The impact of project maturity on project performance in the Cape Metropole

by

Dinesh Isaacs

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: Dr L.E Jowah

District 6 Campus

Date submitted: October 2018

DECLARATION

I Dinesh Isaacs declare that the contents of the dissertation represent my own unaided work and that the dissertation has not previously been submitted for academic examination towards any qualifications. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

…………………………………   …………………….

Signed   Date

ABSTRACT

Organisations in both private and public sector have embraced Project Management as the ideal means of managing projects with the hopes of ensuring that they deliver their intended benefit. Projects have therefore become particularly prominent within the public sector including Municipalities, as a means of fulfilling developmental goals and delivering services. This has resulted in organisations investing considerable resources to ensure that they build the capacity needed to effectively manage projects. This investment usually takes the form of training and development of project managers or adopting and implementing project management methodologies with clear processes that guide how projects are managed.

Within academia there has also been a broad spectrum of research devoted to the field of project management. A major focus area of project management research has been to determine the value of Project Management by measuring aspects of an organization's project management performance and how best they can improve it to ensure project success. However, despite the advances in Project research and the practice of project management, organisations continue to face low project success rates.

Findings from previous research has found that project management is very context specific and that there is not a 'one size fits all' when it comes to implementing project management practices. Therefore, organisations should be tailoring their project management approach to best suit their unique needs.

This study has therefore chosen to evaluate project management performance within Municipalities in the Western Cape Province, South Africa. The aim of which was to find how best municipalities can improve their current performance and ensure project success. The rationale for this research is further supported by evidence which indicates that project management within the public sector is generally less developed than in the private sector.

In this study a construct was developed to define project management performance consisting of Project Management Maturity, the impact of project teams and effective project partnerships. Project management maturity was analysed adapting a project management maturity model developed by Labuschagne and Marnewick (2008). Project success was defined by five project success criteria that were identified through literature reviews. The success criteria consisted of the completion of a

project within time, budget, quality requirements, satisfaction of the public's needs and ensuring organizational success. A survey questionnaire was developed and distributed to 108 project managers working within a selected municipal department in South Africa.

The results of this research has provided evidence of the link between project management performance and project success within municipalities. These findings provide insights on which aspects of their project management practice a municipality should focus on and develop to maximise project success. In addition, the research also contributes to a deeper insight into the application, benefits and pitfalls of project management maturity models.

ACKNOWLEDEMENTS

I wish to thank:

- My amazing wife for all her support and encouragement.
- My parents for their support and guidance over the years.
- My employer for the opportunity to conduct the study within the organization
- My Supervisor, Dr Jowah for all his patience and guidance

TABLE OF CONTENTS

List of figures

List of tables

CHAPTER 1 INTRODUCTION TO THE STUDY

Title: **The impact of project maturity on project performance in the Cape Metropole**

1.1 Research Background
1.1.1 Introduction

Morris (2013: 6) stated with reference to the origins of project management that the understanding of its history is a sign of maturity; it provides greater strength to the knowledge base and assists with guiding the future development of the discipline. It is with this in mind that the following chapter aims to provide the context of this research by defining the discipline of project management and providing a background to the various elements comprising the body of knowledge leading up to the development of project management maturity assessments. In addition, this chapter provides further background to the rationale for this research by introducing theory related to the value organisations derive from a projects approach, project success and project management maturity.

1.1.2 A History of Project Management

Projects and their management are an inherent part of our present day lives and human history from the early hunting activities of pre-historic man to the construction of the pyramids and the development of the atom bomb (Jensen et al, 2016:21). However, it was not until 1952 that the theory, tools and techniques of the discipline were formally defined and begun being applied (Morris, 2013:6-7; Crawford, 2006: 75). While projects take place within a broad range of different contexts and technical specialities, one aspect which they all have in common is that they undergo the same life cycle (Morris, 2013: 7). This life cycle is generally described as project initiation, planning, execution and closing and a project will follow this in a linear progression with each phase ending with a delivery of a particular output (PMI, 2013: 42). It is this life cycle that distinguishes projects from operations and other forms of management.

During the early history of the discipline, projects were plagued with issues of complexity and uncertainty regarding limited budgets, time constraints and technical difficulty. This gave birth to popular project management techniques such as PERT, the critical path method, configuration management and stage gate reviews during

the late 50's. During this time the field of project management was closely associated with engineering and only gained wider acceptance during the early 1970's (Morris, 2013: 7-8). Shortly thereafter as interest in project management grew the first group of professional project management associations were born. The Project Management Institute (PMI) being one of the first professional associations, started by defining the body of knowledge which was thought of then as unique to project management. This led to the formulation of the Project Management Body of Knowledge (PMBOK) which at its inception consisted of 6 knowledge areas and which eventually evolved into 10 knowledge areas in 2013. The PMBOK however placed too much emphasis on the execution phase of a project while neglecting the critical front-end stages of a project, which require a greater emphasis on innovation to ensure that the project is properly designed so that expected benefits are realised. Despite this shortcoming the general perception of the field of project management is still predominantly influenced by the PMBOK and its associated certifications. Research in the field was in its infancy during the early 1980's with a strong focus on planning, project manager competencies and project structure. By the late 1980's and early 1990's research started expanding exponentially and focus shifted to how to manage projects successfully with studies such as Jugdev and Muller (2005:4-14) examining the critical success factors on projects. This new avenue of research resulted in the view that project management needed to not only ensure completion within the given constraints which would result in the achievement of efficiency but that the effectiveness of a project was dually important. Emanating from this was the United Kingdom's Association of Project Management (APM) and their body of knowledge (BOK). The APM BOK presented a wider scope of project management that incorporated knowledge surrounding the development of the project front-end, project objectives and a greater emphasis on effectiveness as well as efficiency. The 21st century saw an even greater expansion of research interests in project management to include topics such as strategy, governance, innovation and technical management, to name but a few. Project management research further broadened to include not only what we should be doing to better manage projects but to observing what the reality of projects is in an attempt to better understand the nature of problems experienced (Morris, 2013: 6-23).

One of the great debates in project management is whether project management is indeed responsible for achieving effectiveness. In other words, is that particular

project the best means of achieving the desired outcome/benefit. This problem was particularly evident in the defining of requirements in the IT project environment and lead to the creation of the Agile manifesto in February of 2001. The manifesto encouraged better ways of developing software based on several values and principles including (Ambysoft, n.d.):

I. Prioritising the interaction between individuals and encouraging teams to work together effectively over simply just applying processes and tools

II. A focus on software that works and not just documentation detailing how it works but rather constantly ensuring that the software does for the client what is expected.

III. Collaborating with customers to clearly identify and understand their needs and reduce dependency on a contract to govern the relationship.

IV. Having a flexible project plan that adapts to changes in people's priorities and not rigidly following a plan that may become irrelevant

With the advent of the Agile approach, the project's priority became the satisfaction of the user's needs and not the mere pursuit of completion within the confines of the iron triangle (Morris, 2013: 11). Around the same time as Agile methodologies were beginning to gain popularity, program management emerged. The advocates of program management used it as a means to justify a project's pursuit of achieving efficiency while the goal of program management was better strategic alignment for organisation and the creation of outputs in the form of benefits, i.e. effectiveness (The Project Management Hut, n.d.; Firat, 2013). Arising from the need to standardise project management across the organisation and the achievement of a greater degree of project success was project management maturity assessments. The foundation of many of the maturity assessment models currently available is the software engineering Capability Maturity Model that was developed by Carnegie Mellon University in 1991 (Backlund et al, 2014: 837). PMI's development and introduction of the standard for Organisation Project Management Maturity Model (OPM3) further contributed towards the knowledge on project management maturity and the promotion of project management as an organisational capability (Crawford, 2006: 77).

1.1.3 Defining a project

Before we delve into topics of project success or project management maturity which form the crux of this dissertation it is necessary that we firstly analyse a definition of what a project is and what the purpose is of project management.

All projects regardless of their context share several common characteristics. They are temporary, are initiated to produce a specific outcome or a desired result and are constrained by limited resources (PMI, 2013:3).

Projects have become a key means of organising work within organisations and data from the World Bank estimates that 22% of the world's GDP is derived from projects (Jensen, 2016:21). Projects have become particularly prominent within the public sector including Municipalities as a means of achieving developmental goals and delivering services (Steyn et al, 2012: 3-4). Examples within Municipalities can range from mega infrastructure projects such as constructing roads or enhancing transportation networks, managing large events or social development projects aimed at alleviating poverty or equipping communities with a particular skill set.

Table 1.1: Features of a project.

Feature	Description
Sponsor	• A person or group of people who support the project and its intended benefit.
Stakeholders	• Group of people who are impacted by the project and who usually have certain needs or expectations of the project that will need to be managed.
Project life cycle	• The phases of a project starting with initiation, design, execution and close-out.
Project charter	• A document which formally initiates the project, describes the project purpose, resources allocated and responsible person.
Project manager	• The sole point of responsibility for the planning and execution of the project.
Non-repetitive	• Projects unlike operations management either produce a unique outcome or the same outcome or purpose but in a different context.
Scope of work	• Has a defined scope of work that details what is and is not included in the project.
Work breakdown Structure	• The scope of work is usually subdivided into smaller more manageable work packages.
Schedule	• Schedules are used to sequence the various activities of a project to ensure that the project is completed timeously.

Resources	• All projects are allocated a finite set of resources that need to be managed efficiently; resources could constitute financial, human or material.
Budget	• A project generally has a set budget allocated to it.
Uncertainty	• Given the unique, non-repetitive nature of projects results in a high degree of uncertainty that usually results in greater risk of failure.
Project team	• Projects are usually allocated a team with specific skills needed on the project.

Source: Burke (2010: 21-22)

Table1.1 is adapted from Burke (2010:21-22) and lists some of the common features associated with projects that distinguish them from normal operations.

1.1.4 Defining Project Management

Project management involves the application of specific management processes, tools and techniques during the life cycle of a project to ensure that the project is completed within the given constraints and that it achieves its desired outcome (PMI, 2013: 5-6). While there are similarities between project management and general management, project management is specifically suited to managing the large degree of uncertainty and risk associated with projects by employing very specific tools focusing primarily on time, cost and quality of the intended deliverables (Steyn et al, 2012: 11-17).

Figure 1.1: the iron triangle

Source: Authors own construction

Figure 1.1 depicts the iron triangle or triple constraint which has traditionally been the main focus areas in project management.

The Project Management Institute's, Project Management Body of Knowledge (PMBOK) however prescribes a more expanded view of project management practice as comprising ten knowledge areas, each with its own set of processes that are executed at different phases of a project's life cycle. These knowledge areas and their associated processes are described in tables 1.2 to 1.11.

Table 1.2 Project Integration Management Processes

Project Phases	Project Management Process
Initiation	• Define the project charter
Planning	• Create the project management plan
Execution	• Implement project management plan
Control	• Monitor project outputs against project management plan and apply corrective action if needed
Close out	• Hand over project • Formally close each process • Measure success

Source: Authors own construction

Table 1.2 identifies the processes within the Project Integration Management knowledge area. Project integration management involves the coordinating of all the various processes contained within each knowledge area (PMI, 2013:63).

Table 1.3: Project Scope Management Processes.

Project Phases	Project Management Process
Planning	• Define the project's scope of work • Create the Work Breakdown Structure
Control	• Validate scope of work with project outputs • Apply scope change control if necessary

Source: Authors own construction

Project scope management processes involve identifying and defining the projects deliverables and ensuring that the project delivers it's intended benefit (PMI, 2013:105).

Table 1.4: Project Time Management Processes

Project Phases	Project Management Process
Planning	• Identify project activities • Estimate durations and required resources • Sequence activities • Develop network diagrams and Gantt chart
Control	• Manage schedule

Source: Author's own construction

Project time management processes identified in Table 1.4 ensure that all the activities required to successfully complete the project are identified and scheduled (PMI, 2013:141).

Table 1.5: Project Cost Management Processes

Project Phases	Project Management Process
Planning	• Identify budget requirements • Obtain budget approval
Control	• Monitor costs against approved budget

Source: Author's own construction

Table 1.5 identifies all the project processes required to ensure that sufficient budget is allocated and properly controlled during the life of the project (PMI, 2013:193).

Table 1.6: Project Quality Management Processes

Project Phases	Project Management Process
Planning	• Define quality requirements
Execution	• Implement quality requirements
Control	• Measure quality outputs against quality requirements • Control quality

Source: Author's own construction

Project quality management processes as described in table 1.6 are used to identify the project's product/service quality requirements in order to ensure that the project will satisfy the needs of all stakeholders (PMI, 2013:227).

Table 1.7: Project Human Resources Management Processes

Project Phases	Project Management Process
Planning	• Identify human resource requirements
Execution	• Appoint project management team
Control	• Manage team outputs

Source: Author's own construction

Project Human Resources Management (table 1.7) consists of all the processes to identify, recruit and manage the human resources required to execute all project activities (PMI, 2013:255).

Table 1.8: Project Communications Management Processes

Project Phases	Project Management Process
Planning	• Define communications plan
Execution	• Implement communications plan
Control	• Control communications

Source: Author's own construction

Project Communications Management process (table 1.8) involves the strategies to effectively communicate project information to the various stakeholders at various stages in the project's life cycle (PMI, 2013:287).

Table 1.9: Project Risk Management Processes

Project Phases	Project Management Process
Planning	• Identify and analyse project risks • Develop plan to mitigate risks
Control	• Monitor project risks and apply risk mitigation strategies

Source: Authors own construction

Project Risk Management processes identifies all the potential risks to the project's success and develops plans to mitigate those risks should they arise (PMI, 2013:309).

Table 1.10: Project Procurement Management Processes

Project Phases	Project Management Process
Planning	• Develop procurement plan
Execution	• Initiate procurement processes
Control	• Manage procurement
Close out	• Close procurements

Source: Author's own construction

Project Procurement Management processes (table 1.10) identifies, implements and coordinates the procurement of various goods/services required for the project (PMI, 2013:309).

Table 1.11: Project Stakeholder Management Processes

Project Phases	Project Management Process
Initiation	• Identify project stakeholders
Planning	• Develop stakeholder management plan
Execution	• Engage stakeholders
Control	• Manage stakeholder engagements

Source: Author's own construction

Project Stakeholder Management (table 1.11) involves the identification of all the role players who are impacted by the project, analysing their needs and determining the best means of managing those needs throughout the project (PMI, 2013:391).

The tools, techniques and processes described in the PMBOK are regarded as 'best practices' that are applicable to most projects however given the multidisciplinary nature and variations in context, the responsibility remains with practitioners to decide which aspects are necessary for their projects (Besner & Hobbs, 2008: 16). There are many variations of project management methodologies however they all recommend that a structured and standardised approach be followed when managing a project.

1.1.5 Programme Management

The Project Management Institute's, Standard for Programme Management defines a programme as comprising several projects or sub-programmes, that are managed jointly to achieve a shared benefit that would not be achievable from an individual project (PMI, 2013:4-5). The delivering of benefits via a program helps to ensure that individual projects/sub-programs are aligned and managed efficiently within the given constraints. A key feature and requirement of a program is that all its sub-projects and programs are related through the collective contribution towards a shared goal. It is recommended that where a group of projects do not have a shared goal/intended benefit that they are managed as a portfolio instead (Grimes, 2004). Programmes deliver benefits to organisation by contributing to business value through the enhancement of capabilities, delivering of products/services to the market and the facilitation of business change.

Program management is the alignment of various projects or sub programs with the purpose of delivering a unified benefit that is usually of strategic benefit to the organisation (Omar, 2010). It involves applying certain program management tools, knowledge and techniques to the collection of projects and sub programs with the aim of ensuring that each one delivers its intended benefit, contributes to the collective benefit and is managed as efficiently as possible within the given constraints. Program management may include managing any or all of the following (Grimes, 2004):

    I.   A collection of projects that are all linked some common objective

    II.   The alignment with an organisations strategy by designing and implementing a series of projects or Sub programs

    III.   The allocation of resources to the various projects/sub programs

    IV.   Controlling the interdependency between the various projects/sub programs

The PMI Standard for program management further prescribes that a program manager manages the interdependencies between the various sub programs and projects by applying knowledge and processes contained within five Program Management Performance Domains.

The Program Strategy Alignment Domain ensures that the program is designed in such a way that it contributes towards the achievement of the organisations strategy.

Program Benefits Management clearly defines the programs deliverables, plans and executes the activities needed to ensure they're achieved and sustained.

Program Stakeholder Engagement identifies the needs and expectations of the various stakeholders, ensures that the program addresses those needs, provides constant communication and helps to obtain and maintain stakeholder support.

Program governance helps to facilitate management oversight, support and decision making throughout the program.

Program Life Cycle Management ensures the integrated management of all the activities throughout the program's life cycle

Figure 1.2: Project Management Performance Domains
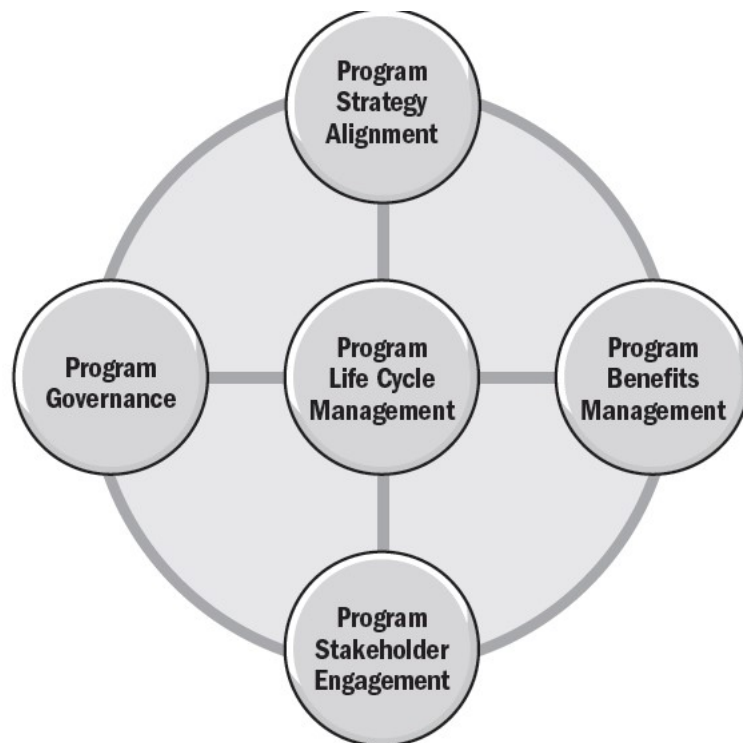
Figure 1.2 displays the five interrelated and interdependent domains that a program manager needs to manage throughout the life cycle of a program.

1.1.6 Portfolio Management

The Project Management Institute's, Standard for Portfolio Management describes a portfolio as consisting of a collection of various components which are usually a collection of projects, programs, or sub-portfolios. The difference between a Portfolio and Program is that the elements comprising a Portfolio do not necessarily have to be related, they do however need to be linked to an organisational strategy or objective for its existence to be relevant (PMI, 2013: 3). A portfolio's collection of projects, programs, and sub-portfolio's all share a common pool of resources that are managed collectively to optimise the use of those resources and to ensure that the various projects/programs/sub-portfolios remain relevant to the greater strategic objectives of the organisation (Muller et al, 2008:28).

An article in the July 1999 issue of PMI's, PM Network predicted the rising needs of organisations to bridge the gap between projects and their value contribution. In the

article Levine (1999) noted that business executives were starting to ask questions such as:

I.   What is the value of a particular to the organisation?
II.   How much of the organisations resources should we be investing and what is the threshold in a particular project?
III. What value will a proposed project have to the current project mix?

Questions such as the one listed above pointed to a need within the realm of project management and resulted in the evolution of program and portfolio management. Portfolio management is the planning, control and allocation of resources to the portfolio of projects/programs/sub-portfolios to ensure that collectively they all ensure the realisation of a particular organisational strategy. Portfolio management is responsible for fulfilling the strategy of an organisation which should have been formulated to realis the organisations business objectives, values, mission and vision. Projects occur within the greater context of the organisation and programs and portfolios are a means of ensuring that they remain relevant to the greater strategic objectives of the organisation. The various components of a portfolio all share a common pool of resources and are managed collectively to help optimise the use of those resources thereby contributing to greater efficiency (Muller et al, 2008: 28). It requires the application of management processes, tools and knowledge to the various portfolio components to ensure the following (PMI, 2013: 8-11):

I.   The alignment of the portfolio to a particular organisational strategy
II.   The allocation of financial resources to the various components based on their respective priority
III. Assign and allocate the various human and material resources
IV.   Performance measurements and progress tracking of the various components
V.   Managing risks

Muller et al (2008: 29) researched how portfolios are controlled and how that control impacts portfolio management performance. The aim of the research was to develop a framework for portfolio control with evidence as to its impact on portfolio management performance. Of particular interest was the influence of different contexts on portfolio control and management. Literature reviewed by Muller et al (2008: 29) indicated that there are practices at the project-level that contributed to higher performing portfolios. There was however no clear evidence at that time of

practices at the portfolio level that contributed to higher performance. Previous research alluded to certain portfolio management practices that are associated with success at the portfolio level. These practices include clearly defined goals, management support and the allocation and prioritization of resources. The precise link between a particular practice and performance was not clearly established. Projects, Programs and Portfolios are inextricably linked to one another and as a result it is suggested that the success of a portfolio should therefore not be examined in isolation

Figure 1.3: The Influence of Portfolio Control Practices On Portfolio Performance

Portfolio Control Practices

Portfolio selection

Portfolio reporting

Portfolio decision making

Portfolio Performance

Increased business performance

Organisation strategy
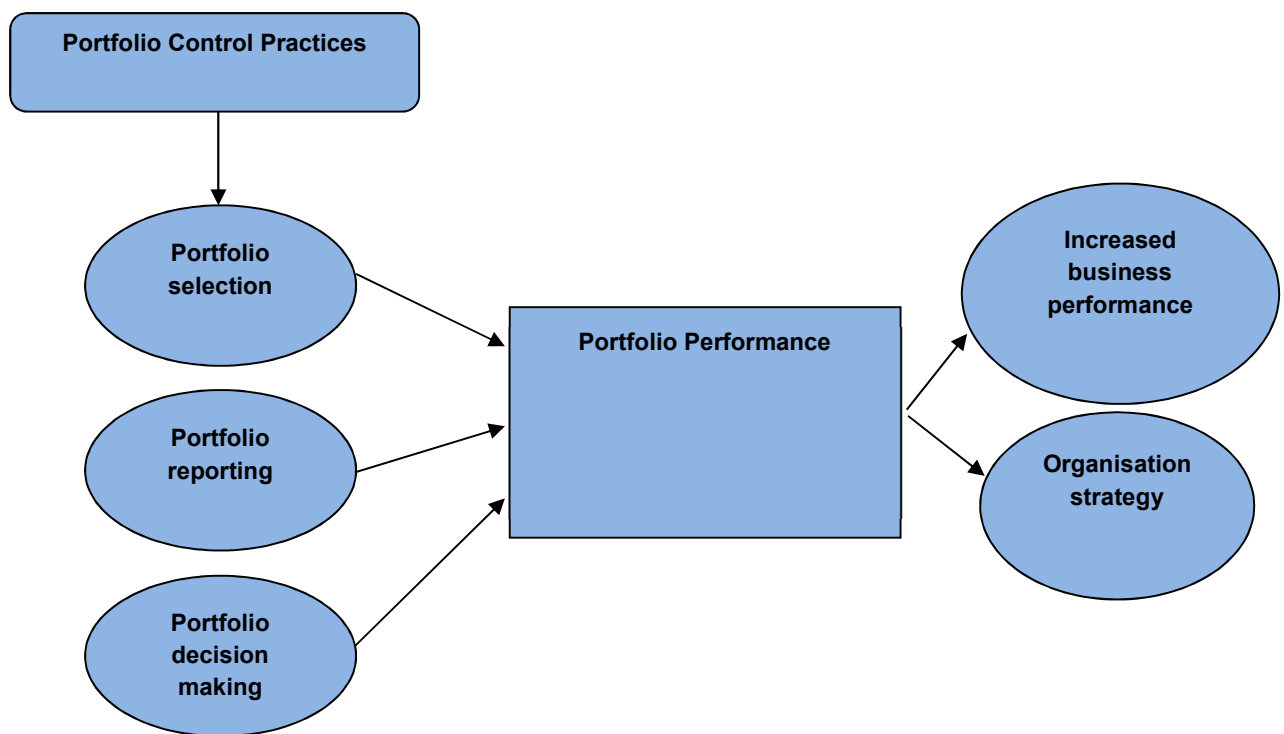
Source Muller et al (2008: 30-31)

Figure 1.3 depicts the findings of Muller et al's (2008: 30-31) research, that portfolio control practices which focuses on selection of the appropriate projects/programs that are aligned to organisational strategy, the availability of information from both the project and program level and the way in which decisions are made all contribute to Portfolio performance. Increased Portfolio performance is ultimately linked to an organisations business performance and strategy realisation and has been found to

be a feature that distinguishes less successful organisations from more successful ones.

1.1.7 Organisational Project Management

Organisational Project Management (OPM) arose from the realisation that projects do not occur in isolation but instead form part of the greater organisation. This link adds to the complexity of managing projects such as the need to ensure that all projects, programs and portfolios are aligned to the organisations strategies and goals. In addition, there exists the complexity associated with ensuring that project personnel throughout the organisation have a common frame of reference when executing and managing projects. The transition from focusing on applying project management to stand alone projects to the application of project management as an organisational capability occurred during the 1990's (Crawford, 2006: 75-76). OPM as an organisational capability was first promoted in publications by the U.K. Government of project management methodology in PRINCE2. Standards for OPM capability started focusing on benefits management and project governance. Latter contributions focused on creating an organisational environment conducive to managing multiple projects, this saw the development and introduction of PMI's Organisation Project Management Maturity Model (OPM3). OPM3 was influence by the Capability Maturity Model designed for software engineering to enhance capability maturity, the purpose of which was to help organisations benchmark their pm practices and standardise the application of project management throughout the organisation. The contribution of maturity models towards achieving maturity within the project management capability of an organisation is uncertain within the project management literature (Crawford, 2006: 77). However, there is general consensus around the concept of organisational project management capability and the ability to mature that capability.

The Project Management Institute (2014:1-9) describes in their guide to the implementing of OPM, that it is a management approach aimed at establishing an organisation wide, holistic approach to managing projects, programs and portfolios. Organisations which implement OPM have embraced the value that project, program and portfolio management offers and develop a system that incorporates and embeds those practices, techniques and knowledge throughout the organisations, as

a means of achieving their strategy. The application of OPM provides organisations with the following:

    I.   A framework for executing strategy

   II.   The standardization of project, program and portfolio management methodologies across the organisation

 III.   Assist in more efficient planning and deployment of organisational resources

The benefits from implementing OPM range from enhanced efficiency due to better resource allocation, improved business performance and the ability to constantly adapt to an ever increasing competitive environment.

1.1.8 The value of project management

Determining the organisational and business value of practicing project management is a major issue for organisations applying or who are considering adopting project management. This has been a much debated topic in project management literature (Besner & Hobbs, 2006: 37; Thomas & Mullaly, 2007: 74). Mir and Pinnington (2014: 215) stated that the true value of project management is not only in the short term achievement of efficiency in a single project but the lasting legacy that that project will have on the organisation's future. Similarly, Besner and Hobbs (2006:38) posits that Project Management has the potential of being a valuable asset for an organisation by improving its capability to meet its strategic objectives through the successful and consistent completion of projects. Crawford (2006: 3-29) concurs with the above statements but further elaborates that in order for organisations to unlock the value of project management it requires that they possess the capability to effectively utilize project management standards and procedures as well as the ability to develop and retain project talent.

Project management maturity models were therefore developed as a means to help organisation benchmark and then improve their project management capability. The Maturity models provide organisations with a framework to assess their current project management capability and pinpoint areas for improvement (Backlund et al. 2014: 840). It is therefore recommended that organisations develop their own unique project management approach, consisting of well-developed project management tools and techniques in order to realise the strategic value offered by project management (Besner& Hobbs, 2006:38-39).

Eskerod and Riis (2009: 6-13) further investigated the value organisations derived from using project management. Their findings from in depth case studies revealed that organisations derived a host of benefits by developing and utilising a standardised project management approach.

Table 1.12: Project Management Common Frame of Reference

'Common frame of reference'	1. **Common project management model**	Comprising standard tools, techniques, methods and processes that could be applied to any type of project throughout the organization.
	2. **Organization wide project management training program**	Resulting in a common understanding of terminology, use of various tools and methods.
	3. **Customised examination and certification of project managers**	To assist with career development.
	4. **Knowledge sharing**	Especially among project managers to assist with the constant development/enhancement of project methodologies.

Source Eskerod and Riis (2009: 10-11)

In their study Eskerod and Riis (2009: 6-7) used the term 'common frame of reference' to describe a uniform approach to project management which consisted of four elements, described in table 1.12. These elements when employed simultaneously maximised the benefit an organisation would derive.

Table 1.13: Organisational Benefits from Using a Common Project Management Approach

Benefits derived from a common organisation wide project management frame of reference
1. Improved communication – especially within the organisation as there is a common understanding of the methods, tools and terminology.
2. Improved project quality due to efficient use of resources
3. Easier project progress tracking and monitoring by sponsors and senior management
4. Scoping is easier and more efficient due to a structured approach to discussing ideas
5. Increased rate of projects completed on time
6. Increased rate of projects completed within budget
7. Improved stakeholder satisfaction

Source Eskerod and Riis (2009: 6-13)

Table 1.13 lists the benefits of using a common organisation wide approach to managing projects (Eskerod & Riis.2009: 6-13).

However, research regarding project management maturity and its contribution to project performance and success has been somewhat unclear as to the link between the two variables (Backlund et al, 2014: 837-846; Mir & Pinnington, 2014: 202-217; Pretorius et al., 2012: 1-12).

1.2 Study Rationale

1.2.1 Background to the research problem

This study investigated the performance of project management and its relationship to project success within Municipalities in the Western Cape Province, South Africa. Organisations that apply a formalised project management approach and who have gained higher levels of maturity in applying project management should be experiencing greater degrees of project success. However, despite advances in the field of project management, Organisations are still experiencing high incidences of project failure.

The primary research question was whether there is any relationship between project management performance and project success within the context of Municipalities in the Western Cape Province, South Africa. The aim was to further knowledge on the potential value that maturing project management within the Municipal environment can have and to provide recommendations on how best to start the process of improving project management capability thereby increasing the rate of project success. The study also provides Municipalities with proof that enhancing project management performance would lead to an improved rate of project success

1.2.2 Research Methodology

This study utilized a mixed-methods approach, by collecting data both qualitatively and quantitatively through emailed questionnaires (Cameron et al, 2015: 90-104). The quantitative approach was the main form of data collection. The qualitative questions were used to gain deeper insights into factors that may be impacting project success, these questions also served to eliminate the presence of any nuisance variables thereby further adding to the validity of the research (Welman et al, 2005: 81-85). Non-probability sampling was used where project managers within a Municipal Department in the Western Cape Province of South Africa were emailed the questionnaire. The questionnaire was split into four sections. The first section gathered general biographical information about the respondent. The second section

gathered data regarding the respondent's perception of project success using a 5 point Likert scale. The third section addressed project management maturity within ten project management knowledge areas. This section was structured on the maturity model developed by Labuschagne and Marnewick (2008) which was also used by Pretorius (2012: 5) in a similar study. The fourth section included the qualitative dimension of the study where respondents were asked to list any factors which they felt hindered or contributed to the success of projects within their organisation.

CHAPTER 2 PROJECT SUCCESS

2.1 Introduction to Project Success

Our understanding of what constitutes project success and how we measure it has changed considerably over the years. Project success has evolved from the traditional focus on the 'iron triangle' of time, cost and quality to include such aspects as the effectiveness of projects post implementation (Jugdev& Muller, 2005:19; Williams, 2016: 97). A review of research on the topic of project success was done by Ika (2009:6-19) with the aim of identifying the characteristics of project success found by past researchers and to develop a new theory to the approach on research on project success. Ika's (2009:6-19) review spanned the period 1986 to 2004 and reviewed literature from two of the most prominent journals on project management at that time, namely the Project Management Journal and the International Journal of Project Management.

Ika's (2009:10-11) analysis revealed that research on project success has evolved from a focus on the traditional 'iron triangle' of time, cost and quality during the 1960's and 1980's to include aspects such as customer satisfaction, organisational benefits, stakeholder benefits and benefits to the project team during the period between 1980 and 2000. The 21st century is seeing a further change in our understanding of project success to include aspects related to a projects ability to fulfil the strategic objective of the client and attain business success.

While there is no consensus between researchers regarding the definition of project success, there are however certain characteristics that researchers and practitioners do agree upon and which help to develop the framework for our understanding of project success (Mir &Pinnington, 2014: 203; Ika, 2009:6-7). Analysing project success also has practical advantage for organisations. For instance, a study by Todorovic et al (2015:772-783) highlights the value of capturing the results of a project. Todorovic et al (2015: 772-783) noted that an organisations ability to acquire and transfer knowledge from one project to the next is difficult in project driven organisations. This is mainly attributed to the nature of project work which results in the formation of several 'temporary organisations', each comprising their own teams. The issue of poor knowledge management is further exacerbated by a lack of defined processes, project operational routines and proper documentation. However,

an organisation that is able to constantly learn and develop is considered to be at the pinnacle of project management maturity. Todorovic et al (2015: 772-783) therefore hypothesized that valuable information could be gathered by analysing the results of a project and subsequently developed a framework for analysing a project's success. Ika (2009: 7) quotes Baker, Murphy and Fisher (1974) as stating that "there is probably no such thing as absolute success in project management, only the perception of success. The perception of whether a project is successful differs between various stakeholders or role players on a project. Ensuring that a project is successful is not the sole responsibility of the project manager and he's team, the role of the project sponsor also impacts the success a project will have (Kloppenborg, 2014: 9-20). The project team may view success as completing the project within the constraints of time, cost and quality, whereas a beneficiary of the project's output will assess its success according to how well the project has met their needs (Prabhakar, 2008: 3-4).

Project success is also perceived differently with the passing of time. Consider for instance a project which is aimed at delivering a product to be used by the client. The project is completed within all the parameters of time, cost, quality and scope, however over time the client discovers that the product is not as effective as intended, thereby diminishing the initial perception of success. Jugdev and Muller (2005: 21-23) therefore emphasizes the importance of differentiating between the project life-cycle and the product life-cycle and that the project life-cycle is a subset of the product life-cycle. Where the project life-cycle is concerned with achievement of efficiency in the management of the project and generally ends with the handover of the final product during the project's close-out phase. The product life-cycle extends beyond that of the project and addresses the effectiveness of the project's output post implementation. Ika (2009: 7) uses the example of Ford's second generation Taurus car which was completed within all the constraints of the 'iron triangle' and yet was regarded as a business failure.

By examining the variables which impact the perception of project success, Ika (2009: 7-8) as well as Munns and Bjeirmi (1996: 81-82) highlight the importance of distinguishing between project management success, project success, success criteria and success factors. All of which are discussed further in the following sections.

2.2 The Difference between Project Success and Project Management Success

In order to form the basis of our perception on what constitutes project success, both Cooke-Davies (2002:185) and Munns and Bjeirmi (1996: 82) among others highlight the importance of differentiating between project management success and project success. Project management success refers to the completion of a project within its allocated time frame, budget, in accordance with the required standard of quality and scope (Serrador & Turner, 2015: 30). Munns and Bjeirmi (1996: 81-82) further elaborates by stating that project management is focused on the short term achievement of the project's objectives by utilising planning, control and monitoring tools and techniques that are inherent to project management. Project management success is therefore associated with the achievement of efficiency in a project. This statement is supported by both Mir and Pinnington (2014: 215) as well as Berssaneti and Carvalho (2015, 638) who emphasized that time; cost and quality (iron triangle) are associated with efficiency factors of project success.

Project success on the other hand involves the projects ability to satisfy the needs for which it was created and is more focused on the long term benefits of a project (Cooke-Davies, 2002: 185). Ika (2009: 7-8) describes project success as a broader, ambiguous concept that encompasses both efficiency and effectiveness. Cleland (1986) is cited by Prabhakar (2008:4) as stating that project success should be assessed on two criteria, namely that the projects technical requirements as well as budget and time were met and the degree to which the project contributed to the organisations strategy.

Munns and Bjeirmi (1996: 82) therefore state that given the distinction between the two concepts that a project can be a success despite the project management having failed and vice versa. A good example is the 2010 FIFA World Cup, whereby the collection of projects undertaken to deliver the new stadiums and infrastructure can be seen as being delivered successfully within the traditional 'iron triangle' of constraints. However as pointed out by Molloy and Chetty (2015: 88-107) the aim for the host country to host the event was to fast track economic development, an aim which the program failed to deliver.

2.3 Success Criteria and Critical Success Factors

Project success criteria and critical success factors (CSF's) as they are most commonly referred to, provide us with a means of defining and measuring a project's

success. While there is no agreement between researchers on the definition of success, they do however seem to all agree on the existence and importance of success criteria and factors. It is also important that the differences between the two are clarified (Ika, 2009: 8).

Project success criteria represent the aspects against which a project's success will be judged. They should ideally be agreed upon at the start of a project and are what the project manager and his team will be assessed against. Researchers such as Ika (2009: 8) and Cooke-Davies (2002: 185) refers to them as standards or principles that the success or failure of a project will be judged on. Project Success and the criteria which define it has been the topic of much debate in the project management literature with very few authors reaching consensus (Mir & Pinnington, 2014: 203). As previously mentioned the most common method of assessing the success of a project has been the 'triple constraint' or 'iron triangle' of time, cost and performance (quality). Brown and Hyer (2010:9-10) state that while the triple constraint has merit as a means of measuring a project's performance that it is however not comprehensive enough to capture other aspects of a project's success.

Success factors on the other hand represent the aspects that the project management team will focus their efforts on to ensure that the success criteria are met (Cooke-Davies, 2002:185; Jugdev & Muller, 2005:24; Prabhakar, 2008:3). Williams (2016: 97-112) discovered that not only is the nature of project success multi-dimensional and complex but that success factors also interact with one another and are interdependent.

Several studies have attempted to measure the value of Project Management by investigating the correlation between project management performance and project success. Mir and Pinnington (2014: 202-217) conducted a study aimed at gaining further clarity on the inter-relationship between project management performance and project success thereby attempting to validate the value of project management. Their study was based on the premise that previous attempts to link project management performance with project success had failed to clarify the relationship between the two variables. Similarly, a study by Cserhati and Szabo (2014: 613-624) was aimed at identifying attributes for success criteria and success factors as well as attempting to determine the correlation between the two, however their study was restricted to Organisational Events Projects.

Project success was measured by Mir and Pinnington (2014: 203-204) by adapting a construct based on previous work by Shenhar et al. (2001) and Stefanovic (2007).

Table 2.1 Success Criteria and Success Factors

Initial success factors	New re-organised success factors
• Project Efficiency	• Project Efficiency
• Impact on the customer	• Impact on the customer and financial success
• Business success	• Impact on long term benefits
• Preparing for the future	
• Impact on the team	

Source Mir and Pinnington' (2014:210-214)

This model measured success on five dimensions which were later condensed into three. Both the initial and re-organised success factors are listed in table 2.1.

Table 2.2: Success criteria for Organizational events

Success criteria for Organisational events projects
• Meeting a projects primary aims
• Meeting specified aims
• Satisfaction of sponsors and contractors
• Satisfaction of local and national stakeholders

Source Cserhati and Szabo (2014:619)

Cserhati and Szabo (2014: 619) measured success for organisational events projects using four criteria as listed in table 2.2 and makes a further distinction between 'task' and 'psychosocial' related success criteria. Task related criteria measures the more tangible aspects of a projects success such as cost and schedule which relates to criteria measured by Mir and Pinnington's (2014: 213-214) success factors. Psychosocial criteria refer to more intangible/softer aspects of success such as customer satisfaction or team morale. Project performance was measured by Mir and Pinnington (2014: 204-205) using the 'Project Management Performance Assessment' (PMPA) model. This model was developed by Bryde (2003), and was validated by Qureshi et al. (2009) as well as Din et al. (2011), as closely resembling EFQM (European Foundation of Quality Management, Business Excellence Model) which is an established performance assessment model that incorporates TQM principles making it suitable for project management.

Table 2.3: Performance factors

Initial performance assessment factor	New re-organised performance factors
• PM Leadership	• PM Leadership
• PM Staff	• PM Policy and strategy
• PM Policy and Strategy	• Pm Partnerships and Resources
• PM Partnership and Resources	• Pm Environment
• Project Life-cycle management process	
• PM KPI's	

Source Mir and Pinnington (2014:210-214)

The PMPA Performance model consisted of six factors which measured a project's performance. Mir and Pinnington's (2014: 213-215) findings resulted in the recommendation that the six performance factors be re-organised into four factors which are all listed in table 2.3. These factors were then further grouped into those that are indirectly related to project success, namely 'leadership', 'policy and strategy', 'partnerships and resources' and those that are directly related to project success, namely the 'project management environment'. The 'Project management environment' performance factor resulted from the merging of 'PM staff', 'Project life-cycle management process' and 'KPI'S' as it was determined that all three factors represent the organisational environment where project management occurs. Cserharti and Szabo (2014:621) identified six dimensions to measure the performance of organisational events projects. They used the term success factors as opposed to Mir and Pinnington's (2014: 204-205) performance factors, both however represent areas that will be focused on to ensure that the required success criteria are met. These factors are listed in table 8 and are further categorized into task related and relationship related success factors.

Table 2.4: Project Success factors

Project success factors	
• Project definition	• Task related factors
• Contract strategy	
• Project leadership	• Relationship related factors
• Organisational culture of project team	
• Relationship related factors Communication and co-operation with contractors and sponsors	
• Partnerships with local and national stakeholders	

Source Cserhati and Szabo (2014:621)

Cserhati and Szabo's study (2014: 620) confirmed the theory of Chan and Chan (2004) which stated that both objective criteria of goal achievement and subjective criteria consisting of the perceptions of various stakeholder interest groups are important when evaluating a project's success. Cserhati and Szabo (2014: 621) also came to the conclusion that success factors that are relationship oriented have more of an impact on the success of organisational event projects than factors which are task oriented.

In 2005 Turner and Müller (2005: 49-61) made the observation that studies on success factors on projects seemed to ignore the role of the project manager and his/her leadership style and they further postulated that the project manager's leadership style should be included as a success factor. This observation is further supported by Creasy and Anantatmula (2013: 36-51) who theorised that the personality dimensions of a project manager is a contributing factor to a project's success. It is interesting then that both the list of success factors used by Cserhati and Szabo (2014: 621) and Mir and Pinnington (2014: 210-214) included project leadership as a factor.

Cserhati and Szabo (2014: 621-622) did however determine that when it came to success criteria related to the fulfilment of the primary and specified aims, that those criteria could only be met through the matured management of tasks and responsibility which provide teams with direction in the execution of their activities (Cserhati & Szabo, 2014: 621-622). This further supports earlier statements that project management contributes to the achievement of efficiency in a project (Berssaneti & Carvalho, 2015: 638). The study by Mir and Pinnington's (2014: 212-215) confirmed that there is a statistical relationship between the performance of project management and project success. The KPI, lifecycle management process and pm staff performance factors, collectively had the most impact on the success variables. The authors theorise that these factors represent operational aspects which directly relates to the success of a project while leadership, policy and strategy and partnerships and resources are aspects which while they do affect performance, they are controlled by upper management and as respondents mainly represented the operational staff of a project, they may not have been fully aware how these variables impact success.

Studies by Serrador and Turner (2015:32) and Berssaneti and Carvalho(2015: 647) have proven that project management performance does impact the successful

achievement of efficiency measures on a project as well as the ability to meet technical requirement. There does however appear to be no clear link established between project management performance and the achievement of the intangible success aspects such as 'customer satisfaction'. How project management maturity impacts project performance has not been clearly identifiable. The study by Berssaneti and Carvalho (2015: 642-647) did indicate a strong correlation between a project's achievement of planned budget, schedule and meeting technical requirement with project management maturity. Furthermore, research by Joslin and Muller (2015) was successful in proving that an organisations project management methodology does positively correlate to an increase in success and that the experience an organisation has in applying its chosen pm methodology can be considered a factor of success. Literature reviewed by Cserhati and Szabo (2014: 614) on project success criteria, further supports the statement that measuring project success against the criteria of the 'iron triangle' alone are not sufficient and that a more thorough evaluation that considers aspects such as contribution to organisational strategy, stakeholder/customer satisfaction as well as efficiency, should be considered. Project success is therefore influenced by elements which can be measured both objectively and subjectively (Jugdev& Muller, 2005: 29; Berssaneti & Carvalho, 2015: 638) For example Cserhati and Szabo (2014: 614) made the distinction between task related success criteria which include aspects such as cost, time, performance and psychosocial success criteria such as customer satisfaction, team motivation and other relationship/softer success aspects.

The impact that psychosocial criteria has to the success of a project has been further validated through a study conducted by Haried and Ramamurthy (2009: 56-71). Their research examined the relational aspects between a client and a vendor and how it impacted success on international sourcing projects. Their study found evidence that managing the relational aspects from the perspective of both the client and vendor are important in ensuring project success. The efficient and timely exchange of information as well as the vendor's willingness to adapt their service to suit the needs of the client were among the factors which contributed to the success of international sourcing projects.The list of success criteria used by Cserhati and Szabo (2014: 614), Berssaneti and Carvalho (2015: 638) and Mir and Pinnington (2014: 210-214) all interestingly highlight the importance of stakeholder satisfaction in assessing a project's success. Dissatisfied stakeholders are according to Eskerod

et al. (2015: 42), still one of the main reasons of project's being regarded as unsuccessful.

2.4 Conclusion

Studies attempting to link the performance of project management with the success of a project have proven that project management does influence success, particularly aspects regarding the achievement of efficiency within a project (Berssaneti &Carvalho, 2015; Martinsulo et al. 2006: 92-95). It would also appear as though the link between performance and success is easier to establish when the focus is context specific (Cserharti & Szabo, 2014; Khang & Moe, 2008: 72-84). This observation is supported by Ika (2009: 7) who stated that "the only thing that is certain in project management is that success is an ambiguous, inclusive and multidimensional concept whose definition is bound to a specific context." The success of Organisational change projects for instance are affected by the level of authority afforded to the project manager, the support of project sponsors, the governance system of projects within the Organisation and the degree of flexibility that the project manager and project team has to negotiate the final scope of works (Ives, 2005: 49). Within the following section we review literature surrounding project management maturity models which has developed as a method for measuring the existence and level of development an organisation has in applying pm methodologies. The models developed to assess project maturity as well as a review of previous studies that have attempted to link project management maturity with project success is also discussed.

CHAPTER 3 PROJECT MANAGEMENT MATURITY

3.1 Introduction

Project Management Maturity can be used to describe an organisation's level of development in applying project management when managing projects or to a system of organisational project management (Backlund, 2014: 839).

The Project Management Institute's, Guide to the Project Management Body of Knowledge (Pmbok) (2013: 5) describes project management as "the application of knowledge, skills, tools and techniques to project activities in order to meet project requirements." An organisation's project management maturity level defines the level of development an organisation has achieved in the application of its project management knowledge, skills, tools and techniques'. Similar definitions describe pm maturity as an organisations approach to the management of its projects and where an organisation has certain standards and procedures in place to effectively and efficiently manage projects (Pretorius et al., 2012: 1-12; Ofori & Deffor, 2013: 41).

The field of project management has evolved from the application of tools and techniques on a single project to the development of an organisation wide capability for managing projects. Following the acceptance and pursuit for organisational project management, practitioners were faced with the need to constantly improve project management capabilities within their organisation (Crawford, 2006: 74-97). Maturity models have developed as a means of measuring an organisation's Project Management Capability against certain standards and best practices of Project Management (PMI, 2013: 2-4; Backlund, 2014: 837-846). The aim was to identify areas of an organisations project management capability that if improved will help increase its maturity and therefore reap the benefits of increased effectiveness, competitive advantage, success and performance (Backlund, 2014: 837).

Grant and Pennypacker (2006) as cited by Backlund (2014: 838) have estimated that there are around 30 variations of maturity models on the market place, all of which are based on the concept that an organisation advances through various levels of maturity in the application of their processes. The following sections describe ad compare several maturity models.

3.2. The Capability Maturity Model – CMM

The Capability Maturity Model (CMM) was developed by the Software Engineering Institute at Carnegie Mellon University, is the first known maturity model and also the foundation of subsequent project management maturity models. It was initially developed as a means of improving software development processes by identifying five levels of maturity each with a set of key processes that define it (Yiman, 2011: 50; Backlund et al. 2014: 837-839).

The CMM model has five defined levels of maturity, each one details the key criteria that define each level and an organisation acquires greater maturity as it progresses from the first level up to the fifth (Jugdev & Thomas, 2002: 4-6). These levels are described as Level 1: Initial, Level 2: Repeatable, Level 3: Refined, Level 4: Managed and Level 5: Optimized.

3.3 The Organizational Project Management Maturity model (OPM3)

The Organizational Project Management Maturity Model (OPM3) was developed by the Project Management Institute (PMI) (2013) as a method for assessing the maturity of an organization's project management processes. This model utilizes PMI'S foundational standards for project, program and portfolio management as well as certain organisational enabling practices and converts them into best practices which are then used as a basis for comparison against an organisation's current practices.

This comparison to industry accepted best practices is intended to indicate how close an organisation's current level is towards achieving a certain best practice. PMI (2013: 27) states that in order to identify and consequently increase an organisation's maturity that one would need to understand the following two aspects of OPM3 method:

I. OPM3 Construct – which provides a description of each component comprising OPM3 and the relationship between them

II. OPM3 Framework – in which the processes that make up the approach that's used to implement OPM3 is described.

3.3.1 OPM3 Construct
3.3.1a Best Practice

By using OPM3 an organisation's maturity is determined by identifying the existence of best practices (PMI, 2013: 29). Each best practice consists of various capabilities which are made up of several outcomes. If an organisation can provide evidence

either tangible or intangible of one or more of the associated outcomes of a particular capability, then it is awarded that capability. If an organisation has demonstrated that all of a best practice's capabilities exist, then it has achieved that particular best practice.

3.3.1b Capabilities

A capability is made up of the human resources, pm processes and the technology that an organisation uses to deliver its projects. A best practice consists of a number of capabilities which all need to be in place before an organisation is awarded that particular best practice (PMI, 2013: 30)

3.3.1c Outcome

In order for an organisation to prove that it has a particular capability, it needs to prove that it has one or more of the resulting outcomes. This proof can be either in the form of tangible or intangible evidence. PMI (2013: 30) gives an example of a tangible outcome as a policy on project management and an intangible outcome as a verbal acknowledgement of project management.

3.3.1d Domains

OPM3 domains refer to Portfolio, Program and Project management and their associated process-based standards, developed by PMI. These standards provide the bases for best practices against which an organisations maturity is measured (PMI, 2013: 30).

3.3.1e Process Improvement Stages

Process improvement stages are used to add a dimension of quality to the OPM3 process. These stages are Standardize, Measure, Control and Improve (SMCI) (PMI, 2013: 34-35).

I. Standardize – the means of documenting a process which can then be repeated and communicated throughout the organisation, resulting in consistency when delivering a best practice.

II. Measure – the process of quantifying the outputs of a process in order to determine its performance.

III. Control – requires the comparing of the performance of a process with planned performance, analysing the variance and applying corrective action to ensure the process is brought back into accepted control limits.

IV. Improve – results in a process which is continually assessed and improved upon

3.3.1f Organizational Enablers

Organizational Enablers (OE) are set of best practices within OPM3 that identify and measure the maturity of general management processes that an organisation should possess in order to effectively apply organisational project management. OE's stem from the organisations cultural, structural, technological and human resource practices (PMI, 2013: 36).

3.3.1g Categorization

OPM3 groups its best practices into 9 categories that make it easier for an organisation to identify areas for improvement. The 9 categories are:

1. Domain
2. Process improvement stage (SMCI)
3. Organizational enabler (OE)
4. Process Group
5. Performance Domain
6. Knowledge area
7. Project predictability
8. Resource optimization
9. Balanced scorecard

3.3.2 OPM3 Framework

The OPM3 framework is a guide which an organization can utilize to guide them through the assessment process. The framework is made up of Areas of expertise and cycle elements that are aligned to OPM3 processes which consist of inputs, tools and techniques and outputs (PMI, 2013: 40).

3.3.2a Areas of Expertise

Areas of expertise describe 3 areas of knowledge and skills that should be in place before undergoing the OPM3 assessment process. These 3 areas are (PMI, 2013: 41):

I.   Governance, Risk and Compliance (GRC)
II.   Delivery and Benefits Management
III. Organisational change

3.3.2b Cycle Elements

OPM3 cycle elements consist of Acquire Knowledge, Perform Assessment and Manage Improvements. These elements each describe a group of processes that is

needed to implement the OPM3 initiative. Each Element with its associated processes is described in Table 3.1, 3.2 and 3.3.

Table 3.1: Cycle Element 1 - Acquire Knowledge

Process 1	**Understand OPM3**	Understand OPM3 and the value its application will have to the organisation
Process 2	**Define Outcomes**	Understand the organisation and its reason for undertaking the OPM3 process and its intended business results
Process 3	**Assess Change Readiness**	Assess the organisations readiness for change, the willingness for change and any potential barriers which may limit the adoption of any improvement initiatives

Source: Authors Own Construction

The Acquire Knowledge Element as described in table 3.1 requires that before conducting the OPM3 assessment an organisation ensures that it has undergone the three processes to ensure that the objectives for implementing an OPM3 assessment are made clear and that any risks that may be encountered are identified early on (PMI, 2013: 43-44).

Table 3.2: Cycle Element 2 – Perform Assessment

Phase 1	**Establish Plan**	This phase involves using the PMBOK Guide to develop a project plan for executing the OPM3 initiative.
Phase 2	**Define Scope**	A detailed statement of work is developed that clearly defines the objectives, resources utilized and the acceptance criteria
Phase 3	**Conduct Assessment**	The OPM3 assessment is performed according to the plan and scope developed in Phase 1 and 2.
Phase 4	**Initiate Assessment**	The organisation initiates a change management process to ensure that the recommended improvement initiatives are adopted throughout the organisation.

Source: Authors Own Construction

Once the relevant knowledge has been acquired the organisation is then ready to embark on the assessment which consists of the four phases described in table 3.2 (PMI, 2013: 44-45). PMI (2013: 41) recommends that managing the OPM3 initiative as a project is one of the key actions that result in successful application.

Table 3.3: Cycle Element 3 – Manage Improvement

Phase 1	Measure Results	Compares the business results envisaged during the planning phase with the actual results of the assessment
Phase 2	Create Recommendations	The gap between the organisations desired state of its Organisational Project Management is analysed and results in recommendations being made to steer the organisation to its desired state.
Phase 3	Select Initiatives	A list of viable initiatives is compiled and presented to the relevant stakeholders for decision making purposes.
Phase 4	Implement Improvement Initiatives	The improvement initiatives selected by the organisation's stakeholders during phase 3 (select initiatives) is developed into projects, programmes and portfolios which are then implemented.
Phase 5	Manage Change	The change management process that was initiated is managed to ensure that the desired business results are achieved.

Source: Authors Own Construction

Manage improvements involves 5 phases described in table 3.3 which are aimed at identifying, selecting and implementing the improvement initiatives identified based on the OPM3 assessment (PMI, 2013: 45-46).

3.4 Project Management Process Maturity Model (PM²)

Kwak and Ibbs (2000: 32-34) developed the Project Management Process Maturity Model (PM²) along with an analysis methodology for assessing an organisations project management practices. PM² 's development was influenced by the quality theories of Crosby and Deming. In particular Crosby's 5 stages for adopting quality in an organisation and Deming's processes for the continuous improvement of quality management processes (Kwak&Ibbs, 2002: 150).

The goals of this study were as follows:

I.   Provide managers with a tool that allows them to measure a project management process and the value that process will bring to the organisation

II. Provide organisations in any industry with a means of determining the value that adopting project management will have

III. To develop a methodology that could quantitatively asses the current level of PM practices and processes

IV.   To identify the financial and organisational impacts that project management has on an organisation

This study was based on the premise that organisations were becoming more projectised in their approach to work but in doing so many were unclear or miss-directed regarding the application of project management. Furthermore, the investment required in tools, processes and practices was challenging to justify (Kwak & Ibbs, 2000:34).

Their maturity model originally consisted of 148 multiple choice questions that covered 8 knowledge areas and 6 project phases. The model was later changed to include 9 knowledge area and 5 project phases (Kwak & Ibbs, 2000:34; Kwak & Ibbs, 2002: 150). It assesses the strengths and weaknesses of an organisations pm practices, allows for the comparison against similar organisations and it determines how maturity is impacting performance.

The assessment questionnaire consists of 3 major sections, general organisational information (section 1), Organisational project management process maturity assessment (section 2) and the actual performance assessment (section 3).

Pm maturity levels were defined on a 1 to 5 point Likert scale with 1 being the lowest and 5 the highest. By averaging the scores of each question, it was possible to calculate an organisations maturity level within each knowledge area, PM process and by adding all the average scores an overall PM maturity level could be determined.

Data on the cost of project management services was determined by calculating the cost of PM services as a percentage of the total project cost. A list of items representing PM related expenditure was provided to the participating organisations in order to more accurately estimate the average cost.

Questions were developed based on the Project Management Body of Knowledge (PMBOK 94). The research team also decided to add an additional PM process they named the "Project driven Organization Environment". This process assessed the PM infrastructure in an organisation that supported training, career development and other means of equipping project managers to be more prepared to manage its projects.

Accuracy regarding the responses received was a concern for the researchers as respondents may have a tendency to score themselves higher when evaluating

themselves. Ideally the assessment should be conducted via in-depth interviews of the project managers at the various participating organisations. However due to time and resource constraints a self-assessment was the chosen method. In order to help ensure the accuracy of data collected, researchers did the following:

I. Thorough pre-screening of all companies selected for the study to ensure that only companies willing to share PM knowledge as well performance data.

II. Respondents were told of the importance of being honest and that it would provide them with a more accurate picture of how they compared against other organisations, thereby highlighting areas for improvement.

III. Organisations participating had the opportunity to discuss with researchers any questions requiring more clarity and a glossary section was provided to explain any unfamiliar concepts.

IV. Researchers then tested the completed questionnaire mostly via telephone interviews with various companies.

Organisations were also encouraged to allow several people to respond jointly as certain questions may require the knowledge of various project managers.

Of the 38 organisations participating in the study, 15 were from the engineering and construction industry, 10 from information management and movement, 10 from information systems and 3 High-Tech manufacturing companies.

This study resulted in the following findings:

I. The PM² assessment methodology is an effective method for assessing an organisation's PM level as well as its maturity within each PM knowledge area and 6 project phases.

II. PM² methodology provides an organisation with a benchmark from which continual improvements can be made via reassessments.

In addition, this study also contributed to the understanding of how project management practices impact on performance.

3.5 The Project Management Maturity Model (ProMMM)
The ProMMM maturity model measures an organisations maturity on four levels instead of 5 as in PM². These levels are labelled as Naive, Novice, Normalised and Natural. Hillson (2003: 299) states that "while knowledge and processes are undoubtedly important contributors to project management capability they are by no means the only important element and a number of other attributes should be

assessed to give a true picture of an organisations project management capability."
ProMMM therefore attempts to address the contributions of organisational culture,
experience levels of human resources and implementation, by including them along
with process to define each level of the maturity assessment. This appears to be in
line with PMI's inclusion of Organisational Enablers in the OPM3 model, which
acknowledges the importance of cultural, structural, technological and human
resource practices that help an organisation pursue, implement and sustain best
practices within the domains of project, program and portfolio management (PMI,
2013: 36).

An assessment using ProMMM can be done using either structured interviews or a
perceptions-based questionnaire. Using the questionnaire allows an organisation to
assess its performance by answering a series of multiple choice questions that relate
to each attribute of culture, experience, process and implementation. Each answer
corresponds to a ProMMM level and is answered based on how the respondents
perceive their organisation to be performing in their management of projects (Hillson,
2003: 303).

However, the associated score of each question is not available to respondents
while answering and the order of questions are also randomised. The author further
states that it is important to collect responses from a wide range of participants as
this helps to protect the confidentiality and help ensure a more honest response.
Mean scores are determined for each question as well as the set of questions
related to a specific attribute (e.g. process) thereby determining the associated
ProMMM level and standard deviation is used to determine the degree of agreement
between respondents. The organisations overall ProMMM level is then calculated by
averaging the scores of all four attributes.

The questionnaire results can be interpreted on 3 levels. Firstly, by analysing the
overall ProMMM level, organisations are able to identify where its overall maturity
level lies. Further analysis of the attribute scores helps to identify strengths and
weaknesses of the project management approach that contributed to the overall
level. An example provided by the author was a score resulting in high levels of
culture and process but low scores in the areas of experience and application. Which
indicates an organisation that believes in the benefits of project management and its
processes however may lack the necessary skill and experience for effective
application. Lastly an analysis of the individual questions assists with a more detailed

evaluation of a particular project management capability. Standard deviation is calculated at each level of evaluation to determine the degree of agreement between responses with a standard deviation of 0.6 considered as normal (Hillson, 2003: 307).

ProMMM interviews are recommended to supplement the information gathered from the questionnaire as perceptions of organisational project management performance represent a subjective view. The interview therefore helps to confirm the questionnaire's results and detect any variances that may have occurred due to misinterpretation of concepts or language differences. In addition, it provides a more detailed description of an organisation's pm capability as interviewers are encouraged to explore any aspects of pm capability that may have arisen other than that covered by the questionnaire (Hillson, 2003: 307).

3.6 The Project Management Maturity Model (PMMM)

Crawford (2006:50-58) also developed a project management maturity model which like most maturity models was based on the Software Engineering Institute's (SEI), Capability Maturity Model (CMM). CMM was developed after organisations realised the need to obtain consistent results when executing software development projects and to reduce their dependence on what Crawford (2006:50) termed the "star" developer. As a result, CMM was found to be highly compatible in measuring the maturity within an organisations project management capability.

Crawford (2006:51-53) used PMI'S PMBOK as a knowledge base along with the CMM method to develop his Project Management Maturity Model (PMMM). PMMM identifies 5 levels of maturity, from Level 1 – Initial process through to Level 5 – Optimizing process. Maturity is assessed by examining the key components within each of the knowledge areas as identified in the PMBOK. In addition, Crawford (2006: 54-55) acknowledges the important contributions of the project office, management oversight and support as well as the professional development of project personnel towards maturity.

There are however certain limitations and potential pitfalls in applying maturity models that were highlighted by Crawford (2006:54-56). These are:

I.   The subjective nature of the assessment makes it imperative that a tool which has been proven to be reliable is used.

II. In order to ensure that an organisation is moving towards its improvement targets a baseline assessment should be followed by regular follow up assessments.

III. An understanding of the relationships between the various project management processes is important in determining maturity as well as ensuring a consistent level of maturity across the knowledge areas.

3.7 The Link between Project Management Maturity and Project Success

As mentioned in the previous sections, the use of project management has been proven to increase efficiency and increase project success in organisations (Mir &Pinnington, 2014: 212-215; Pollack & Adler, 2015: 17-24). However, research attempting to prove the benefits of maturity models or using maturity models to link increased levels of maturity and project success has been inconclusive (Mullaly, 2006: 62-73; Sonnekus & Labuschagne, 2003: 3-25; Labuschagne & Marnewick, 2009: 2-33; Pretorius et al., 2012: 1-12).

Ofori and Deffor (2013: 42) undertook a study to explore project management maturity levels across various industries in Ghana and noted that while there was much growth and development in the field of project management that the rate of project failure was still notably high. The general poor success rate of projects despite advancements in the field of project management was also observed by several other researchers (Yazici, 2009: 14; Belassi et al, 2007: 12-24; Jayaram & Narasimhan, 2007: 241-256).

In an earlier paper Ofori (2006) came to the conclusion that the lack of standardised project management tools, techniques and processes as well as certain cultural issues that were raised by Awuah (2008) all contributed to low levels of project success in Ghana (Ofori & Deffor, 2013: 42). This finding is further supported by Yazici (2009: 14-33) who researched the combined impact of project management maturity and organizational culture on business performance as well project performance. In their study Yazici (2009: 14-33) found a positive correlation of maturity and organisational culture to improved business performance. Strangely no correlation could be found between maturity and project performance however a relationship was found between an improved organizational culture and improved project performance.

The findings by Ofori and Deffor (2013: 58) suggest that organisations display different levels of maturity at different phases of the project management lifecycle. These findings support PMI's (2013: 32-33) OPM3 methodology which measures maturity in the project lifecycle process groups. Interestingly organisations in the public sector received the lowest maturity scores. This was of particular concern to the authors considering that most of the development projects are undertaken by the public sector. The low maturity levels may be an indicator as to the reason for the many incidents of project failure in the country.

The theory that pm capability is not only dependent on project management processes is further strengthened by Du Plessis (2014: 3) who states that it is the behaviour of people and their capacity to effectively utilise project tools and techniques that result in project success. Cooke-Davies (2002: 189) makes an interesting observation, that people are the drivers of process and that how they execute a process determines whether it will have the desired outcome. This supports one of the weaknesses of maturity models that were highlighted by Backlund et al (2014: 840) which states that they are not able to capture the non-tangible side of project management which also affects an organisations project management capability. For an organisation to improve their project management capability therefore requires the development of both hard and soft skills (Fernandes et al., 2014: 81)

Belzer (2001); Cook-Davies (2002); Loo (2002); Mantel et al. (2004) and Strang (2003) as cited by Du Plessis (2014: 3) all criticised the emphasis placed on the technical or "hard skills" to deliver projects and agree that the human or "soft skills" of project management should not be overlooked.

Pretorius et al. (2012: 1-12) explored the relationship between project management maturity and project success in the engineering and construction industries in Southern Africa as well as maturity within the nine knowledge areas and its effect on project outcome. The main focus of the study was to correlate project success with maturity. Similarly, Labuschagne and Marnewick (2009:2-33) as well as Sonnekus and Labuschagne (2003: 3-25) attempted to determine the correlation between IT project success and the maturity of IT project management. All three studies (Sonnekus & Labuschagne, 2003: 3-25; Labuschagne & Marnewick, 2009: 2-33; Pretorius et al., 2012: 1-12) failed to determine any correlation between project success and project management maturity. The three studies come to the same

conclusion that an organisations project management capability is dependent on numerous factors. However, Labuschagne and Marnewick (2009: 33) concluded that the way in which success is defined must be clearly defined. This may suggest that when attempting to correlate maturity with project success that the criteria for success if more clearly defined may make finding the correlation easier. This was not the case in both the studies by Pretorius et al. (2012: 3) and Labuschagne and Marnewick (2009: 16) in which respondents were allowed to rate success based on their own perceptions.

Pretorius et al (2013: 3) did identify that project management success is largely dependent on four dimensions, namely:

I.   Skill and competency of the project manager

II.   Organisational structure

III.   Measurement systems

IV.   Management practices that represent an organisations culture

Literature reviewed by Pretorius (2012: 2-4) revealed the following contradicting theories which are supported by literature findings by Backlund (2014: 839-841) and Ofori and Deffor (2013: 41-47):

I.   That there seems to be a relationship between maturity and performance but that no statistical evidence exists to prove it

II.   A higher level of project management maturity does not necessarily guarantee success

III.   There is no correlation between the success of projects and the maturity level of an ICT organisation in South Africa

However, contrasting the above findings, the study by Pretorius et al. (2012: 4-10) which also tested the maturity of the nine knowledge areas within an organisation and its impact on project success. The results indicated that organisations with more mature integration management, scope management, time management, cost management and human resource management do produce more successful projects. The maturity of the quality management, communication management, risk management and procurement management knowledge areas was revealed to have no significant correlation to project success. The conclusion drawn was that the knowledge areas that contributed the most were the ones regarded as 'core

functions' whereas those that contributed the least were found to be more facilitating functions.

Table 3.4: IT Project Challenges

Rating	Reason for Success	Reason for Failure	Reason for Challenges
1	Project team	Communication infrastructure	Requirement definition
2	Understanding user needs	Requirement definition	Handling change
3	Communication infrastructure	User involvement infrastructure	Communication
4	Requirement definition	Executive support	User involvement

Source: Sonnekus and Labuschagne (2003: 11)

Table 3.4 represents the four most common reasons for projects succeeding, failing or being challenged as identified by survey responses collected by Sonnekus and Labuschagne (2003: 11). The Table indicates that most of the problems that were currently facing IT projects in South Africa were the softer issues. This finding is supported by that of Pretorius et al. (2012: 9-11).

Two other studies which help to highlight the benefits of maturity models are those of Jugdev and Thomas (2002: 4-14) and Mittermaier and Steyn (2009: 95-107). In 2002 Jugdev and Thomas conducted a study to assess pm maturity models using several resource-based views (RBV) to determine whether maturity models could be classified as a source of competitive advantage. The author's findings indicate that if organisations focus on the elements measured by maturity models that they may achieve competitive parity but not a sustained competitive advantage. These findings are further strengthened by research done by Wen and Qiang (2016:113-126) which confirmed that project management practices fall within the realm of organisational resources which are imitable and whose maturity may contribute to bringing an organisation on par with its competition but not necessarily provide them with a competitive advantage.

Mittermaier and Steyn (2009: 95-107) conducted a study to assess the level of project management maturity within South African mining and engineering organisations that were involved with the development of pilot plants. They observed that projects within the South African engineering and mining industry were not being implemented according to well documented principles and standards of good project

management (Mittermaier& Steyn. 2009: 98). This was resulting in situations whereby projects were being initiated based on poor estimates and unrealistic time schedules. Given that the engineering and mining industry attracted large capital investments for projects, it was necessary that the project maturity of organisations in those industries were aligned to the required levels that would result in more successful project delivery (Mittermaier& Steyn. 2009: 99). The study utilised the project management maturity model developed by Project Management Solutions, which assesses maturity based on the nine knowledge areas as defined by the PMBOK. The research approach was based on the Delphi technique, in which experts in various organisations defined the required level of maturity and then assessed the current level of maturity. The results of the survey indicated a significant difference between the current levels of maturity in eight of the nine knowledge areas.

3.8 The Limitations and Drivers of Project Management Maturity

It's important that organisations realise that pursuing maturity alone may not result in the desired increase in organisational project management capability or in project success (Ives, 2005: 37). Maturity assessments may help to pinpoint weak areas however the process of selecting and adopting the correct improvement initiatives is equally important (Fernandes, 2014: 81-108; Wen & Qiang, 2016:113-126).

For instance, Backlund et al. (2014: 837-838) conducted a study to investigate how and what benefits companies derived from the use of maturity models. The study was based on their findings that research into how organisations use the results of maturity models to improve their project management process performance is limited and unclear. The study by Backlund (2014: 837-846) is further supported by that of Mir and Pinnington (2014: 202-217) who has stated that despite the increase in the use of project management methodologies that very little quantifiable evidence exists to support its value.

Project management maturity has become espoused theory among practitioners, however there has been contradicting research which has indicated that project management maturity as it is assessed by many of the current maturity models may not be the only drivers of project success (Pretorius et al., 2012: 1-12; Labuschagne & Marnewick, 2009: 32; Sonnekus &Labuschagne, 2003: 9-25). Besner and Hobbs (2013: 20) found a correlation of only 14% between maturity and success a result

which does indicate that maturity contributes to success but again there are clearly other drivers of success. Certain studies have indicated that more investigation is needed into the application of maturity models and the assessment of maturity in different industries conducting various types of projects, which will help to broaden the view and understanding of this topic (Pasian, 2012: 154).

Backlund et al. (2014: 840) further goes on to identify some of the possible challenges with applying maturity models that were listed by Jugdev and Thomas (2002). Namely:

I. Given the subjective nature of measuring the maturity level makes it difficult to select a tool that has a history of being consistent in its application.

II. Maturity models are unable to measure the non-tangible or softer side of project management, which can also contribute to a more mature capability.

III. Lack of flexibility when managing change

IV. Problem areas are identified but not solved, after identifying the problem area the organisation will need to develop and implement their own strategies for solving them.

V. The levels of maturity do not provide sufficient detail to measure progress over time

Pasian (2012: 146-157) researched the use of project management maturity models to assess the project management capability within organisations that conducted projects that had goals which were undefined. The author's findings confirm some of the limitations of pm maturity models identified by Backlund et al. (2014: 840), namely that other aspects may contribute to an organisations pm capability which are not measured by conventional pm maturity models. Pasian's (2012: 150-155) research focused on e-learning projects which the author identified as being without defined goals. The results of this study found that the level of customer involvement, an organisations ability to adapt to changing cultures and circumstances, personal factors such as attitude and motivation of stakeholders and an organisations ability to develop processes unique to its project environment play a significant role in its project management capability. In depth interviews with highly successful project managers conducted by Konstantiou (2015: 21-35) corroborates some of Pasian's (2012: 150-155) findings. Namely that the situational knowledge that project managers gained within their organisations coupled with numerous discursive

abilities such as collaborating with colleagues and a strong focus on client needs, all aided in their personal success.

Pasian (2012: 150-155) also alluded to the important role that the context in which project management is practiced has and therefore it is only logical that it can have a strong influence on how maturity is assessed and advanced within that particular context. Organisations need to ensure that their approach to managing projects fits their particular context (Ives, 2005: 37-50).

For instance, Besner and Hobbs (2013: 17-34) researched the variation of pm practice within various contexts and in the process developed a construct called 'performing-maturity' which was found to be an effective means of identifying contextual variances as well as best practices. This construct measures four aspects namely: project management maturity, the amount of support an organisation provides for pm tools and practices, the presence of competent project personnel and each respondent's perception of project success. Interestingly research by Aubry (2015: 19-45) found that the supportive role of Project management offices and organisations have a direct positive impact on project management maturity. Thereby highlighting the relevance of including 'organisational support for pm tools and practices' within the 'performing maturity' construct developed by Besner and Hobbs (2013: 17-34). The study by Besner and Hobbs (2013:17-34) was able to identify a list of general project management practices and tools that were common within various contexts; however, the study also confirmed that there are practices that were more widely used in one context than in another. This seems to imply that maturity within a certain process as it is measured by many maturity models may have varying degrees of impact depending on the specific organisation or project context. Research by Wen and Qiang (2016: 113-126), supports the theory that the maturity assessment of an organisation is highly context specific. In their study they examined the role that organisational enablers had on the application of Organisational Project Management (OPM) within the Chinese context. Project, Program and Portfolio management are important means of ensuring that an organisation achieves its strategic goals and organisational enablers (OE) are the driving force that ensures that project, program and portfolio management are successfully applied (Wen & Qiang, 2016:113-126; PMI, 2013: 4-6).

Table 3.5: Organisational Enablers for Project Management

Categories of OE	OE per category
Standardised supporting factors	Standard project approval process
	Standard project manager appointment process
	Standard project planning baseline
	Standard management techniques
	Standard performance benchmarking and improvement process
	Technical specification guidance
	Corporate knowledge base
	Estimating templates and tools
Well defined responsibility system	Support and guidance from steering committee
	Strong project sponsorship
	Delegating enough authority to project managers
	Clearly defined lines of authority between project and functional managers
	Cleary defined responsibilities amongst team members
Mature organisation structure	Good cooperation amongst team members
	Access to technical resources from various functional groups
	Cooperation and support from functional groups
	Team involvement in problem solving
	Efficient system that allows team members to report to both functional and project managers

Source Wen and Qiang, (2016: 113-126)

A construct to identify the OE within the Chinese context was developed by Wen and Qiang (2016: 113-126) which grouped organisation enablers into 9 categories divided amongst project, program and portfolio management. Within project management there were three categories of organisational enablers as described in table 3.5 which lists each category and the associated enablers identified by Wen and Qiang (2016: 113-126). By examining the enablers in the above table, once can immediately notice the correlation with the construct developed by Besner and Hobbs (2013:17-34). In particular, the importance of an organisation having a good support structure for its project management seems to play a vital role in improving its capacity to successfully deliver projects.

3.9 Conclusion

The studies mentioned above all highlight that for an organisation to improve its ability to successfully deliver projects, a more holistic approach is needed, one which considers advancing maturity within project management processes, ensuring that the organisational environment is both conducive and supportive of pm as well as developing and retaining project talent (Fernandes,2014: 81-108).

CHAPTER 4: RESEARCH METHODOLOGY

4.1 Problem Statement

The adoption and maturation of project management tools within an Organisation is believed to contribute to an increased rate of project success.

However, there appears to be limited research on the relationship between the performance of project management and its effect on project success within the context of projects being executed by Municipalities.

This study therefore proposed to investigate the link between project management performance and project success within the Municipal environment. The results of which may assist in improving the rate of project success within Municipalities by identifying areas within the current project management practice that should be developed to increase capability.

4.2 Research Question

The research question which this study has attempted to answer is**:**

Does Project Management performance result in an increased rate of Project success for selected Municipalities in the Western Cape Province, South Africa?

4.3 Research objectives

I. Determine whether Project Management performance does result in an increase in project success within Municipalities in South Africa.

II. Identify areas within the current project management practice that Municipalities in South Africa should be focusing on to improve the rate of project success.

III. Contribute to knowledge on the link between project management maturity and success.

IV. Contribute to the knowledge on the value of Project Management Maturity Models

V. Contribute to the knowledge on Project Management Maturity within Municipalities in South Africa.

4.4 Variables

4.4.1 Independent variables

The independent variable in this study is Project Management performance which was represented by the level of project management maturity, the assistance of

project teams and project partnerships. Project teams and Partnerships are as two success factors identified through the literature review that contribute towards project performance. Project management maturity will represent the "hard skills" aspect of project management while the project staff variable as well as project partnerships and resources variable, which were both adopted from Mir and Pinnington (2014: 204), will represent the "softer skills" which are also believed to contribute to an organisations project management capability.

Figure 4.1: Project Management Performance Construct

Independent variable	
Project Management performance	• Project management maturity level
	• Project staff
	• Project management partnerships

Source: Authors Own Construction

4.4.2 Dependent variables

The dependent variables for this study was Project Success and was represented by five project success criteria. Due to the diverse and multi-dimensional nature of project success, it was therefore defined for the purpose of this study using a construct comprising several criteria (Ika, 2009). In a similar study conducted by Pretorius (2012: 1-12) respondents defined and identified success within their particular project environment. This was later identified by Pretorius (2012: 11) as a potential shortcoming of the study which failed to make any correlation between a projects outcome and the level of project maturity. The construct used to measure success was selected and based upon the re-organised success criteria developed by Mir and Pinnington (2014: 212-215) and was further adapted to best describe aspects of project success relevant to the Municipal environment.

Figure 4.2: Project Success Construct

Dependent Variable	
Project Success	• Completion of a project on time
	• Completion of a project within budget
	• Completion of a project to the required quality standard
	• Impact on the community
	• Impact on the long term benefits to the organisation

Source: Authors Own Construction

4.5 Delineation of study

The aim of this study is to provide further insights into the potential benefits Municipalities within South Africa may derive from maturing their project management capability and assist in pinpointing specific areas for improvement. However, there are certain limitation as described below which may limit the generalizability of the findings. Further research is therefore recommended to build upon the findings of this study. The following is a list of the possible limitations of this study:

I.   The study gathered responses from project managers within a single Department of a selected Municipality in the Western Cape Province, South Africa and therefore the results may not apply to all Municipalities in the Province or South Africa.

II. The project managers who participated in this study all execute projects within a certain technical field and therefore the results obtained may not be applicable to other technical fields.

4.6 Research strategy

The research strategy refers to the use of either qualitative or quantitative research methods (Burger, 2013: 162). In this study the Researcher utilised a mixed-methods approach which Cameron et al (2015: 90-104) regards as the "third methodological movement" and who emphasizes the benefits that a mixed approach has for research in project management. While the study has utilised both qualitative and quantitative techniques, the quantitative approach remains the dominant means of data collection with the qualitative approach allowing for a deeper insight into the factors which may be contributing to or hampering the achievement of project success. In addition, the qualitative aspect is envisaged to assist in the elimination of any unforeseen "nuisance variables" which may otherwise impact on the validity of the research. Another efficient way of controlling the effects of any nuisance variable is to identify them via a literature review of similar studies and purposively incorporate them into the proposed design (Welman et al, 2005:81). To this effect the researcher has therefore included "project staff" and "project management partnerships and resources" as additional independent variables.

4.7 Research design

4.7.1 Time dimension

This section describes the time period in which the research has taken place and the various activities. This study represents a cross-sectional study as all data was collected over a specific time frame (Burger, 2013: 165).

Figure 4.3: Research Schedule

Research activity	Duration/weeks									
	1	2	3	4	5	6	7	8	9	10
Pilot study	■	■								
Evaluate questionnaire			■							
Main study				■	■	■	■			
Data analysis								■	■	
Presentation of findings										■

Source: Authors Own Construction

In order to identify any unclear or ambiguous questions a pilot study was conducted over a two-week period where the questionnaire was administered to a controlled group of five respondents from the target population (Welman et al, 2005:148). The questionnaire was administered in the presence of the Researcher who was present to observe the length of time it took to complete the questionnaire and in some instances answer questions regarding difficulty that respondents may have encountered.

After the pilot study the research instrument was re-evaluated based on concerns raised over a lack of understanding of some the project management terminology. The questions were then reviewed and simplified so that their interpretation was easier for respondents, particularly those who may not have a background in project management. Throughout the process though the PMBOK was consulted to ensure that in the simplification of some of the questions that they're meaning was not lost. The revised questionnaire was then administered to 3 respondents with no formal training in project management, the results indicated a success in the new revision as all respondents reported no difficulty in understanding and completing any of the questions.

4.7.2 Target population

The target population consisted of 108 project managers within a selected Municipal Department in the Western Cape Province, South Africa.

4.7.3 Sampling techniques

We utilized non-probability sampling where the unit of analysis was self-selected (Welman et al, 2005:69). The names of project managers managing projects within the selected Municipal Department was obtained. This resulted in a list of 108 project managers who were then sent invitations to participate in the study by completing an electronic version of the questionnaire.

4.7.4 Data collection method

Data was collected by emailing respondents a copy of the questionnaire. Respondents were given a choice between completing a version on google forms or a controlled version available on MS Word.

4.7.5 Questionnaire design and selected Maturity Model Description

The questionnaire was split into four sections (refer to annexure 3). Section A gathered general biographical information starting with a screening question which asked whether respondents had ever managed a project within their organisation. This was done to ensure that data obtained reflected actual project activities performed by respondents while managing projects. Remaining questions in section A gathered data regarding the project manager's years of experience, level of project management training and their perception of the average size of project that they managed. qualification as well as contextual data relating to the organisation and projects being managed by the respondent. The purpose of this section was to allow for further analysis on how maturity varies with different project managers and projects.

Section B gathered data regarding the respondent's perception of project success. Using a 5 point Likert scale, respondents were asked to rate from strongly disagree to strongly agree with the associated question. Project success was measured across 5 criteria:

    I.   Completion of a project within time

    II.   Completion of a project within budget

    III.   Completion of a project to a high standard of quality

    IV.   Did the project satisfy the public's needs?

    V.   Was the project regarded as an Organizational success

Table 4.1: Maturity Level 1

Maturity Level 1:	Ad-hoc / no Processes
Processes	No established, standardised practices
Documentation	Loose and ad-hoc documentation
Management	Management is not aware of formal project management, how to implement it or the benefits it may have for the organisation. Project managers are not guided by an enterprise wide approach to managing projects
Metrics	Either not collected or is collected very informally

Source: Labuschagne and Marnewick (2008:39-40)

Table 4.2: Maturity Level 2

Maturity Level 2:	Basic processes and standards
Processes	Processes exist but are not considered an organisational standard and are applied at the discretion of the project manager
Documentation	Some documentation exists on basic processes
Management	Management supports the implementation of project management, with a very basic understanding of what pm entails. Compliance by project managers is not mandatory except for Larger high risk projects. The organisation is starting to realise the need to adopt project management and has started experimenting with basic tools/processes.
Metrics	Basic metrics to track cost, schedule and technical performance exist but collection of such information is not mandatory

Source: Labuschagne and Marnewick (2008:39-40)

Table 4.3: Maturity Level 3

Maturity Level 3: Organised Standards and Documented Processes	
Processes	Project management processes have been put in place and established as accepted organisational standards which are applied to all projects
Documentation	Guidelines exists for all processes
Management	Management has accepted the need for an organisation wide approach to managing projects and ensures that project managers receive training and are compliant
Metrics	Metrics are formally collected for each project

Source: Labuschagne and Marnewick (2008:39-40)

Table 4.4: Maturity Level 4

Maturity Level 4: Established Processes/ Best practices	
Processes	Project management processes, standards and supporting systems are integrated with other corporate processes and systems. The organisation has established best practices for certain project management processes.
Documentation	Processes and standards are documented to support using metrics to make project decisions
Management	Management understands its role in the project management process. There are different management styles and project management requirements for different projects. Organisation embraces project management and consistently applies pm tools and techniques.
Metrics	Efficiency and effectiveness metrics are used. All projects changes and issues are evaluated based upon metrics from cost estimates, baseline estimates, and earned value calculations.

Source: Labuschagne and Marnewick (2008:39-40)

Table 4.5: Maturity Level 5

Maturity Level 5: Optimised Processes and continuous improvement	
Processes	Project management processes are continuously being refined and adapted to the changing environment and organisations needs
Documentation	Lessons learned are regularly examined and used to improve project management processes, standards and documentation
Management	Management is focused not only on effectively managing projects but also on continuous improvement
Metrics	The metrics collected during project execution are used to understand the performance of a project and to assist in the making of organisational management decisions for the future. Knowledge management is a key focus.

Source: Labuschagne and Marnewick (2008:39-40)

Section C addressed project management maturity within the ten knowledge areas of the PMBOK (PMI,2013). The project management maturity model developed by Labuschagne and Marnewick (2008) was used. This model was chosen as it was based on the structure of several other maturity models as well as the PMBOK. The model plots maturity on 5 levels which include Level 1: Initial, Level 2: Repeatable, Level 3: Defined, Level 4: Managed and Level 5: Optimised. Tables 4.1 to 4.5 provides a detailed description on the state of project management within each level. In addition, this particular maturity model was also used by Pretorius (2012: 5) who used an earlier version developed by Sonnekus and Labuschagne (2003). This therefore further added to the reliability of the research tool.

Questions regarding the variables "project management staff" and "project management partnerships and resources" are addressed in section D. Respondents answers questions using the same Likert scale used in the project management maturity section of the survey. In addition, a qualitative dimension was introduced in section D of the questionnaire where respondents were given an open ended question that asked them to list any other factors which they feel hinder or contribute to the success of projects within their organisation.

Each of the points on the five point Likert scale used to measure maturity corresponds to one of the maturity levels as described in Tables 4.1 to 4.5. By calculating the average response per question it allowed us to determine the maturity level within each of the ten knowledge areas and collectively arrive at a maturity level for the entire organisation. Project management performance was further measured by averaging responses to questions on the 'project staff' and 'project partnerships' variable in Section D. Project success was then measured by averaging responses to each of the questions relating to project success. The scores for each success

factor is then correlated to the maturity level within each knowledge area to determine the relationship between the two variables.

The qualitative data was examined and grouped into themes that assisted the researcher in gaining a deeper insight into the variables impacting project success.

Table 4.6 Questionnaire Legend

Section	Question number	Variable
C	1.1 – 1.7	Project Integration Management
C	2.1 - 2.5	Scope management
C	3.1 – 3.5	Time management
C	4.1 – 4.3	Cost management
C	5.1 - 5.3	Quality management
C	6.1 - 6.6	Human resource management
C	7.1 - 7.3	Communications management
C	8.1 – 8.8	Risk Management
C	9.1 – 9.5	Procurement management
C	101 – 10.7	Stakeholder management
D	1	Project management staff
D	2	Partnerships

Source: Authors Own Construction

Table 4.6 provides a breakdown of each pm maturity question and the corresponding knowledge area it addresses, also indicated are the questions relating to the two critical success factors as well as the qualitative questions.

4.7.6 Data analysis

Data analysis describes the techniques and methods employed to analyse collected data and answer our research questions. Data was analysed using mainly deductive reasoning while an inductive approach was used to analyse data collected qualitatively (Burger, 2013: 166). In this study statistical analysis was done using SPSS software. The following section describes the measurements used to analyse the data and the measures used to ensure a high degree of reliability and validity throughout the study.

4.7.7 Reliability

Reliability in research refers to the uniformity, stability and dependability of the data collected. Data that has a high degree of reliability should possess qualities of repeatability and accuracy. When a test is repeated over two or more occasions and the data collected produces similar results then the test is regarded as having a high degree of repeatability which also implies a degree dependability. Another characteristic of reliability within research refers to whether the data obtained are true reflections of what the researcher was intending to measure. If there is a low

variance between responses it is an indication that the data collected has a high degree of accuracy (Burns & Burns, 2008: 411).

There are various statistical means of determining reliability that is based on the premise that a range of scores can be correlated to identify their association with a desired construct. In this study Cronbach's Alpha which is a means of determining internal consistency reliability, was used to determine whether items listed in the questionnaire are measuring their associated construct. For instance, questions C1.1 – C 1.7 are collectively intended to measure the maturity of the Project Integration knowledge area. Cronbach's Alpha was used to ensure that each question relates to the Project Integration knowledge area by measuring how the individual questions inter-correlate. The higher they inter-correlate or the less diverse the values obtained by answering those questions, then the higher the degree of internal reliability. Cronbach's Alpha was selected to determine internal reliability for this study based on its's popularity for measuring reliability within attitude scales and questionnaires. An alpha of 0.8 or higher is considered as highly desirable with 0.7 being the minimum level acceptable (Burns & Burns, 2008: 410 – 424).

4.7.8 Validity

While reliability addresses aspects of accuracy and dependability of data collected, validity addresses the question of whether a measuring instrument is measuring what we want it to measure. There are two types of validity which researchers need to consider, namely external and internal validity. External validity refers to the generalizability of findings extracted from a particular sample population with that of a population as a whole. Within external validity there are two aspects which need considering, population validity and ecological validity. Population validity referring to whether responses gathered can be regarded as representative of the larger population and ecological validity which refers to the generalizability of finding from a study to other contexts. Internal validity relates to the presence and control of any nuisance or unwanted variables which may impact the dependant variable. When a study has a high degree of internal validity then any association or changes to the dependant variable can be attributed to the independent variable. Internal validity can be affected by the lack of control of unwanted variables, poor design of the questionnaire or an oversight on the part of the researcher to detect any alternative explanations for causal relationships (Burns & Burns, 2008: 426 – 431).

This study analysed the relationship between project management maturity and project success within the context of a selected municipality. The sample population within the selected Municipality consisted of 108 project managers working within a particular Department. Municipalities generally consist of several Departments, each of whom execute projects within a particular technical field based on their line function. For instance, civil engineering projects, IT projects or environmental management projects. Although they all form part of the larger organisation, there may be differences in the project management tools and techniques applied to manage projects across the various departments. Therefore, the researcher felt by restricting data collection within a particular department it would provide a more accurate representation of PM Maturity and the association with the success factors more likely. This study is therefore externally valid within the chosen Department in the selected Municipality and further research should be undertaken to further generalise the findings. The maturity model and questionnaire are based on previous maturity models which aids in ensuring that the study maintained a high degree of construct validity.

4.7.9 Determining correlations

Determining the link between project management performance and project success was done by correlating the data received from both variables. Spearmans rank order correlation which is depicted as '*rho*' was chosen as the statistical method for determining the correlations and was computed using SPSS software. Correlation refers to the link or relationship between two or more variables with a common basis. Determining the correlations identifies the strength of the connection which is either positively, negatively or randomly correlated. The strength of the correlation is indicated by the size of the correlation coefficient. The closer the coefficient is to 1:00 then the greater the association. Levels of significance are calculated at both the 5% and 1% level. Lower levels of significance indicate a lower probability that the association is not a chance encounter and the greater confidence the researcher has that the association witnessed is statistically significant (Burns & Burns, 2008: 342-358)

4.7.10 Ethical considerations

The following measures were put into place to ensure that the research is conducted as ethically as possible:

I. The confidentiality of each respondent was maintained as the questionnaire does not ask for any personal details such as name or designation. This is also done to ensure that respondents feel comfortable to answer questions honestly.

II. The purpose of the research is explained to respondents in an opening paragraph at the start of the questionnaire.

III. The name of the organisation will be kept confidential.

IV. A letter from the target organisation was received granting permission to conduct the research.

CHAPTER 5 DATA ANALYSIS

5.1 Introduction

The questionnaire was distributed via email to 108 project managers working within a selected Municipal Department. Of the 108 questionnaires, 79 responses were received representing a 73% response rate. In an introductory paragraph on the questionnaire respondents are informed that their participation is part of a Master's qualification examining project management. They are also assured that their responses would remain strictly confidential. Respondents were therefore not required to provide their names or any other information which may compromise their anonymity. The researcher also felt that omitting this type of information may help in eliciting more honest responses and therefore aid the research's validity. Analysis of the data follows the structure of the questionnaire. Starting with an analysis of the biographical information of respondents. This is then followed by an analysis of how successful respondents felt that their projects were by examining outcomes of projects they had managed against the five project success criteria as identified through the literature review. Next is an analysis of the maturity level of each knowledge area and the organisations overall maturity level. Lastly correlations are analyzed between the maturity levels of each knowledge area, two project success factors and each of the project success criteria.

5.2 Biographical Data

Section A of the questionnaire asks respondents for general biographical information. Questions are aimed at confirming whether target respondents are indeed responsible for managing projects, their years of experience, level of training and the size of projects that they manage.

5.3 Number of Project Managers

Question A1 asked respondents to indicate yes or no as to whether they have ever been responsible for managing a project within the organization. All 79 respondents indicated yes.

5.4 Years of experience

Question A2 asked respondents to indicate their number of years' experience managing projects within the organization.

Figure 5.1: Respondents Project Management Experience
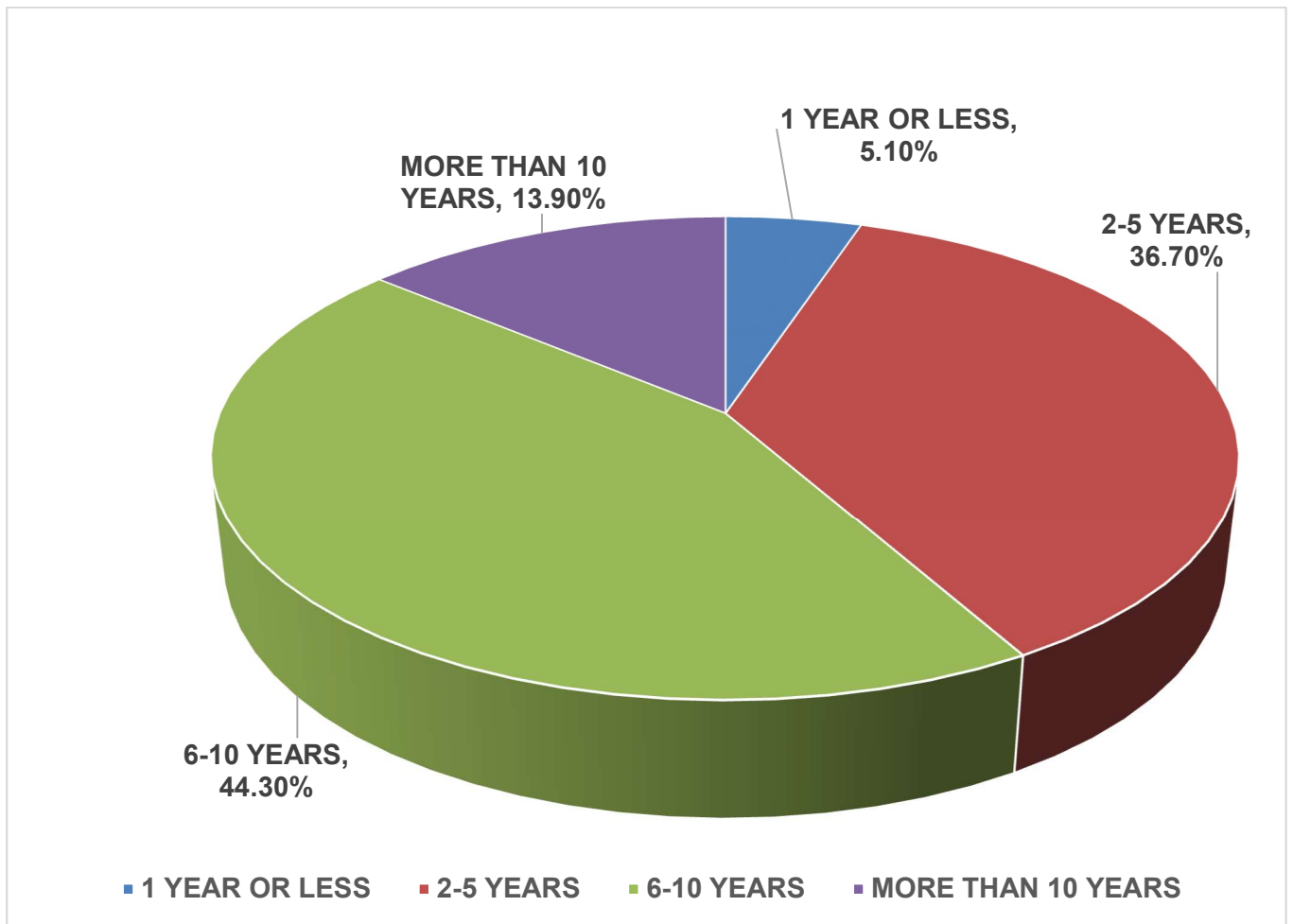
Source: Authors Own Construction

Data indicated that the majority of the Project Managers who responded had between 6-10 years' experience which accounted for 44.3%. This was followed by 35.7% who had 2-5 years' experience, 13,9% had more than 10 years and 5.1% had 1 year or less experience in managing projects.

Table 5.1: Data Analysis of Project Management Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 year or less	4	5.1	5.1	5.1
	2 - 5 years	29	36.7	36.7	41.8
	6 - 10 years	35	44.3	44.3	86.1
	More than 10 years	11	13.9	13.9	100.0
	Total	79	100.0	100.0	

Source: Authors Own Construction

5.5 Level of Project Management Training

Question A3 was aimed at determining the level of project management training that the respondents had

Figure 5.2: Level of Project Management Training.
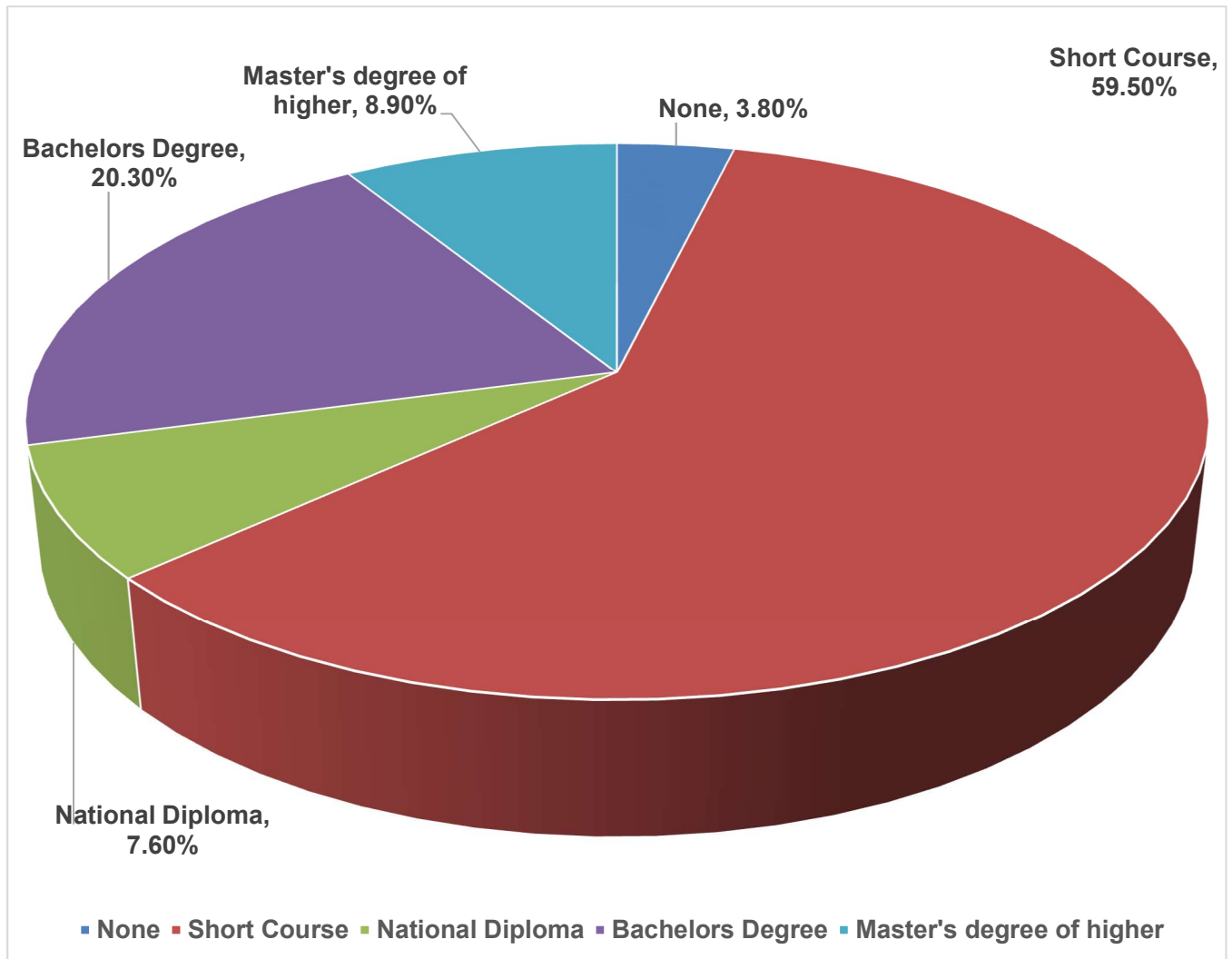
Source: Authors Own Construction

Table 5.2: Level of Project Management Training Data Analysis

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	3	3.8	3.8	3.8
	Short Course	47	59.5	59.5	63.3
	National Diploma	6	7.6	7.6	70.9
	Bachelor's Degree	16	20.3	20.3	91.1
	Master's Degree or Higher	7	8.9	8.9	100.0
	Total	79	100.0	100.0	

Source: Authors Own Construction

The data indicated that the majority of respondents had completed a short course in Project Management, this accounted for 59.5%. This was followed by 20.3% who had completed a bachelor's degree, 8.9% completed a Master's degree or higher, 7.6% had a national diploma and 3.8% had no project management training. Therefore, we can confirm that 96.3% of respondents have completed some form of formal project management training and are likely aware of many of the techniques that are evaluated in the maturity assessment.

5.6 Project Size

Question A4 asked respondents to tick what they regarded as the average size of projects that they had managed.

Figure 5.3: Project Size
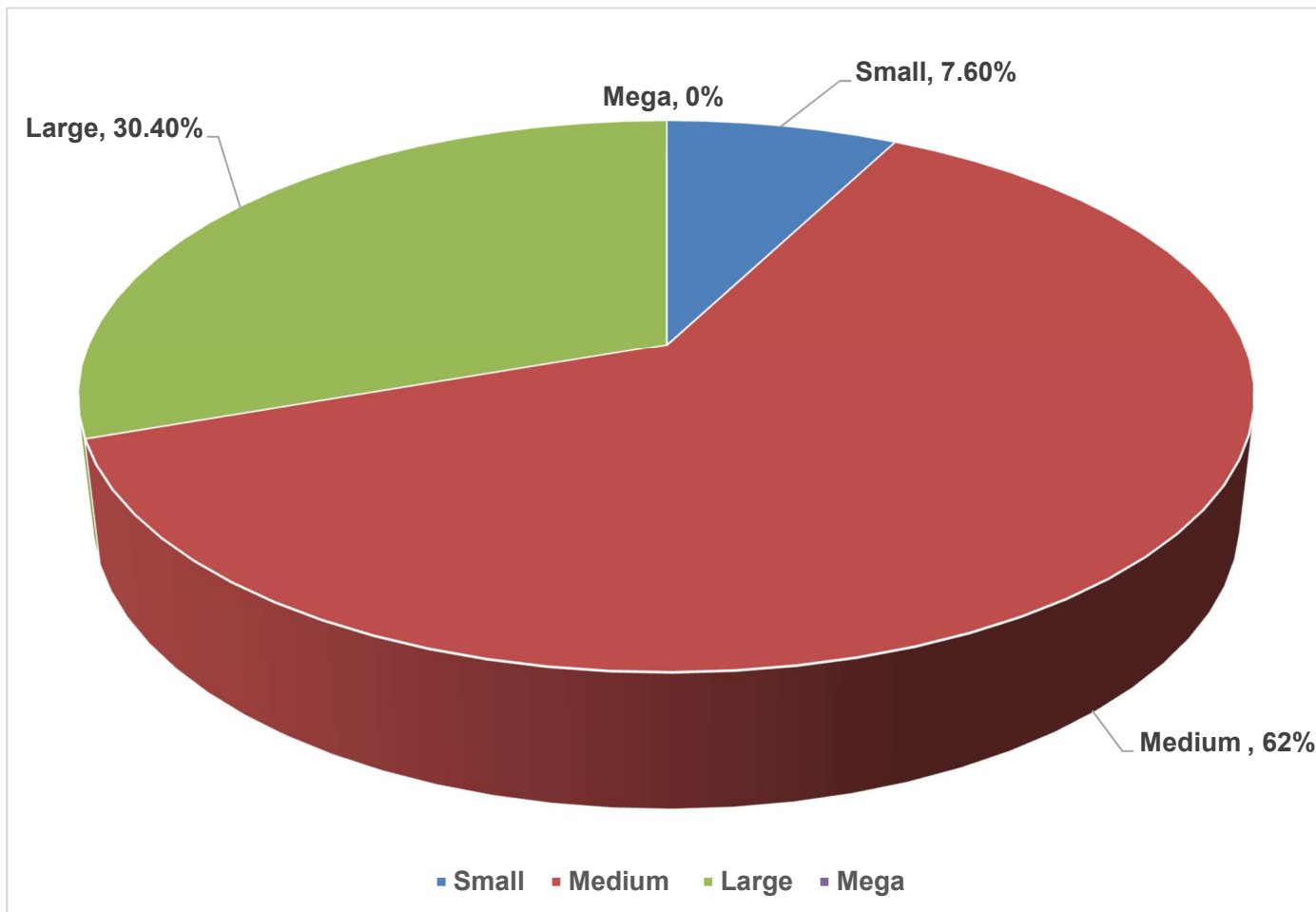
Source: Authors Own Construction

Table 5.3: Project Size Data Analysis

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Small	6	7.6	7.6	7.6
	Medium	49	62.0	62.0	69.6
	Large	24	30.4	30.4	100.0
	Total	79	100.0	100.0	

Source: Authors Own Construction

Respondents were able to choose between four options, namely small, medium, large and mega. 0% - mega projects The data indicated that the majority of projects were perceived as medium size according to the Project Managers, this had accounted for 62% while 30.4 % were regarded as large and 7.6% as small. None of the project managers perceived their projects to be mega in size.

5.7 Project Success

This section analysis data collected on the five success criteria. Respondents were asked in section B of the Questionnaire to reflect on the outcome of projects they had completed and indicate on a scale from strongly disagree to strongly agree with each of five statements.

Table 5.4: Project Success Data Analysis

	N	Minimum	Maximum	Mean	Std. Deviation
My projects were always completed on time.	79	2	5	4.24	.645
My projects were always completed within budget.	79	4	5	4.33	.473
My projects were always delivered to a high standard of quality.	79	3	5	4.01	.610
My projects satisfied the needs of the public.	79	3	5	4.16	.565
My projects are regarded as a success by my organisation.	79	3	5	4.22	.498

Source: Authors Own Construction

The data in table 5.4 indicated that respondents generally agreed with the statements in Section B of the questionnaire and regard their projects as successful as measured by the five criteria.

5.8 Project Management Maturity

The maturity level was calculated per knowledge area by averaging the response for each associated question of that particular knowledge area which is summarized in Figure 5.4. Cronbach's Alpha was used to determine reliability of each question with the desired construct. Minimum levels of acceptance were 0.7 with scores above 0.8 as being highly desirable. The Organization's overall maturity level was then calculated by averaging the maturity score for each knowledge area.

Figure 5.4: Project Management Maturity Levels
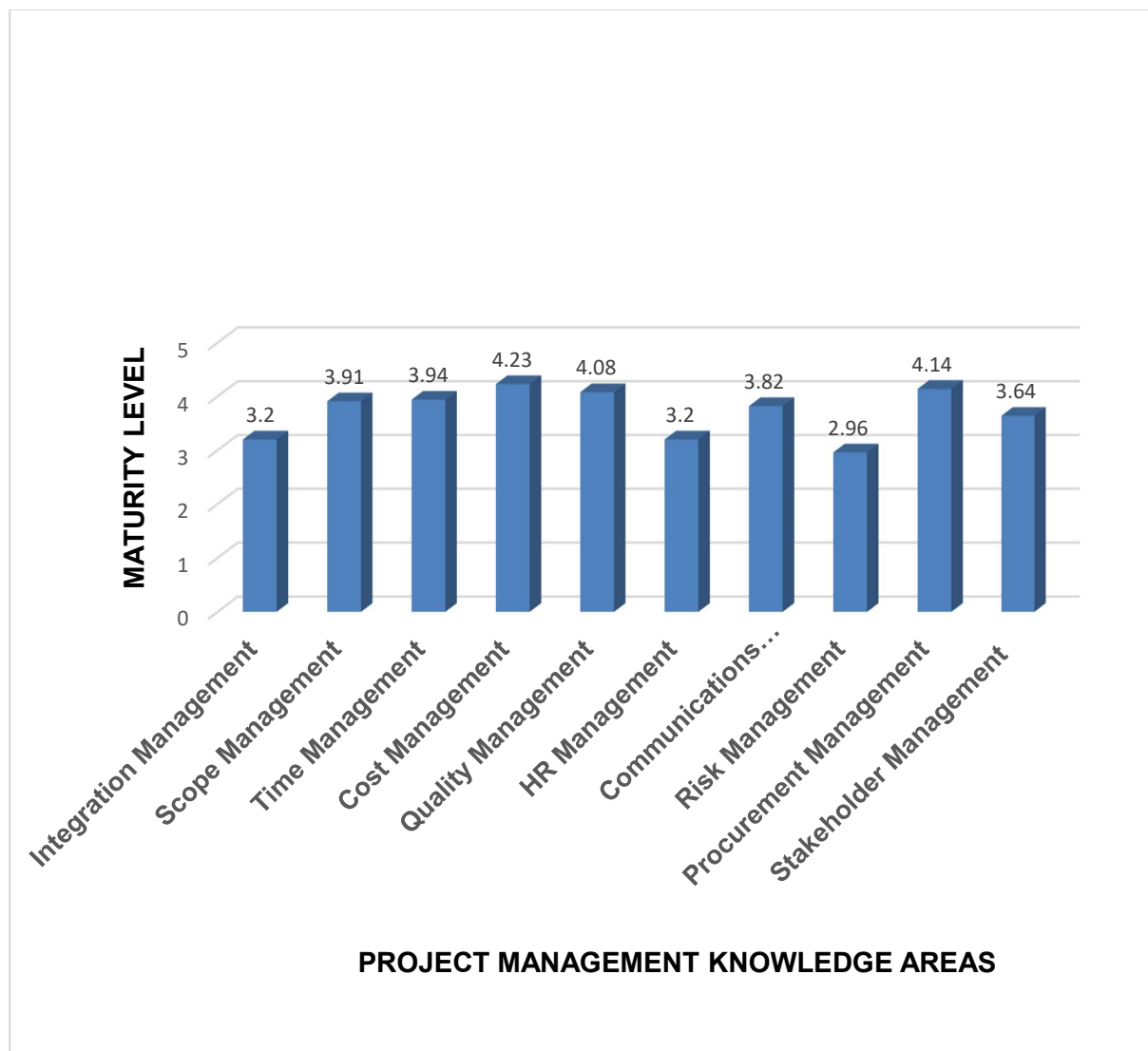
Source: Authors Own Construction

Figure 5.4 provides the maturity level for each of the knowledge areas.

Table 5.5: Data Analysis for Maturity Levels per PM Knowledge Area

Knowledge Areas	N	Min	Max	Mean	Std. Deviation
Project Integration Management	79	2	5	3.20	.859
Project Scope Management	79	3	5	3.91	.736
Project Time Management	79	2	5	3.94	.862
Project Cost Management	79	3	5	4.23	.693
Project Quality Management	79	1	5	4.08	.759
Project HR Management	79	0	5	3.20	1.124
Project Communications Management	79	0	5	3.82	1.096
Project Risk Management	79	0	5	2.96	1.170
Project Procurement Management	79	0	5	4.14	1.092
Project Stakeholder Management	79	2	5	3.64	.724
Valid N (list wise)	79				

Source: Authors Own Construction

5.8.1 Project Integration Management Maturity

Questions 1.1 – 1.7 in section C of the questionnaire address the maturity of processes within the Project Integration Management knowledge area.

Table 5.6: Project Integration Management's Cronbach Alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
.887	7

Source: Authors Own Construction

Table 5.7: Project Integration Management Cronbach Alpha per Question

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
C1.1	19.90	28.990	.596	.880
C1.2	18.96	25.499	.793	.856
C1.3	19.41	25.603	.785	.857
C1.4	19.30	25.214	.862	.847
C1.5	18.47	29.227	.713	.872
C1.6	19.68	26.886	.565	.888
C1.7	18.78	28.094	.528	.890

Source: Authors Own Construct

Table 5.6 and 5.7 display the reliability of the construct which was tested using Cronbach's Alpha. The item received a total score of 0.887 which is highly desirable and indicates that all questions relate to the target construct The maturity level of the Project Integration Management knowledge area is at 3.20 on the 5 leveled maturity scale. This level is described as the 'Defined' level and is an indication that the Organization has embraced the need for Project Integration Management and has documented processes and standards in place.

5.8.2 Project Scope Management Maturity

Questions 2.1 – 2.5 in section C of the questionnaire address the maturity of processes within the Project Scope Management knowledge area.

Table 5.8: Project Scope Management's Cronbach Alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
.853	5

Source: Authors Own Construction

Table 5.9: Project Scope Management Cronbach Alpha per question

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
C2.1	16.18	7.609	.613	.864
C2.2	15.71	8.619	.797	.789
C2.3	15.58	9.169	.720	.811
C2.4	15.27	9.864	.621	.835
C2.5	15.44	9.635	.702	.819

Source: Authors Own Construction

Table 5.8 and 5.9 indicated the reliability of the construct which was tested using Cronbach's Alpha. The item received a total score of 0.887 which is highly desirable and indicates that all questions relate to the target construct.
The maturity level of the Project Scope Management knowledge area is at 3.91 on the 5 leveled maturity scale. This indicates that the Organization is very close to the 4th level of maturity which is described as 'Managed'. The maturity level was determined by calculating the overall mean of all the associated questions.

5.8.3 Project Time Management Maturity

Questions 3.1-3.5 in section C of the questionnaire address the maturity of processes within the Project Time Management knowledge area.

Table 5.10 Project Time Management Cronbach Alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
0.904	5

Source Authors Own Construction

Table 5.11 Cronbach Alpha Questions C3.1 – C3.5

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
	Item-Total Statistics			
C 3.1	15.61	13.575	.754	.889
C 3.2	15.72	11.716	.871	.859
C 3.3	15.67	11.660	.811	.871
C 3.4	15.59	11.834	.826	.868
C 3.5	16.19	12.079	.608	.924

Source Authors Own Construction

Table 5.10 and 5.11 indicate the reliability of the construct which was tested using Cronbach's Alpha. The item received a total score of 0.887 which is highly desirable and indicates that all questions relate to the target construct.

The maturity level of the Project Time Management knowledge area is at 3.94 on the 5 leveled maturity scale. This indicates that the Organization is very close to the 4th level of maturity which is described as 'Managed'. The maturity level was determined by calculating the overall mean of all the associated questions.

5.8.4 Project Cost Management Maturity

Questions 4.1 - 4.3 in section C of the questionnaire address the maturity of processes within the Project Cost Management knowledge area.

Table 5.12 Project Cost Management Cronbach Alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
0.577	3

Source Authors Own Construction

Table 5.13 Cronbach Alpha Question C 4.1 – C 4.3

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
		Item-Total Statistics		
C 4.1	8.44	2.301	.542	.273
C 4.2	8.58	2.272	.440	.395
C 4.3	8.34	2.407	.229	.747

Source Authors Own Construction

Table 5.12 and 5.13 indicate the reliability of the construct which was tested using Cronbach's Alpha with a total score of 0.577 which is below the 0.7 limit of acceptability and therefore suggests that the three items do not measure the same construct.

The maturity level of the Project Cost Management knowledge area is at 4.23 on the 5 leveled maturity scale. This indicates that the Organization is at the 4th level of maturity which is described as 'Managed'.

5.8.5 Project Quality Management Maturity

Questions 5.1 - 5.3 in section C of the questionnaire address the maturity of processes within the Project Quality Management knowledge area.

Table 5.14 Project Quality Management Cronbach Alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
0.737	3

Source Authors Own Construction

Table 5.15 Cronbach Alpha Questions C 5.1 – C5.3

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
		Item-Total Statistics		
C 5.1	8.00	3.846	.347	.856
C 5.2	8.28	2.075	.647	.546
C 5.3	8.18	1.891	.776	.350

Source Authors Own Construction

Table 5.14 and 5.15 indicate the reliability of the construct which was tested using Cronbach's Alpha with a total score of 0.737 which is only slightly above 0.7 limit of acceptability.

The maturity level of the Project Quality Management knowledge area is at 4.09 on the 5 leveled maturity scale. This indicates that the Organization is at the 4th level of maturity which is described as 'Managed'. The maturity level was determined by calculating the overall mean of all the associated questions.

5.8.6 Project Human Resources Management Maturity

Questions 6.1 - 6.6 in section C of the questionnaire address the maturity of processes within the Project Human Resources Management knowledge area.

Table 5.16 Project Human Resources Management Cronbach Alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
.887	6

Source Authors Own Construction

Table 5.17 Cronbach Alpha Questions C 6.1 – C 6.5

	Item-Total Statistics			
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
C 6.1	15.13	31.881	.765	.857
C 6.2	16.32	34.399	.467	.908
C 6.3	16.46	32.226	.777	.856
C 6.4	16.46	32.405	.755	.859
C 6.5	16.18	30.660	.753	.858
C 6.5	15.48	32.073	.743	.861

Source Authors Own Construction

Table 5.16 and 5.17 indicate the reliability of the construct which was tested using Cronbach's Alpha with a total score of 0.887 which is highly desirable and indicates that all items relate to the desired construct. The maturity level of the Project Human Resources Management knowledge area is at 3.20 on the 5 leveled maturity scale. This indicates that the Organization is at the 3rd level of maturity which is described as 'defined'.

5.8.7 Project Communications Management Maturity

Questions 7.1 - 7.3 in section C of the questionnaire address the maturity of processes within the Project Communications Management knowledge area.

Table 5.18 Project Communication Management Cronbach Alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
.886	3

Source Authors Own Construction

Table 5.19 Cronbach Alpha Questions C 7.1 – C 7.3

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
	Item-Total Statistics			
C 7.1	7.67	5.377	.800	.825
C 7.2	7.54	4.918	.842	.782
C 7.3	7.72	4.947	.707	.910

Source Authors Own Construction

Table 5.18 and 5.19 indicate the reliability of the construct which was tested using Cronbach's Alpha with a total score of 0.886 which is highly desirable and indicates that all items relate to the desired construct. The maturity level of the Project Communications Management knowledge area is at 3.82 on the 5 leveled maturity scale. This indicates that the Organization is very close to the 4th level of maturity which is described as 'managed'. The maturity level was determined by calculating the overall mean of all the associated questions.

5.8.8 Project Risk Management Maturity

Questions 8.1 - 8.8 in section C of the questionnaire address the maturity of processes within the Project Risk Management knowledge area.

Table 5.20 Project Risk Management Cronbach Alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
.954	8

Source Authors Own Construction

Table 5.21 Cronbach Alpha Questions C 8.1 – C8.8

	Item-Total Statistics			
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
C 8.1	20.22	69.684	.724	.954
C 8.2	20.71	68.337	.823	.947
C 8.3	20.89	66.051	.917	.941
C 8.4	20.68	65.809	.926	.941
C 8.5	21.37	68.235	.753	.952
C 8.6	20.39	68.908	.753	.952
C 8.7	20.52	65.381	.939	.940
C 8.8	21.10	68.015	.784	.950

Source Authors Own Construction

Table 5.20 and 5.21 indicate the reliability of the construct which was tested using Cronbach's Alpha with a total score of 0.954 which is highly desirable and indicates that all items relate to the desired construct. The maturity level of Project Risk Management knowledge area is at 2.96 on the 5 leveled maturity scale. This indicates that the Organization is very close to the 3rd level of maturity which is described as 'defined'. The maturity level was determined by calculating the overall mean of all the associated questions.

5.8.9 Project Procurement Management Maturity

Questions 9.1 - 9.5 in section C of the questionnaire address the maturity of processes within the Project Procurement Management knowledge area.

Table 5.22 Project Procurement Management Cronbach Alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
.892	5

Source Authors Own Construction

Table 5.23 Cronbach Alpha Questions C 9.1 – C9.5

	Item-Total Statistics			
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
C 9.1	16.63	21.543	.573	.903
C 9.2	16.42	19.298	.857	.844
C 9.3	16.67	18.044	.750	.868
C 9.4	16.58	19.631	.690	.880
C 9.5	16.43	19.530	.853	.845

Source Authors Own Construction

Table 5.22 and 5.23 indicate the reliability of the construct which was tested using Cronbach's Alpha with a total score of 0.892 which is highly desirable and indicates that all items relate to the desired construct. The maturity level of Project Procurement Management knowledge area is at 4.14 on the 5 leveled maturity scale. This indicates that the Organization is at the 3th level of maturity which is described as 'managed'. The maturity level was determined by calculating the overall mean of all the associated questions.

5.8.10 Project Stakeholder Management Maturity

Questions 10.1 - 10.7 in section C of the questionnaire address the maturity of processes within the Project Stakeholder Management knowledge area.

Table 5.24 Project Stakeholder Management Cronbach Alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
.790	7

Source Authors Own Construction

Table 5.25 Cronbach Alpha Questions C 10.1 – C 10.7

	Item-Total Statistics			
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
C 10.1	22.59	19.090	.170	.913
C 10.2	21.87	17.702	.708	.724
C 10.3	21.56	19.968	.643	.747
C 10.4	21.86	18.993	.785	.724
C 10.5	21.65	19.514	.787	.729
C 10.6	21.70	20.086	.729	.740
C 10.7	21.58	21.375	.540	.766

Source Authors Own Construction

Table 5.24 and 5.25 indicate the reliability of the construct which was tested using Cronbach's Alpha with a total score of 0.790 which is highly desirable and indicates that all items relate to the desired construct. The maturity level of Project Stakeholder Management knowledge area is at 3.64 on the 5 leveled maturity scale. This indicates that the Organization is approximately mid-way between the 3rd and 4th level. The maturity level was determined by calculating the overall mean of all the associated questions.

5.9 Correlation between Project Management Maturity and project success.

5.9.1 Project Integration Management Maturity and Project Success

Table 5.26 indicates the correlations between Project Integration Management maturity and project success.

Table 5.26 Project Integration Management Maturity and Project Success Correlations

Project Success Criteria		Project Integration
My projects were always completed on time.	Correlation Coefficient	-.214
	Sig. (2-tailed)	.058
	N	79
My projects were always completed within budget.	Correlation Coefficient	-.223*
	Sig. (2-tailed)	.049
	N	79
My projects were always delivered to a high standard of quality.	Correlation Coefficient	.205
	Sig. (2-tailed)	.070
	N	79
My projects satisfied the needs of the public.	Correlation Coefficient	.599**
	Sig. (2-tailed)	.000
	N	79
My projects are regarded as a success by my organisation.	Correlation Coefficient	.549**
	Sig. (2-tailed)	.000
	N	79
Project Integration	Correlation Coefficient	1.000
	Sig. (2-tailed)	.
	N	79

Source Authors Own Construction

A Spearman *rho* of –0.214 was recorded between the maturity of Project Integration Management and the completion of projects on time. The is not significant due to the 0.58 significance level. Therefore, there is no statistically significant relationship between the maturity of Project Integration Management and the completion of a project on time.

A Spearman *rho* of –0.223 was recorded between the maturity of Project Integration Management and the completion of projects within budget. The is not significant due to the 0.49 significance level. Therefore, there is no statistically significant relationship between the maturity of Project Integration Management and the completion of a project within budget.

A Spearman *rho* of 0.205 was recorded between the maturity of Project Integration Management and the delivery of projects to a high standard of quality. The is not significant due to the 0.70 significance level. Therefore, there is no statistically significant relationship between the maturity of Project Integration Management and the completion of a project on time.

A Spearman *rho* of 0.599 was recorded between the maturity of Project Integration Management and whether projects are satisfying the needs of the public. The is significant due to the 0.000 significance level. Therefore, there is a moderate statistically significant relationship between the maturity of Project Integration Management and whether projects are satisfying the needs of the public.

A Spearman *rho* of 0.549 was recorded between the maturity of Project Integration Management and whether projects are regarded as a success by the organization. The is significant due to the 0.000 significance level. Therefore, there is a moderate statistically significant relationship between the maturity of Project Integration Management and the whether projects are regarded as a success by the organization

5.9.2 Project Scope Management Maturity and Project Success

Table 5.27 indicates the correlation between the Maturity of Project Scope Management and Project Success.

Table 5.27 Project Scope Management Maturity and Project Success Correlations

Project Success Criteria			Project Scope
	My projects were always completed on time.	Correlation Coefficient	-.201
		Sig. (2-tailed)	.076
		N	79
	My projects were always completed within budget.	Correlation Coefficient	-.215
		Sig. (2-tailed)	.057
		N	79
	My projects were always delivered to a high standard of quality.	Correlation Coefficient	.374**
		Sig. (2-tailed)	.001
		N	79
	My projects satisfied the needs of the public.	Correlation Coefficient	.755**
		Sig. (2-tailed)	.000
		N	79
	My projects are regarded as a success by my organisation.	Correlation Coefficient	.730**
		Sig. (2-tailed)	.000
		N	79
	Project Scope	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	79

Source: Authors Own Construction

A Spearman *rho* of –0.201 was recorded between the maturity of Project Scope Management and the completion of projects on time. This is not significant due to the 0.76 significance level. Therefore, there is no statistically significant relationship between the maturity of Project Scope Management and the completion of a project on time.

A Spearman *rho* of –0.215 was recorded between the maturity of Project Scope Management and the completion of projects within budget. This is not significant due to the 0.57 significance level. Therefore, there is no statistically significant relationship between the maturity of Project Scope Management and the completion of a project within budget.

A Spearman *rho* of 0.374 was recorded between the maturity of Project Scope Management and the delivery of projects to a high standard of quality. This is

significant due to the 0.001 significance level. The data indicates that there is a low correlation or weak relationship between the maturity of project scope Management and the delivery of a project to a high standard of quality. A Spearman *rho* of 0.755 was recorded between the maturity of Project Scope Management and whether projects are satisfying the needs of the public. This is significant due to the 0.000 significance level. Therefore, there is a high statistically significant correlation between the maturity of Project Scope Management and whether projects are satisfying the needs of the public. A Spearman *rho* of 0.730 was recorded between the maturity of Project Scope Management and whether projects are regarded as a success by the organization. This is significant due to the 0.000 significance level. Therefore, there is a high statistically significant correlation between the maturity of Project Scope Management and the whether projects are regarded as a success by the organization

5.9.3 Project Time Management and Project Success

Table 5.27 indicates the correlation between the Maturity of Project Scope Management and Project Success.

Table 5.28 Project Time Management Maturity and Project Success Correlations

Project Success Criteria			Project Time
	My projects were always completed on time.	Correlation Coefficient	-.324**
		Sig. (2-tailed)	.004
		N	79
	My projects were always completed within budget.	Correlation Coefficient	-.443**
		Sig. (2-tailed)	.000
		N	79
	My projects were always delivered to a high standard of quality.	Correlation Coefficient	.432**
		Sig. (2-tailed)	.000
		N	79
	My projects satisfied the needs of the public.	Correlation Coefficient	.648**
		Sig. (2-tailed)	.000
		N	79
	My projects are regarded as a success by my organisation.	Correlation Coefficient	.701**
		Sig. (2-tailed)	.000
		N	79

	Project Time	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	79

Source Authors Own Construction

A Spearman *rho* of – 0.324 was recorded between the maturity of Project Time Management and the completion of projects on time. This was significant at the 0.004 significance level. There is a low, negative relationship between the maturity of Project Time Management and the completion of a project on time. Which seems to indicate that as Project Time Management matures, the completion of a project on time decreases.

A Spearman *rho* of –0.443 was recorded between the maturity of Project Time Management and the completion of projects within budget. This is significant due to the 0.000 significance level. This indicated a moderate negative correlation between the maturity of Project Time Management and the completion of a project within budget. Which seems to indicate that as Project Time Management matures, the completion of projects on time decreases.

A Spearman *rho* of 0.432 was recorded between the maturity of Project Time Management and the delivery of projects to a high standard of quality. This was significant due to the 0.000 significance level. The data indicates that there is a moderate correlation between the maturity of Project Time Management and the delivery of a project to a high standard of quality.

A Spearman *rho* of 0.648 was recorded between the maturity of Project Time Management and whether projects are satisfying the needs of the public. This was significant due to the 0.000 significance level. There is a moderate statistically significant relationship between the maturity of Project Time Management and whether projects are satisfying the needs of the public.

A Spearman *rho* of 0.701 was recorded between the maturity of Project Time Management and whether projects are regarded as a success by the organization. This was significant due to the 0.000 significance level. There was a high correlation between the maturity of Project Scope Management and the whether projects are regarded as a success by the organization

5.9.4 Project Cost Management and Project Success

A Spearman *rho* of – 0.179 was recorded between the maturity of Project Cost Management and the completion of projects on time. The significance level was calculated at 0.114. There is therefore no statistically significant relationship between the maturity of Project Cost Management and the completion of a project on time. A Spearman *rho* of –0.259 was recorded between the maturity of Project Cost Management and the completion of projects within budget. This was significant at the 0.021 significance level. This indicated a low negative correlation between the maturity of Project Cost Management and the completion of a project within budget. A Spearman *rho* of 0.352 was recorded between the maturity of Project Cost Management and the delivery of projects to a high standard of quality. This was significant due to the 0.001 significance level. The data indicates that there is a low correlation between the maturity of Project Cost Management and the delivery of a project to a high standard of quality.

Table 5.29 Project Cost Management Maturity and Project Success Correlations

Project Success Criteria		Project Cost
My projects were always completed on time.	Correlation Coefficient	-.179
	Sig. (2-tailed)	.114
	N	79
My projects were always completed within budget.	Correlation Coefficient	-.259[*]
	Sig. (2-tailed)	.021
	N	79
My projects were always delivered to a high standard of quality.	Correlation Coefficient	.352[**]
	Sig. (2-tailed)	.001
	N	79
My projects satisfied the needs of the public.	Correlation Coefficient	.495[**]
	Sig. (2-tailed)	.000
	N	79

	My projects are regarded as a success by my organisation.	Correlation Coefficient	.655**
		Sig. (2-tailed)	.000
		N	79
	Project Cost	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	79

Source Authors Own Construction

A Spearman *rho* of 0.495 was recorded between the maturity of Project Cost Management and whether projects are satisfying the needs of the public. This was significant due to the 0.000 significance level. Data therefore indicates a moderate statistically significant relationship between the maturity of Project Cost Management and whether projects are satisfying the needs of the public.

A Spearman *rho* of 0.655 was recorded between the maturity of Project Cost Management and whether projects are regarded as a success by the organization. This was significant due to the 0.000 significance level. There was a moderate correlation between the maturity of Project Cost Management and the whether projects are regarded as a success by the organization

5.9.5 Project Quality Management and Project Success

A Spearman *rho* of – 0.142 was recorded between the maturity of Project Quality Management and the completion of projects on time. The significance level was calculated at 0.213. There is therefore no statistically significant relationship between the maturity of Project Quality Management and the completion of a project on time.

A Spearman *rho* of –0.233 was recorded between the maturity of Project Quality Management and the completion of projects within budget. This was significant at the 0.039 significance level. This indicated a low negative correlation between the maturity of Project Quality Management and the completion of a project within budget.

A Spearman *rho* of 0.245 was recorded between the maturity of Project Quality Management and the delivery of projects to a high standard of quality. This was significant at the 0.024 significance level. The data indicates that there is a low

correlation between the maturity of Project Quality Management and the delivery of a project to a high standard of quality.

A Spearman *rho* of 0.443 was recorded between the maturity of Project Quality Management and whether projects are satisfying the needs of the public. This was significant due to the 0.000 significance level. Data therefore indicates a moderate statistically significant relationship between the maturity of Project Quality Management and whether projects are satisfying the needs of the public.

A Spearman *rho* of 0.616 was recorded between the maturity of Project Quality Management and whether projects are regarded as a success by the organization. This was significant due to the 0.000 significance level. Data indicated a moderate correlation between the maturity of Project Quality Management and the whether projects are regarded as a success by the organization

Table 5.30 Project Quality Management Maturity and Project Success Correlations

Project Success Criteria			Project Quality
	My projects were always completed on time.	Correlation Coefficient	-.142
		Sig. (2-tailed)	.213
		N	79
	My projects were always completed within budget.	Correlation Coefficient	-.233*
		Sig. (2-tailed)	.039
		N	79
	My projects were always delivered to a high standard of quality.	Correlation Coefficient	.254*
		Sig. (2-tailed)	.024
		N	79
	My projects satisfied the needs of the public.	Correlation Coefficient	.443**
		Sig. (2-tailed)	.000
		N	79
	My projects are regarded as a success by my organisation.	Correlation Coefficient	.616**
		Sig. (2-tailed)	.000

	N		79
Project Quality	Correlation Coefficient		1.000
	Sig. (2-tailed)		.
	N		79

Source Authors Own Construction

5.9.6 Project Human Resources Management Maturity and Project Success

A Spearman *rho* of – 0.403 was recorded between the maturity of Project Human Resources Management and the completion of projects on time. The significance level was calculated at 0.000. There is therefore a moderate negative correlation between the maturity of Project Human Resources Management and the completion of a project on time. Which indicates that as Project Human Resources Management maturity increases that it negatively influences the ability of a project to complete on time.

A Spearman *rho* of –0.187 was recorded between the maturity of Project Human Resources Management and the completion of a project within budget. The significance level was recorded at 0.098 significance. The correlation is therefore so low as to be random with no statistical significance.

A Spearman *rho* of 0.394 was recorded between the maturity of Project Human Resources Management and the delivery of projects to a high standard of quality. This was significant at the 0.000 significance level. The data indicates that there is a low correlation between the maturity of Project Human Resources Management and the delivery of a project to a high standard of quality.

A Spearman *rho* of 0.258 was recorded between the maturity of Project Human Resources Management and whether projects are satisfying the needs of the public. This was significant at the 0.022 significance level. Data therefore indicates a low statistically significant relationship between the maturity of Project Human Resources Management and whether projects are satisfying the needs of the public.

A Spearman *rho* of 0.306 was recorded between the maturity of Project Human Resource Management and whether projects are regarded as a success by the organization. This was significant at the 0.006 significance level. Data indicated a low correlation between the maturity of Project Human Resources Management and the whether projects are regarded as a success by the organization

Table 5.31 Project HR Management Maturity and Project Success Correlations

	Project Success Criteria		Project HR
	My projects were always completed on time.	Correlation Coefficient	-.403**
		Sig. (2-tailed)	.000
		N	79
	My projects were always completed within budget.	Correlation Coefficient	-.187
		Sig. (2-tailed)	.098
		N	79
	My projects were always delivered to a high standard of quality.	Correlation Coefficient	.394**
		Sig. (2-tailed)	.000
		N	79
	My projects satisfied the needs of the public.	Correlation Coefficient	.258*
		Sig. (2-tailed)	.022
		N	79
	My projects are regarded as a success by my organisation.	Correlation Coefficient	.306**
		Sig. (2-tailed)	.006
		N	79
	Project HR	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	79

Source Authors Own Construction

5.9.7 Project Communications Management Maturity and Project Success

A Spearman *rho* of – 0.201 was recorded between the maturity of Project Communications Management and the completion of projects on time. The significance level was calculated at 0.076. There is therefore no statistically significant correlation between the maturity of Project Communications Management and the completion of a project on time.

A Spearman *rho* of –0.121 was recorded between the maturity of Project Communications Management and the completion of a project within budget. The significance level was recorded at 0.287 significance. The correlation is therefore so low as to be random with no statistical significance.

A Spearman *rho* of 0.028 was recorded between the maturity of Project Communications Management and the delivery of projects to a high standard of quality. The significance level was recorded at 0.803. Data therefore indicates no statistically significant relationship between the maturity of Project Communications Management and whether projects are delivered to a high standard of quality.

Table 5.32 Project Communications Management Maturity and Project Success Correlations

	Project Success Criteria		Project Communications
	My projects were always completed on time.	Correlation Coefficient	-.201
		Sig. (2-tailed)	.076
		N	79
	My projects were always completed within budget.	Correlation Coefficient	-.121
		Sig. (2-tailed)	.287
		N	79
	My projects were always delivered to a high standard of quality.	Correlation Coefficient	.028
		Sig. (2-tailed)	.803
		N	79
	My projects satisfied the needs of the public.	Correlation Coefficient	.323**
		Sig. (2-tailed)	.004
		N	79
	My projects are regarded as a success by my organisation.	Correlation Coefficient	.482**
		Sig. (2-tailed)	.000
		N	79
	Project Integration	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	79

Source Authors Own Construction

A Spearman *rho* of 0.323 was recorded between the maturity of Project Communications Management and whether projects are satisfying the needs of the public. The significance level was recorded at 0.004. Data therefore indicates a low significant relationship between the maturity of Project Communications Management and whether projects are satisfying the needs of the public.

A Spearman *rho* of 0.482 was recorded between the maturity of Project Communications Management and whether projects are regarded as a success by the organization. This was significant at the 0.000 significance level. Data indicated a moderate statistically significant correlation between the maturity of Project

Communications Management and the whether projects are regarded as a success by the organization

5.9.8 Project Risk Management Maturity and Project Success

A Spearman *rho* of – 0.382 was recorded between the maturity of Project Risk Management and the completion of projects on time. The significance level was calculated at 0.001. There is therefore a negative low, statistically significant correlation between the maturity of Project Risk Management and the completion of a project on time.

A Spearman *rho* of –0.304 was recorded between the maturity of Project Risk Management and the completion of a project within budget. The significance level was recorded at 0.007 significance. There is therefore a low negative correlation between the maturity of Project Risk Management and the completion of a project within budget.

A Spearman *rho* of 0.228 was recorded between the maturity of Project Risk Management and the delivery of projects to a high standard of quality. The significance level was recorded at 0.803. Data therefore indicates no statistically significant relationship between the maturity of Project Risk Management and whether projects are delivered to a high standard of quality.

A Spearman *rho* of 0.334 was recorded between the maturity of Project Risk Management and whether projects are satisfying the needs of the public. The significance level was recorded at 0.003. Data therefore indicates a low statistically significant relationship between the maturity of Project Risk Management and whether projects are satisfying the needs of the public.

A Spearman *rho* of 0.389 was recorded between the maturity of Project Risk Management and whether projects are regarded as a success by the organization. This was significant at the 0.000 significance level. Data indicated a low statistically significant correlation between the maturity of Project Risk Management and the whether projects are regarded as a success by the organization

Table 5.33 Project Risk Management Maturity and Project Success Correlations

	Project Success Criteria		Project Risk
	My projects were always completed on time.	Correlation Coefficient	-.382**
		Sig. (2-tailed)	.001
		N	79
	My projects were always completed within budget.	Correlation Coefficient	-.304**
		Sig. (2-tailed)	.007
		N	79
	My projects were always delivered to a high standard of quality.	Correlation Coefficient	.228*
		Sig. (2-tailed)	.044
		N	79
	My projects satisfied the needs of the public.	Correlation Coefficient	.334**
		Sig. (2-tailed)	.003
		N	79
	My projects are regarded as a success by my organisation.	Correlation Coefficient	.389**
		Sig. (2-tailed)	.000
		N	79
	Project Risk	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	79

Source Authors Own Construction

5.9.9 Project Procurement Management Maturity and Project Success

A Spearman *rho* of 0.130 was recorded between the maturity of Project Procurement Management and the completion of projects on time. The significance level was calculated at 0.253. The correlation was therefore so low as to random.

A Spearman *rho* of 0.143 was recorded between the maturity of Project Procurement Management and the completion of a project within budget. The significance level was recorded at 0.210 significance. The correlation was therefore so low as to random.

A Spearman *rho* of -0.041 was recorded between the maturity of Project Procurement Management and the delivery of projects to a high standard of quality. The significance level was recorded at 0.721. Data therefore indicates no statistically significant relationship between the maturity of Project Procurement Management and whether projects are delivered to a high standard of quality.

A Spearman *rho* of -0.009 was recorded between the maturity of Project Procurement Management and whether projects are satisfying the needs of the public. The significance level was recorded at 0.939. Data therefore indicates no

statistically significant relationship between the maturity of Project Procurement Management and whether projects are satisfying the needs of the public.

A Spearman *rho* of 0.223 was recorded between the maturity of Project Procurement Management and whether projects are regarded as a success by the organization. This was significant at the 0.048 significance level. Data indicated a low statistically significant correlation between the maturity of Project Procurement Management and the whether projects are regarded as a success by the organization

Table 5.34 Project Procurement Management Maturity and Project Success Correlations

Project Success Criteria		Project Procurement
My projects were always completed on time.	Correlation Coefficient	.130
	Sig. (2-tailed)	.253
	N	79
My projects were always completed within budget.	Correlation Coefficient	.143
	Sig. (2-tailed)	.210
	N	79
My projects were always delivered to a high standard of quality.	Correlation Coefficient	-.041
	Sig. (2-tailed)	.721
	N	79
My projects satisfied the needs of the public.	Correlation Coefficient	-.009
	Sig. (2-tailed)	.939
	N	79
My projects are regarded as a success by my organisation.	Correlation Coefficient	.223[*]
	Sig. (2-tailed)	.048
	N	79
Project Procurement	Correlation Coefficient	1.000
	Sig. (2-tailed)	.
	N	79

Source Authors Own Construction

5.9.10 Project Stakeholder Management Maturity and Project Success

A Spearman *rho* of -0.312 was recorded between the maturity of Project Stakeholder Management and the completion of projects on time. The significance level was calculated at 0.005. Data therefore indicates that there is a low negative correlation between the maturity of Project Stakeholder Management and the completion of a project on time.

A Spearman *rho* of -0.389 was recorded between the maturity of Project Stakeholder Management and the completion of a project within budget. The significance level

was recorded at 0.000 significance. Data therefore indicates that there is a low negative correlation between the maturity of Project Stakeholder Management and the completion of a project within budget.

A Spearman *rho* of 0.321 was recorded between the maturity of Project Stakeholder Management and the delivery of projects to a high standard of quality. The significance level was recorded at 0.004. Data therefore indicates a low statistically significant relationship between the maturity of Project Stakeholder Management and the completion of a project to a high standard of quality.

Table 5.35 Project Stakeholder Management Maturity and Project Success Correlations

	Project Success Criteria		Project Stakeholder
	My projects were always completed on time.	Correlation Coefficient	-.312**
		Sig. (2-tailed)	.005
		N	79
	My projects were always completed within budget.	Correlation Coefficient	-.389**
		Sig. (2-tailed)	.000
		N	79
	My projects were always delivered to a high standard of quality.	Correlation Coefficient	.321**
		Sig. (2-tailed)	.004
		N	79
	My projects satisfied the needs of the public.	Correlation Coefficient	.635**
		Sig. (2-tailed)	.000
		N	79
	My projects are regarded as a success by my organisation.	Correlation Coefficient	.769**
		Sig. (2-tailed)	.000
		N	79
	Project Procurement	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	79

Source Authors Own Construction

A Spearman *rho* of 0.635 was recorded between the maturity of Project Stakeholder Management and whether projects are satisfying the needs of the public. The significance level was recorded at 0.000. Data therefore indicates a moderate statistically significant relationship between the maturity of Project Stakeholder Management and whether projects are satisfying the needs of the public.

A Spearman *rho* of 0.769 was recorded between the maturity of Project Procurement Management and whether projects are regarded as a success by the organization. This was significant at the 0.000 significance level. Data indicated a high statistically significant correlation between the maturity of Project Stakeholder Management and whether projects are regarded as a success by the organization

5.10 Project Teams and Project success

The following data describes the impact that a Project Team has on the success of a project. The question firstly asked respondents whether they had a project team assisting them with their project. Of the 79 responses, only 50 answered yes or 63.3 percent. Respondents who answered yes were then asked to rate on a 5-point scale from strongly disagree to strongly agree that their team were important in ensuring that their project was a success. Answers were then correlated to the five project success criteria.

Table 5.36 Number of Respondents who had teams assist with their project

		Frequency	Percent
Valid	Yes	50	63.3
	No	29	36.7

Source Authors Own Construction

A Spearman *rho* of 0.059 was recorded between the Importance of Project Teams and the completion of a project on time. Data therefore indicates that there is no correlation between the importance of a project team and whether a project was completed on time.

A Spearman *rho* of -0.274 was recorded between the Importance of Project Teams and the completion of a project within budget. Data therefore indicates that there is no correlation between the importance of a project team and whether a project was completed within budget.

A Spearman *rho* of 0.064 was recorded between the Importance of Project Teams and the completion of a project to a high standard of quality. Data therefore indicates that there is no correlation between the importance of a project team and whether a project was completed to a high standard of quality.

A Spearman *rho* of 0.542 was recorded between the Importance of Project Teams and whether a project satisfies the needs of the public. This was significant at the

0.000 level. Data therefore indicates a moderate correlation between the importance of a project team and whether a project satisfies the needs of the public.

A Spearman *rho* of 0.624 was recorded between the Importance of Project Teams and whether the Organization regarded the project as a success. This was significant at the 0.000 level. Data therefore indicates a moderate correlation between the importance of a project team and whether the Organization regarded the project as a success.

Table 5.37 Correlations between Project Teams and Project Success

			If yes, would you agree that your team was important in ensuring that your project was a success?
Spearman's rho	My projects were always completed on time.	Correlation Coefficient	.059
		Sig. (2-tailed)	.683
		N	50
	My projects were always completed within budget.	Correlation Coefficient	-.274
		Sig. (2-tailed)	.054
		N	50
	My projects were always delivered to a high standard of quality.	Correlation Coefficient	.064
		Sig. (2-tailed)	.660
		N	50
	My projects satisfied the needs of the public.	Correlation Coefficient	.542**
		Sig. (2-tailed)	.000
		N	50
	My projects are regarded as a success by my organisation.	Correlation Coefficient	.624**
		Sig. (2-tailed)	.000
		N	50
		N	50

Source Authors Own Construction

5.11 Project Partnerships and Project success

The following data describes the impact that Project Partnerships have on the success of a project. Question D2 asked respondents whether they agreed that partnerships with role players and stakeholders were important in ensuring success.

Respondents answered by rating their response on a 5-point scale from strongly disagree to strongly agree. Answers were then correlated to the five project success criteria.

A Spearman *rho* of 0.033 was recorded between Project Partnerships and the completion of a project on time. Data therefore indicates that there is no correlation between project partnerships and whether a project was completed on time.

A Spearman *rho* of -0.195 was recorded between Project Partnerships and the completion of a project within budget. Data therefore indicates that there is no correlation between project partnerships and whether a project was completed within budget.

 A Spearman *rho* of -0.198 was recorded between Project Partnerships and the completion of a project to a high standard of quality. Data therefore indicates that there is no correlation between project partnerships and whether a project was completed to a high standard of quality.

A Spearman *rho* of 0.136 was recorded between Project Partnerships and whether a project satisfies the needs of the public. Data therefore indicates no correlation between the project partnerships and whether a project satisfies the needs of the public.

A Spearman *rho* of 0.358 was recorded between Project Partnerships and whether the Organization regarded the project as a success. This was significant at the 0.001 level. Data therefore indicates a low correlation between project partnerships and whether the Organization regarded the project as a success.

Table 5.38 Correlations between Project Partnerships and Project Success

			Would you agree that partnerships with role players and stakeholders during the project have been important in ensuring success?
Spearman's rho	My projects were always completed on time.	Correlation Coefficient	.033
		Sig. (2-tailed)	.774
		N	79
	My projects were always completed within budget.	Correlation Coefficient	-.195
		Sig. (2-tailed)	.084
		N	79
	My projects were always delivered to a high standard of quality.	Correlation Coefficient	-.198
		Sig. (2-tailed)	.080
		N	79
	My projects satisfied the needs of the public.	Correlation Coefficient	.136
		Sig. (2-tailed)	.233
		N	79
	My projects are regarded as a success by my organisation.	Correlation Coefficient	.358**
		Sig. (2-tailed)	.001
		N	79
		N	

Source Authors Own Construction

5.13 Qualitative Data Analysis

Section D, question 5 represents the qualitative aspect of the questionnaire and was inserted for the purpose of identifying any other aspects which may be hampering success other than the variables comprising the Project Management Performance construct. The question asks respondents to list up to 3 things which they felt the Organization could be doing to improve the success of their projects. The question was entirely optional and respondents were not required to answer. From the 79 completed questionnaires received only 4 responses to question 5 were received. Respondents stated the following which they felt would improve project success in their organization:

1. A list of project specifications and standards
2. Improved criteria for vendor selection
3. More efficient means of managing vendors who deliver poor quality service
4. Simplified procurement process
5. Availability of project management consultants
6. Better trained project managers

Points 1-4 on the above list all pertain to procurement management processes. Points 5 and 6 relate to the training level of project managers.

CHAPTER 6 SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

The main objective of this study was to determine whether there is in fact a link between the performance of project management and the delivery of successful projects within Municipalities in South Africa. In order to determine the link, the study's independent variable namely Project Management Performance was defined as the level of project management maturity, the assistance of a project team and the impact of effective project partnerships. The dependent variable was defined by five project success criteria, namely the completion of a project in time, within budget, to a high standard of quality, a projects ability to 'satisfy the publics needs' and to be regarded as an 'organizational success'. In the following section findings are presented, based on the data analysis on the relationships between the independent and dependent variables. These findings assisted in answering the main research question. This is then followed by a list of recommendations on how Municipalities can improve their rate of project success, recommendations for future research and a list of limitations of this study.

6.2 Findings and recommendations.

6.2.1 Project Integration Management Maturity and Project Success

Table 6.1 below provides a summary of the relationship between Project Integration Management and the Project Success variables.

Table 6.1 Relationship between Project Integration Management and Project Success

	Independent variable	Correlation strength	Dependent variable	
Project Management Performance	Project Integration Management maturity	None	Time	Project Success Criteria
		None	Budget	
		None	Quality	
		Moderate	Satisfy public needs	
		Moderate	Organizational success	

Source Authors Own Construction

No statistically significant relationship was found between the maturity of Project Integration Management and three of the success criteria. Interestingly these success criteria are the completion of a project within budget, time and to a high standard of quality all of which are regarded as the iron triangle within Project Management. A moderate relationship was however found between Project Integration Management maturity and whether projects satisfy the needs of the public and whether projects are regarded as a success by the organization. This can be regarded as a very positive outcome if we consider that Municipalities are not profit driven but instead are mandated to provide public service.

Therefore, based on data we can conclude that increasing Project Integration Management Maturity will result in an increase in the ability of a project to satisfy the needs of the public and to increase the chances that the project is regarded as an Organizational success.

6.2.2 Project Scope Management Maturity and Project Success

Table 6.2 below provides a summary of the relationship between Project Scope Management and the Project Success variables.

Table 6.2 Relationship between Project Scope Management and Project Success

	Independent variable	**Correlation strength**	**Dependent variable**	
Project Management Performance	**Project Scope Management maturity**	None	**Time**	**Project Success Criteria**
		None	**Budget**	
		Low	**Quality**	
		High	**Satisfy public needs**	
		High	**Organizational success**	

Source Authors Own Construction

No statistically significant relationship was found between the maturity of Project Scope Management and the completion of a project within budget and on time. There was a low correlation between Project Scope Management maturity and the delivery of a project to a high standard of quality. A substantial relationship was found between Project Scope Management maturity and whether projects satisfy the needs of the public and whether projects are regarded as a success by the organization. Since Project Scope Management involves defining what work is required to complete a project successfully, its therefore understandable that it would

have a strong link to satisfying user needs. The findings corroborate with the PMBOK (PMI, 2013: 105) definition of Project Scope Management.Pursuing Project Scope Management maturity therefore does impact achieving the quality standard of a project, result in an increased ability of the project to satisfy the needs of the public and for the project to be regarded as an organizational success.

6.2.3 Project Time Management Maturity and Project Success

Table 6.3 below provides a summary of the relationship between Project Time Management and the Project Success variables.

Table 6.3 Relationship between Project Time Management and Project Success

	Independent variable	Correlation strength	Dependent variable	
Project Management Performance	Project Time Management maturity	Low negative	Time	Project Success Criteria
		Moderate negative	Budget	
		Moderate	Quality	
		Moderate	Satisfy public needs	
		high	Organizational success	

Source Authors Own Construction

The maturity level of Project Time Management indicates that the Organization is close to level 4. Interestingly though the data indicates a negative relationship with the completion of a project on time. Data also indicates a negative relationship with the completion of a project within budget. A positive yet moderate correlation was found with the completion of a project to a high quality standard and with a projects ability to satisfy the needs of the public. A substantial relationship was found with B5. Data seems to suggest that there are other factors or processes responsible for the delivery of a project on time other than Project Time Management. This may be explained by the fact that within the Organization, projects are executed through the appointment of Contractors. Project Time Management may have a greater impact on the timely delivery of a project when exercised by the Contractors executing the actual project work. While the sample Municipal Department was found to have a high maturity level in Project Time Management, this could merely be as a result of a management requirement that Project Managers need to comply with. This may explain the high correlation found between Project Time Management Maturity and

success criteria B5, which relates to whether the Project Manager's Organization, views his/her project's as a success.

6.2.4 Project Cost Management Maturity and Project Success

Table 6.4 summarises the relationship between Project Cost Management and Project Success.

Table 6.4 Relationship between Project Cost Management and Project Success

	Independent variable	**Correlation strength**	**Dependent variable**	
Project Management Performance	**Project Cost Management maturity**	None	**Time**	**Project Success Criteria**
		Low negative	**Budget**	
		Low	**Quality**	
		Moderate	**Satisfy public needs**	
		Moderate	**Organizational success**	

Source Authors Own Construction

The low Cronbach Alpha of 0.577 indicates that not all items are measuring the desired Project Cost Management construct. The researcher therefore felt that all data related to the Project Cost Management and its relationship to project success should be discarded from the study.

6.2.5 Project Quality Management Maturity and Project Success

Table 6.5 below provides a summary of the relationship between Project Quality Management and the Project Success variables.

Table 6.5 Relationship between Project Quality Management and Project Success

	Independent variable	**Correlation strength**	**Dependent variable**	
Project Management Performance	**Project Quality Management maturity**	None	**Time**	**Project Success Criteria**
		Low negative	**Budget**	
		Low	**Quality**	
		Moderate	**Satisfy public needs**	
		Moderate	**Organizational success**	

Source Authors Own Construction

Data indicated no relationship between Project Quality Management maturity and the completion of a project on time, a very low negative correlation with the completion of a project within budget and surprisingly only a very weak relationship with the delivery of a project to a high standard of quality. A moderate positive correlation

was found with a projects ability to satisfy the needs of the public and a strong correlation was found with whether the Organization regarded projects as a success.

6.2.6 Project Human Resources Management Maturity and Project Success

Table 6.6 below provides a summary of the relationship between Project HR Management and the Project Success variables.

Table 6.6 Relationship between Project HR Management and Project Success

	Independent variable	Correlation strength	Dependent variable	
Project Management Performance	**Project HR Management maturity**	Moderate negative	**Time**	**Project Success Criteria**
		None	**Budget**	
		Low	**Quality**	
		Low	**Satisfy public needs**	
		Low	**Organizational success**	

Source Authors Own Construction

Data indicated a negative, low correlation between the maturity of Project Human Resources Management and the completion of a project on time. No correlation was found with the completion of a project within budget and weak correlations were found with the delivery of a project to a high standard of quality, whether project satisfy the needs of the public and whether the Organization views projects as a success. These findings indicate that there was no significant influence of the Maturity of Project Human Resources Management on any of the success criteria. This may be as a result on any of the following:

I. The low maturity level recorded

II. That Project Managers within the targeted Municipal Department are only part of the process of recruiting and do not have full control over who is appointed.

III. Implementation of most projects are done via an external service provider who delivers the actual project product or service and the project manager therefore doesn't control the actual resources working on the project.

6.2.7 Project Communications Management Maturity and Project Success

Table 6.7 below provides a summary of the relationship between Project Communications Management and the Project Success variables.

Table 6.7 Relationship between Project Communications Management and Project Success

	Independent variable	Correlation strength	Dependent variable	
Project Management Performance	Project Communications Management maturity	None	Time	Project Success Criteria
		None	Budget	
		None	Quality	
		Low	Satisfy public needs	
		Moderate	Organizational success	

Source Authors Own Construction

Data indicated that there is no statistically significant relationship between the maturity of Project Communications Management and the completion of a project within budget, time or to a high standard of quality. Low correlations were found with a projects ability to satisfy the needs of the public and moderate correlation was found with whether the organization viewed projects as successful.

6.2.8 Project Risk Management Maturity and Project Success

Table 6.8 below provides a summary of the relationship between Project Risk Management and the Project Success variables.

Table 6.8 Relationship between Project Risk Management and Project Success

	Independent variable	Correlation strength	Dependent variable	
Project Management Performance	Project Risk Management maturity	Low negative	Time	Project Success Criteria
		Low negative	Budget	
		None	Quality	
		Low	Satisfy public needs	
		Low	Organizational success	

Source Authors Own Construction

The maturity of Project Risk Management was found to be the lowest of all knowledge areas at 2.96. Data further indicated a negative correlation between the maturity of Project Risk Management and the completion of a project in time and within budget. Which seems to indicate that the more mature Risk Management is the more likely projects will not be complete within the specified budget or time. Low correlations were found with the completion of a project to a high standard of quality, whether projects

satisfy the needs of the public and whether the organization views the project as a success.

6.2.9 Project Procurement Management Maturity and Project Success

Table 6.9 below provides a summary of the relationship between Project Procurement Management and the Project Success variables.

Table 6.9 Relationship between Project Procurement Management and Project Success

	Independent variable	Correlation strength	Dependent variable	
Project Management Performance	**Project Procurement Management maturity**	None	**Time**	**Project Success Criteria**
		None	**Budget**	
		None	**Quality**	
		None	**Satisfy public needs**	
		Low	**Organizational success**	

Source Authors Own Construction

The maturity of Project Procurement Management was one of the highest recorded at 4.14. Despite this though there was no correlation found with four of the five success criteria. The only correlation found was a low correlation with whether the Organization viewed the project as successful. Procurement within the Municipal environment is highly regulated and high maturity found may simply indicate compliance on the part of Project Managers. This assumption is further supported by the only correlation found with whether the Organization views the project as a success.

6.2.10 Project Stakeholder Management Maturity and Project Success

Table 6.10 below provides a summary of the relationship between Project Stakeholder Management and the Project Success variables.

Table 6.10 Relationship between Project Stakeholder Management and Project Success

	Independent variable	Correlation strength	Dependent variable	
Project Management Performance	**Project Stakeholder Management maturity**	Low negative	**Time**	**Project Success Criteria**
		Low negative	**Budget**	
		Low	**Quality**	
		Moderate	**Satisfy public needs**	
		High	**Organizational success**	

Source Authors Own Construction

The maturity of Project Stakeholder Management is recorded at 3.64 which is mid-way between level 3 and level 4. Data on correlations indicate a negative relationship between the Maturity of Project Stakeholder Management and the completion of a project within budget and time. This seems understandable as one may expect that with greater stakeholder involvement and engagement that the completion date of a project could be effected. Furthermore, stakeholder's may cause scope changes which could impact a project's budget. A positive low correlation was found with the completion of a project to a high standard of quality. A moderate correlation was found with whether a project satisfies the needs of the public and a high correlation was found whether the Organization views the project as a success.

6.2.11 Project Teams and Project Success

Table 6.11 below provides a summary of the relationship between Project Teams and the Project Success variables.

Table 6.11 Relationship between Project Teams and Project Success

	Independent variable	Correlation strength	Dependent variable	
Project Management Performance	Project Teams	None	Time	Project Success Criteria
		None	Budget	
		None	Quality	
		Moderate	Satisfy public needs	
		Moderate	Organizational success	

Source Authors Own Construction

Data correlations reveal no correlation between the importance of a project team and whether a project is completed within time, budget or to a high standard of quality. Moderate correlations were however found with whether a project satisfied the needs of the public and if a project was regarded as a success by the organization.

6.2.12 Project Partnerships and Project Success

Table 6.12 below provides a summary of the relationship between Project Partnerships and the Project Success variables

Table 6.12 Relationship between Project Partnerships and Project Success

	Independent variable	Correlation strength	Dependent variable	
Project Management Performance	**Project Partnerships**	None	**Time**	**Project Success Criteria**
		None	**Budget**	
		None	**Quality**	
		None	**Satisfy public needs**	
		Low	**Organizational success**	

Source Authors Own Construction

Data revealed no correlation between Project Partnerships and four of the five success criteria. The only correlation found was a low correlation with whether the Organization regarded the project as a success.

6.2.13 Qualitative data

Data obtained qualitatively via an open ended question at the end of the survey support the data and findings relating to the maturity of project procurement management. Responses all supported the need for more efficient procurement processes. Our conclusion drawn based on findings for the maturation of project procurement management stated that while the maturity level was particularly high, that it may be as a result of mandated legal requirements but that there was no correlation with the first four success criteria. The organization should therefore focus on ensuring that while pursuing compliance with legal requirements that as a result efficiency of procurement processes is not lost. Procurement processes should better assist project manager's in overcoming any obstacles they may find. The qualitative data further emphasized the need for better training for project managers. This also supports our data obtained on the training level of respondents which indicated that 59.5% of the respondents had only completed short courses in project management.

6.3 Conclusion

The study successfully revealed that there is a relationship between some of project management performance variables and project success. However, the relationship does not appear to be as strong as would be expected as most of the positive correlations found were low to moderate, particularly with the completion of a project within time, budget and to a high standard of quality. This suggests that there are

other factors that contribute to achieving project success within municipalities in South Africa. These findings support that of a similar study by Besner and Hobbs (2013: 20) who only found a correlation of 14% between maturity and success. Other researches such as Ives (2005: 37) and Pasian (2012: 154) have also come to the conclusion that project management capability is not only reliant on matured processes. We therefore recommend that while the selected Municipality will derive some benefit from continuing to mature their project management practice, that they adopt a more holistic approach that also focuses on developing individual project manager competencies.

REFERENCES

1) Ambysoft. n.d. Examining the agile manifesto.
   http://www.ambysoft.com/essays/agileManifesto.html
   a. (16 July 2016).

2) Aubry, M., 2015. Project management office transformations: Direct and moderating effects that enhance performance and maturity. Project Management Journal, 46 (5): 19-45.

3) Backlund, F, Chroneer, D. And Sundqvist, E. 2014. Project management maturity models – a critical review, A case study within Swedish engineering and construction organisations. *Procedia Social and Behavioural Sciences*, 119: 837-846.

4) Belassi,W., Kondra, A.Z., and Tukel, A.I. 2007. New product development projects: The effects of organizational culture. Project Management Journal, 38(4): 12-24.

5) Berssaneti, F.T. and Carvalho, M.M. 2015. Identification of variables that impact project success in Brazilian companies. International Journal of Project Management, 33: 638-649.

6) Besner, C., Hobbs, B. 2006. The perceived value and potential contribution of project management practices to project success. *Project Management Journal*, 37(3): 37-48, August.

7) Besner, C. And Hobbs, B. 2008. Project management practice, generic or contextual: A reality check. Project Management Journal, 39(1): 16-33.

8) Besner, C., Hobbs, B. 2013. Contextualized project management: a cluster analysis of practices and best practices. *Project Management Journal*, 44(1): 17-34.

9) Brown, K.A. &Hyer, N.L. 2010.Managing Projects A Team-Based Approach. New York: McGraw-Hill/Irwin.

10) Burger, M. 2013. Project management in the built environment: the need for industry specific knowledge. Unpublished PhD thesis, University of the Free State, Bloemfontein.

11) Burke, R. 2010. Fundamentals of Project Management. Burke Publishing.

12) Burns, R.B & Burns, R.A. 2008. Business Research Methods and Statististics using SPSS. London: Sage Publications Ltd.

13) Cameron, R; Sankaran, S & Scales, J. 2015. Mixed methods use in project management research. Project Management Journal, 46(2): 90-104.

14) Cooke-Davies, T. 2002. The "real" success factors on projects. International Journal of Project Management, 20: 185-190.

15) Crawford, J.K. 2006. Optimizing Human Capital with a Strategic Project Office. Boca Raton, FL: Auerbach.

16) Crawford, J.K. 2006. The Project Management Maturity Model. Information Systems Management, 23(4):50-58.

17) Crawford, L. 2006. Developing Organizational Project Management Capability: Theory and Practice. Project Management Journal, 36 (3): 74-97.

18) Creasy, T. and Anantatmula, V.S. 2013. From every dimension – How personality traits and dimensions of project managers can conceptually affect project success. Project Management Journal, 44 (6): 36-51.

19) Cserhati, G. And Szabo, L. 2014.The relationship between success criteria and success factors in organisational event projects. International Journal of Project Management, 32: 613-624.

20) Du Plessis, Y. 2014. *Project management a behavioural perspective*. Cape Town. Pearson.

21) Eskerod, P. and Riis, E. 2009. Value creation by building an intraorganizational common frame of reference concerning project management. Project Management Journal, 40(3): 6-13.

22) Eskerod, P; Huemann, M; &Ringhofer, C. 2015. Stakeholder inclusiveness: enriching project management with general stakeholder theory. Project Management Journal, 46(6): 42-53.

23) Fernandes,G; Ward, S & Araujo, M. 2014. Developing a framework for embedding useful project management improvement initiatives in organisations. Project Management Journal, 45(8):81-108.

24) Firat, D.B. 2013. Program – project management, relations, commonalities, differences. *Proceedings of the 2013 Global Congress of the Project Management Institute*, New Orleans, 2013.

25) Grimes, S.M. 2004. A conceptual framework for implementing programs to program completion. *Proceeding of the 2004 Research Conference of the Project Management Institute*, London, 11-14 July 2004.

26) Haried, P. and Ramamurthy, K. 2009. Evaluating the success in international sourcing of information technology projects: the need for a relational client-vendor approach. Project Management Journal, 40 (3): 56-71.

27) Hilson, D. 2003. Assessing organisational project management capability. Journal of Facilities Management, 2(3): 298-311.

28) Ika, L.A. 2009. Project success as a topic in project management journals. Project Management Journal, 40(4): 6-19.

29) Ives, M. 2005. Identifying the contextual elements of project management within organisations and their impact on success. Project Management Journal, 36(1): 37-50.

30) Jayaram, J. andNarasimhan, R. 2007. The influence of new product development competitive capabilities on project performance. IEEE Transactions on Engineering Management, 54: 241-256.

31) Jensen, A. Thuesen, C. and Geraldi, J. 2016. The projectification of everything: Projects as a human condition. Project Management Journal, 47(3): 21-34.

32) Joslin, R. And Muller, R. 2015. Relationship between a project management methodology and project success in different project governance contexts. International Journal of Project Management, http://dx.doi.org./10.1016/j.ijproman.2015.03.005.

33) Jugdev, K. and Muller, R. 2005. A Retrospective Look at Our Evolving Understanding of Project Success. Project Management Journal, 36(4): 19-31.

34) Jugdev, K., Thomas, J. 2002. Project management maturity models: the silver bullets of competitive advantage, *Project Management Journal*, 33(4): 4-14.

35) Khang, D.B. and Moe, T.L. 2008. Success Criteria and Factors for International Development Projects: A Life-Cycle Based Framework. Project Management Journal, 39 (1): 72-84.

36) Kloppenborg, T.J. Tesch, D. and Manolis, C. 2014. Project success and executive sponsor behaviors: empirical life cycle stage investigations. Project Management Journal, 45 (1): 9-20.

37) Konstantinou, E. 2015. Professionalism in Project Management: Redefining the role of the project practitioner. Project Management Journal, 46(2): 21-35.

38) Kwak, Y. H. and Ibbs, C.W. 2000. Assessing Project Management Maturity. *Project Management Journal* 31(1): 32-43.

39) Kwak, Y. H. and Ibbs, C.W. 2002. Project Management Process Maturity (PM²) Model. *Journal of Management in Engineering, 18(3): 150-155.*

40) Labuschagne L. andMarnewick C. 2008. The Prosperous Report 2008: IT Project Management Maturity vs. Project Success in South Africa. Project Management South Africa (PMSA).

41) Levine, H.A. 1999. Project Portfolio Management: a song without words. PM Network, July.

42) Martinsulo, M. Hensman, N. Artto, K. Kujala, J. and Jaafari, A. 2006. Project-based management as an organizational innovation: drivers, changes and benefits of adopting project-based management. Project Management Journal 36(3): 87-97.

43) Millholland, C. and Kaarst-Brown, M. 2016. Leasons for IT Project Manager Efficacy: A review of the literature associated with project success. Project Management Journal, 47(5): 89-106.

44) Mir, F.A. and Pinnington, A.H. 2014.Exploring the value of project management: Linking Project Management Performance and Project Success. International Journal of Project Management, 32: 202-217.

45) Mittermaier, H.K., Steyn, H. 2009. Project management maturity: an assessment of maturity for developing pilot plants, *South African Journal of Industrial Engineering*, 20(1): 95-107, May.

46) Molloy, E., and Chetty, T. 2015. The rocky road to legacy: lessons from the 2010 FIFA world cup South Africa stadium program. Project Management Journal, 46(3): 88-107.

47) Morris, P. 2013. Reconstructing Project Management Reprised: A Knowledge Perspective. Project Management Journal, 44(5): 6-23.

48) Muller, R. Martinsuo, M. and Blomquist, T. 2008. Project Portfolio Control and Portfolio Management Performance in different contexts. Project Management Journal, 39(3): 28-42.

49) Mullaly, M. 2006. Longitudinal analysis of project management maturity. Project Management Journal, 36(3): 62-73.

50) Munns, A.K. and Bjeirmi, B.F. 1996. The role of project management in achieving project success. International Journal of Project Management, 14(2): 81-87.

51) Ofori, D. and Deffor, E.W. 2013.Assessing Project Management Maturity in Africa: A Ghanaian Perspective. International Journal of Business Administration, 46(6): 41-61.

52) Omar, Z. 2010. Roles, responsibilities and skills in program management. Proceedings of the 2010 Global conference of the Project Management Institute, Milan.

53) Pasian, B. Sankaran, S. and Boydell, S. 2012. Project management maturity: a critical analysis of existing and emergent factors, International Journal of Managing Projects in Business, 5(1): 146-157.

54) Pollack, J. and Adler, D. 2015. Does project management affect business productivity? Evidence from Australian small to medium enterprises. Project Management Journal, 45(6): 17-24.

55) Prabhakar, G.P. 2008. What is project success: A literature review. International Journal of Business and Management, 3(9): 3-10.

56) Project Management Institute, Inc. 2013. Guide to the Project Management Body of Knowledge, fifth ed. Pennsylvania: Project Management Institute, Inc.

57) Project Management Institute, Inc. 2014. Implementing organizational project management: A practice guide, Pennsylvania: Project Management Institute, Inc.

58) Project Management Institute, Inc. 2013. Organisational Project Management Maturity Model, Third ed. Pennsylvania: Project Management Institute, Inc.

59) Project Management Institute, Inc. 2013. The Standard for Program Management, Third ed. Pennsylvania. Project Management Institute, Inc.

60) Project Management Institute, Inc. 2013. The Standard for Portfolio Management, Third ed. Pennsylvania. Project Management Institute, Inc.

61) Pretorius, S. Steyn, H. and Jordaan, J.C. 2012. Project management maturity and project management success in the engineering and construction industries in Southern Africa, *South African Journal of Industrial Engineering*, 23(3): 1-12, November.

62) Project Management Institute, Inc. 2013. *A guide to the project management body of knowledge*. 5th ed. Pennsylvania: Project Management Institute, Inc.

63) Serrador, P. and Turner, R. 2015. The relationship between project success and project efficiency. Project Management Journal, 46(1): 30-39.

64) Sonnekus, R. and Labuschagne, L. 2003. The Prosperous Report 203: IT project management maturity versus project success in South Africa. Johannesburg: RAU Standard Bank Academy for Information Technology.

65) Steyn, H. Carruthers, M. du Plessis, Y. Kruger, D. Kuschke, B. Sparrius, A. van Eck, S. and Visser, K. 2012. Project Management A Multi-Disciplinary Apprroach, Third edition. Pretoria: FPM Publishing.

66) The Project Management Hut. n.d. *How program management differs from project management.* http://www.pmhut.com/how-program-management-differs-from-project-management (16 July 2016).

67) Thomas, J. and Mullaly, M. 2007. Understanding the value of project management: The first steps on an international investigation in search of value. Project Management Journal, 38 (3): 74-89.

68) Todorovic, M. LJ.,Petrovic, D.C., Mihic, M.M./ Obrodovic, V.LJ &Bushuyev, S.D. 2015. Project success analysis framework: A knowledge-based approach in project management. International Journal of Project Management, 33: 772-783.

69) Turner, J.R., Müller, R. 2005. The project manager's leadership style as a success factor on projects: a literature review. Project Management Journal, 36(1): 49-61.

70) Welman, C., Kruger, F. & Mitchell, B. 2005. Research methodology. 3rd ed. Cape Town: Oxford university press.

71) Wen, Q. and Qiang, M. 2016. Enablers for organizational project management in the Chinese context. Project Management Journal, 47(1): 113-126.

72) Williams, T. 2016. Identifying success factors in construction projects: a case study. Project Management Journal, 47(1): 97-112.

73) Yazici, H.J. 2009. The role of project management maturity and organizational culture in perceived performance. Project Management Journal, 40(3): 14-33.

74) Yimam, A.H. 2011. Project management maturity in the construction industry of developing countries (The case of Ethiopian contractors). Unpublished Master's thesis, University of Maryland, College Park.

Annexure 1 Ethical Clearance

P.O. Box 1906 • Bellville 7535 South Africa •Tel: +27 21 4603534 • Email: majamanin@cput.ac.za
Symphony Road Bellville 7535

Office of the Chairperson Research Ethics Committee	Faculty:	**BUSINESS AND MANAGEMENT SCIENCES**

At a meeting of the Research Ethics Committee on 27 February 2017, Ethics Approval

was granted to DINESH ISAACS (200702270) for research activities

Related to the MTech/DTech: Mtech Business Administration in Project Management at the Cape

Peninsula University of Technology

Title of dissertation/thesis/project:	AN EVALUATION OF PROJECT MANAGEMENT MATURITY WITHIN SELECTED MUNICIPALITIES IN THE WESTERN CAPE PROVINCE, SOUTH AFRICA Lead Researcher/Supervisor: Dr LE Jowah

Comments:

Decision: APPROVED

	31 MARCH 2017
Signed: Chairperson: Research Ethics Committee	Date

Clearance Certificate No | 2017FBREC430

Annexure 2 Employers letter of permission

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

CITY MANAGER

LUCINDA CARSTENS
OFFICE ADMINISTRATION MANAGER

T: 0214005011
E: lucinda.carstens@capetown.gov.za
HO: 2/8/7   Ref: crr37529

2015-11-23

Achmat Ebrahim
City Manager

Dear Mr Ebrahim,

REQUEST FOR PERMISSION TO CONDUCT RESEARCH – DINESH ISAACS

The above request refers.
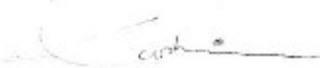
Dinesh Isaacs, staff number 10040539, employed in City Parks, has applied to do research for his Master of Technology in Business Administration (Specialisation – Project Management) at the Cape Peninsula University of Technology on the City of Cape Town (Annexure 1).

The request was referred to Mr Keith Smith: Director Strategic Development Information for attention and comments to you. Please see the attached email in this regard (Annexure 2).
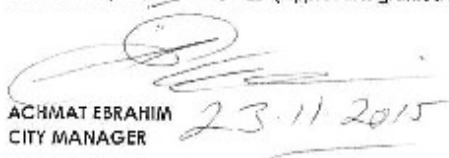
In this regard, it has been recommended that the City Manager approves the request to conduct the research subject to the following:-

1. Participation by any CCT officials, is on a voluntary basis and at the discretion of the staff member as they feel able to respond/participate.

2. The name of the City of Cape Town is not mentioned or used.

3. Mr Isaacs clearly stating in his thesis that it is prepared in his personal capacity and does not reflect the views of his employer (which is to remain nameless).

4. A copy of the final completed thesis being sent to the Manager: Capital Program Monitoring and Support (Rade Boskovic) and Director: Development Information & GIS (Keith Smith).

The above comments are supported by Mr Craig Kesson: Director: Strategy and Operations as per the attached email (Annexure 3)

LUCINDA CARSTENS
OFFICE ADMINISTRATION MANAGER

APPROVED/ NOT APPROVED (Approval is granted subject to the recommendations above being adhered to)

ACHMAT EBRAHIM   23.11.2015
CITY MANAGER

CIVIC CENTRE   IZIKO LOLUNTU   BURGERSENTRUM
12 HERTZOG BOULEVARD CAPE TOWN 8001 P O BOX 298 CAPE TOWN 8000
www.capetown.gov.za

Making progress possible. Together.

Questionnaire

An evaluation of project management maturity within municipalities in the Western Cape Province, South Africa

Dear Respondent

The aim of this questionnaire is to examine how developed project management is within this Municipality. Please note that this is entirely an academic exercise for the fulfilment of a Masters qualification. Your identity and responses will remain completely anonymous.

Section A: Biography

1. Have you ever been responsible for managing a project within the City?

Yes ☐	No ☐
1	2

2. How much experience do you have managing projects within the City?

1 year or less☐	2-5 years ☐	6-10 years ☐	more than 10 years ☐
1	2	3	4

3. What sort of project management training have you had?

none☐	short course☐	national diploma ☐	bachelor's degree ☐	Master's degree or higher ☐	other ☐
1	2	3	4	5	6

If other please specify Click here to enter text.

4. What would you classify the average size of your projects as?

small ☐	medium☐	large☐	mega☐
1	2	3	4

Section B

By reflecting on the outcome of projects that you completed, please answer the following questions by indicating how strongly you agree or disagree with each statement. Please click in the appropriate box.	strongly disagree	disagree	indifferent	agree	strongly agree
1.	My projects were always completed on time.	1☐	2☐	3☐	4☐	5☐
2.	My projects were always completed within budget.	1☐	2☐	3☐	4☐	5☐
3.	My projects were always delivered to a high standard of quality.	1☐	2☐	3☐	4☐	5☐

		Not at all	Sometimes	Most of the time	Almost always	repeatedly
4.	My projects satisfied the needs of the public.	1☐	2☐	3☐	4☐	5☐
5.	My projects are regarded as a success by my organisation.	1☐	2☐	3☐	4☐	5☐

Section C The following section seeks to gather information on the type of activities you perform when managing your projects. **<u>Please tick the appropriate box.</u>**		Not at all	Sometimes	Most of the time	Almost always	repeatedly
1.1	Do you create project charter for your project?	1☐	2☐	3☐	4☐	5☐
1.2	Do you consult with stakeholders to develop a project scope statement?	1☐	2☐	3☐	4☐	5☐
1.3	Do you create a detailed project management plan?	1☐	2☐	3☐	4☐	5☐
1.4	Do you carry out work according to a project management plan?	1☐	2☐	3☐	4☐	5☐
1.5	Do you oversee project work in order to meet the performance objectives?	1☐	2☐	3☐	4☐	5☐
1.6	Do you ensure that all changes requested on your project are addressed by following a change request process?	1☐	2☐	3☐	4☐	5☐
1.7	Do you formally close the project by finalizing all project activities?	1☐	2☐	3☐	4☐	5☐
2.1	Do you follow a set process for determining how the project scope of work is identified, defined, verified and controlled?	1☐	2☐	3☐	4☐	5☐
2.2	Do you ensure that all stakeholder needs are addressed in the project?	1☐	2☐	3☐	4☐	5☐
2.3	Do you develop a detailed description of your project?	1☐	2☐	3☐	4☐	5☐
2.4	Do you monitor and control the project to ensure that what is delivered meets the scope of work?	1☐	2☐	3☐	4☐	5☐
2.5	Do you ensure that the completed project is accepted by the stakeholder/s?	1☐	2☐	3☐	4☐	5☐
3.1	Do you list all the activities that need to be performed?	1☐	2☐	3☐	4☐	5☐
3.2	Do you identify the sequence of all the project activities?	1☐	2☐	3☐	4☐	5☐
3.3	Do you estimate the duration of each activity?	1☐	2☐	3☐	4☐	5☐

3.4	Do you identify all the resources you need to complete the project?	1☐	2☐	3☐	4☐	5☐
3.5	Do you create a project schedule?	1☐	2☐	3☐	4☐	5☐
4.1	Do you estimate all the costs needed to complete your project?	1☐	2☐	3☐	4☐	5☐
4.2	Do you develop a detailed budget?	1☐	2☐	3☐	4☐	5☐
4.3	Do you monitor expenses during the project?	1☐	2☐	3☐	4☐	5☐
5.1	Do you define the quality standards relevant to the project?	1☐	2☐	3☐	4☐	5☐

Please tick the appropriate box.		Not at all	Sometimes	Most of the time	Almost always	repeatedly
5.2	Do you evaluate project performance against your quality standard?	1☐	2☐	3☐	4☐	5☐
5.3	Do you apply control measures to correct instances of poor quality?	1☐	2☐	3☐	4☐	5☐
6.1	Do you identify all the skills you require on the project?	1☐	2☐	3☐	4☐	5☐
6.2	Do you follow a recruitment process for project staff?	1☐	2☐	3☐	4☐	5☐
6.3	Do you build individual skills to enhance project performance?	1☐	2☐	3☐	4☐	5☐
6.4	Do you build group skills to enhance project performance?	1☐	2☐	3☐	4☐	5☐
6.5	Do you track team member performance?	1☐	2☐	3☐	4☐	5☐
6.6	Do you address incidents of poor performance of project staff?	1☐	2☐	3☐	4☐	5☐
7.1	Do you determine what project information your stakeholders will need?	1☐	2☐	3☐	4☐	5☐
7.2	Do you make information available to stakeholders in a timely manner?	1☐	2☐	3☐	4☐	5☐
7.3	Do you distribute progress reports?	1☐	2☐	3☐	4☐	5☐
8.1	Do you determine which risks are likely to affect a project?	1☐	2☐	3☐	4☐	5☐
8.2	Do you document the details of each risk?	1☐	2☐	3☐	4☐	5☐

8.3	Do you prioritise risks based on their probability of occurring?	1☐	2☐	3☐	4☐	5☐
8.4	Do you prioritise risks based on their impact?	1☐	2☐	3☐	4☐	5☐
8.5	Do you numerically estimate the effects of risks on project objectives?	1☐	2☐	3☐	4☐	5☐
8.6	Do you take steps to reduce threats to meeting project objectives?	1☐	2☐	3☐	4☐	5☐
8.7	Do you monitor risks and their likelihood of occurring throughout the project?	1☐	2☐	3☐	4☐	5☐
8.8	Do you carry out risk response plans?	1☐	2☐	3☐	4☐	5☐
9.1	Do you plan how you will purchase various resources for your project?	1☐	2☐	3☐	4☐	5☐
9.2	Do you request proposals/bids/quotations from potential suppliers?	1☐	2☐	3☐	4☐	5☐
9.3	Do you select potential suppliers based on a system of criteria?	1☐	2☐	3☐	4☐	5☐
9.4	Do you use a detailed contract to manage the relationship with the supplier?	1☐	2☐	3☐	4☐	5☐
9.5	Do you complete and settle each contract on completion of the work?	1☐	2☐	3☐	4☐	5☐
10.1	Do you identify and list all the project stakeholders?	1☐	2☐	3☐	4☐	5☐
Please tick the appropriate box.		Not at all	Sometimes	Most of the time	Almost always	repeatedly
10.2	Do you identify and analyse the needs and expectations of all stakeholders?	1☐	2☐	3☐	4☐	5☐
10.3	Do you ensure that stakeholder needs and expectations are being met by the project?	1☐	2☐	3☐	4☐	5☐
10.4	Do you develop strategies to effectively engage stakeholders?	1☐	2☐	3☐	4☐	5☐
10.5	Do you ensure continuous communication with stakeholders?	1☐	2☐	3☐	4☐	5☐
10.6	Do you ensure that conflict with or between stakeholders is managed constructively?	1☐	2☐	3☐	4☐	5☐

10.7	Do you ensure that stakeholder satisfaction is a key priority?	1☐	2☐	3☐	4☐	5☐

Section D

1A Have you had a project team assisting you with your project?

YES☐	NO☐
1	2

1B If yes, would you agree that your team was important in ensuring that your project was a success?

Strongly disagree	disagree	indifferent	agree	strongly agree
1☐	2☐	3☐	4☐	5☐

2 Would you agree that partnerships with role players and stakeholders during the project have been important in ensuring success?

Strongly disagree	disagree	indifferent	agree	strongly agree
1☐	2☐	3☐	4☐	5☐

5.	List up to 3 things which you feel the City could be doing to improve the success of projects.
1.	Click here to enter text.
2.	Click here to enter text.
3.	Click here to enter text.