct will apply.

Thank you for your time and participation.

Best regards,



.....  
**Student: Crecencia Naison Chauma**

MTech in Business Administration in Project Management

The Cape Peninsula University of Technology, Faculty Business and Management Sciences

Email: [cnchauma@gmail.com](mailto:cnchauma@gmail.com)

**Supervisor: Mr Fore**

The Cape Peninsula University of Technology, Faculty Business and Management Sciences

Department of Management & Project Management;

Office 3.26, Commerce Building; Cape Town Campus;

Tel: 0214603516 Email: [sfore@cput.ac.za](mailto:sfore@cput.ac.za)

Participant consent to fill in the survey.....

## Questionnaire

### Instructions

Answer questions as truthfully as possible. For most answers, check the box(es) most applicable to you or fill in the blanks.

### Section A: Demographics

#### 1 Age .

< 18	18 – 25	26 – 35	36 – 45	46 +

#### 2. Gender

Male  Female

#### 3. Role

(Select only one)

Project manager	Project coordinator	Project Monitor	Technical	Director/ Founder	Other (specify)

#### 4. Highest completed level of education

Tertiary level	Matriculated	High school Grade 10	Primary school	No formal education	Other

### Section B: About the business

5. How many years ago was the business / company established? \_\_\_\_\_

6. How many employees does the company have? \_\_\_\_\_

7. How much is your annual turnover ?

(Select only one.)

> 100k	100K- 500K	500K – 1Million	1- 5 Million	5- 10 million	10- 20 million	20Mil +

8. Where are you located?

(Select only one.)

- Cape Town CBD  Northern Suburbs  Southern Suburbs  West Coast  
 Other - Please specify.....

**Section C: Clients and operations**

**9. What is the selection criteria used to define your target market?**

**(Select only one.)**

- Firms must be start up
- Firms can be already trading but must be above certain size
- Firms must be involved in certain type of activities
- High impact firms
- Other –specify .....

**10. What type of services or products do you offer?**

**(You can select more than one.)**

- Software development and Deployment
- Business Analysis and Project Management
- Consultation and training
- Hardware support and sourcing
- Systems development and Deployment
- App Development ( Web,Mobile etc)
- Web Development
- General ICT- (Internet cafe)
- Networking and Fibre services
- Design and UIX
- Other –specify .....

**11. What methods are in place to obtain feedback from clients?**

**(Select more than one were applicable.)**

- Feedback via informal contact
- Periodic meeting with clients and stakeholders
- Social Media
- No particular methods
- Other methods – please specify.....

**12. What do you consider success indicators or criteria in your business?**

**(Select more than one were applicable.)**

- Completion on time
- Delivering High Quality
- Loyal customers and appreciation by users
- Appreciation of service by stakeholders
- Achieving personal goals and specifications in my project or business
- Completion within budget of work for clients

Other – please specify.....

**13. Do you have a project management division in your organisation?**

**(Select only one.)**




Yes  No

**14. Which of these clients bring at least 70% of your revenue?**

**(Select only one.)**

- Government and State Agencies       Non Governmental Organizations
- Corporate Clients                      Non For Profit Organisations       Small Businesses
- Individual consumers (please indicate criteria)
  - Working individuals
  - University students
  - Not sure
- Other– please specify.....

**15. Please rate how you agree or disagree with the statements**

	Strongly agree			Strongly disagree	
					
I plan my work each day	5	4	3	2	1
I schedule my tasks with my team in mind	5	4	3	2	1
There is clarity of the work breakdown in our team	5	4	3	2	1
I allocate resources to each task/ project prior to the project	5	4	3	2	1
I can quickly change my focus areas when pressed for time to complete critical areas	5	4	3	2	1
I usually have tasks that have dependencies	5	4	3	2	1
I always have sprints and a dashboard when planning my tasks	5	4	3	2	1
I plan my project and scope before I start a project	5	4	3	2	1
I evaluate my projects after completion	5	4	3	2	1
I always seek the help of a project manager to assist in the project	5	4	3	2	1
Each project is planned with the team in mind	5	4	3	2	1
There is someone in the team that keeps us on track and on schedule in our projects	5	4	3	2	1
We always deliver our projects on time	5	4	3	2	1
We always deliver our projects within budget	5	4	3	2	1
We always have resources available to implement work on schedule	5	4	3	2	1
Each team member is accountable for their work	5	4	3	2	1
We have never under delivered on the client specs	5	4	3	2	1
We allow our projects to change direction in execution	5	4	3	2	1
Our clients have a limit to changing their requirements( e.g. time period, number of times)	5	4	3	2	1
I have a project manager / division in the organisation?	5	4	3	2	1

Our organisation is driven by projects?	5	4	3	2	1
I have used some project management tools before	5	4	3	2	1

**16. Do you use any one of these project management tools?**

**(You can select more than one.)**

- Trello ProjectManager Asana Gantify Jira Smartsheet Wrike
- Replicon CMiC ManageEngine Zoho WorkflowMax ResourceGuru
- Other –specify .....

**17. Which of these project management methods and standards do you use?**

**(You can select more than one.)**

- Gantt Chart/ Timelines PERT  Scrum Agile Issue Tracking / Bug Tracking
- PMBOK principles  Critical Path Method (CPM)  Time Tracking Prince2
- Getting things done/ productivity system  Work breakdown structure
- Other –specify .....

**18. Would you like to use more project management tools? (Select only one.)**

- Yes No

**19. If no, which are the following reasons best describe why you do not use these project management tools? (You can select more than one.)**

- Financial constraints
- No person to run with it
- I do not understand them
- They are too complex for my business
- It's time consuming to use them
- Other –specify .....

**20. If yes, which are the following reasons best describe why you use these project management tools? (Select more than one.)**

- They save time
- Better collaboration as a team
- Better planning and visibility in project
- Better project accountability and risk management
- Other –specify .....

Any other comments?

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.....

.....

.....

**Thank you for your response**

## APPENDIX B: APPROVAL FOR RESEARCH



02 July 2015

Dear Cape Peninsula University of Technology Research Committee

RE: APPROVAL FOR CRECENCIA CHAUMA TO CONDUCT RESEARCH AT THE CAPE INFORMATION TECHNOLOGY INITIATIVE

On behalf of Cape Information Technology Initiative (CiTi), I am writing to formally indicate our awareness of the research proposed by Crecencia Chauma, a master's student at Cape Peninsula University of Technology.

We are aware that Crecencia Chauma intends to conduct her research by administering questionnaires and interviews with our panel and some of the clients we have assisted.

As the Head of Enterprise Development, I grant Crecencia Chauma the permission to conduct her research at our organization.

If you have any questions or concerns, please feel free to contact my office at +27 (0) 21 409 7000/ 27 (0) 82 312 5065.

Yours Sincerely,

**Chris Vermeulen**

Cape Information Technology Initiative (CiTi)

**Head: Enterprise Development**

27 (0) 21 409 7000

27 (0) 82 312 5065

## APPENDIX C: ETHICAL CLEARANCE



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P.O. Box 1906 • Bellville 7535 South Africa • Tel: +27 21 6801680 • Email: saliefa@cput.ac.za  
Symphony Road Bellville 7535


Office of the Chairperson Research Ethics Committee	Faculty: <b>BUSINESS</b>
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At a meeting of the Research Ethics Committee on 18 May 2016, Ethics Approval  
was granted to CHAUMA Crecencia Naison (210227508) for research activities  
Related to the MTech/DTech: MTech: BUSINESS ADMINISTRATION  
(PROJECT MANAGEMENT) at the Cape Peninsula University of Technology

Title of dissertation/thesis:	Application of project management tools and techniques in ICT SME projects in Western Cape  Supervisor: Dr S Fore
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Comments:

Decision: APPROVED

	18 May 2016
Signed: Chairperson: Research Ethics Committee	Date

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Clearance Certificate No | 2016FBREC367

## APPENDIX D: GRAMMARIAN CERTIFICATE

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### GRAMMARIAN CERTIFICATE

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#### MELODY KOZAH PROOF READING AND EDITING SERVICES

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18 January 2017

Dear Sir/ Madam

This confirms that I have proof read and edited the research study entitled, '*Application Of Project Management Tools And Techniques In ICT SME Projects In Western Cape*', and that I have advised the candidate to make the required changes.

Thank you.

Yours faithfully



**MELODY RUMBIDZAI KOZAH**

Editor

(University of Cape Town LL.M and LL.B)

[melkozah@gmail.com](mailto:melkozah@gmail.com)

+27 78 398 7468

## APPENDIX E: CROSS TABULATION REPORT

### Cross tabulation of respondent's age and gender.

Age group		Gender		Total
		Male	Female	
18 - 25		37	31	68
26 - 35		59	49	108
36 - 45		15	13	28
46 or older		4	2	6
<b>Total</b>		<b>115</b>	<b>95</b>	<b>210</b>

### Cross Tabulation Role vs. Education vs. Gender

Gender	Highest completed level of education	Role	Role				Total	
			Project Manager	Project Coordinator	Technical	Director/ Founder		Other
Male	Tertiary Level	Tertiary Level	3	1	19	23	46	
		Matriculated	0	0	28	33	61	
		High School Grade 10	0	0	6	0	6	
		Other	0	0	1	1	2	
	<b>Total</b>		3	1	54	57	115	
Female	Tertiary Level	Tertiary Level	9		10	4	1	24
		Matriculated	32		34	0	0	66
		Other	4		1	0	0	5
	<b>Total</b>		45		45	4	1	95
Total	Highest completed level of education	Tertiary Level	12	1	29	27	1	70
		Matriculated	32	0	62	33	0	127
		High School Grade 10	0	0	6	0	0	6
		Other	4	0	2	1	0	7
	<b>Total</b>		48	1	99	61	1	210

### Cross Tabulation: Years of firm establishment vs. Use of project management tools vs. Presence of a project management division

Count	Would you like to use more project management tools?		Do you have a project management division in your organisation		
	Yes	No	Yes	No	
How many years ago was the business / company established?	1.0	18	17	24	11
	2.0	10	18	14	14
	3.0	9	9	10	8
	4.0	4	6	5	5
	5.0	10	5	10	5
	6.0	2	3	3	2
	7.0	9	12	12	9
	8.0	22	11	19	14
	9.0	5	8	7	6
	10.0	8	7	8	7
	11.0	2	2	3	1
	12.0	3	3	6	0
	13.0	3	3	5	1
	14.0	0	1	1	0
<b>Total</b>		<b>105</b>	<b>105</b>	<b>127</b>	<b>83</b>

### Cross Tabulation of Revenue Generated and Number of years of firm's establishment

Count		How much is your annual turnover						Total	
		Less than 100K	100K – 500K	500K – 1 Million	1– 5 Million	5– 10 Million	10–20 Million		20 Million +
How many years ago was the business / company established?	1.0	4	0	24	4	0	0	3	35
	2.0	3	1	8	12	0	0	4	28
	3.0	1	1	5	10	0	1	0	18
	4.0	0	0	1	8	0	0	1	10
	5.0	3	0	7	4	1	0	0	15
	6.0	0	0	0	2	1	0	2	5
	7.0	0	0	4	11	2	1	3	21
	8.0	0	2	8	14	6	0	3	33
	9.0	0	0	2	5	4	0	2	13
	10.0	0	0	1	11	1	0	2	15
	11.0	0	0	0	2	0	0	2	4
	12.0	0	0	1	3	0	0	2	6
	13.0	1	0	2	2	1	0	0	6
	14.0	0	0	0	0	1	0	0	1
	<b>Total</b>		12	4	63	88	17	2	24

### Cross Tabulation of Location of firm vs. Presence or absence of project management division

Count		Do you have a project management division in your organisation?	
		Yes	No
Where are you located	Cape Town CBD	53	44
	Northern Suburbs	29	15
	Southern Suburbs	25	11
	West Coast	20	13
<b>Total</b>		<b>127</b>	<b>83</b>

### Cross Tabulation of Measurement of success and the criteria for firm selection

Count	Measurement of success					
	Completi on on time	Delivering High Quality	Loyal customers &appreciati on by users	Appreciatio n of service by stakeholde rs	Achieving personal goals &specification s in my project or business	Completion within budget of work for clients
Firm must be a start up	27	47	25	30	11	16
Firms can be already trading but must be above a certain size	24	47	32	31	16	16
Firms must be involved in certain types of activities	36	68	41	34	20	22
High impact firms	16	28	15	18	8	8
Other	3	3	3	2	2	2
<b>Total</b>	<b>106</b>	<b>193</b>	<b>116</b>	<b>115</b>	<b>57</b>	<b>64</b>

### Cross Tabulation of Target Market selection and Client Feedback Method

What is the selection criteria used to define your target market?	Feedback method with clients				
	Feedback via informal contact	Periodic meeting with clients and stakeholders	Social Media	No particular methods	Other methods
Valid Firm must be a start up	21	37	22	5	2
Firms can be already trading but must be above a certain size	23	37	27	5	7
Firms must be involved in certain types of activities	33	47	31	6	6
High impact firms	15	22	17	2	4
Other	2	3	1	1	1

### Cross tabulation of presence of project management tool and success criteria

Count	Do you have a project management division in your organisation		Total
	Yes	No	
Completion on time	66	40	106
Delivering High Quality	117	76	193
Loyal customers and appreciation by users	69	47	116
Appreciation of service by stakeholders	72	43	115
Achieving personal goals and specifications in my project or business	31	26	57
Completion within budget of work for clients	44	20	64

### Cross tabulation of having a project management division and use of more project management tools

Count	Do you have a project management division in your organisation		
	Yes	No	Total
Would you like to use more project management tools?	64	41	105
	63	42	105