



**A CORRELATIONAL STUDY OF PROJECT MANAGEMENT MATURITY AND PROJECT
MANAGERS' ATTRIBUTES AND INFLUENCE IN SOUTH AFRICA**

by

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DECLARATION

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ABSTRACT

The purpose of the study reported in this dissertation was to establish if there is a relationship between project managers' attributes and their organisations' project management maturity. To achieve this, the study evaluated the existence of relationships between the project managers' power, project managers' technical expertise, and project managers' project management experience and their organisations' project management maturity.

The study was based on a survey of self-identified project managers in South Africa. Data was collected using a self-administered questionnaire of 306 respondents from 1500 invitations to members of a project management association. The collected data was edited and descriptively and inferentially analysed using a commercial statistics package.

From the descriptive analysis, the study found that South African organisations are responsive to changes in project resources, are benchmarking the capability, are becoming aware of the importance of project management as a strategic enabler and are embracing a project culture within their operations. From the inferential analysis, the study found that project managers' power and project managers' technical expertise have a weak positive correlation with organizational project management maturity

The study contributes to knowledge on project management maturity by showing that project managers, particularly the power that they have and their technical expertise, cannot be ignored in initiatives that organisations embark on to improve their project management maturity.

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ACRONYMS

Acronym/Abbreviation	Description
CMM	Capability Maturity Model
CPI	Cost Performance Index
CPM	Critical Path Method
EV	Earned Value
IT	Information Technology
Kerzner-PMMM	Kerzner-Project Management Maturity Model
KPI	Key Performance Indicator
OPM3	Organizational Project Management Maturity Model
PLC	Product Life Cycle
PERT	Program Evaluation and Review Technique
PID	Project Initiation Document
PMBOK	Project Management Body of Knowledge
PMI-USA	Project Management Institute USA
PMO	Project Management Office
PMSA	Project Management South Africa
PMS-PMMM	Project Management Solution's Project Management Maturity Model
PRINCE2	PRojects IN Controlled Environments
SACPCMP	The South African Council for Project and Construction Management Professions
SDLC	Systems Development Life Cycle
SEI	Software Engineering Institute
STEM	Science, Technology, Engineering, and Mathematics
CMMI	Capability Maturity Model Integration
SPI	Schedule Performance Index
WBS	Work Breakdown Structure

CHAPTER ONE

BACKGROUND AND ORIENTATION

1.1 INTRODUCTION

Kwak (2003: 1) claims that people have been managing projects since the dawn of civilisation. For instance, historical records indicate that the Egyptian pharaohs had massive pyramid building projects. Additionally, the Roman empire had extensive road network projects. However, it is only recently that project management has been recognised as a distinct form of management. Formalisation of project management started during the period 1917 to 1962 when the now common project management tools such as Gantt Chart, PERT and WBS were developed. Today, project management has become pervasive, organisations routinely initiate and manage projects. As shown in Table 1.1, project management is unique and different from general management.

Table 1.1: Comparison of general management and project management

General management	Project management
It has no continuous, with no specific end date	It is a temporary endeavour.
It is routine.	It produces a unique outcome
It focuses on managing the five	It focuses on managing time, cost, and quality
A general manager has formal authority.	A project manager has no formal authority.
A general manager can reside within a functional department.	It can cut across functional boundaries. Project team members can be co-opted from different departments.
It has a broad focus. Project management is a subset of general management	It has a narrow focus. It is limited to the project scope

Source: Larson and Gray (2013: 5-6)

A project is a temporary undertaking to develop a unique product within a specified time, specified budget and adhering to a well-defined scope (Gray & Larson, 2011: 24). Each project is considered unique from the next project, it therefore means that there are specific skills, tools and techniques required to effectively execute the project (Project Management Institute, 2003: 22). By large, the project is a specialised undertaking which requires unique competencies from the project leader to meet the requirements of the iron triangle – the triple constraints of time, budget and scope (Kerzner, 2014: 1641). The larger the project, the more likely it is to be complex and interdisciplinary, thus involving the formation of interdisciplinary teams to participate in the creation of this unique structure. Projects are characterised by high failure rates, high risks, team conflicts, and many other unique problems which need effective leadership (Jawah & Laphi, 2015: 4). It is within this context that the study seeks to understand the maturity models of projects and project management as an old practice but new science (Pretorius, Steyn & Jordaan, 2012: 1–11).

Effective project execution is essentially about the ability to manage the triple constraints on the basis on which project success or failure is based. The project execution process involves the ability to apply the required knowledge, appropriate skills, relevant tools and ideal techniques in the process of creating the project product (Project Management Institute, 2008: 453). Project management (execution) like any other management discipline is closely related to general management, except that project management has its own unique features about it (Steyn, Basson & Carruthers, 2004: 11). In as much as the general management practices will be necessary and used at certain stages, there are marked differences between project management and other forms of management (Gray & Larson, 2011: 6). The differences between project management and general management were highlighted in Table 1.1.

Pinto and Morris (2004: 1234) indicate that modern project management principles and practices have their origin in engineering disciplines such as, construction, defence, aerospace and technically orientated and related industries. Sukhoo (2009: 22) notes that much of the development of these tools and techniques used was observed in the 1900s and with increased momentum in the 1950s. Although most of the above developments were associated with the defence industry, the application of these tools and techniques has extended too many non-military engineering industries. Nowadays, it is common to see project management tools and techniques being applied in non-engineering or non-military industries such as event management. The history of these tools are presented in Table 1.2.

Table 1.2: The history of modern project management tools and techniques

Tool / technique	Year	Source and application
Gantt Chart	1917	It was developed by Henry Gantt. A Gantt Chart is a bar chart. Each activity is presented as a bar on a horizontal time scale. It is used for planning, scheduling, and progress reporting.
Critical Path Method (CPM)	1957	It was developed by DuPont (USA). It is a way of optimising the sequence of activities in a project to minimise project duration. A key outcome of CPM is the derivation of a project's critical path, a set of activities that must be completed on time to ensure that the whole project is completed on time.
Program Evaluation and Review Technique (PERT)	1958	It was developed through collaboration between U.S. Navy's Special Projects Office, Lockheed Missile Systems and Booz Allen and Hamilton for managing the Polaris missile programme. A key feature of PERT, just like CPM, is a network visual depiction of project activities and the preferred order of execution. PERT incorporates activity dependences.
Work Breakdown Structure (WBS)	1962	It was developed by United States Department of Defence. A WBS is a hierarchical framework that subdivides activities of a project into smaller work packages. A WBS serves as the first step of project planning.
Primavera	1983	Primavera is a project management software that was developed by Primavera Systems. It is used in project planning, scheduling and monitoring.
Project Management Body of Knowledge (PMBOK)	1983	The Project Management Institute (USA) released the first edition of the PMBOK. PMBOK is the defect standard of project management processes.
Carnegie-Mellon University: Capability Maturity Model (CMM)	1986	Software Engineering Institute (SEI) of Carnegie-Mellon University developed the first project management maturity model. The CMM is used to measure project management maturity in software development.
Microsoft™ Project	1990	Microsoft Project is a Microsoft developed project management software. It is used in project planning and monitoring.
Organizational Project Management Maturity Model (OPM3)	2003	The Project Management Institute developed OPM3. It is used to assess holistically an organisation's maturity in how it executes programme, portfolio, and project management.

Source (Own construction)

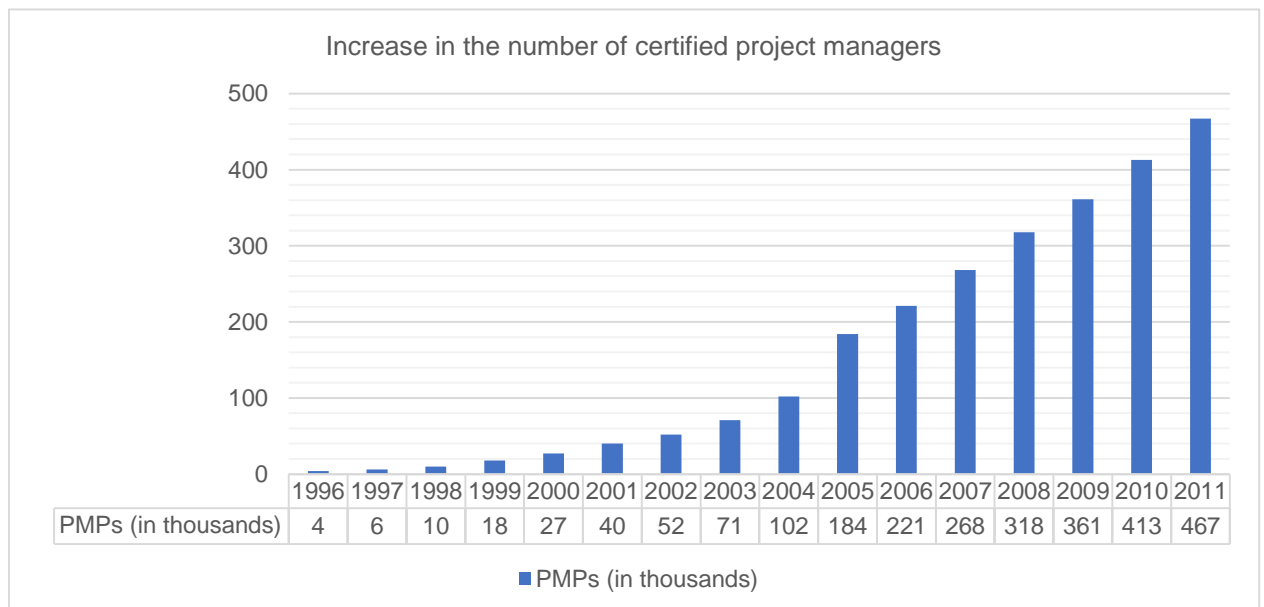
Today, most of the project management techniques can be executed using software packages which enable the execution to be more accurate and to require less time to develop or construct. Together with this has been the unprecedented increase in the number of project management bodies that have developed their own project management standards. These bodies are used to set the standards for the project management profession with clearly

defined and measurable competency expectations. The formation of these project management bodies is listed below in chronological order, namely;

1. The earliest association for project managers in the world is the Project Management Institute USA (PMI-USA) which was formed in 1969. It first certified project managers in the early 1980s (Haughey, 2010: 2). Globally, the period between the 1990s and 2000s was characterised by huge increases in the number of certified project managers as shown in Figure 1.1.
2. Although a local chapter of the PMI-USA was formed in South Africa in 1982. Formalised project management is relatively new in South Africa (Project Management South Africa, n.d.: no pagination). The broadest association of project managers, Project Management South Africa (PMSA) was only formed in 1997. Currently there is no statutory certification body in South Africa for generic project managers that has been able to offer designations to project managers from 2013 (Project Management South Africa, n.d.: no pagination). The South African Council for Project and Construction Management Professions (SACPCMP) which was established by the Project and Construction Management Act (Act 48 of 2000) certifies specialised construction project managers (South Africa, 2000).

The increase in the number of people qualifying as certified project managers is an indication of the growth of the profession (see Figure 1.1). This is because increased industrialisation has increased the demand for project managers. As a result, more institutions of higher learning are introducing qualifications in project management.

Figure 1.1: The increase in the number of certified project managers



Source: Mersino (2013:7)

Project management as a multidisciplinary profession is relatively new in South Africa. A few institutions of higher learning offer training for the profession. However, there are signs of an increase of this profession in the country. For instance, South African project management professional groupings such as PMSA, SACPCMP and the local chapter of PMI-USA have all recorded increased membership. It is worth noting that engineers, IT specialists and business managers form the bulk of professionals that are practising project management in South Africa.

Formalised project management posts are a recent addition to South African organisations. Amongst these, Labuschagne et al. (2013: 76) claim that only 35% were senior enough to influence change in their organisations. The success of the project execution process is generally mandated to the project leader, even though other functionaries (the project team and the project organisation) have a bearing on the effectiveness of the project leader (Nicholas & Steyn, 2012: 10).

Crawford (2005: 7) reports that there is a common sentiment by senior executives in which it is believed that “picking the right project manager” is the answer for the success of the project execution. Left to the project leader (all things being constant), the project leader must be able to develop the culture within the project team that should facilitate delivering the project on schedule and within budget. The project manager, depending largely on the structure of the organisation, may be responsible for sourcing of resources (material, finance and or human resource), communicating with stakeholders and managing the varied expectations of customers (Roeder, 2013: 145–155). The project manager is also responsible for managing the technical aspects of the project including project planning, monitoring and control of costs, schedules, and work tasks (Gray & Larson, 2011: 16). Various professional bodies have attempted to standardise the competencies of project managers to deliver a variety of projects through certifications and the development of competency standards (Crawford, 2005: 7–9).

The effectiveness of a project team is influenced by among other things the project manager and the prevailing culture and political structure of the organisation (Cooke-Davies & Arzymanow, 2003: 473). An effective well constituted project team should be well empowered with authority to deliver on the project execution requirements and strategy. In practice, most teams embedded in a matrix structure suffer from serious authority gap which frustrates the decision-making system and retards progress at the very least or cause dysfunctional conflicts at the most (Jawah & Laphi, 2015: 2). In such instances, the project team members and other project practitioners within may have dual loyalty further weakening the ability of the project leader to influence the direction of the implementation. Regardless of all this, it is expected of the project leader to be able to galvanise support and cooperation from the team members and to work towards achieving deliverables as a team (Mersino, 2013: 126). The focus of the

project leader should therefore be on building and strengthening the relationship among the project team members and other subordinates (Mersino, 2013: 16).

The parent organisation structures and practices may provide the framework that can aid or hinder project success (Project Management Institute, 2013: 20–28). The maturity of an organisation can be evaluated on the basis of the ability of the organisation to provide adequate support, manage the resources, and nurture the project management talent (Cooke-Davies and Arzymanow, 2003: 472). The ability of an organisation to practice project management principles that permeate through the entire organisations demonstrates project management maturity (Farrokh & Mansur, 2013: 68). Such an organisation provides structural support for the implementation of projects within itself at all levels.

The concept of project management maturity is used to provide an indication of an organization's capability to manage projects (Pinto & Morris, 2004: 1214), but it should be noted that this serves as an aid and not the ultimate answer. Tomlinson and Imbeau (2016: 69–70) claim that there is growing evidence of the existence of a causal relationship between project management maturity and project success. They report on a study conducted in Brazil in 2014, conducted on 7885 projects, that found that organisations that had Level 5 maturity had 81% project success rate as compared to a success rate of only 38.7% for a Level 1 organisation. While it is not possible for one to generalise from this single study, the study provides anecdotal evidence of the importance of knowing an organisation's project management maturity. William, Justin and Young (2004: 1216) indicated that a high PMM provides a competitive advantage to organisations for the following reasons:

- More mature organisations deliver project on time as compared to less mature ones that sometimes miss their schedules by as much as 40%.
- More mature organisations have a more predictable cost performance with an average standard deviation of 0.11.
- More mature organisations have generally lower project management direct costs.

Kerzner (2014: 175) explains that organisations use project management maturity models to assess their progress in implementing project management industry best practices thereby assisting them in their quest for growth, excellence, and success. William, Justin and Young (2004: 1214) indicate that the first step on the roadmap for future improvements in project management is understanding an organisation's current standing in terms of its capabilities and efficiencies. Once the level of PMM is known, an organisation can begin to strategise on how its capabilities can be improved as a way of enhancing the project management competitive advantage. In addition, William, Justin and Young (2004: 1223) explain that knowing its maturity enables an organisation to compare its performance with those of others

in its industry. Kerzner (2013: 36) claims that this benchmarking enables an organisation to fasten its PMM development process.

The majority of project management models measure project management maturity of a five-level ordinal scale. Level 1 represents an immature organisation that uses project management tools and techniques on an ad-hoc basis. The maturity level increases with increased use and standardisation of project management within an organisation up to Level 5, where an organisation uses best practices and is in a continuous improvement mode.

In a PMSA commissioned study, Labuschagne et al. (2013: 13), reveal that in South Africa, all industries do not generally have high project management maturity. The study reported that average project management maturity levels of between 2 and 3, measured on a 5-level scale, is prevalent in South African industries. This level of project management maturity is comparable to that found in a fellow BRICS country, namely Brazil. A 2014 report by Prado, Oliveira and Romano (2015: 9) showed that Brazilian organisations had an average maturity of 2.64.

Perhaps, the aforementioned low maturity is indicative that South African organisations see project management as a tool, not as a strategic enabler that should be exploited. The low maturity was also reported in the construction industry, an actual maturity of 3.06, despite the industry having had a longer history of project management (Labuschagne et al., 2013a: 123).

1.2 PROBLEM STATEMENT

The project management profession has been in the country from the days of the Mapungubwe, before colonisation of South Africa. Throughout the years of colonial rule construction has been taking place in different parts of the country in different forms. In spite of all this, project management maturity may be considered to be in its infancy in the country, like in many other developing countries too. South African literature has focused on project management maturity and project success, but no studies have examined the relationship between project management maturity and the project manager's attributes. The study seeks to establish the possibility of the existence of a relationship between project manager's attributes and project management maturity. Cognisance is made of the fact that there are other success factors outside of project management maturity, of which may be resident in the project manager.

1.3 RESEARCH OBJECTIVES

Research objectives are the expectations or the expected outcomes of research by the researcher in relation to the study. Objectives are generally classified into two types, namely, primary objective and secondary objectives. To avoid wandering off and losing focus, it is necessary to formulate clear and verifiable research objectives.

1.3.1 The primary objective

Objectives should be understood as an element of the problem statement in that they clarify in more refined terms and form what the problem statement seeks to establish. In this case the establishment of these relationships will enable the researcher to make conclusions on the effect of project management maturity to the project manager's success. The primary objective of the study is as follows:

- To establish if there is a relationship between project managers' attributes and their organisations' project management maturity.

1.3.2 The secondary objective

The secondary objectives of the study are as follows:

- To determine if there is a relationship between project managers' technical expertise and their organisations' project management maturity.
- To determine if there is a relationship between the project managers' power and influence and their organisations' project management maturity.
- To determine if there is a relationship between project managers' project management experience and their organisations' project management maturity.

1.4 RESEARCH QUESTION

Research questions are at the centre of research design and they also serve as a valuable starting point of the research process (Maxwell, 2013: 75). A research question represents a facet of an inquiry that a researcher wants to know (Maxwell, 2013). Punch (2014: 6) defines a research question simply as “-something requiring an answer – followed by an investigation designed to collect the data to answer the question”. Punch (2014: 206-207) and Maxwell (2013: 5) assert that research questions should dictate the research design that is adopted, not vice versa. Punch (2014: 207) further argue that the nature of the data required to answer the research questions dictates the research approach that is appropriate.

1.4.1 The main research question

The primary research question of this study is as follows:

- Is there a relationship between project managers' attributes, and their organisation's project management maturity?

1.4.2 The sub-questions

The secondary research question of this study is as follows:

- Does the technical expertise of an organisation's project managers influence its project maturity management?
- Do the project managers' power and influence within their organisations influence its project maturity management?
- Does the project management experience of an organisation's project managers influence its project maturity management?

1.5 SIGNIFICANCE OF THE STUDY

Project management continues to grow as a discipline and industry continues projectivity as the discipline has been considered a critical component of effective management. The definition of what constitutes a project has been expanded, and many businesses have taken on to use management by projects as a panacea for the effective management of scarce resources. The introduction of project management as an independent, separate, and unique discipline in colleges and universities has brought about more attention to this age-old profession. Consequently, many more techniques and tools for effective project execution are developed and/or modernised aided by the technological advances that are helped the invention of software packages. Despite all these, the project success rates are still low. As project management practice changes, the human being remains the only constant in the equation. It is known that more project management mature organisations have a better project success rate. Amongst other factors, their success that might be attributable to the quality and calibre of their project managers. Therefore, the study of the impact and or relationship between project management maturity and the project manager's attributes becomes indispensable.

1.6 RESEARCH METHODOLOGY

The study adopted a correlational survey methodology primarily because this approach, as claimed by Lodico, Spaulding and Voegtler (2006: 239), allows a researcher to determine whether and to what degree, a relationship exists between two or more research variables.

Mills and Birks (2014: 64) explain that research methodology defines the methods that will be used to answer the research questions and how these methods would be used for the best effect. Research methodology encompasses sampling, data collection, data analysis, and reporting. Mills and Birks (2014: 65), indicate that the choice of research methodology is strongly influenced by the desired outcome of a study and the type of data that will be used to answer the research questions.

1.6.1 Population

The study focused on individuals working for South African organisations who self-identified as being involved in project management. These individuals are expected to have first-hand understanding of how projects are managed in their organisations. The study focused on those who self-identified, as not all of those who manage projects have the title of project manager. These individuals were considered to have identified themselves with project management by virtue of their membership of a project management association.

1.6.2 Sampling

The researcher decided to survey all members of one project management association as doing so did not carry any negative costs and time implications. Sampling is done primarily because it is generally expensive to conduct a census. In this study all the respondents could be accessed via this association at the same time and at zero cost.

1.6.3 Sample size

As indicated above, the sample comprised all 1500 members of the selected project management association.

1.6.4 Data collection instrument

A questionnaire was developed based on concepts of Kerzner's Project Management Maturity Model and project managers' attributes that according to Cooke-Davies and Arzymanow (2003: 471-478) and Crawford (2005: 7-16) highlight project managers' experience, power, and influence. Independent and dependent variables were coded into the questionnaire to facilitate data analysis.

1.6.5 Data collection

Quantitative data was collected through a questionnaire that was deployed on the web platform, SurveyMonkey™. An invitation to participate in the study, with a link to the online questionnaire, was published in the selected association's newsletter that was sent to all their

members. The responses were downloaded from SurveyMonkey™ and cleaned in Microsoft Excel to facilitate data analysis.

1.6.6 Data analysis

The main purpose of data analysis was to establish if there was a relationship between project managers' attributes and project management maturity. To establish that, inferential statistical analysis and hypotheses testing was conducted. Hypothesis testing was done using Pearson Chi-Square and Fisher's Exact Test. Prior to inferential statistical analysis, the sample was described using means, modes, range, and standard deviations of gender and highest qualification.

1.6.7 Ethical consideration

The study was guided by the five principles of ethical practice (Easterby-Smith et al., 2013: 187–190) that seek to protect the interests of the research subjects. Details of the procedures that were followed to seek informed consent, protect the respondents' confidentiality, and anonymity will be dealt with in Section 4.9.

1.7 CHAPTER CLASSIFICATION

CHAPTER 1: This chapter introduces the study and provides a literature review around the definition, development and functioning of project maturity management. The chapter discusses the problem statement, states the objectives and research questions. It also discusses the research design and methodology, target population, sample, sample size, sampling method, research instrument, data collection methods, data analysis, ethical considerations, and chapter classification for the entire study.

CHAPTER 2: The chapter defines project management methodologies and discusses the units of project management methodologies covering among others, the two classes/categories, namely, traditional and agile. The traditional methodologies (and their applications) include the sequential path with one phase following the other, examples of these are discussed (PMBOK and Projects IN Controlled Environments – PRINCE2). The agile methodologies (and their applications) evolved from software development, the common principles they share are identified, examples of these were discussed, Scrum and Systems Development Life Cycle (SDLC). Together with this different system of practices, techniques and tools, procedures, and rules common in the project management discipline are discussed.

CHAPTER 3: The chapter defines project maturity models, classifies them in a tabular form and then discusses the history and development of these models and their applications in the industry. Each model provided is also clearly indicated as to how it operates, the benefits, the

measurements and the applications and discussed in finer detail per model. A detailed literature review is provided for each one of the models. Leadership and the power of leadership and its influence and limitations in relation to the project execution process – a relationship is made between project management maturity in organisations and the project manager's power.

CHAPTER 4: This chapter introduces the research design and research methodology, compares the two, identifies and discusses in detail the types of research methodologies, their differences and their applications in this study, the target population, sample, and sampling techniques. The research instrument, validity, and reliability together with data collection methods and the final data analysis are presented.

CHAPTER 5: This chapter descriptively summarises the results and performs hypothesis testing to derive project manager related factors that affect an organisation's project management maturity. It takes the questionnaire items one by one and responds to them as such using illustrations (figures and tables) with detailed explanation, identifying similarities and key features. It presents findings from the hypotheses testing outlining which factors associated with each other and which ones are not. It finished with qualitative analysis for identified themes from respondents comments.

CHAPTER 6: This chapter summarises the work done in the study and condenses the problem statement, research objectives and research question into what the actual findings are on the basis on which a conclusion and recommendations are made and submitted. Opportunities for future research and any limitations on this are identified and reported.

1.8 SUMMARY

This chapter provides the contextual settings of the study. The next two chapters provide literature review. Firstly, Chapter Two reviews literature on project management methodologies. Thereafter Chapter Three reviews literature on project management maturity models and the project manager as a leader.

CHAPTER TWO

LITERATURE REVIEW OF PROJECT MANAGEMENT METHODOLOGIES

2.1 INTRODUCTION

The previous chapter provided an introduction and background to the study. This chapter reviews some of the common project management methodologies and project management maturity models. Project management methodology is defined as “a system of practices, techniques, procedures, and rules used by those who work” in managing projects (Project Management Institute, 2008:438). Project management methodologies are classified as either traditional or agile. The traditional methodologies (and their applications) include the sequential path with one phase following the other – examples of these are discussed (PMBOK and PRINCE2) – and other related methodologies such as International Organisation for Standardisation’s ISO 21500:2012 and Guidance on Project Management. Gonçalves and Heda (2010: 10) warn that there is no project management methodology that is universal; the choice of project management methodology to adopt depends on organisational context. To accommodate the diversity of contexts, there are many project management methodologies in industry. It is not possible to profile all of them in this chapter; therefore, two methodologies, PMBOK and PRINCE2, will be discussed as exemplars.

Gonçalves and Heda (2010: 14) define agile project management as an incremental approach to managing projects that iteratively deliver a subset of the final product with every iteration. The agile methodologies (and their applications) evolve from software development – the common principles they share are identified (customer-driven improvisation of requirements and incremental delivery of the project outcomes). Examples of agile methodologies include SDLC, Scrum, eXtreme programming, lean development, and dynamic systems development methods. Each of these agile methodologies has a different system of practices, techniques and tools, procedures, and rules that have evolved due to the context in which these methodologies are applied. It is not possible to profile all the agile methodologies in this chapter, but SDLC and Scrum will be profiled as exemplars.

2.2 PROJECT MANAGEMENT METHODOLOGIES

Schwalbe (2014: 89) operationalises the above definition by stating that project management methodology outlines how project management is undertaken in an organisation. Because of the diversity in the type of project that is executed in industry, it is not possible to have a universal methodology that is applicable to all. Many project management methodologies have been developed over the years. Gray and Larson (2011: 583) categorise them into traditional and agile methodologies. In traditional project management methodologies, project

management processes follow a sequential path; one phase must be completed before the next phase begins (Gray & Larson, 2011: 583; Schwalbe, 2014: 57). In the other category, agile methodologies, project management processes are iterative and product/process delivery is incremental. Gonçalves and Heda (2010: 42) indicate that agile methodologies evolved from software development. Table 2.1 presents a summary of the key differences between traditional project management and agile project management methodologies.

Table 2.1: Comparison of traditional and agile project management methodologies

Traditional project management	Agile project management
Design up front	Continuous design
Fixed scope	Flexible scope
Deliverables	Features/requirements
Freeze design as early as possible	Freeze design as late as possible
Low uncertainty	High uncertainty
Avoid change	Embrace change
Low customer interaction	High customer satisfaction
Conventional project teams	Self-organised project teams

Source: Gray and Larson (2011: 585)

2.2.1 Traditional project management methodologies

The most widely used traditional project management methodologies are the PMBOK and PRINCE2 (Schwalbe, 2014: 25). These traditional methodologies are commonly used in the construction, manufacturing, business and financial sectors.

2.2.1.1 PMBOK and its application

PMBOK is the most widely used traditional project management methodology. It gained worldwide acceptance when its 1996 release was made freely available on the PMI-USA website. It divided project management into 37 project management processes. The latest edition of PMBOK, the fifth edition, is available only to members of the PMI-USA. The fifth edition of the PMBOK has increased project management processes to 42 and divided them into five process groups: initiating, planning, executing, monitoring, controlling, and closing processes and 13 project management knowledge areas (Project Management Institute, 2008:36-70). The Project Management Institute (2004: 40) identified and described the five project management process groups that are required for a project. A project management process group is “a set of interrelated actions and activities performed to achieve a pre-specific product, result or service” (Marchewka, 2015: 28). These processes may include inputs, directions, techniques, or tools that are used to achieve desired outcomes. The project management process groups are performed sequentially in each project.

First, the initiating process group involves developments that facilitate the formal authorisation for the start of a new project or a project phase (Schwalbe, 2014: 29). These comprise of a feasibility study, development of project charter, and developing a preliminary project scope statement. A feasibility study is conducted to determine whether a new project should be undertaken or not. This is done through documenting a clear selection criteria process. The project charter is concerned with authorisation of a project or project phase. The charter documents the resources to be allocated to the project through a preliminary project scope statement. The project charter and funding for a project are approved externally. During the initiating phase, a project manager is assigned to the project (Project Management Institute, 2004:43-45).

Secondly, the planning process group encompasses devising and maintaining working schemes for both individual project phases and the entire project. The processes in this group are iterative. The project teams usually revise the plans as the project proceeds. The project manager is responsible for developing project plans. Executives or project steering committees are responsible for approvals of project plans. The planning process group consists of scope planning, activity planning, resources planning, cost estimates, schedule estimates, and procurement planning (Marchewka, 2015:29). A work breakdown structure is created with activities and allocation of resources (time, labour, and risks) (Project Management Institute, 2004: 46-55). Once approved, a project management plan becomes the primary document of the project.

Thirdly, the executing process group is directed towards coordinating of resources, both physical and human resources that are needed to perform the planned activities. This process group comprises of project management processes such as risk management, quality assurance, and team development (Marchewka, 2015: 30). Most time and allocated resources are spent in the executing process phase (Marchewka, 2015: 236).

Fourthly, the monitoring and controlling process group involves the process of tracking, reviewing, and reporting the progress in achieving performance objectives. The progress can be tracked by use of computer software or manually. Several steps are followed for measuring and evaluating project performance (Gray & Larson, 2011: 454). The first step requires setting up a baseline plan by using the cost and duration information from the WBS. The second step measures performance and progress through either on-site inspection, actual use, or Earned Value (EV). The project is monitored at regular intervals, and the performance is reported to project stakeholders (Schwalbe, 2014: 83). The third step is to periodically measure the status of the project by comparing the expected plan with the actual plan. The final step is taken when identifying potential problems to take corrective actions, preventive action, or defect repair (Gray & Larson, 2011: 455).

Lastly, the closing process group involves the end or termination of a project or project phase. The project stakeholders go through the project contract to ensure that all deliverables of the project have been achieved. The project is then signed off and handed over where applicable. The project team will follow all the necessary closure administration and procedures (Project Management Institute, 2004:66-67). Table 2.2 provides a summary of PMBOK project management process and process group structure.

Table 2.2: PMBOK project management processes, process groups and knowledge areas

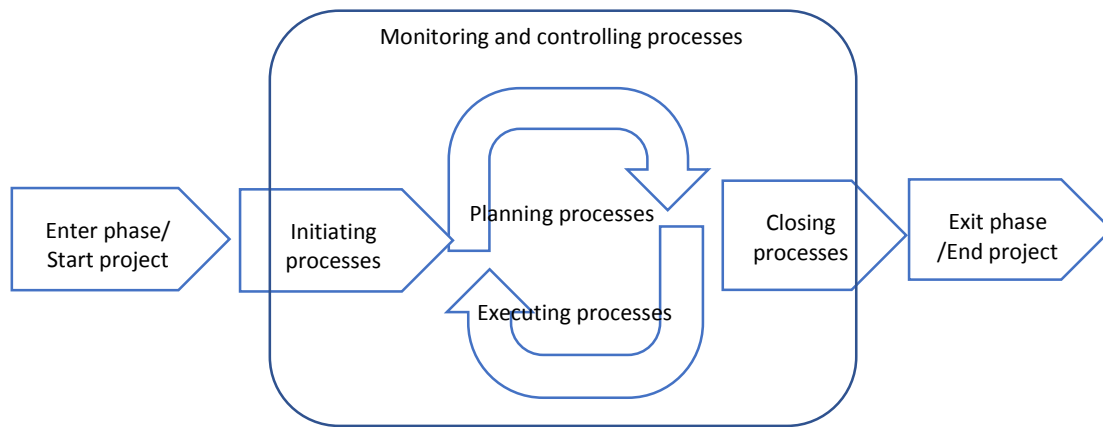
Knowledge Area	Project Management Process Groups				
	Initiating Process	Planning Process	Executing Process	Monitoring and Controlling Process	Closing Process
Project Integration Management	Develop project charter	Develop project management plan	Direct and monitor project work	Monitor and control project work Perform integrated change control	Close project or phase
Project Scope Management		Plan scope management Collect requirements Define scope Create WBS		Validate scope Control scope	
Project Time Management		Plan, monitor, and control schedule		Control schedule	
Project Cost Management		Plan and estimate costs Determine budget		Control costs	
Project Quality Management		Plan quality management	Perform quality assurance	Control quality	
Project Human Resource Management`		Plan human resource management	Acquire, develop, and manage project team		
Project Communication Management		Plan communication management	Manage communication	Control communication	
Project Risk Management		Plan risk management		Control risks	
Project Procurement Management		Plan procurement management	Conduct procurements	Control procurements	Close procurements
Project Stakeholder Management	Identify stakeholders	Plan stakeholder management	Manage stakeholder engagement	Control stakeholder engagement	

Source: Project Management Institute (2013: 60)

The project management process groups are linked by their outputs; the output from the initiating process becomes the input of the planning process (Steyn et al., 2004). The monitoring and controlling process groups and the executing processes are intertwined. They move in a cycle until the desired deliverable is achieved. Figure 2.1 presents the relationship

between project management process groups for traditional projects that are based on the PMBOK.

Figure 2.1: PMBOK arrangement on project management process groups within a project.

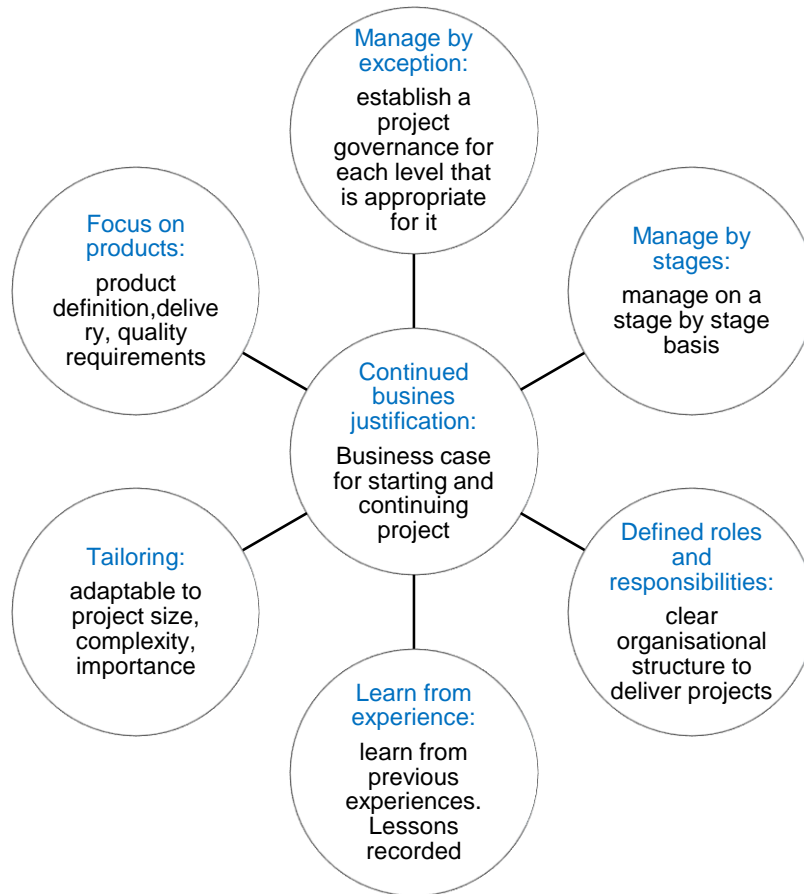


Source: Project Management Institute (2013:50)

2.2.1.2 PRINCE2 and its applications

Another most popular traditional project management methodology is PRINCE2. PRINCE2 is a scalable generic project management methodology that addresses project management with four integrated elements of seven principles, seven themes, and seven processes within the project environment (Office of Government Commerce, 2009:5). The seven principles detail what constitutes good practice within PRINCE2. The principles are summarised in Figure 2.2. Office of Government Commerce (2009:11) warned that it is not the uses of PRINCE2 procedures and documentation that make an organisation to be PRINCE2 compliant, but it is adherence to the seven principles. At the centre of each project is the business case, and the project continued relevance to it. The business case details the rationale for starting a project and continuing to execute it (Marchewka, 2015:32). Without continually revisiting the business case, an organisation may continue with a project that no longer delivers benefits to it. The business case details the rationale for starting a project and continuing to execute it (Marchewka, 2015:32). In PRINCE2, an organisation is required to terminate a project if its business case becomes no longer valid. Figure 2.2 also shows that organisations must adapt project management processes, structures, and methods to suit the complexity of the project, the stage at which the project is at and the level of the operations.

Figure 2.2: The seven principles for managing projects with PRINCE2



Source (Own construction)

PRINCE2 has seven themes that must be addressed continuously during the project life cycle. Marchewka (2015: 32) explains that the themes act as guidelines to ensure that the project activities and processes facilitate achievement of the project's objectives. The PRINCE2 themes are outlined in Table 2.3. It is advised that all the seven PRINCE2 themes should be applied to every project (Office of Government Commerce, 2009: 18). However, the themes can be scaled up or scaled down depending on the size and complexity of a particular project.

Table 2.3: The seven themes for managing projects with PRINCE2

Theme	Description
Business case	Business case provides justification for a project. No project should start without it. The executives are responsible for ensuring that every project has an approved business case.
Organisation	Every project must have a structure that allocates accountability and responsibility to the various project players. The structure must be clear for effective direction, management, and control.
Quality	Every project must have a structure that verifies and ensures that project output meets their business expectations and facilitates achievement of desired objectives.
Plans	Product based plans are developed to facilitate communication and monitoring of delivery of project objectives. Plans range from corporate plans to project team plans. A plan is also developed for each project stage
Risk	In every project, risks must be systematically managed to improve the potential of project success. Risks must be identified, assessed, and controlled.
Change	Every project must have a common and systematic approach to managing identification, assessment and control of events that necessitate change in the project-configuration management
Progress	In every project, there must be systems monitor progress, compare actual achievement with planned and initiate corrective actions.

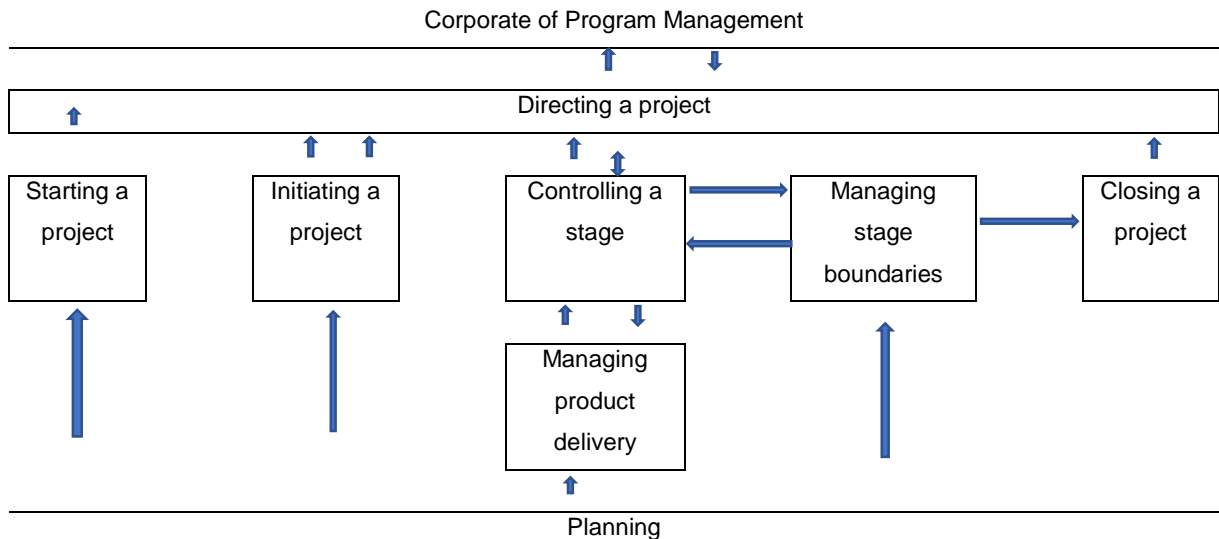
Source: Office of Government Commerce (2009: 18)

Schwalbe (2014:89) states that the PRINCE2 components are Starting up a project, Planning, Initiating a project, Directing a project, Controlling a stage, Managing product delivery, Managing stage boundaries and Closing a project. The seven stages of project management under PRINCE2 are summarised in Figure 2.3. Bentley (2010: 13) indicates that although any project that is managed using PRINCE2 must follow the seven stages, the extent and intensity with which each stage is implemented is scalable depending on the nature of the project. The stages entail the following:

1. Starting up a project can be considered as a pre-project phase that has six main objectives: appointment of the project management team, preparation of the project brief, choosing of the project approach, creating a project plan for the next stage, initiating a project plan for the next stage, and preparation of the business case (Bentley, 2010: 13-14). A key deliverable from this stage is the development of the project's business case. The business case details the rationale for starting a project and continuing to execute it (Marchewka, 2015: 32). The project cannot start without a persuasive business case.

2. Directing a project covers the work of the Project Board. It runs from project start-up to project closure. Bentley (2010: 14) states that, since the Project Board members are very busy people, they are only involved in making key decisions about the project such as approving the project, the business case, and the project plan, as well as monitoring project progress and giving direction when required. The Project Board is also responsible for ensuring that the project closes out successfully.
3. Initiating a project is essentially project planning – developing a Project Initiation Document (PID) and project plans (Bentley, 2010: 15). The PID becomes the baseline against which project progress is comparatively measured. During this stage, the project team develops strategies for managing risks, change, communication, and quality (Office of Government Commerce, 2009: 149).
4. Controlling a stage is a project manager's responsibility (Bentley, 2010: 15). The project manager manages the day-to-day activities of a project, authorising work packages; monitoring progress; managing changes; and identifying and responding to risks (Office of Government Commerce, 2009: 168). The project manager prepares progress reports for the attention of the Project Board.
5. Managing product delivery is the responsibility of the project manager and the project team (Office of Government Commerce, 2009: 185). The stage deals with three activities: receiving work instructions on work packages, building relevant products or services, and handing them over to the client (Graham, 2009: 19).
6. Managing a stage boundary is the interface between the project manager and the Project Board. The purpose of the stage is to make sure that the Project Board has sufficient information to review the project's progress and provide the necessary approvals for the next phase of the project (Office of Government Commerce, 2009:193). A project manager prepares a stage end report, updates the business plan and project plan, and prepares an Exception Plan for the Project Board approval should a project deviate from agreed deviation tolerances (Office of Government Commerce, 2009: 194).
7. Closing a project covers the work which a project manager does on instruction from the Project Board to either execute planned closure of the project or its premature termination (Bentley, 2010: 16). During this stage, the project manager verifies user acceptance of the project deliverables, ensures systems are in place to support the delivered product or service, and reviews performance against the baseline (Office of Government Commerce, 2009: 205).

Figure 2.3: PRINCE2 project management stages



Source: Office of Government Commerce (2009: 115)

Bentley (2010: 5) highlights the key feature of PRINCE2 as that it distinguishes between management of the project and the techniques that are involved in the management process. This distinction is essential as it facilitates the scaling up or scaling down of the methodology depending on the context. Thus, PRINCE2 can equally be applied in managing simple, small projects and big, complex projects.

2.2.2 Agile project management methodologies

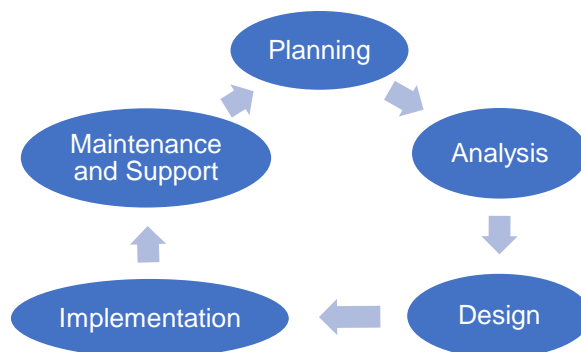
Wysocki (2014: 328) indicates that agile project management is a collection of project management life cycle models that can be used to manage innovative and complex projects in a dynamic and continuously adaptive approach. They share common principles in that they employ customer-driven prioritisation of requirements, iterative and incremental delivery of the project deliverables, experimentation and adaptation, and self-organisation of project teams improvement (Gray & Larson, 2011: 587; Schwalbe, 2014: 60-61). Examples of agile methodologies are SDLC, Scrum, eXtreme programming, lean development, dynamic systems development method, and others (Gray & Larson, 2011: 583-587). Agile methodologies have not been readily accepted outside the software industry due to the fact that agile methodologies do not plan ahead. They face resistance in some organisations, particularly those that require approval of a budget before a project starts (Gray & Larson, 2011: 593). Agile methodologies are suitable for small projects, information technology (IT) projects, or during the early exploratory phase of a project (Gray & Larson, 2011: 595).

2.2.2.1 Systems Development Life Cycle

Information technology projects generally follow a product life cycle (PLC) approach to new product development. Although there are many PLC methodologies, Marchewka (2015: 34) claims that the SDLC is the most common methodology that is used in the information technology industry. Marchewka (2015: 34-36) explains that project management of a software development process that follows an SDLC methodology has five sequential phases: Planning, Analysis, Design, Implementation, and Maintenance and Support. The first phase, Planning phase, focuses on either identifying opportunities that require the development of a new IT system or responding to problems in IT systems that require to be addressed through a software development project. During the Analysis phase, the project team further analyses the software development opportunities fully. They look at the existing systems and consider the experiences of the current users. At the end of this phase, the project team documents the project specifications and user requirements. After the Analysis phase, the project proceeds to the Design phase. During this phase, the project team develops the hardware and software architecture that is required to support the proposed IT system. Thereafter, the project proceeds to the Implementation phase. During this phase, the IT system is installed, documentation and training that is required to enable operation of the system is provided to the user. In most cases, implementation also includes testing of the IT system to ensure that it performs as intended.

In traditional projects, delivery of the product to the user marks the end of the project. This is not often the case with IT projects. Once the IT system has been delivered to the user, the project enters the Maintenance and Support phase. The project team is often required to fix errors or 'bugs' in the installed IT system. In some cases, the fix requires the development of either a new system or another version of the IT system. In such cases, the SDLC restarts in an iterative manner as outlined in Figure 2.4.

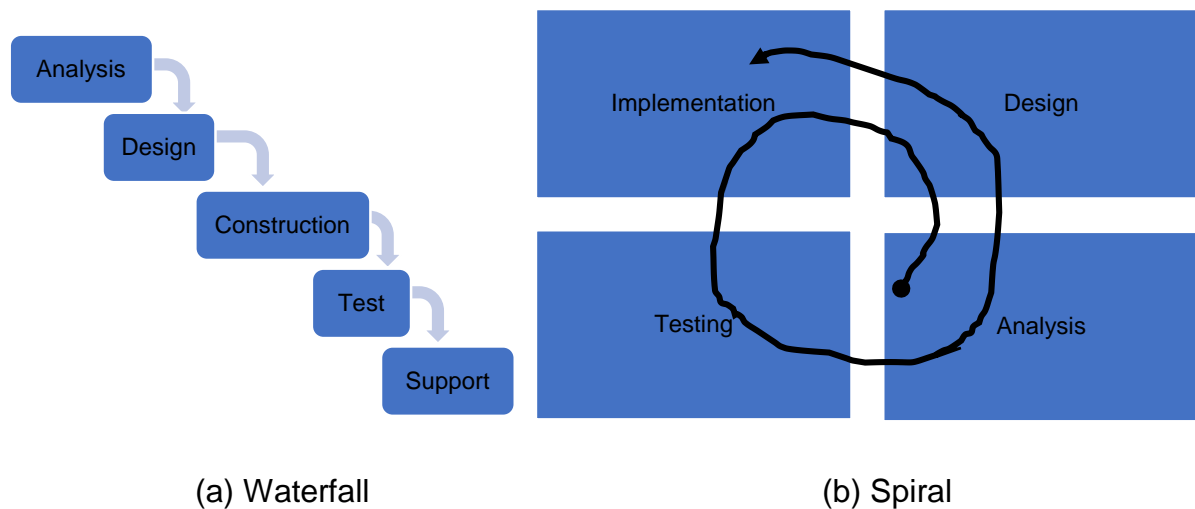
Figure 2.4: The cyclic phases of SDLC methodology



Source: Marchewka (2015: 34)

The cyclic approach is not the only way to execute SDLC projects. Some IT projects are once-off and do not require ongoing support. In such cases, the SDLC process can be implemented either using a waterfall approach as shown in Figure 2.5(a) or as a spiral as shown in Figure 2.5(b). Schwalbe (2016: 89) states that the spiral model of SDLC is suitable for IT projects that incorporate changes such as large government IT projects. Schwalbe (2016: 60) further highlights that a project undertaken using SDLC methodology provides from incremental addition of capabilities. For example, the development of an e-commerce platform can start with only web-based capabilities but later add mobile apps.

Figure 2.5: Modifications of the SDLC methodology



Source: Schwalbe (2016: 60)

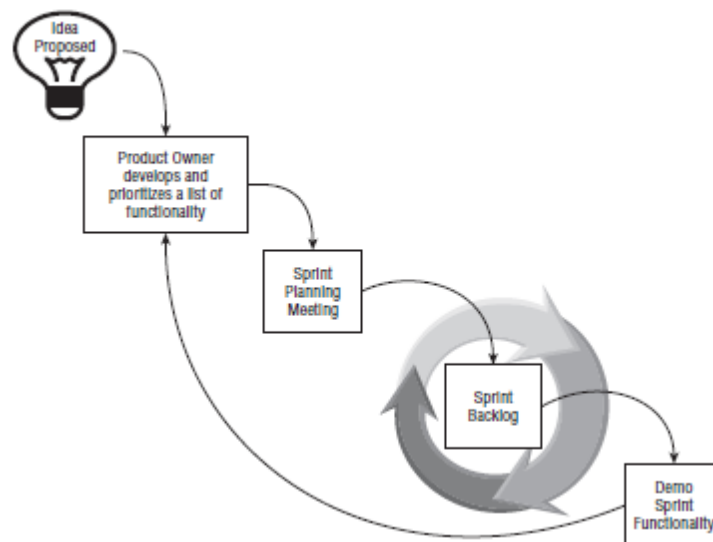
2.2.2.2 Scrum

Scrum is an agile methodology that is built on a Sprint, a 30-day cycle that deliver increments of the product (Gonçalves & Heda, 2011: 42). Scrum works by breaking down a complex project into small manageable increments. Scrum is the most appropriate method when project requirements are not clearly stated upfront and the user is not sure of the features that are required (Canty, 2015: 19). Project members use lessons learned during previous iterations to manage subsequent iterations better. The word scrum is from rugby. Brown et al. (2011: 22) define scrum as a formation that is made after restarting play from a minor infringement; eight players from each team bind and push against one another for possession of the ball. The stop and restart feature of rugby, as well as the strategic focus on the chaotic appearance in a rugby scrum, is shared by Scrum, the project management methodology. Just like in rugby, closeness of the project team is required for effective performance. The project team is also required to work as a collective (Goodpasture, 2016: 3). Just like in rugby, there are disastrous consequences to the scrum process if one of the team members leaves (Canty, 2015: 20).

Perhaps this is one of the disadvantages of Scrum. Canty (2015: 20-21) warns that for the Scrum process to be effective, all the team members must be well experienced.

Wysocki (2014: 397) explains that a Scrum project team is self-directed, meets daily, engages regularly with the customer for demonstration of current iteration of the product, and the team members continuously revise their priorities. Scrum processes can be defined either as adaptive or iterative (Wysocki, 2014: 397). The defined Scrum process has five steps, as shown in Figure 2.6, that operate iteratively until the customer is satisfied with the current iteration of the product.

Figure 2.6: Process flow for defined Scrum project management



Source: Wysocki (2014: 398)

Since Scrum is essentially a project management framework or agenda, Schwalbe (2016: 70-71) indicates that the internal technical processes for each stage as well as the steps themselves can be adapted to suit a particular project context. Wysocki (2014: 397) brings out that the Scrum process starts with a proposal for a system or product. The initial idea might be vague. The project owner, who is called Product Master, is then required to define and prioritise the requirements of the project emanating from the current understanding of the idea. The owner details these requirements on a form called a Product Backlog. In the next step, the project team considers the Product Backlog, deliberates, and then decides on which functionality they will deliver in the first iteration, Sprint, bearing in mind the owner's prioritisation. The project team members meet daily for daily Scrum meeting to plan and to develop the functionality they will deliver for the end of that Sprint. A list of this functionality is called Sprint Backlog. The project manager serves as the Scrum Master and facilitates daily Scrum meetings. At the end of each Sprint, the Scrum Master meets with the Product Master for a retrospective meeting to review project progress and to revise project requirements and

prioritisation. All the project team members are invited to attend this meeting. At this meeting, the project team also demonstrates the developed product or functionality to the Product Master.

2.3 SUMMARY OF THE PROJECT MANAGEMENT METHODOLOGIES

Table 2.4: A summary of the key features of exemplars of project management methodologies

	Traditional methodologies		Agile methodologies	
	PMBOK	PRINCE2	SDLC	Scrum
Techniques				Daily meetings, Sprint Demo, 30-day sprint
Tools	Gantt charts, WBS, CPM	Gantt charts, WBS, CPM		Sprint backlog, Product backlog
Procedures	Phases.	Stages	Cyclic phases	Iterations
Examples of application area	Construction	Construction	IT	IT

Source (Own construction)

2.4 SUMMARY

This chapter reviewed the two main categories of project management methodologies: the traditional and agile methodologies. It was not possible to review all the traditional methodologies; therefore, the PMBOK and PRINCE2 were reviewed as exemplars of traditional methodologies. Traditional methodologies have achieved widespread use, mainly due to their emphasis on pre-planning. Standard business practices require a project plan with relevant schedules and costing before approval. Agile methodologies evolved from software development. They allow for faster project implementation and are more sensitive to changing user requirements. Traditional project management considers changes to scope as undesirable. Two agile methodologies were reviewed as exemplars, SDLC and Scrum. It is worth noting that agile methodologies require expert project and technical practitioners and responsive organisations. These are critical to industries such as software development that have a fast-changing environment. It is no wonder that agile methodologies have achieved wide acceptance in the software industry but are yet to achieve the same acceptance in traditional industries such as construction.

The chapter that follows will focus on project management maturity models and the project manager as a leader.

CHAPTER THREE

LITERATURE REVIEW OF PROJECT MANAGEMENT MATURITY MODELS AND THE PROJECT MANAGER AS A LEADER

3.1 INTRODUCTION

The preceding chapter discussed project management methodologies. This chapter reviews some of the common project management maturity models and literature on the project manager as a leader in a project environment. Crawford (2015: 1) defines project management maturity as a measure of an organisation's project management effectiveness. Archibald and Archibald (2016: 69) claim that knowing and improving an organisation's project management maturity is essential, a more project management mature organisation achieves higher overall project success, has less scope creep and less cost and schedule variation. Cooke-Davies and Arzymanow (2003: 472) concur with the above that higher maturity reduces variations in an organisation's project execution effectiveness. To measure project management maturity, various project management maturity models have been developed.

Ibbs, Reginato and Kwak (2004: 1214) and Schwalbe (2016: G7) define project management maturity models (PMMM) as frameworks that are used by organisations to gauge and improve their project management capabilities. Project management maturity models serve the following functions:

- They assist organisations to identify where project management capability improvements are required (Archibald & Archibald, 2016: 66).
- They provide systematic guidance on the steps required for project management capability improvement.
- They assist in benchmarking by highlighting practices and processes that other organisations have found useful in managing their projects (Archibald & Archibald, 2016: 82).
- They can assist organisations to integrate project management practices into normal business processes.

The project management community uses many more project management maturity models. Grant and Pennypacker (2006: 60) reports that there were more than 30 maturity models that were being used with none receiving worldwide acceptance. Archibald and Archibald (2016: 65) report that by the end of the decade, 2006-2016, the number of project management maturity models had grown to hundreds, covering all types of industries. This proliferation in project management maturity models is because, as indicated by Archibald and Archibald (2016: 82), companies have realised that following up an improvement path suggested that project management maturity assessment can lead to significant competitive advantages.

Nicholas and Steyn (2012: 560) categorise the models into three: technical delivery process, project management process, and total organisation models.

Technical delivery process models originated from total quality management. They place emphasis on documenting project management processes and measuring the level of application of these processes within the organisation. Technical delivery process models show similarities with the general philosophy of ISO standards (Cooke-Davies and Arzymanow, 2003: 472). The first technical process model to be developed was Carnegie Mellon University Software Engineering Institute's Capability Maturity Model (SEI-CMM). The other technical delivery process models spawned from the SEI-CMM (Grobler & Steyn, 2006).

The chapter also discusses the project manager as a leader in project management. It discusses how power is available to a project manager and how the project manager can influence decision-making during the project execution process and their organisations' perceptions on project management maturity improvement; a relationship is made between project management maturity in organisations, the project manager's power, and the probability of successful project execution. The issues of power and influence are very crucial as, according to Mersino (2013: 16), project managers achieve their objectives through the work done by other people whom the project manager has functional authority over. Mazibuko *et al.* (2015:315) called this the project manager's authority gap.

3.2 PROJECT MANAGEMENT MATURITY MODELS

Ofori and Deffor (2013: 45) and Marchewka (2015: 241) claim that the concept of project management maturity models was developed from the capability assessments that were done for total quality management processes. It was not until the development of the Capability Maturity Model (CMM) in 1986 (see Table 3.1) that capability assessment started being used in software development. With government funding, Carnegie Mellon University Software Engineering Institute adapted CMM into a generic maturity model that would be used in other areas outside software development. As shown in Table 3.1, later project management maturity models were aligned with a project management methodology or standard.

Table 3.1: Key developments in the evolution of project management maturity models

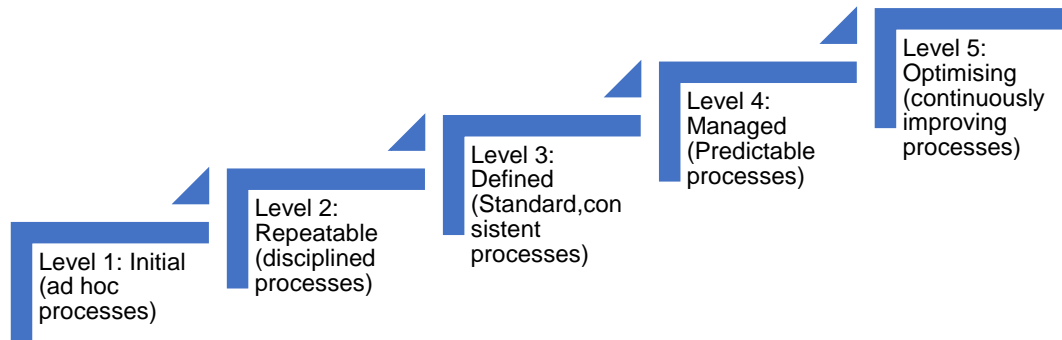
Year	Model	Developer and application
1986	Capability Maturity Model (CMM)	Developed by Carnegie Mellon University Software Engineering Institute to assess software development capability
2000	Kerzner Project Management Maturity Model (Kerzner-PMMM)	Developed by Harold Kerzner as a generic model that was meant to extend CMM into general project management
2002	Berkeley Project Management Process Maturity Model, (PM) ²	Developed by Young Kwak and William Ibbs as a generic model that encompassed key project management knowledge areas and key processes that occur within the knowledge areas
2002	Project Management Maturity Model (PMS-PMMM)	Developed by PM Solutions as a generic model that is aligned with the PMBOK knowledge areas
2003	Organizational Project Management Maturity Model (OPM3)	Released by the PMI-USA as a generic organisation-wide model for project, programme, and portfolio management maturity assessment
2009	PRINCE2 Maturity Model (P2MM)	Developed by United Kingdom's Office of Government Commerce to support maturity assessments in organisations that are using PRINCE2

Source (Own construction)

3.2.1 Model one – Software Engineering Institute’s Capability Maturity Model

SEI-CMM was developed for assessing the capability of an organisation’s software development process (Kumta & Shah, 2002: 1–14). SEI-CMM describes the key elements of an effective software development process. SEI-CMM can be used to evaluate an organisation’s software development processes against standard criteria and allocate an organisation’s maturity to one of its five levels of maturity. As shown in Figure 3.1, SEI-CMM charts an evolutionary path from Level 1 (ad hoc processes) to Level 5 (continuously improving processes) (Jiang et al., 2004: 280). It covers practices for planning, engineering and managing software development and maintenance (Jiang *et al.*, 2004:280). SEI-CMM assists organisations in their quest to effectively manage the triple constraints of a software development project by establishing a yardstick on which the organisations can benchmark the effectiveness of their processes (Jiang *et al.*, 2004:281, 286). Farrokh and Mansur (2013:5-28) claim that SEI-CMM can also be used to compare the status of an organisation with others in the industry.

Figure 3.1: The framework for the CMM for software development



Source: Paul (1994: 11–19)

SEI-CMM covers practices for planning, engineering and managing software development and maintenance (Jiang et al., 2004: 280). The SEI-CMM assists organisations in their quest to effectively manage the triple constraints of a software development project by establishing a yardstick on which the organisations can benchmark the effectiveness of their processes (Jiang et al., 2004: 281,286). Farrokh and Mansur (2013: 5–28) claimed that the SEI-CMM can also be used to compare the status of an organisation with others in the industry.

The SEI used a US government grant to adapt the CMM for assessment of organisations’ effectiveness in managing non-software projects (Paulk, 1994: 11–19). The maturity levels for a generalised capability maturity model that was termed Capability Maturity Model Integration (SEI-CMMI) are described in Table 3.2.

Table 3.2: Maturity levels in the SEI-CMM

Maturity Levels	Description
Level 5 (Optimising)	Continuous improvement using both quantitative and qualitative data generated from previous and current projects is practised. Innovation in both processes and project management tools is routine.
Level 4 (Managed)	Metrics are collected for both products and processes. All projects are carefully monitored and controlled.
Level 3 (Defined)	Standardisation and documenting of project process become the norm. The organisation develops its own way of managing projects. Each section/department manages projects in the same way.
Level 2 (Repeatable)	Project management processes are in place and track the triple constraints of each project: time, cost, and requirements. Lessons learned are used in the execution of similar projects. Project success can be repeated for similar projects.
Level 1 (Initial)	Project management process is ad hoc or even chaotic. The organisation does not provide support for the project manager. Success in projects depends on competence and the effort of individual project managers. While organisations in the level can succeed in a project, success is not often repeatable.

Source (Own construction)

The key concept is that an organisation will advance through the various levels as it gets more mature. The levels assist the organisation in focusing on its project management improvement efforts. The five levels of the SEI-CMMI define an ordinal scale for evaluating an organisation’s

project management capabilities: Level 1 for an immature organisation to Level 5 for a mature organisation. Khosrow-Pour (2009: 2942) summarises the different processes and practices of an immature and mature organisation in terms of SEI-CMMI (see Table 3.3). An organisation moves from ad hoc processes driven by individual project managers to the integration of project management within an organisation's business practices. SEI-CMMI gives an indication of what processes should be present if an organisation is at a certain project management maturity level. It does not provide assessment of internal methodologies of those processes (Jiang et al., 2004: 286; Khosrow-Pour, 2009: 2942).

Table 3.3: Difference between an immature and mature organisation in terms of SEI-CMMI

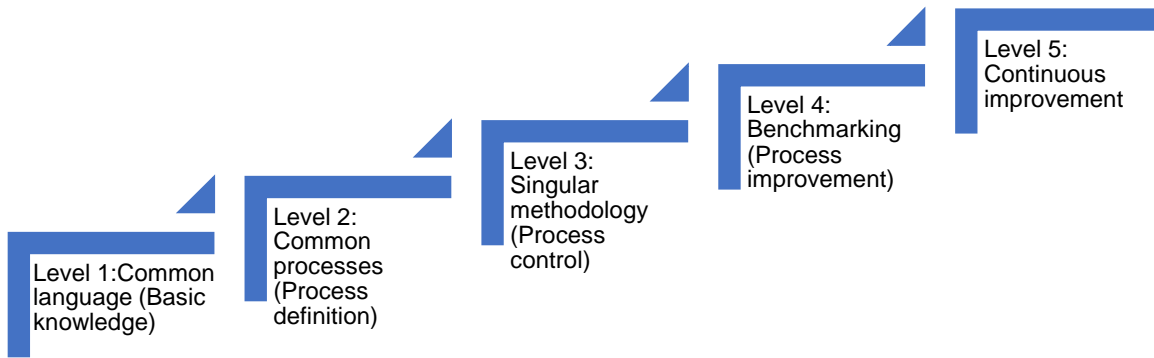
Immature Organisation	Mature Organisation
Ad hoc: improvised process by practitioners and managers. Not rigorously followed and not controlled. Highly dependent on personal knowledge. Little understanding of progress and quality. Compromising product functionality and quality to meet schedule. High risk when new technology is applied. High maintenance costs and unpredictable quality.	Coherent with action plans: the work is effectively achieved. Processes are documented and continuously improved. Perceptible top and middle management commitment. Well controlled assessment of the process. Product and process measures are used. Disciplined use of technology

Source: Khosrow-Pour (2009: 2942)

3.2.2 Model two – Kerzner Project Management Maturity Model

Kerzner developed a technical delivery model that is specific to project management other than SEI-CMMI that was adapted from software development (Khosrow-Pour, 2009: 2943). Kerzner Project Management Maturity Model (Kerzner-PMMM) focuses on assisting organisations in addressing the fundamental aspects of managing a project (Khosrow-Pour, 2009: 2943). Kerzner-PMMM defines maturity progression from understanding common processes of project management to institutional-wide adoption of a singular project management methodology (Kerzner, 2001: 42–43). Just like the SEI-CMMI, Kerzner-PMMM comprises five levels of maturity, feedback among the levels is highlighted in Figure 3.2.

Figure 3.2: Kerzner's five levels of project management maturity



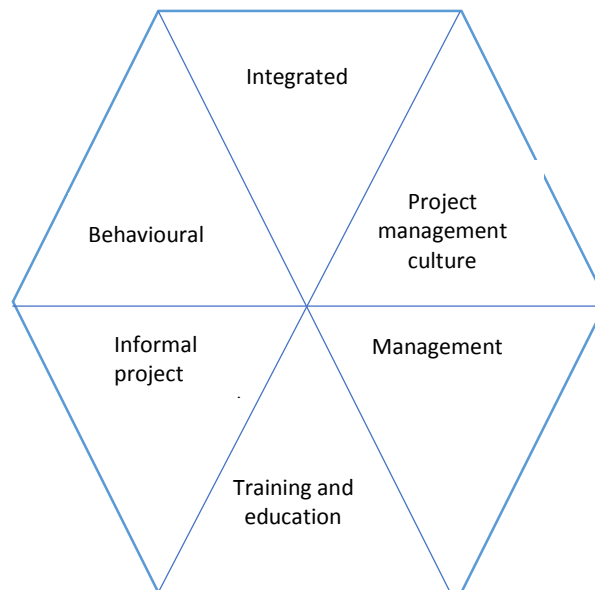
Source: Kerzner (2001: 44)

Although Kerzner-PMMM and SEI-CMMI have five maturity levels, what constitutes a Level 1 maturity is different between these two models. In Kerzner-PMMM Level 1, projects and departments within the same organisation have different views and use different project management methodologies and tools (Kerzner, 2001: 47). In Level 1, the organisation pays lip service to project management as there is no executive level support to institutional wide application of project management (Kerzner, 2001: 48). However, everyone within the organisation shares common language as there is some cursory knowledge of project management (Kerzner, 2001: 47). They all understand the importance of sound project management knowledge, but managers are more worried about what a new way of managing projects would do to their power and authority. A Level 1 organisation does not provide support to its staff's project management education and training (Kerzner, 2001: 48). In Level 2, there is institutional-wide support for project management, as its benefits are widely acknowledged (Kerzner, 2001: 68). The organisation recognises and develops common processes that are applied across all projects within the organisation (Kerzner, 2001: 67). The organisation starts providing in-house project management training and has policies for formal project management training for its staff (Kerzner, 2001: 68).

The key requirement for Level 3 maturity is the integration of project management with the other business processes in an organisation (Kerzner, 2001: 79). In Level 3, the entire organisation adopts a singular project management methodology rather than use multiple project management methodologies (Kerzner, 2001: 77–85). However, not all organisations are able to adopt a single project management methodology due to the structure of some organisations (Kerzner, 2001: 77). These make control of projects, training, and reporting easier. This level is like Level 3 of the SEI-CMMI. It is easier for a Level 3 organisation to establish a Project Management Office (PMO) or to adopt a single project management

software. The six characteristics of excellence outlined in Figure 3.3 are prevalent in an organisation that has achieved Level 3 maturity.

Figure 3.3: The hexagon of excellence for an organisation that has achieved Level 3 maturity



Source: Kerzner (2001: 79)

A Level 4 organisation recognises that project management processes are not fixed; they can be continuously improved. In preparation for continuous improvement, the organisation starts benchmarking its processes (quantitative benchmarking) as well as its culture (qualitative benchmarking). The organisation benchmarks itself with both similar and non-similar organisations (Kerzner, 2001: 103). A PMO is established, and it takes a leading role in the benchmarking processes (Kerzner, 2001: 99–100). The PMO also takes a central role in strategic planning for project management. Kerzner-PMMM introduces benchmarking as a key element that indicates that an organisation has achieved Level 4 project management (Kerzner, 2001: 97).

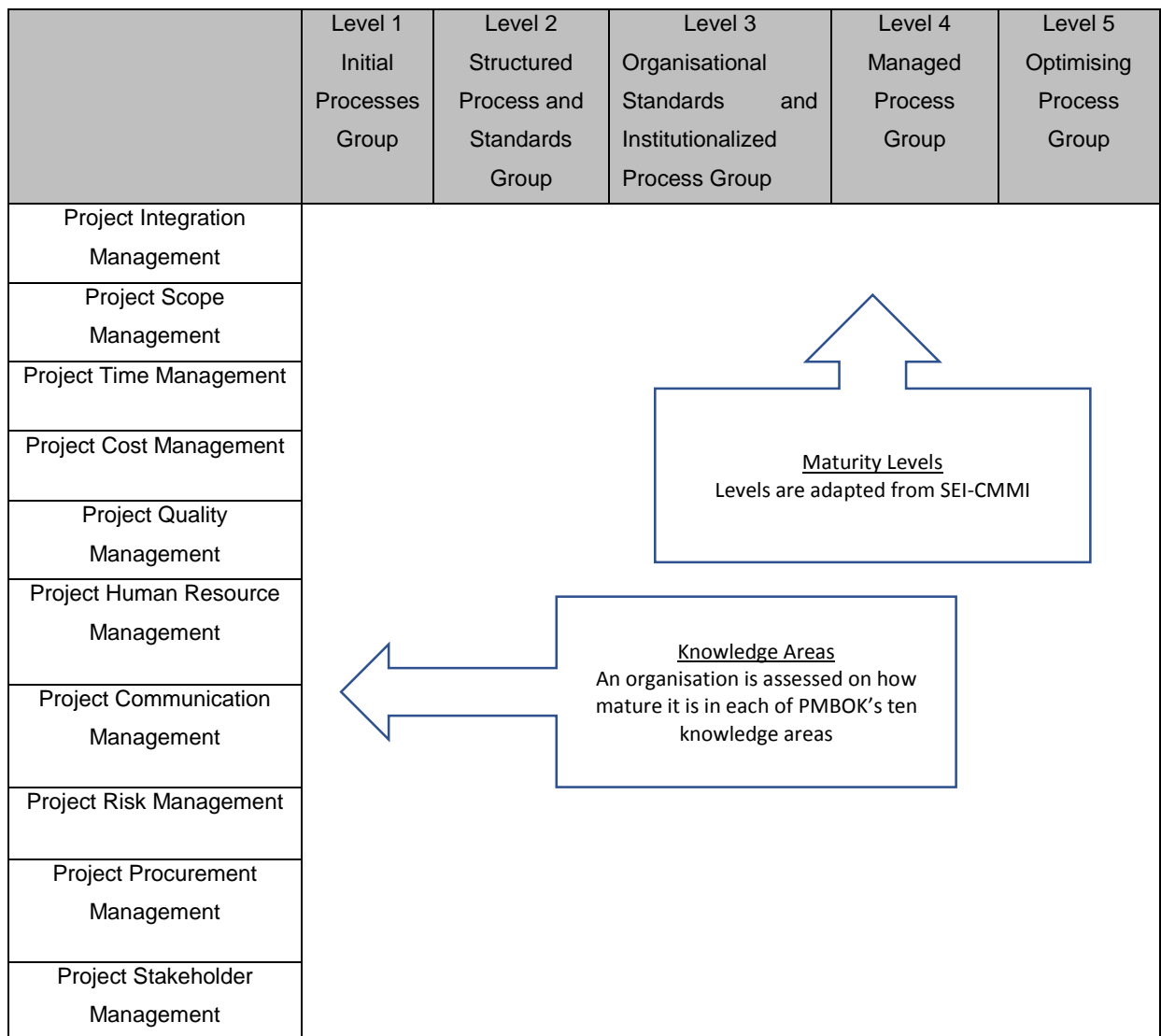
For a Level 5 organisation, continuous improvement that incorporates addressing managerial and behavioural issues, integrated processes, existing improvement processes, and benchmarking becomes the norm (Kerzner, 2001: 111). In a Level 5 organisation, not only are lessons learned from other organisations in the industry but they are also learned from previous projects (Kerzner, 2001: 110). There is a deliberate attempt to provide knowledge transfer between established project managers and novices (Kerzner, 2001: 110). The organisation's continuous improvement initiatives encompass existing processes, benchmarking, behavioural issues, management issues, and business integrated processes (Kerzner, 2001:111-112).

Project management maturity used in this study was based on Kerzner-PMMM. Kerzner-PMMM is not aligned with maturity standards such as the PMBOK and PRINCE2. This allows the determination of a quick overview of an organisation's maturity that can be performed with a questionnaire.

3.2.3 Model three – Project Management Solution's Project Management Maturity Model

Project management process maturity models integrate a project management standard such as PMBOK or PRINCE2 with a technical capability maturity assessment that has its theoretical roots in SEI-CMMI. One such model is Project Management Solution's Project Management Maturity Model (PMS-PMMM) which integrates an adaptation of SEI-CMM with PMBOK Guide's 10 knowledge areas to come up with a generic project management maturity model that can be applied outside software development (Souza and Gomes, 2015: 95). The PMS-PMMM assigns a maturity level based on five levels to an organisation's effectiveness to execute activities within the 10 knowledge areas of the PMBOK (Crawford, 2015: 2–6). Figure 3.4 summarises the key features of the PMS-PMMM.

Figure 3.4: A summary of the PMS-PMMM integrating maturity levels with PMBOK knowledge areas



Source: Crawford (2015:5)

Since the knowledge requirements of each PMBOK knowledge area are huge, the assessment of maturity is broken down further into the individual knowledge areas. Each of the knowledge areas is further subdivided into its process components. For example, time management comprises time management planning, activity definition, activity sequencing, activity resource estimation, schedule development, schedule control and schedule integration. The PMS-PMMM is then used to determine the effectiveness of an organisation in managing the individual process components. A maturity level will then be assigned to the organisation's management of a process component. An aggregation of an organisation maturity in each of the process component becomes the organisation's maturity level for that knowledge area. The PMS-PMMM does not report a consolidated maturity level for an organisation's entire project management but rather reports an organisation's project management maturity for

each PMBOK knowledge area. The maturity level is assigned to each component process area as outlined in Table 3.4.

Table 3.4: Levels of project management maturity for PMS-PMMM

Maturity Levels	Description
Level 5 (Optimising Process)	Processes are followed to ensure project effectiveness and efficiency to improve project performance with the aim of continuous improvement.
Level 4 (Managed Process)	The organisation now moves to portfolio management and projects get integrated into an organisation's business systems.
Level 3 (Organisational Standards and Institutionalised Process)	Records of all previous projects are kept ensuring repeatability. Detailed records are kept as stipulated by institutional policies. Organisational goals guide all projects.
Level 2 (Structured Process and Standards)	There is an effort to standardise processes for both small and complex projects.
Level 1 (Initial Process)	Management is aware of the strategic value of project management however the project management processes are undertaken on ad hoc basis.

Source (Own construction)

PMS-PMMM highlights three areas that influence an organisation's project management maturity: the project management office, management oversight, and project managers' continuing professional development. The first one is the existence and the role of the PMO (Crawford, 2015: 8–10). The PMO serves as a focal point of an organisation's project management capability development. It provides mentoring of junior project management staff, aids and assists in project planning, and monitors developing company-specific project management methodologies and standards. The PMO facilitates the standardisation of project management processes and practices across the organisation.

Management oversight and involvement provide impetus to project management activities in an organisation. This sends a signal to project teams and other staff that project management is important for an organisation. Once management takes the lead in project management, it becomes easier for project management activities to be integrated with other business practices and demonstrates active involvement in project activities. PMM has been known to increase in organisations where senior management demonstrates an interest in project management and its improvement within the organisation (Crawford, 2015:8-10).

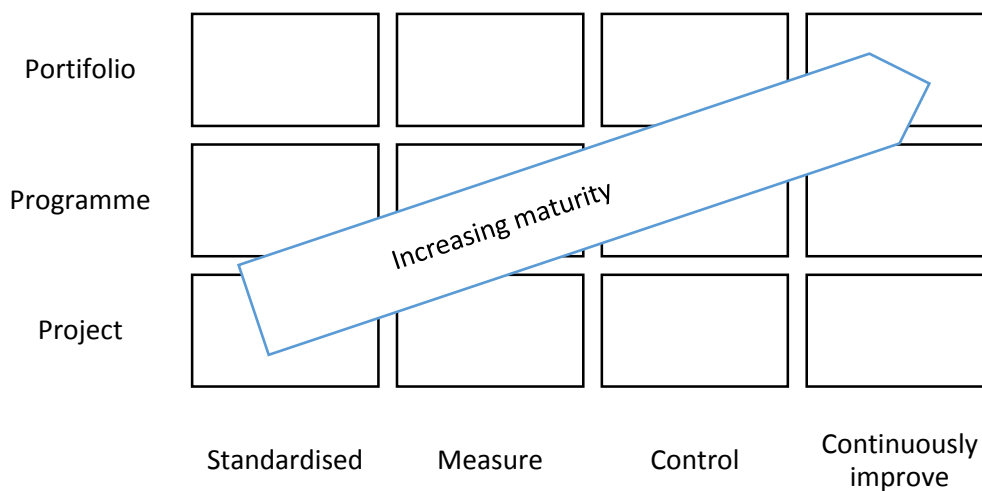
The maturity of an organisation's project management is affected by the ability of project team members to maintain high levels of competency through continuing professional development (Crawford, 2015: 10). Project management is continuously evolving as lessons learned from project successes and failures informs project management's state of art. Team members need to continuously upgrade their technical, management, and leadership skills, as successful execution of projects often requires a blend of these skills.

3.2.4 Model four- Organizational Project Management Maturity Model

The third type of project management maturity models, organisational models, differ from the previous two types in that they consider the entire organisation. They include other business processes that support management of an organisation to meet strategic objectives through projects (Grobler & Steyn, 2006: 153). Organizational Project Management Maturity Model (OPM3) that was developed by the PMI-USA and released in 2003 is discussed as an example of these types of maturity models.

OPM3 is linked to the PMBOK programme management and portfolio management standards developed by the PMI-USA. OPM3 is the only truly multi-dimensional project management maturity model. The premise of OPM3 is that when an organisation executes multiple projects, an assessment of its maturity must also take a holistic view looking at programme, portfolio, and project management. A programme is a related group of projects whose management is consolidated so that they can be managed in a coordinated way. Portfolio management is the management of an organisation's portfolio to achieve the organisation's strategic objectives. An organisation's portfolio encompasses all its programmes and projects. There are usually synergies that are derived from executing multiple projects (Project Management Institute, 2003: 6). Figure 3.5 outlines the structure of the multi-dimensional nature of OPM3 maturity assessment (Project Management Institute, 2003:6).

Figure 3.5: Summary of key aspects of OPM3 maturity trajectory



Source: Project Management Institute (2003: 6)

OPM3 breaks with the tradition of having five levels of maturity that have their roots in SEI-CMM. As shown in Figure 3.5, an organisation's growing maturity within the domains of project, programme, and portfolio management is assessed in terms of four stages of process improvement. In the first stage, an organisation develops common processes and rigidly monitors compliance. In the second stage, an organisation measures performance and tracks

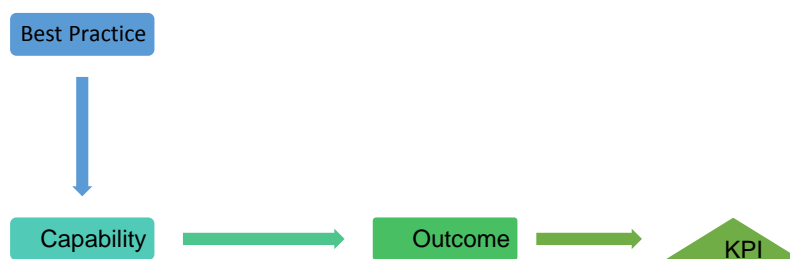
critical characteristics of processes. In the third stage, control stage, an organisation develops and audits improvement processes to maintain stable process control. Lastly, an organisation develops and implements a system for identifying process problems and continuously improving the processes.

Three interlocking elements of knowledge, assessment, and improvement determine an organisation's progression from one stage to the next. In the knowledge element, members of the organisation become proficient in PMBOK and the body of best practices outlined in the OPM3. They also master the concepts and methodologies of OPM3. In the assessment element, the organisation either through a self-assessment or otherwise compares itself as to how it fares on an organisational maturity continuum. Assessment forms the basis of planning for organisational project management improvement. In the improvement element, the organisation implements change initiatives that are required to improve its maturity. The elements are repeated until the organisation shifts to another stage of development.

During the first stage of process development, standardisation, the goal is to procure standard processes and tools for the organisation. Once procured, the organisation focuses on ensuring compliance with the standards. The second stage is to measure performance and compare it with standards and best practices. After this stage, the organisation establishes audit systems to ensure control and stability of processes and practices.

OPM3 has four building blocks that are linked together as shown in Figure 3.6 (Project Management Institute, 2003: 14).

Figure 3.6: Relationship between building blocks of OPM3



Source: Project Management Institute (2003: 16)

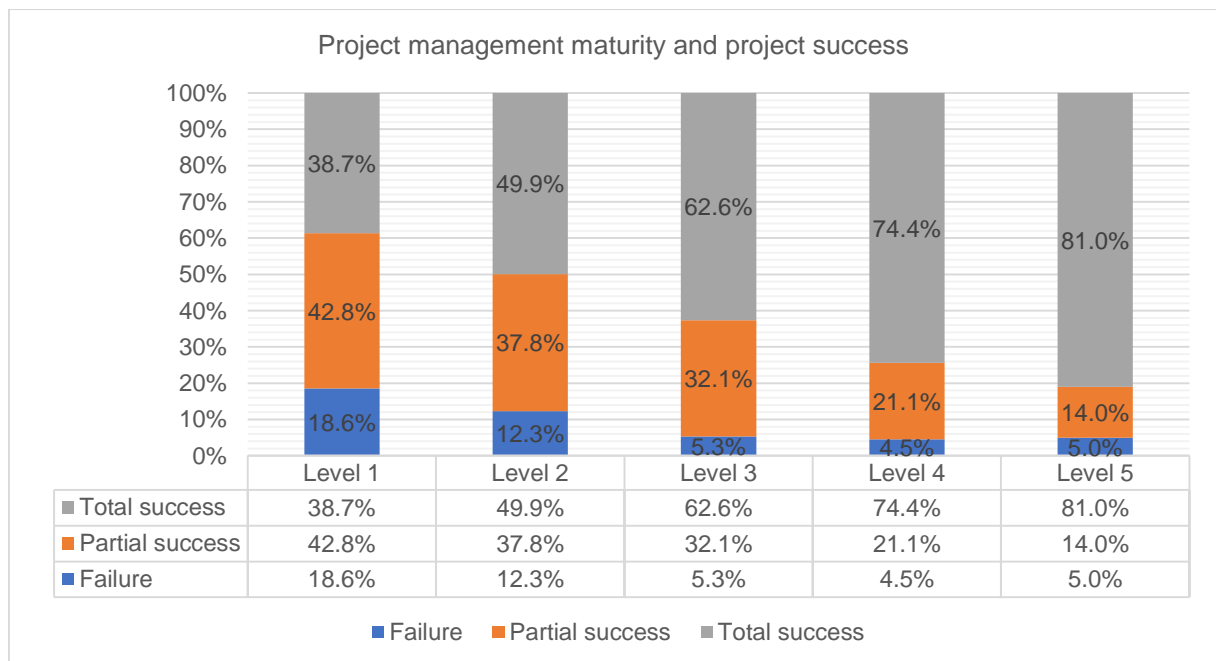
Increasing maturity relies on an organisation adopting best practices. A best practice is what a particular industry considers as the most appropriate way of performing a task to achieve specified objectives. Best practices are not static; they change from time to time. An organisation's ability to perform best practices depends on its capabilities. A capability is a competency that must exist in an organisation for it to successfully execute best practices. The desired outcome will be produced from successfully executing industry's best practice. An organisation confirms whether it has the capability to successfully execute best practices by

quantitatively and qualitatively establishing key performance indicators (KPIs). The above building blocks grows an organisation’s project management maturity.

3.3 BENEFIT AND APPLICATIONS OF THE MODELS

Project management maturity models are not the silver bullets that solve project management capability challenges. Cooke-Davies (2007: 1238) warns that project maturity models do not in themselves confer competitive advantage to an organisation, but they are rather a valuable tool that can assist an organisation in its quest for project management excellence. Perhaps the value of the models can be appreciated when one considers anecdotal evidence of project success rates of organisations that have low maturity levels. In a Brazilian study, Prado, Oliveira and Romano (2015: 14) found that there is a direct positive relationship between project management maturity and project success (as shown in Figure 3.7). They found that as project maturity increased from 1 to 5, project success also increased from 38.7% to 81%. Conversely, as maturity decreased from 5 to 1, project failure rate increased from 5% to 18.6%. Other researchers reported similar findings as well.

Figure 3.7: Relationship between project management maturity and project management success

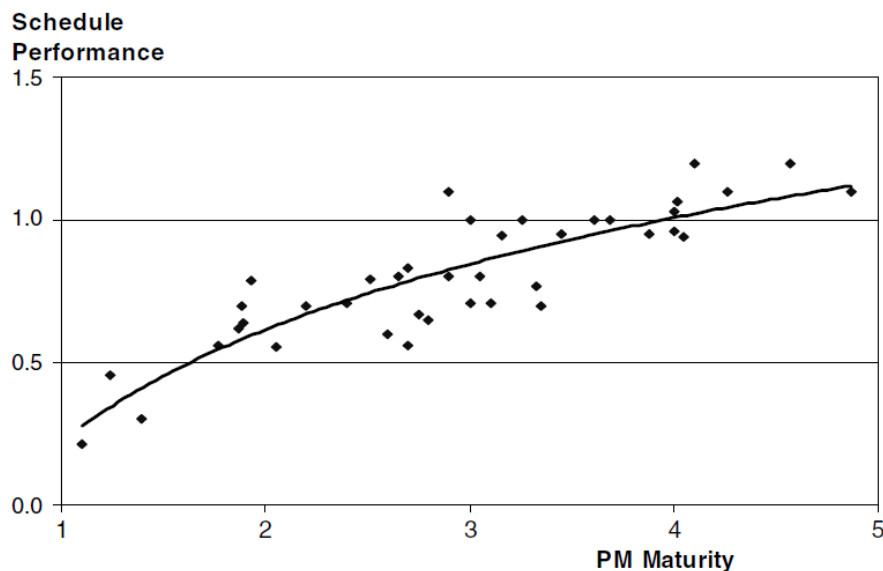


Source: Prado, Oliveira and Romano (2015: 14)

Ibbs, Reginato and Kwak (2004: 1226) warn that one must not lose sight of the goal of maturity improvement initiative. They indicate that the real goal of any process improvement initiative is to increase the probability of project management success. Gray and Larson (2011: 106) explain that project management success is judged based on the triple constraints of time, scope, and cost. A project is considered successful if it delivers the entire scope on time and

within budget. Schedule Performance Index (SPI) and Cost Performance Index (CPI) measure project management achievement. A project is considered a project management success if its SPI and CPI on project completion are united. Ibbs, Reginato and Kwak (2004: 1226–1228) report on a study that found the relationships between SPI, CPI, and project management as shown in Figure 3.8. The results show that more mature organisations are able to deliver projects better than less mature one in terms of the project management triple constraints, and both SPI and CPI get close to Level 1 as project management maturity approaches Level 5. The two studies that have been reported in this section support the assertion that project management maturity and project management success are not independent. Ibbs, Reginato and Kwak (2004: 1226–1228) report on a study that found that as an organisation’s project management maturity increases, it can deliver projects with SPI that nears unity (see Figure 3.8).

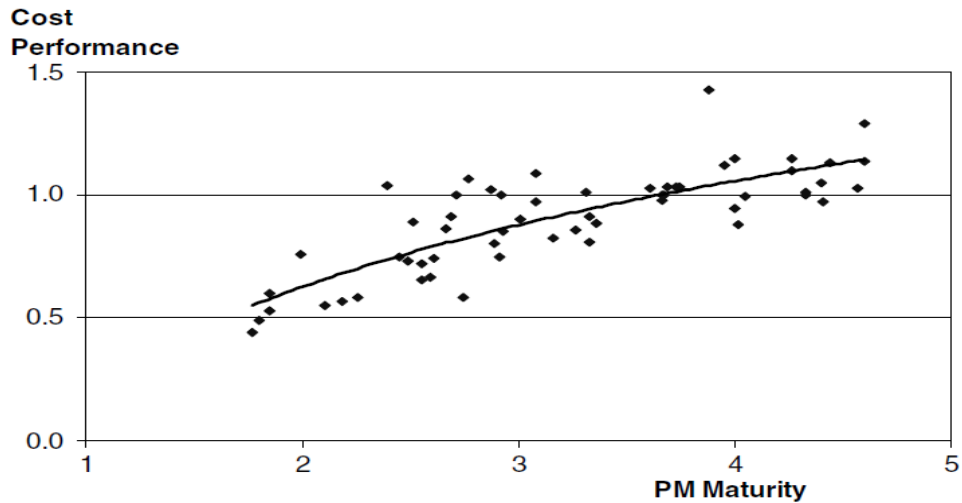
Figure 3.8: Association between SPI and project management maturity



Source: Ibbs, Reginato and Kwak (2004: 1227)

Similarly, the study also found that as an organisation’s project management maturity increases, the CPI of its projects nears unity (see Figure 3.9). In both cases, increase in project management maturity correspond to better project performance in terms of schedule and cost. The CPI and SPI for Level 5 organisations are slightly above unity, indicate that such organisations can deliver project earlier than planned and at less than the anticipated cost. The two studies, Prado, Oliveira and Romano (2015) and Ibbs, Reginato and Kwak (2004: 1226–1228), that have been reported in this section support the assertion that project management maturity and project management success are not independent.

Figure 3.9: Association between CPI and project management maturity



Source: Ibbs, Reginato and Kwak (2004: 1227)

3.4 COMPARISON OF THE MODELS

SEI-CMM and other technical delivery process models focus on documenting project management processes and increasing the level of application on standardised project management processes within an organisation. Project management process models are an evolution of the technical delivery process models in that they apply the same concept of increased capability within the context of an organisation which practises project management based on a standard such as PMBOK or PRINCE2. PMS-PMMM is an example of such a model that integrates the capability structure of SEI-CMM. Organisational maturity models go beyond project management and review the entire organisation. They can be applied to organisations that are not project-orientated. A comparison of the maturity models that were reviewed in this chapter is presented in Table 3.5.

Table 3.5: Comparison of common project management models

	SEI-PMMM	Kerzner-PMMM	PMS-PMMM	OPM3
Type	Technical delivery process	Technical delivery process	Project process	Organisational
Focus	Software development process	Project management	Integration of SEI-CMM and PMBOK	Project, portfolio, and programme management
Levels/stages	5. Optimisation 4. Management 3. Refined 2. Repeatability 1. Initial	5. Common language 4. Common process 3. Benchmarking 2. Singular methodology 1. Continuous improvement	5. Optimising 4. Manage 3. Organisational standard and Institutionalised process 2. Structured and standard 1. Initial	4. Continuously improve 3. Control 2. Measure 1. Standardised

Source (Own construction)

Technical delivery models are excellent tools to move an organisation from traditional management processes to project management. Project management process models assist organisations that are practising project management based on a particular standard to gauge how well that standard has become entrenched in their management processes. For example, an organisation that uses PMBOK can use PMS-PMMM to review the maturity of its project management. Once an organisation is practising project, programme, and portfolio management, organisational maturity models can then be used to review the entire organisation's processes. Project management maturity models are not a case of one size fits all. Applicable maturity models should be chosen based on an organisation's state of development and the project management standard that it ascribes to.

Project management maturity assessment used in this study was based on Kerzner-PMMM, as it is not aligned with any methodology such as PMBOK or PRINCE2. The study required a model that is not a non-aligned maturity model, to avoid respondent bias. All the process models are aligned to a project management methodology. The organisational models are also not applicable, as they require high PMM to be effective. South African organisations have relatively low maturity. Labuschagne *et al.* (2013:13) found that South African organisations have an average maturity of Level 3. The OPM3 is unsuitable for organisations that have a maturity level of three or below.

3.5 RELATIONSHIP BETWEEN PROJECT MANAGEMENT MATURITY AND THE PROJECT MANAGER

An organisation's project management maturity depends on the competency of its staff, particularly that of the project manager (Crawford, 2005: 7). Competency is "the ability to mobilise, integrate and transfer knowledge, skills and resources to reach or surpass performance in work assignments adding economic and social value to the organisation" (Takey & Carvalho, 2015: 785). Although the competency of a project manager cannot be directly measured, it can be inferred from personal attributes such as qualifications, experience, attitudes, and behaviours (Crawford, 2005: 9). Project management associations have recognised the impact of project managers on project management success such that they have introduced frameworks for assessing and certifying PM competencies (Takey & Carvalho, 2015: 784).

Chipulu, Neoh, Ojiako and Williams (2013:506-517) investigated and mapped key project manager competencies from a study of project manager recruitment adverts from all over the world. Employers sought project management knowledge and expertise as evidence of project management qualifications, certifications, and years of project management experience (Chipulu et al., 2013: 510). They also sought senior managerial experience that can provide

strategic leadership as well as manage change (Chipulu et al., 2013: 510). High emotional intelligence and understanding of professional ethics were also sought (Chipulu et al., 2013: 512). Lastly, highly sought project managers are expected to be experts in risk management (Chipulu et al., 2013: 512).

A project manager is defined as an individual who is responsible for managing a project (Gray & Larson, 2011: 647). It is not a title that makes one a project manager. Gray and Larson, (2011: 4) correctly note that most people who manage projects do not carry a project manager title, suggesting that the function is unique given the unique nature of the projects themselves. Crawford (2005: 7) concurs and posits that their function goes beyond mere coordination of activities to implement a plan, since they are liable for the success or failure of the project execution process.

Effective project managers are essentially leaders in that they too often do not have formal authority (Roeder (2013: 147). However, Mersino (2013: 112) notes that like other managers, project managers are expected to be able to get work done. Mazibuko, Tait and Jowah (2015: 315) concur and assert that project leaders have a serious problem because they have an authority gap (no formal authority) and thus find themselves having to develop other competencies to enable them to overcome the authority gap and deliver on expectations. This necessitates the definition of what leadership is.

Leadership has been defined differently by many authors; what is common, however, or what many agree on, is that leadership involves dealing with people, with followers. Daft (2015: 5) defines leadership as the ability to influence other people to get involved in agreed on action to achieve a shared purpose. Roeder (2013: 150) contextualises leadership into project management operations and defines it as a process used by an individual to influence other people to agree with a vision and give them power and ability to work towards achievement of that vision motivated and guided by the leader to try and achieve the deliverable objectives. Leadership is therefore the ability to exert power on other people and make them accept that they can follow, trusting that they are being led in the right direction (Jowah, 2014: 15). There is therefore a distinction between a project leader and a project manager even though these are constantly (wrongly though) interchangeably used. Jowah and Laphi (2015: 3) state that the primary difference between a leader and a manager is that leaders focus on people and relationships, but managers' focus on tasks and schedules. Young and Dulewics (as quoted in Jowah and Laphi, 2015: 3) outline some key aspects that distinguish leadership from management as shown in Table 3.6.

Table 3.6: Differences between leadership and management

Leadership	Management
Setting a direction	Planning and budgeting
Aligning people	Organisation and staffing
Motivation	Controlling and problem-solving
Mastery of the context	Control of the environment

Source: Jowah and Laphi (2015:3)

Leadership starts with the philosophy that projects are done by people through people for people, so people become the pivot of the success of any operation from a leader's perspective. As identified by McGregor in the X and Y theories, the attitude of the man/woman at the top suggests and/or informs whether the authority will be a leader or a manager. As project leaders, they go beyond implementing the project plan and coordinate all the activities in the process, and are responsible for resource allocation, stakeholder management, project team functions, communicating to both internal and external stakeholders, and ultimately the politics that brings the whole project into being (Roeder, 2013: 150). All this is within the limitations caused by the authority gap, specifically in organisations that have embedded projects (matrix organisations) where the project team members have dual loyalty reporting to their functional managers. Thoms and Kerwin (2004: 1014) note that leading a project team has its own unique challenges emanating from the uniqueness of the project execution process, namely:

1. First, project managers are essentially change agents. They are involved in initiating the change and then implementing the change.
2. Secondly, projects often involve the bringing together of stakeholders who too often have conflicting interests.
3. Thirdly, the project process is characterised by risks that need constant management throughout the process.
4. Fourthly, coordination and navigation are expected to be done within the triple constraints of project execution success.
5. Fifthly, practitioners know that their coming together is temporal and may start looking elsewhere for alternative jobs.

Effectively executing the foregoing therefore goes beyond the manager's call of duty, where the focus is on tasks, controlling, setting up of rules and procedures, and standing to watch who fails to abide. Leadership empowers, guides, enables space for innovation and errors but directs continually towards the intended goal. The project leader's role and their expectations and leadership styles are informed at all times by the type of tasks to be performed, the people to perform the tasks, and the expectations of the stakeholders and sponsors (Roeder, 2013: 150–151). Consequently, the project leader's role changes during different stages or phases of the project and when dealing with different types of stakeholders within the constraints of

the project square root (time, quality, budget, and scope) (Roeder, 2013: 152–153). From the preceding hypothesis then, the primary leadership model that may be adopted by project managers is the situational leadership model, but it should combine both people and tasks. This model implies that leaders change their behaviour as needs change according to the situation; thus, the leader may adopt a relationship-orientated leadership style in certain situations and task-orientated leadership in others (Magenau & Pinto, 2004: 1015). A project manager might adopt a task-orientated behaviour with subcontractors and a relationship-orientated with experienced team project managers.

3.6 PROJECT MANAGERS' POWER

It is claimed that power is distinct from influence and is defined as the force that one uses to make things happen (Elearn Limited (2007: 53). On the other hand, Jowah and Laphi, (2015: 3) define power as the ability to influence. Despite the difference in the definition of power, power resides in certain aspects of the leader. Different forms of power are known to exist and as such, an understanding of the type of power enables the leader to identify when to use the power and on whom the power should be used. Two types or classifications of power may be identified, and these are positional power and personal power, largely as enablers for the project leader to function (Schermerhorn, Hunt & Osborn, 2002: 173). Positional power or legitimate power is power bestowed on an individual by virtue of their position in the organisation or structure in which they are operating (Daft, 2015). On the contrary, personal power is power coming from an individual because of who they are, centred more on their personality and this power cannot be taken away from the individual (Schermerhorn, Hunt & Osborn, 2002: 173). Using another method of classification of power, Schwalbe (2014: 369–370) identified five different forms of power, namely, legitimate power, reward power, expert power, coercive power, and referent power. Table 3.7 illustrates the relationship between the different classifications of power.

Table 3.7: Relationship between the two power classes

Power	Type of power
legitimate	positional
referent	personal and positional
expert power	personal
coercive	positional
reward power	positional and personal
informational power	personal power
political power	personal power
negotiation power	personal and positional power

Source (Own construction)

It is possible for a manager to have all the powers in one individual, and that would be the most ideal situation, but it is not always the case in the real world. Whatever the case, there is a need for the leader to have power to be able to direct the operations of a project execution process (Elearn Limited, 2007: 56). It may be hypothesised here that not all people work because of the power of the leader; some people would work even if they did not know who the project leader is. Other individuals would also not work even in the presence of a powerful leader, for instance, if they have a grievance. To a large extent, there should be basic willingness from an individual to perform, which is what is then directed or guided by the leader; that is why people come to work in the first place. Thus, therefore means that project leaders must use their power constructively (Peiró and Meliá (2003: 15), since there is a basic desire to work as shown by the presence of the individual at the workplace. Power can enable a project manager to pursue project objectives – the type of power needed may depend on the structure of the organisation.

The second source of power that a project manager might have is personal power. Personal power is not derived from a person's position within an organisational hierarchy; it is derived from the characteristics, qualities, or traits which an individual possesses (Magenau and Pinto, 2004: 1035). Magenau and Pinto (2004: 1036) state that there are four forms of personal power: referent power, expert power, information power, and connection power. Referent power is acquired through building confidence and a good name for oneself such that one's peers look up to them. When someone has expert power, it is based on the individual's relevant experience and knowledge for the team to complete the task (Schermerhorn, Hunt & Osborn, 2002: 174). A project manager that has an international certification such as PMI-USA's PMP certification, a certification from the South African Council for Project and Construction Management Professions, or any other reputable body would be considered to have expert power as far as project management is concerned. In information power, one has power based on the belief that one possesses or has access to information that is necessary for successful completion of a task. Connection power is not related to someone's position in the organisation or team but rather tied to the connection to power players that an individual might have (Elearn Limited, 2007). The connection can be internal or external with other sources that would be beneficial to completing the project.

Mark McManus (2006:76) argues that it is important for project managers to build support for their discussions by engaging stakeholders and affected interests. He warns that without engagement, today's solutions might result in tomorrow's problems. It is during this engagement that project managers have an opportunity to influence stakeholders. Using influence, a project manager might gain compliance from other organisational players even though the project manager has no direct authority over them. It is important to distinguish

between power and influence. Power is cross-cutting, while influence is situation-specific. Schermerhorn, Hunt and Osborn (2002: 173) define influence “as what you have when you exercise power”. Table 3.8 outlines the key differences between influence and power, which highlights that they differ in terms of “scope and generality, strength of foundation and tenure” (Magenau & Pinto, 2004:1038).

Table 3.8: Comparison of power and influence

	Power	Influence
1. Scope and generality	Cuts across situations and relationships.	Situation-specific and usually face-to-face.
2. Strength of foundation	Strong base. Does not have to be done well to work.	Weak base. Must be used well or will not work.
3. Tenure	Long-term.	Short-term.

Source: Magenau and Pinto, (2004: 1039)

A project manager can use persuasion, ingratiation, and pressure (Magenau & Pinto, 2004: 1040). In using persuasion, the project manager will attempt to influence other stakeholders by arguing the merits of the project manager’s position. Persuasion is a good tactic to employ when the project manager thinks that her arguments and supporting evidence are strong. Persuasion works well when dealing with open-minded stakeholders. In ingratiation, the project manager uses flattery or cajolery to attempt to gain cooperation from other stakeholders. A project manager might also apply pressure to solicit compliance from stakeholders. Pressure applies external consideration to supplement the message that is being conveyed. For example, a project manager might apply pressure in the form of exercising penalties that are provided for in a supplier’s contract to force him to hasten completion of an activity that is on a critical path. Correct application of pressure requires skills and experience because applying pressure can backfire (Magenau & Pinto, 2004:1040).

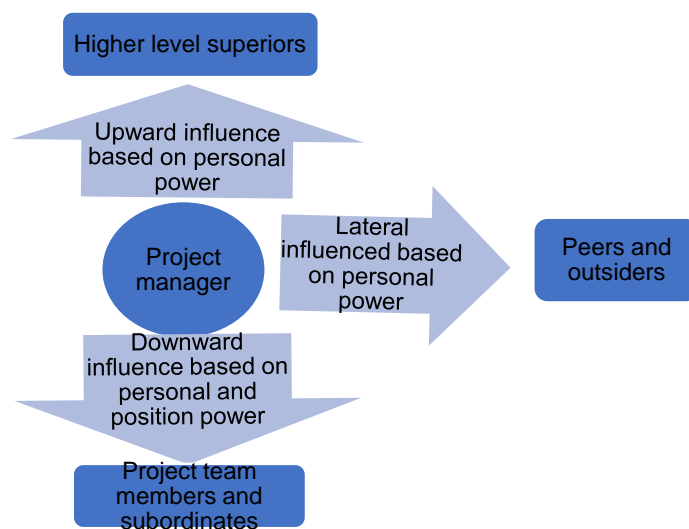
Methods which project managers can use to enhance their influence with superiors, project team members, and other stakeholders have been presented (Elearn Limited, 2007:55-57). It is recommended that project managers strive to establish a reputation as an expert in the type of project which their organisations engage in. One of the ways of establishing a reputation as an expert is for project managers to pursue certification in project management and the industry that the organisation belongs to. “A project manager who is widely perceived as lacking any sort of technical skill or competency cannot command the same ability to use influence as a power mechanism to secure the support of other important stakeholders or be perceived as a true ‘leader’ of the project team” (Magenau and Pinto, 2004: 1041). It is recommended that a project manager should establish a network of other experts that she can call upon for assistance (Elearn Limited, 2007:56-57). One of the ways of achieving this is to

belong and participate in the activities of professional associations such as PMSA, SACPCMP and the local chapter of the PMI-USA. Another way to establish sustained influence is for the project manager to establish close ties and contacts around her organisation on the basis of accomplishing goals other than social preference (Magenau and Pinto, 2004: 1041–1042).

Improvement in PMM requires change of an organisation’s policies and processes. Project managers must therefore also act as change agents and influential leaders (Yukl, Fu & McDonald, 2003: 69; Kendra & Taplin, 2004: 23). A change agent is an individual who is accountable for introducing and maintaining change in an organisation (Kendra & Taplin, 2004: 21). A change agent consciously maintains the change to ensure a lasting influence. The change agent must have “high cognitive complexity in thinking about change and high behavioural complexity in the realm of making change” (Kendra & Taplin, 2004: 22). Researchers agree that project managers need to have leadership, communication, and teamwork skills to effectively manage change that is required in order to improve PMM (Saka, 2003; Kendra & Taplin, 2004: 31; Crawford & Nahmias, 2010: 14). Project managers must demonstrate mastery of these skills that can only be achieved through knowledge and skill development over many years (Kendra & Taplin, 2004:31).

To effect change, project managers must be able to influence superiors, colleagues on the same organisational level, as well as subordinates (see Figure 3.9). The project manager can achieve this by using influence that is based on expert power and rational persuasion power (Schermerhorn, Hunt & Osborn, 2002: 178). Thus, a project manager might use friendliness, reason, and coalition to exercise influence (Schermerhorn, Hunt & Osborn, 2002: 177). A project manager must have expert knowledge and skills, impeccable experience, and personal mastery to be successful in exercising influence (Kendra & Taplin, 2004: 31).

Figure 3.10: Dimensions of managerial power that can be used by project managers



Source: Schermerhorn et al. (2002: 175)

3.7 SUMMARY

In this chapter, the origin, purpose, and benefits of conducting project management maturity assessment were discussed. The chapter discussed exemplars of technical, process, and organisational project management maturity models. It discussed Kerzner-PMMM as an exemplar of process models, PMS-PMMM as an exemplar of process models, and OPM3 as an exemplar of organisational models. It was highlighted that maturity models are not the silver bullets that would solve all project management problems; they are tools that if properly implemented would assist organisations in their quest for project management excellence. For project management improvements to be effectively implemented, there is a need for someone to champion the change. The project manager was identified as that change agent. Project managers do not usually have functional authority or authority gap; they exercise personal rather than positional power. The chapter also discussed the various ways which project managers can use to influence change.

The next chapter will discuss the research design and methodology used in this study.

CHAPTER FOUR

RESEARCH DESIGN AND METHODOLOGY

4.1 INTRODUCTION

The foregoing chapter discussed project management maturity models and the project manager as a leader. This chapter focuses on the research design and methodology employed in this study.

Babbie (2013: 3) brings out that research is about knowing things and research design about how people go about the process of knowing. How people know something depends on what they want to know. Punch (2014: 4) explains that he poses the following simple but profound question to his students when they struggle in focusing their research design: “What are we trying to find out here?” According to Punch (2014: 6), a follow-up to the above question is either a research question or research problem. A research question represents a facet of an inquiry detailing with what a researcher wants to know (Maxwell, 2013: 5). Punch (2014:6) defines a research question simply as “-something requiring an answer – followed by an investigation designed to collect the data to answer the question”. On the other hand, a research problem is a problem which needs a solution which takes the form of an intervention (Punch, 2014: 6). Punch (2014:6) advises that research can start either with a research question or with a research problem.

Whether one starts with a research problem or research question, to ensure credibility of the resulting findings or interventions, the research must be done systematically – follow a set research design. A research design outlines how the research activity is organised: the strategy that will be followed, how and from whom data will be collected, and how it is going to be analysed. A study that adheres to a valid research design is most likely to achieve the research objectives. In a study that is neither interventionist nor exploratory, Punch, (2014: 6) and Yin (2014: 42) recommend that research questions must dictate the research design and not vice versa. Yin (2014: 42) presents a framework that can be used to choose a research design that is appropriate for a given type of research questions. The framework is presented in Table 4.1.

Table 4.1: Relevant situations for different research methods

Method	Form of research questions	Requires control of behaviour or events?	Focus on contemporary events?
Experiment	how, why	yes	yes
Survey	who, why, where how much, how many	no	yes
Archival analysis	why, where, what, how much, how much	no	yes/no
History	why, how	no	no
Case study	why, how	no	yes

Source: Yin (2014: 42)

The nature of data that is collected to answer the research question influences the research approach. Is the data required in the form of numbers, measurements, or not? Answering the research question goes beyond the nature of data required, it covers the way a researcher thinks about machinations of answering the research question – the research approach. A researcher can approach finding answers to research questions numerically; the researcher can use text or can use a combination of numbers and text. Thus, a researcher can use a quantitative, qualitative, or mixed method approach to research design. Table 4.2 provides a summary of the key features of the three approaches to research.

Table 4.2: Key features of the three approaches to research

Quantitative	Qualitative	Mixed approach
Data in the form of numbers	Data in the form of text, images	Both
Associated with positivism – belief in nomothetic knowledge	Associated with constructivism (reality is local, specific, and constructed) or interpretivism (meanings people ascribe to events and behaviour) – idiographic knowledge	Pragmatism – focus on what works to answer the research question
Variable-orientated	Case-orientated	Whatever works – cases and variables
Strips data from context	Sensitive to context	Focus on either at different times or with different relative importance. Either merge the data into the context or embed within the other
Focuses on association/causation/prediction	Focuses on providing thick and rich description of a phenomenon	Whatever answers the research question
Use Humean approach to causal explanation- causation is determined through constant conjunctions between independent and dependent variables	Establish causation through description of causal mechanics	Recognises the complementary nature of deductive-nomological model of explanation and the descriptions of causal mechanisms

Source (Own construction)

4.2 RESEARCH DESIGN

Mouton (2001: 55) indicates that a study's research design should be chosen by considering what would best answer the research question. The study's main question takes the form, is Y related to X? Mouton (2001: 54) shows that this type of question requires finding out if there is a correlation between Y and X. Thus, the answer to the study's research question requires quantitative data. Therefore, the study will follow a quantitative approach. As indicated in Table 4.2, a quantitative approach is associated with positivism, as it seeks nomothetic knowledge-emphasising generalisation just as in the natural sciences. It is indicated in Table 4.2 that quantitative research can focus on association, causation, or prediction. Prediction is in relation to causation, as establishing causation is the first step to prediction. Nomothetic causality has to satisfy the three criteria outlined by Babbie (2013: 93–94): correlation, time order, and non-spuriousness. The first criterion, correlation, means that unless there is a statistical correlation between the dependent and independent variables, one cannot ascribe a causal relation to the variables. The existence of correlation is necessary but not sufficient for causality; the variable that is considered to cause something must cause it before the variable represents the effect – time order. Time order is difficult if not impossible to establish with cross-sectional studies. This is an inherent weakness of all cross-sectional studies, including the current one. Lastly, it should not be possible to explain the effect through some other variable which affects both the apparent cause and effect.

Project management maturity improvement happens over a long period, possibly it takes years, which would have required a longitudinal study conducted over some years to establish its nomothetic causal factors. Because of time constraints, a cross-sectional study was conducted instead. Babbie (2013: 105) explains that in a cross-sectional study, data is collected from a cross-section of the population at the one-point time, which for this study was February to March 2017. Thus, due to the difficulty in establishing temporal order, the study limited itself to establishing the existence of relationships between various project managers' attributes and project management maturity. In summary, the study adopted a cross-sectional correlational research design.

4.3 RESEARCH METHODOLOGY

Kothari (2004: 8) points out that research methodology can be understood as the science of studying how research is conducted. It focuses on how the above research design activities will be conducted, thus; how will the research subject and objectives be decided on, how will the research question be constructed, how will the research population be identified, how will the sample be selected, how will the population be sampled, how will the data be collected,

how will the research instrument be developed, how will the data collection be conducted, how will the collected data be analysed, and how will it be reported. Thus, the methodology is in answer to the “how” of the research, whereas the design is for the “what” of the research.

The study is contemporary, and the researcher had no control over the actions or behaviour of the respondents. As per stipulations outlined in Table 4.1, a survey methodology is the most appropriate for the study. Punch (2014: 216–217) categorises surveys into two categories: descriptive and correlational surveys. The main purpose of a descriptive survey is to describe a sample in terms of simple proportions, percentages of respondents who respond in a particular way to each question. This type of survey is common in the market or political research. The second type of survey, correlational survey, is used to study relationships between variables. According to Punch (2014: 217), correlational surveys are particularly useful in those cases where independent variables of interest to the researcher – as was the case in the study – vary in a situation where the researcher can neither manipulate or control. Thus, the study adopted a correlational survey research methodology.

4.4 TARGET POPULATION

A population is a group of people that have some common attributes that are of interest to a researcher (Babbie, 2013: 99–100). In this study, the researcher was interested in studying project managers’ attributes. As defined earlier, a project manager is anyone who manages projects, whether they have a title of project manager or not. To circumvent this problem of identification, the researcher focused on individuals who self-identified as being involved in project management. The target population was the entire membership of a South African project management association. The selected association has a membership of about 1500.

4.4.1 Sample frame

The sample frame is the total number of people that qualified for the survey. In this study, the sample frame was 1500 self-identified project managers.

4.4.2 Sampling method

Kothari (2004: 55) emphasises that when the population is small – a population of 1500 could be regarded as small – it is no use resorting to sampling. The researcher decided to use or to survey the entire population (the sample frame), since there were no negative costs and time implications. Sampling is done primarily because it is generally expensive to go through the entire population (census); in this study, all the respondents could be assessed via a single invitation.

4.4.3 Sample size

As already stated, the sample size was 1500 potential participants.

4.5 THE RESEARCH INSTRUMENT

It was necessary to decide on how to gather data required for this study. The researcher therefore opted to use a questionnaire. Jowah (2015:163) defines a questionnaire as a set of questions logically constructed with the aim of deriving from the respondents' data that will help get answers to reach the objectives. The survey instrument was developed for the study based on Kerzner-PMMM and attributes that highlight a project manager's technical expertise, project management experience, power, and influence. The instrument used in this study was a structured questionnaire with semi-structured questions (qualitative) at the end. The questionnaire was made up of multiple choice, Likert scale questions, and open-ended comments. It was divided into three sections, namely, Section A, Section B, and Section C (see Appendix A).

Section A was biographical – The first section provided a description for the study and was used to get information about the respondents.

Section B was the Likert scale – The scale measured project managers' attributes and influences and an organisation's project management maturity. The rating scale measures that were used were as follows: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

Section C was for respondent comments – Although the study was quantitative, it was decided to collect respondent comments as a way of checking whether the questionnaire captured the salient points of the study. This section also allowed for the development of emergent themes/constructs that would be incorporated in future studies.

The questionnaire was considered handy, since data could be gathered under anonymous and confidential circumstances and be kept for future use. This data could therefore be converted into information and could be revisited at will should other questions arise pertaining to the study. The three-page questionnaire allowed for wider participation and provided an opportunity to express views about the matter at hand without fear of reprisals. The use of the questionnaire also allowed for the targeting of a wider audience as compared to having a few interviews. After construction, the questionnaire was taken for a "pre-run" and reconstructed with the assistance of a statistician, after which it was sent for ethics clearance. After this, it was used to collect data from the respondents.

4.5.1 Advantages of using the questionnaire method

The questionnaire was decided on because of certain advantages that would assist positively in a survey of this nature. Kothari (2004: 100–101) outlines the advantages and disadvantages of using a questionnaire in a study; these are summarised in Table 4.3.

Table 4.3: Advantages and disadvantages of using questionnaires in surveys

Advantages	Disadvantages
There is low cost even when the universe is large and is widely spread geographically.	Low rate of return of the duly filled in questionnaires, bias due to no-response is often indeterminate.
It is free from the bias of the interviewer, answers are in respondent's own words.	It can be used only when respondents are educated and cooperating.
Respondents have adequate time to give well thought out answers.	The control over questionnaire may be lost once it is sent.
Respondents, who are not easily approachable, can be reached conveniently.	There is inbuilt inflexibility because of the difficulty of amending the approach once questionnaires have been despatched.
Large samples can be made use of and thus the results can be made more dependable and reliable.	There is also the possibility of ambiguous replies or omission of replies altogether to certain questions; interpretation of omissions is difficult.
	It is difficult to know whether willing respondents are truly representative.
	This method is likely to be the slowest of all

Source: Adapted from Kothari (2004: 100–101)

The above-mentioned disadvantages were weighed against the positives. Considering that the respondents were dispersed all over South Africa, other methods of data collection were considered not to be economical.

4.6 DATA COLLECTION TECHNIQUE

Data was collected from individuals who self-identify as project managers. The data collection was done using a structured questionnaire. The developed manual questionnaire was converted to an online questionnaire, which was then deployed through SurveyMonkey™. An online questionnaire was preferred, as the target population was dispersed throughout South Africa. It would have cost more than what was available in the research budget if it were not for the online questionnaire. With this constraint, manual admission of the questionnaire would have limited the target population to those that work in the Cape Town area, thereby making the sample unrepresentative. The second option that was available was to send the questionnaires via e-mail. This would have required the researcher to obtain contacts of the whole target population. Instead, an invitation to participate in the study was sent out in one of the selected association's newsletters. This option was chosen because it was economical, gave the researcher access to nationally dispersed target population, guaranteed anonymity, and confidentiality of the respondents, and was acceptable to the key role players. After waiting for a month, a data file of all the completed responses was downloaded from the SurveyMonkey™ website as a Microsoft Excel file.

Although the study was quantitative, the questionnaire collected qualitative responses in the form of respondent comments. O’Cathain and Thomas (2004: 25) advise that, in a quantitative study, adding a section for comments has the following potential benefits:

- The comments can collaborate answers to the closed questions, thereby increasing the validity of the instrument.
- Adding a comment section has been known to increase the response rate, as respondents feel empowered.
- The comments can reveal areas of a study that were not covered by a researcher. This would form the basis for further work.
- Comments shift the power balance in a study by giving the respondents an opportunity to voice their opinions.

4.7 DATA ANALYSIS

After collection, the data was cleaned and edited for any errors and omissions that were identified, the questions were coded, and the information was captured onto a Microsoft Excel spreadsheet. After the preparation, analysis of the response data was conducted using IBM SPSS Statistics version 24. The data was analysed in two ways. First, data was analysed to provide means, percentage, and standard deviations of the variables. This data was then converted to illustrations in the form of tables, pie charts, histograms, and bar charts. Secondly, hypotheses testing was conducted using the Pearson Chi-Square test of independence (Saunders, Lewis & Thornhill, 2009: 451). This analysis provided information on the basis on which generalisations may be made to the research findings. The data chapter that follows is therefore a result of these findings and generalisations which were limited to establishing association, from which conclusions and recommendations are derived.

The qualitative data from the comments section of the question was analysed inductively for patterns that cut across various respondents and emerging themes (Punch, 2014: 177–178). The resulting themes were reported as elements that would be included in further work arising from the study. The themes also served as a questionnaire validating tool as per recommendation of O’Cathain and Thomas (2004: 25).

4.8 MEASURES TO PROMOTE VALIDITY AND RELIABILITY OF THE STUDY

Silverman (2014: 76) cautions that the persuasiveness of the claims that are made by a study depends on the perceived credibility of the research process and the research instruments that were used in the study. There are two main criteria for assessing the credibility of a quantitative study, namely, validity and reliability. Reliability is concerned with the stability of a research finding in terms of whether the findings are independent of accidental circumstances in which

those findings are produced. In other words, this relates to the extent to which the findings can be generalised to a broader context. On the other hand, validity has to do with whether a measure of a concept really measures that concept. Several ways of establishing the validity of a study such as face validity, concurrent validity, predictive validity, and convergent validity are described in Table 4.4.

Table 4.4: Different sub-types of validity used to assess quantitative research

Validity sub-type	What it measures
Face validity	A measure of how a concept apparently reflects the content of that concept
Concurrent validity	Whether a new test is comparable to a well-established test.
Predictive validity	A measure of how well a score in a current test can be used to predict a future performance related to that concept.
Convergent validity	A measure of the extent to which two measures of constructs that are supposedly related, are in fact related.

Source: Adapted from Bryman (2016:117-119)

Reliability is based on two key related elements: the concepts that are being used in questionnaires and the consistency of the measures of these concepts. Before discussing reliability, its elements must be clarified. Bryman (2016: 111) explains that concepts are labels that are given to significant elements of a phenomenon that share some common features. In quantitative research, concepts become either independent or dependent variables. He further brings out that for a concept to be employed in quantitative research, it must have a measure so that it can be quantified. As shown in Table 4.5, reliability can be assessed in three ways.

Table 4.5: Three sub-types of reliability used to assess credibility of quantitative research

Reliability sub-type	What it measures
Test-retest reliability	Whether a measure for a sample will not fluctuate if the research instrument is administered to a sample at two different periods
Internal reliability	Whether respondents' score on an item in a multiple-item measure are related to their scores on the other items
Inter-rater reliability	Homogeneity of in the judgements of different researchers of what scores on a measure mean

Source: Adapted from Bryman (2016:116-117)

In the study, validity was ensured by modifying and using a questionnaire that was based on an established project management maturity model – Kerzner-PMMM. Kerzner-PMMM has been used to gauge the project management maturity of organisations in different sectors of the economy and has been generally accepted all over the world. Cronbach's alpha is the most common test for internal reliability. A Cronbach's alpha value that is greater than 0.7 is acceptable for most purposes. Internal reliability of multi-item measures in the questionnaire was measured using Cronbach's alpha.

4.9 ETHICAL CONSIDERATIONS

The study was guided by principles of ethical practice that seek to protect the interests of the research subjects. To ensure that the consent is informed, the consent form provided the purpose of the research, methods, and possible research outcomes. Ethics was treated as an important element of this study in view of government expectation and the subsequent university policy on ethics. This was meant specifically so that no individual would be harmed both physically and emotionally. According to Easterby-Smith et al. (2013: 187), there are six generic ethical considerations that should be observed, namely:

- **Voluntary participation:** The respondents at no time should be forced into taking part in the research.
- **Informed consent:** It is imperative that the respondents get a letter before participating, which gives them the opportunity to say no if they wish to do so.
- **Non-maleficence:** The researcher minimises the risk of causing harm to the respondents. Potential harm could be physical, social, occupational, psychological, or related to reputation. The thresholds that must not be crossed depends on ethical standards of institutions, cultural values, and the context of a study (Punch & Oancea, 2014: 70).
- **Confidentiality of information gathered** needs to be taken into consideration and must always be respected.
- **Anonymity** guarantees the right to privacy of the respondents, especially if it could mean that their views on a certain subject could cause problems in the workplace, which could lead to job loss as an example.
- **Beneficence:** The respondents have the right to benefit from any research that might incur a positive outcome. This would most certainly in most cases be an improvement of the conditions that they find themselves in (Punch & Oancea, 2014: 70).

The aforementioned principles were adhered to, and all respondents were informed of their rights before the interviews started. True to the commitment assured to the respondents, no information of a personal nature was released to any authority, and confidentiality was observed to date.

4.10 LIMITATIONS OF THE RESEARCH

In as much as the study was handled with care and objectivity being at the centre of the activities in the research process, the study had its own limitations. While these could have

been averted, it was important to accept the realities of the availability of other factors such as the cost of covering more respondents outside of this case study. The limitations observed are the following:

- The population from which the study's sample was drawn came from members of only one project management association. South Africa has other project managers who are not members of the selected association or any other project management association.
- The study was cross-sectional due to time and logistical constraints. As a result, the time order criteria of nomothetic causality were not met. This prevented the researcher from establishing nomothetic causation between various project managers' attributes and project management maturity. This limitation was acceptable, as the study was correlational; thus, establishing causation would have been a bonus.
- Time, cost, and getting permission were factors that constrained the researcher from covering all the project management associations in South Africa.
- The respondents might not have taken the study as a critical analysis of the university and government endeavours to address a perennial problem in the country.
- The questionnaire being in English might have resulted in the misinterpretation of the questions, as for most respondents, English is only their second language.

However, despite the limitations, the study was objectively carried out, and the processes were clearly outlined and were scientific. The results are expected therefore to be objective, and any other researcher using the same methodology would likely come to the same findings as recorded in the subsequent chapters.

4.11 SUMMARY

The validity and reliability of this study should be understood in the context of work done objectively with the design being followed meticulously. The following have been considered in the study: the background literature reviewed; establishment of the study gap and subsequent understanding of the problem statement; the setting of the objectives; the research questions; identification of the population; the construction and testing of the questionnaire; data collection methods; and data analysis.

The next chapter will present the results of the study and will discuss these.

CHAPTER FIVE

RESULTS AND DISCUSSION

5.1 INTRODUCTION

The previous chapter dealt with the research design and methodology used in the study. This chapter presents findings of the study. Data collection was mainly done online using SurveyMonkey™. An invitation was distributed to members of a South African project management association through a member newsletter. By 2 February 2017, 299 completed responses were received via SurveyMonkey™. This represented 20.47% response rate. A further ten responses, manually completed, were received at the association's January 2017 seminar. These were manually upload into SurveyMonkey™.

All the response data from SurveyMonkey™ were downloaded as a Microsoft Excel file. Three responses that did not meet the study's criteria in terms of location and project management experience were deleted. For the rest, only excess information such as respondent Internet Protocol addresses, e-mails were deleted from the Microsoft Excel spreadsheet in line with the ethical requirement of respondent anonymity.

The cleaned Microsoft Excel spreadsheet was exported into IBM SPSS Statistics version 24 where the data was further prepared. Preparation involved combining categories such as certification. The responses on certification were categorised into full certification, candidate certification and no certification. Negatively asked questions were recoded into positive by reversing the rating scales. The data was then described using a mean, percentages, and standard deviations. Hypothesis testing was then conducted using Pearson Chi-Square, Fisher's Exact Test, and Spearman's rho coefficient. The data analysis was done using IBM SPSS Statistics version 24. Confirmatory analysis was done using partial correlation with project managers' power as the control variable.

5.2 RELIABILITY ASSESSMENT

Reliability assessment of the research instrument was conducted using Cronbach alpha. The results of the assessment are presented in Table 5.1. Overall Cronbach alpha for the scales in the instrument is 0.940 which is greater than the recommended 0.7. This indicates that the scales used for the instrument are internally consistent. The various categories of the instrument (see Table 5.1) also had Cronbach alpha of greater than 0.7. The lowest Cronbach alpha was of 0.724, for the section on project managers' influence. This was still greater than the recommended Cronbach alpha. It was decided to proceed with analysis as the requirement for reliability were met.

Table 5.1: Reliability assessment for the data

Item description	Number of Items	Number of valid cases	Total number of cases	Cronbach Alpha
Project managers' influence	10	300	306	0.724
Project managers' power	10	303	306	0.976
Project manager attributes: project management experience and technical expertise	8	297	306	0.796
Project management maturity	26	294	306	0.936
Overall	54	282	306	0.940

Source (Own construction)

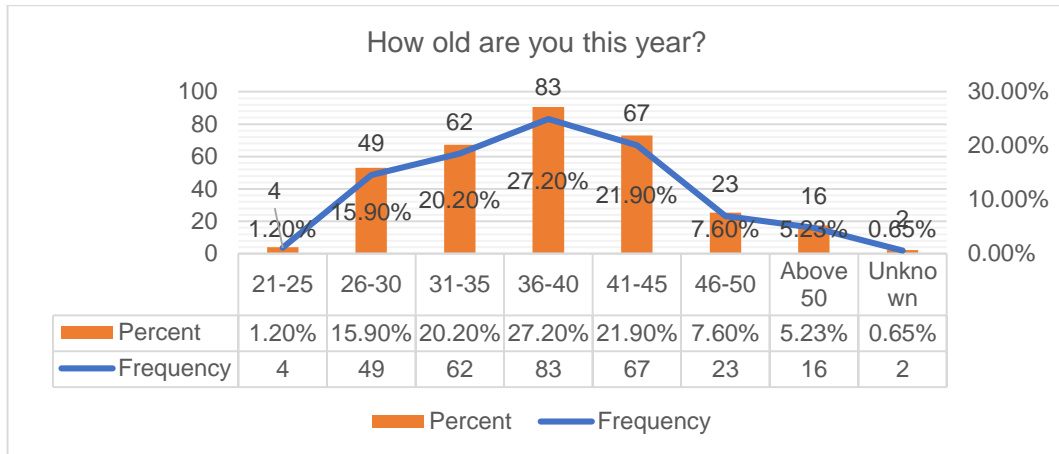
5.3 DESCRIPTIVE FINDINGS AND ANALYSIS

Descriptive statistics are a useful way of summarising characteristics of the data from the sample. There are three sets of data from the sample. Firstly, there are the attributes of the project managers: gender, highest qualifications, number of years of project management experience and the number of projects that the respondents have managed over the last five years. Secondly, there are elements that indicate the perceived project management maturity of the project managers' organisations. Lastly, there are attributes of the project managers' power and influence.

5.3.1 Age distribution of respondents

The results showed a skewed normal distribution curve that leans towards an older population of project managers -average age is 37.58. This can be attributed to the fact that most project managers have an undergraduate qualification in other fields. They only enter the project management field post-graduation. Figure 5.1 shows that almost 70% of project managers are between the ages of 31 and 45 indicating moderate experience.

Figure 5.1: Age distribution of respondents

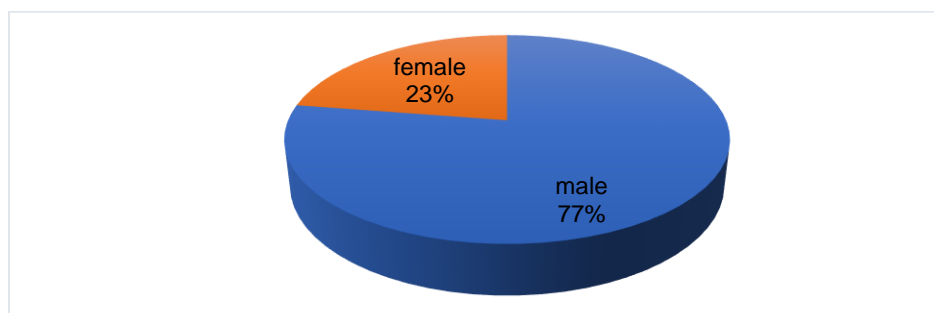


Source (Own construction)

5.3.2 Gender distribution of respondents

Results from the study seem to indicate, as shown in Figure 5.2, that project management in South Africa is a relatively male-dominated profession. The gender distribution reveals a higher percentage of male project managers (77.5%) relative to that of female project managers (22.5%). Sixty-nine female (69) project managers and two hundred and thirty-seven (237) male project managers responded to the survey.

Figure 5.2: Gender distribution of respondents



What is your gender?			
	male	female	Total
Frequency	237	69	306
Percent	77.5%	22.5%	100.0%

Source (Own construction)

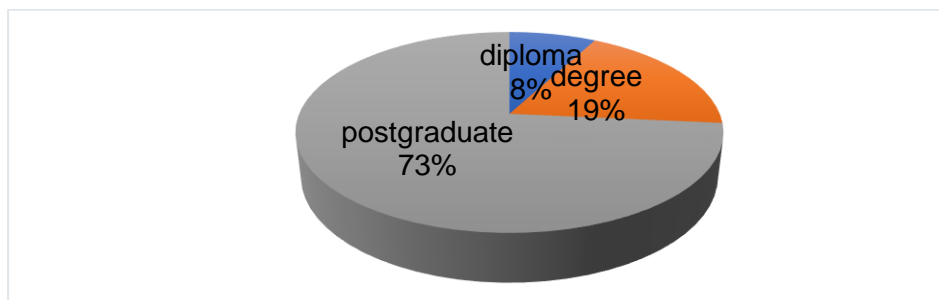
5.3.3 Highest qualifications

Figure 5.3 illustrates the educational levels of the sample. Many respondents were in possession of a postgraduate degree (73.5%), followed by those with a degree (18.6%) and lastly those with a diploma (7.8%). Of the respondents, most men had a postgraduate

qualification as compared to women. Men who had postgraduate qualifications were eight times more than those with a bachelor degree. The ratio was one to one for female project managers. This seems to indicate that male project managers are pursuing post-graduate qualifications at a faster rate than female project managers.

The researcher expected that most respondents would have a diploma and the least would have a postgraduate degree. The sample indicated the contrary. Public South African higher education institutions are not offering project management at diploma level. Those who are in project management with a diploma might either have a diploma in another field or got their qualification from a private institution. Universities of Technology’s are offering project management at B. Tech level. University of Cape Town, University of Pretoria, University of Stellenbosch, and Cape Peninsula University of Technology offer postgraduate qualification in project management.

Figure 5.3: Qualifications of survey respondents



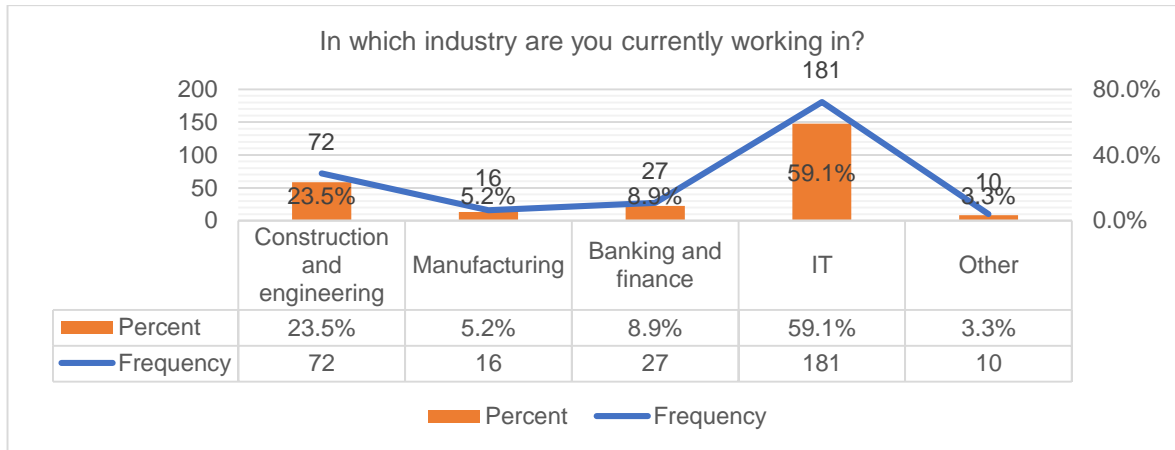
What is your highest qualification?				
	diploma	degree	postgraduate	Total
Frequency	24	57	225	306
Percent	7.8%	18.6%	73.5%	100.0%

Source (Own construction)

5.3.4 Distribution of respondents per industry

The findings from the study in terms of gender distribution were unexpected but not surprising. In drafting the questionnaire, the researcher had expected that a substantial portion of project managers would be employed in retail. This did not pan out. As shown in Figure 5.4, the IT industry is the most significant employer of project management professionals with 59.1% of the respondents indicating that they are employed in that sector. The second biggest employer was the construction and engineering sector. It is worth noting that in this study, over 80% of the respondents’ industries required science, technology, engineering, and mathematics (STEM) qualifications. This finding requires further investigation particularly to answer the question whether project management is a STEM qualification.

Figure 5.4: Distribution of respondents per industry

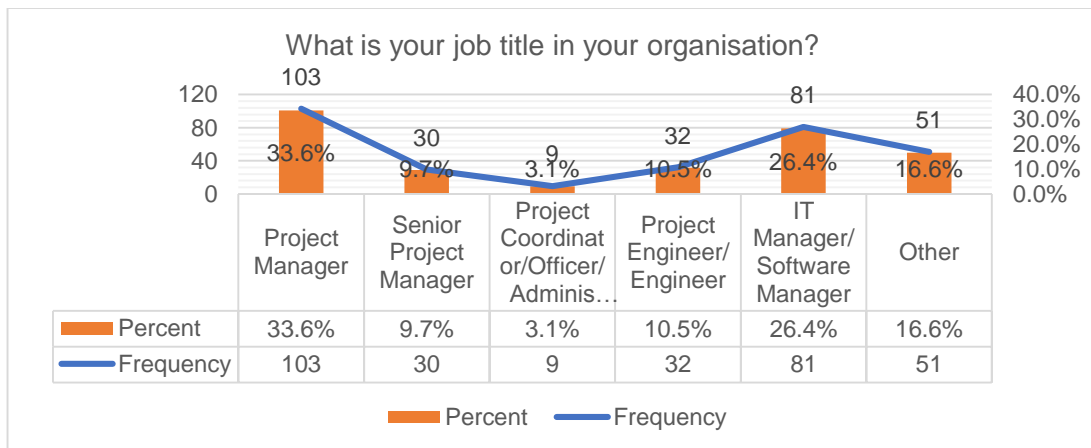


Source (Own construction)

5.3.5 Distribution of respondents' job titles

Although not much can be inferred from a job title, Figure 5.5 shows that only 9.7% of the respondents had the job title of Senior Project Manager. About 33.6% of the respondents had the job title of Project Manager. Over a quarter of the respondents, 26.4% had the job title of IT/Software Manager. A substantial portion of people who manage projects do not carry the title of project manager.

Figure 5.5: Distribution of job titles of respondents



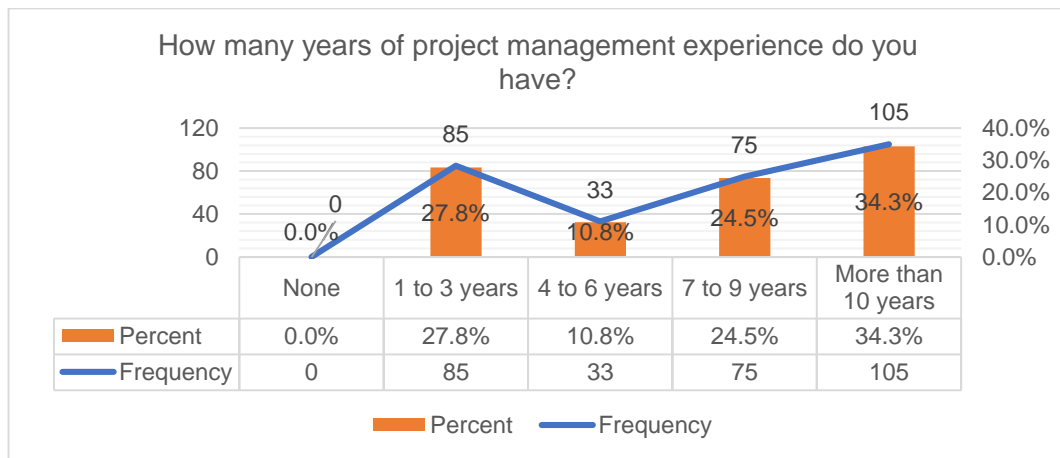
Source (Own construction)

5.3.6 Project management experience

South African project managers have considerable project management experience. Figure 5.6 shows that 34.3 % of the respondents had more than 10 years of project management experience, 24.5% had between 7 and 9 years, 10.8% had experience of between 4 to 6 years and 27.8% had between 1 to 3 years' experience. None of the respondents had zero project management experience. The PMI-USA requires 4500 hours (equivalent to 4.3 years) of

managing and leading projects as a precondition for certification (PMI). Thus, over 60 % of the sample respondents have sufficient experience to achieve PMI-USA certification.

Figure 5.6: Project management experience of survey respondents

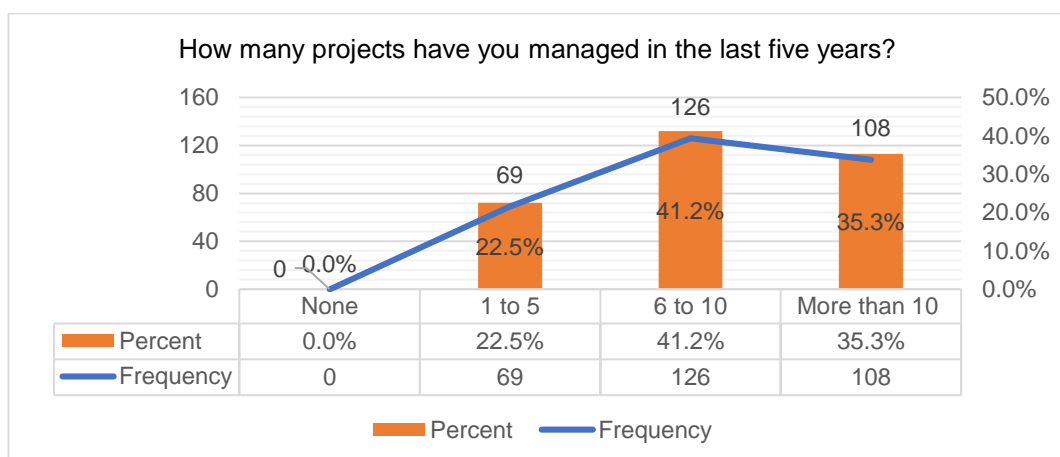


Source (Own construction)

5.3.7 Number of project managed over the past five years

South African project managers are active, as shown in Figure 5.7, as 35.3% of the respondents have managed 10 or more projects, 41.2% have managed 6 to 10 projects and 22.5% have managed less than 5 projects over the past five years. Over twenty-two percent of the respondents, 69, had managed on average more than two project a year. It would be interesting to know if these were short duration projects or if the project managers were managing several projects at the same time.

Figure 5.7: Number of projects that the survey respondents have managed over during a 5-year period



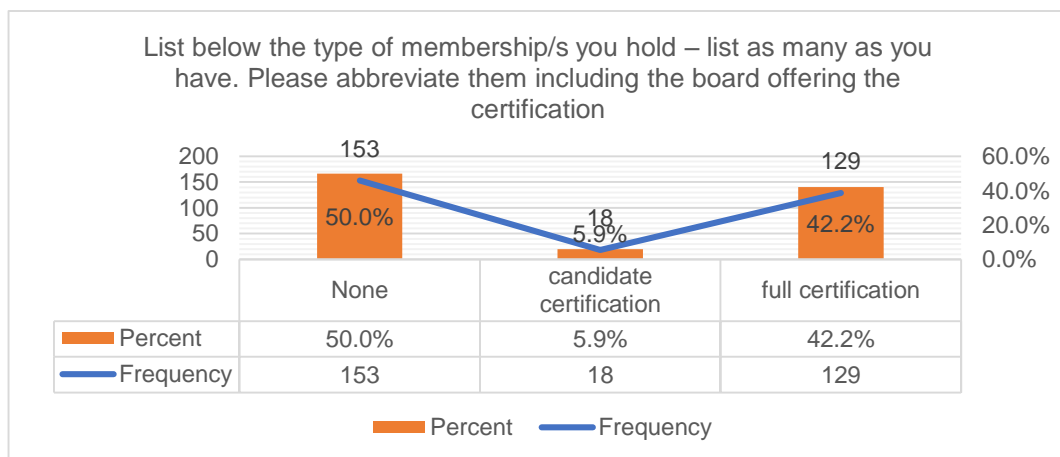
Source (Own construction)

5.3.8 Project management certification

The results indicate that the project management profession in South Africa is relatively unregulated. Figure 5.8 shows that half of the respondents, 153, had no certification in any discipline. Forty-two percent had some form of project management certification. The most common certification was PMP from PMI (78), followed by PRINCE2 (38) and only three respondents had Pr.CPM from SACPCMP. Eighteen respondents had C.CPM, candidate certification, from SACPCMP.

While this low level of certification does not affect the functioning of project managers, it is worrisome due to the reasons outlined below. Professional bodies, who offer certification, set minimum competence standards which serve as a quality assurance to employers and clients. These bodies also prescribe a minimum level of continuous profession development (CPD) for a certified member to maintain certification. Attending courses and seminars enable practitioners to keep up to date with development in the field. Project managers who are not certified are not obliged to participate in CPD.

Figure 5.8: Respondents project management certification



Source (Own construction)

5.3.9 Project management maturity

The questionnaire had 26 statements that addressed elements of project management maturity. As indicated earlier, the respondents were required to indicate their level of agreement of a 5-Level Likert scale. These questions dealt with benchmarking, continuous improvement, project management culture, project scope management, common processes and methods, and the role of management in developing an organisation's project management maturity. A descriptive analysis of the individual statements is presented in sections 5.3.9.1 to section 5.3.9.6 below. It must be noted that the numbering of the statements

is based on their numbering in the questionnaire and not on their presentation order in this section. This was done to facilitate reference to both the questionnaire and other sections of this report.

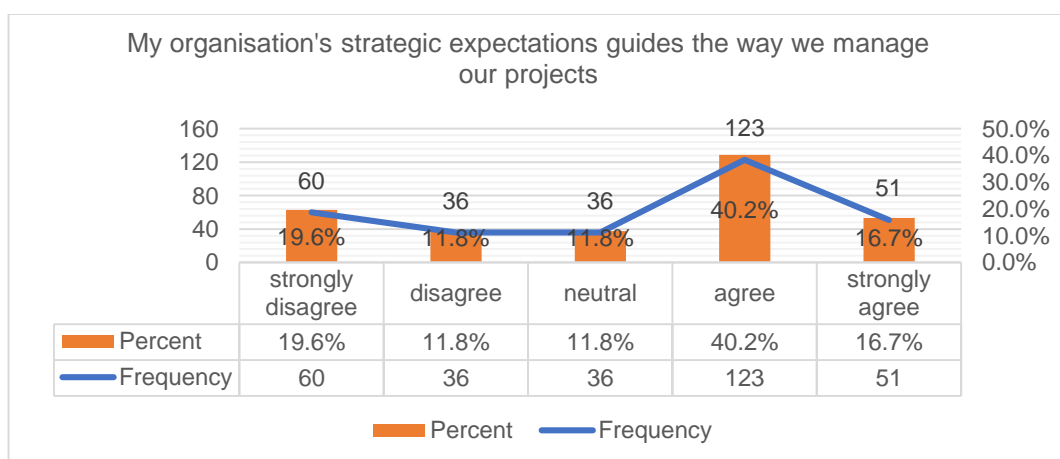
5.3.9.1 Portfolio management and project management maturity

Kerzner (2001: 110–111) indicated that mature project management organisations, develop portfolio management systems to collectively manage their project portfolio as they exploit the synergies amongst projects. They no longer look at projects individually. The study found that South African organisations are responsive to changes in project resources. However, the study also indicated that there is still room for improvement in terms of project and strategy alignment and project prioritisation. The following questions tested the extent of portfolio management within respondent’s organisations (statement number reflects its position on the questionnaire):

Statement 7 My organisation's strategic expectations guide the way we manage our projects.

This statement was sought to identify whether the respondents’ organisation project management choices were guided by their strategic thrust rather than expediency. Most of the respondents, as shown in Figure 5.9, indicates that strategic imperatives influence their project management choices – 40.2%, and 16.7% strongly agreed, respectively. A total of 31.4% of the respondents disagreed with the above- 11.8% disagreed and 19.6% strongly disagreed.

Figure 5.9: Survey responses indicating how strategic expectations guide project management in respondents’ organisations

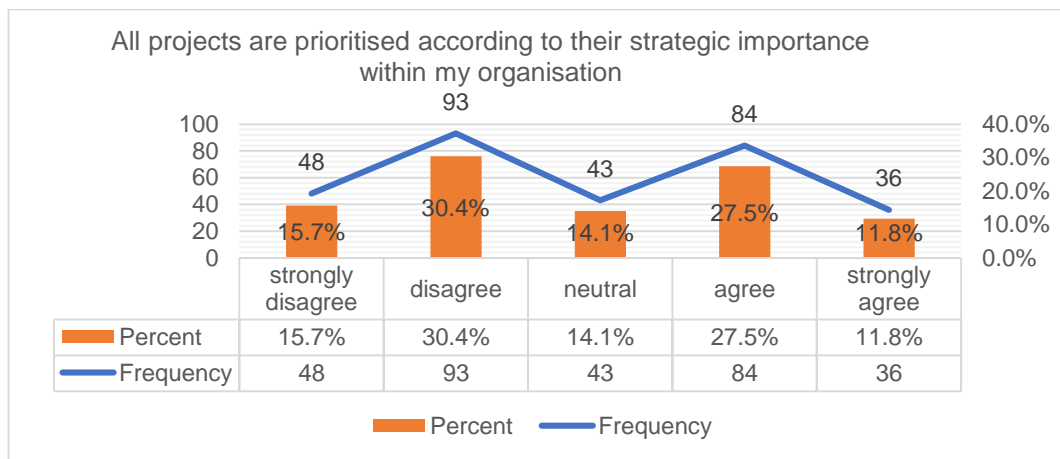


Source (Own construction)

Statement 8 All projects are prioritised according to their strategic importance within my organisation.

This statement is soliciting responses on the alignment of business strategy and project prioritisation. In a way the above statement expended how portfolio management was implemented in respondents' organisations. In some cases, organisations focused on pet projects of senior executives rather than on projects that advance the strategic imperative of the organisation. A portfolio management system is supposed to address this possible weakness. Figure 5.10 below indicates that portfolio management is not yet entrenched in South African organisations: 39.3% indicated presence of project prioritisation in their organisations whereas 46.1% the contrary-15.7% strong disagreed and 30.4% disagreed.

Figure 5.10: Respondents' perceptions on prioritisation of projects in their organisations

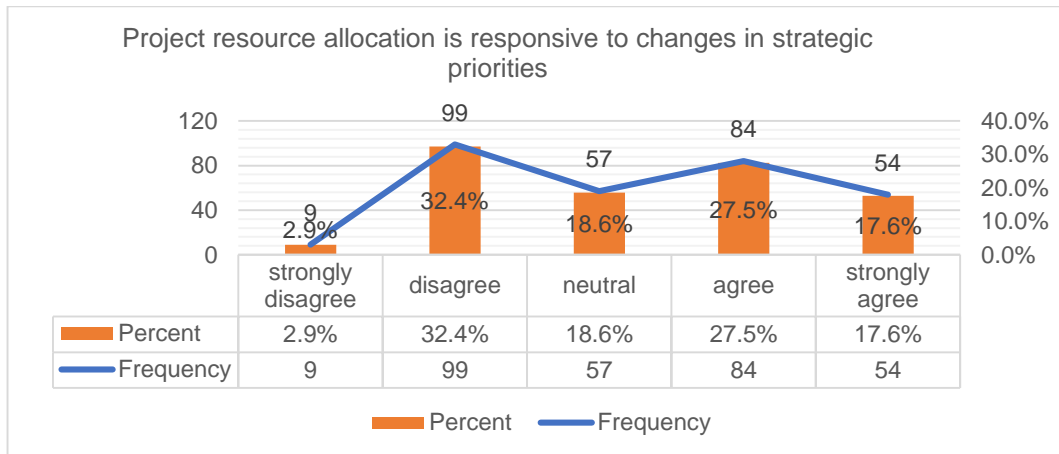


Source (Own construction)

Statement 9 Project resource allocation is responsive to changes in strategic priorities.

An organisation's strategic priorities can change in response to either internal or external forces. Internal forces such as cash flow concerns, labour issues or other cost associated elements can force change in an organisation strategic prioritization. External forces like foreign exchange fluctuations, regulatory changes can also force re-prioritisation. Mature project management organisations have systems that address the changing prioritisation. Figure 5.11 below shows that most respondents thought that their organisations can respond to changing strategic priorities – 45.1% concurrence and 45.3% dissent.

Figure 5.11: Respondents' perceptions on role of strategic prioritisation in project resource allocation in their organisations

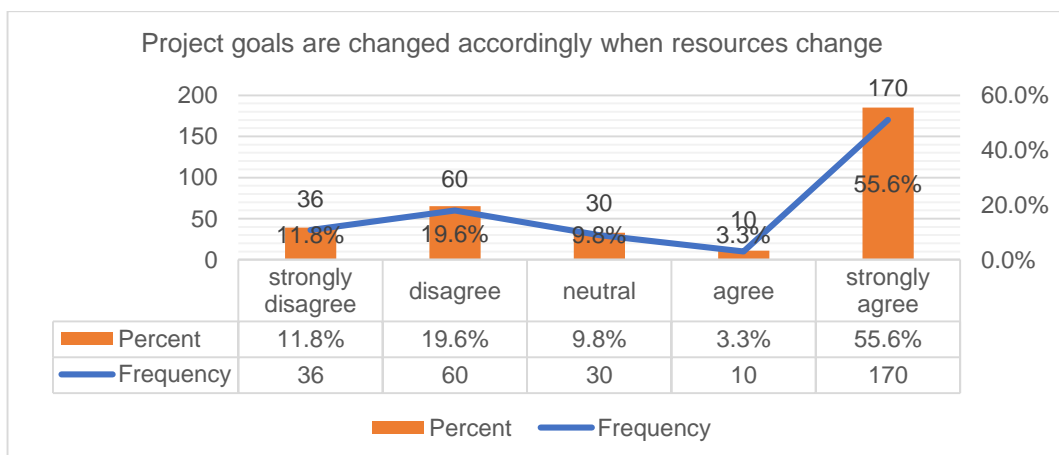


Source (Own construction)

Statement 10 Project goals are changed accordingly when resources change.

Statement 10 is a follow up of Statement 9 as a change in strategic priorities often results in a change in resource allocation. Mature project management organisations can adjust their project goals to accommodate a change in available resources. Figure 5.12 below shows that more than half of the organisations, 58.9%, concurred with the above statement – 55.6% strongly agreed and 3.3% agreed. On the other hand, 31.4 % of the respondent disagreed with the above statement to various degrees – 19.6% disagreed and 11.8% strongly disagreed indicated a poor response to resource changes.

Figure 5.12: Respondents' perceptions on responsiveness of project goals to resource changes in their organisations



Source (Own construction)

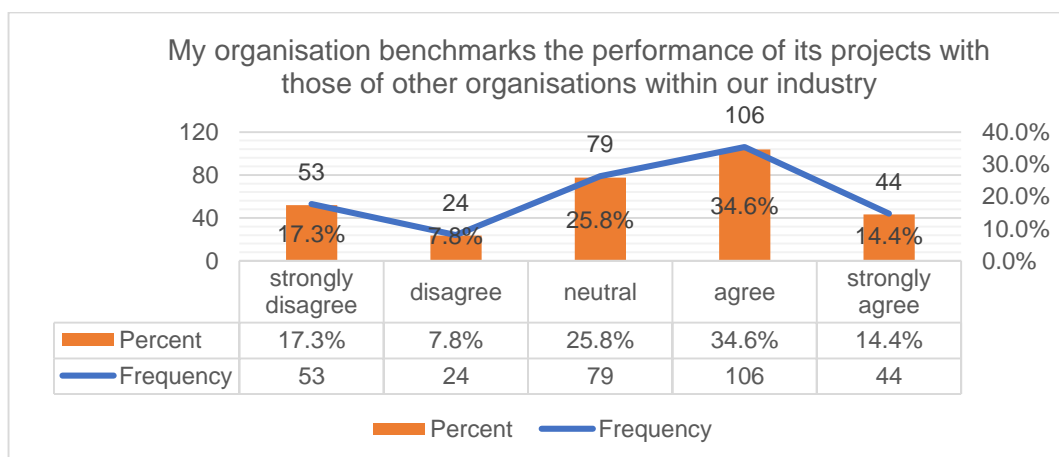
5.3.9.2 Benchmarking and continuous improvement

Benchmarking and continuous improvement are interrelated concepts. Before an organisation can implement a continuous improvement system, it needs to be able to collect data both internally and externally. Thus, benchmarking is the precursor to continuous improvement. This is indicated in Kerzner-PMMM where benchmarking is Level 4 maturity and continuous improvement is Level 5 maturity. Benchmarking can be qualitative or quantitative. Statement 17 and Statement 5 deal with qualitative benchmarking whereas Statement 1 and Statement 14 deal with quantitative benchmarking.

Statement 17 My organisation benchmarks the performance of its projects with those of other organisations within our industry.

Statement 17 sought to solicit agreement from the respondent that their organisation broadly benchmarked its project management performance with that of others within the industry. Almost a half of the respondents, as shown in Figure 5.13 below, that their organisations benchmarked performance of its projects with that of others, 49% (34.6% agreed, and 14.4% strongly agreed with the statement). About a quarter of the respondents, 25.1%, did not support the above statement for their organisations - 7.8% disagreed and 17.3% strongly disagreed, respectively. This suggests that twice as many South African organisations use benchmarking in comparison to those who don't practise it.

Figure 5.13: Respondents' perceptions on the use of performance benchmarking in their organisations

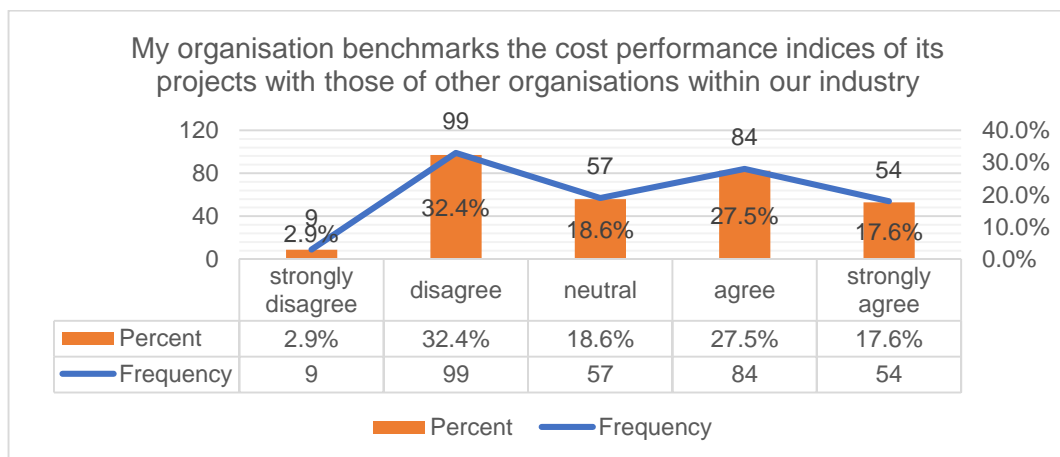


Source (Own construction)

Statement 1 My organisation benchmarks the cost performance indices of its projects with those of other organisations within our industry.

Cost performance is one of the three criteria of project management success – the others being schedule performance (time) and scope. It was therefore essential to find out if organisations; benchmarking efforts include cost performance. Figure 5.14 below, indicates that slightly less than half, 45.1%, of respondents concurred with the statement above that their organisations benchmarked its cost performance of its projects with others – 34.6%, and 14.4% strongly agreed, respectively. However slightly more than a third of the respondents, 35.3% indicated that their organisations do not benchmark its cost performance – 32.4% disagreed with the above- 2.9% strongly disagreed. The statement used cost performance index (CPI) as a cost comparison tool as per the assertion by Gray and Larson (2011: 106) that CPI is the most commonly used project cost performance index.

Figure 5.14: Respondents’ perceptions on the use of cost performance benchmarking in their organisations

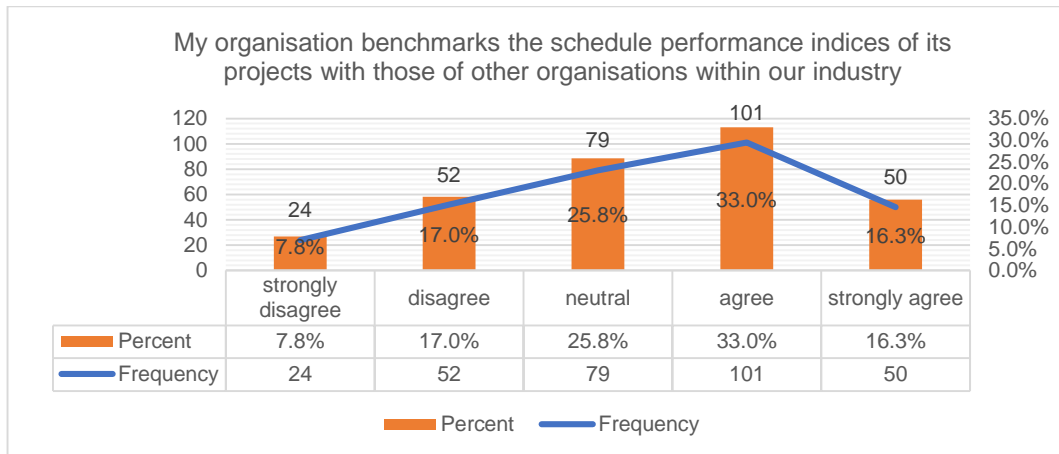


Source (Own construction)

Statement 14 My organisation benchmarks the schedule performance indices of its projects with those of other organisations within our industry.

Schedule performance is one of three criteria of project management success. As per the advice of Gray and Larson (2011: 106), schedule performance index (SPI) was taken as a measure of schedule performance. It was therefore essential to establish if the organisations; benchmarking efforts included schedule performance. Figure 5.15, indicates that slightly less than half, 49.3%, of respondents agreed that their organisations benchmarked its scheduled performance of its projects with others – 33.0% agreed, and 16.33% strongly agreed. Almost a quarter, 24.8% of the respondents opposed the above statement- 17.0% disagreed and 7.8% strongly disagreed.

Figure 5.15: Respondents' perceptions on the use of schedule performance benchmarking in their organisations

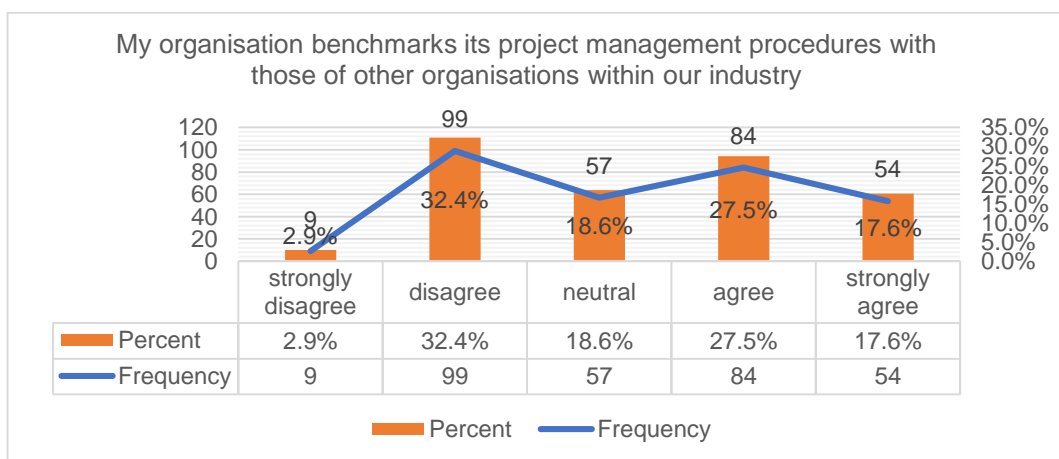


Source (Own construction)

Statement 5 My organisation benchmarks its project management procedures with those of other organisations within our industry.

An organisation can also compare its project management processes with those of others within its industry, perhaps with those who are using a similar project management methodology. Figure 5.16, indicates that 45.1%, of respondents agreed that their organisations benchmarked its scheduled performance of its projects with others – 27.5% agreed, and 17.6% strongly agreed. Almost a third, 32.3% of the respondents opposed the above statement- 32.4% disagreed and 2.9% strongly disagreed.

Figure 5.16: Respondents' perceptions on benchmarking of project management procedures in their organisations

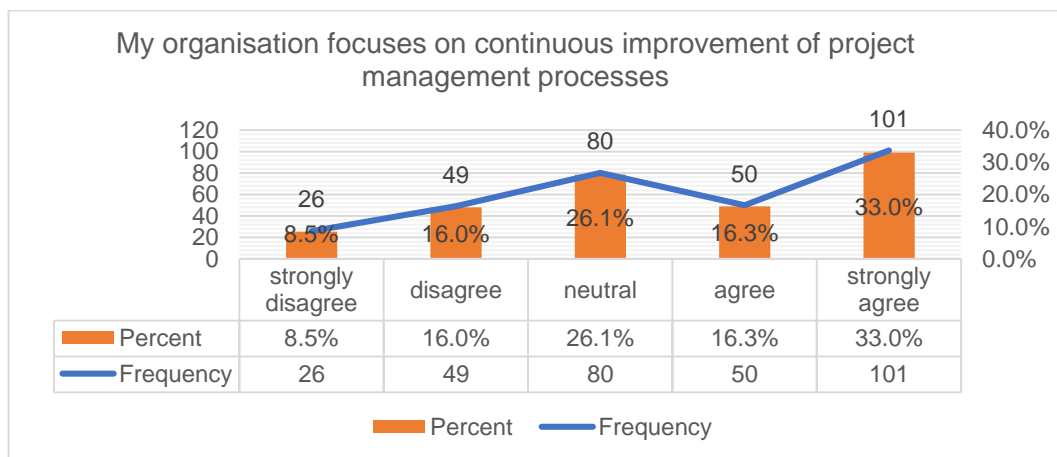


Source (Own construction)

Statement 11 My organisation focuses on continuous improvement of project management processes.

After an organisation has developed a benchmarking system, the next logical step is to use the lessons learnt in improving its operations. Statement 11 sought concurrence with the notion that the respondent’s organisation has a formalised continuous improvement system and that they are aware of efforts to continuously improve the project management processes. Figure 5.17, indicates that a quarter of the respondents, 24.5%, opposed the statement that their organisations focuses on continues improvement of project management processes – 16.0% disagreed and 8.5% strongly disagreed. However, slightly less than half, 49.3% of the respondents concurred with the above statement – 16.3% agreed and 33.0% strongly agreed.

Figure 5.17: Respondents’ perceptions on existence of continuous improvement in their organisations

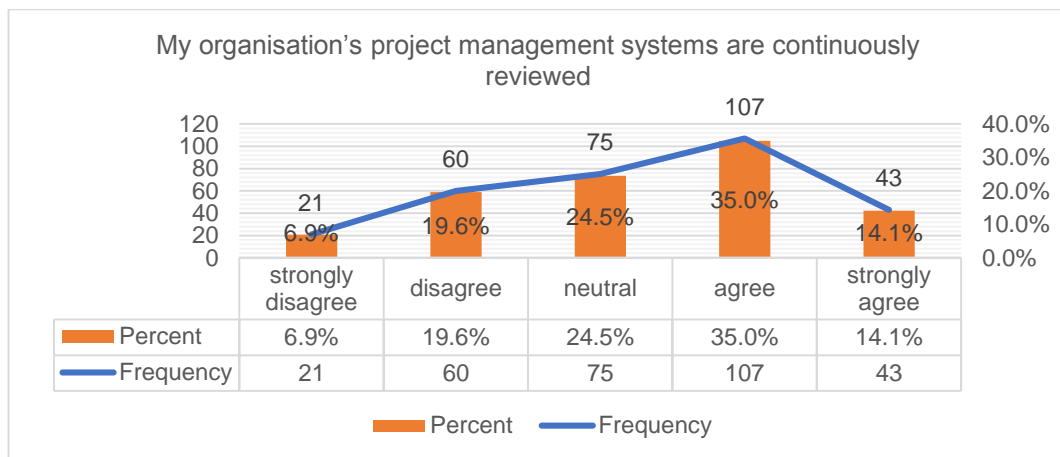


Source (Own construction)

Statement 25 My organisation’s project management systems are continuously reviewed.

Statement 25 sought concurrence with the notion that even project management systems such as the project management methodology that an organisation has adopted need to be continuously reviewed. Organisations need to find out if adopted methodologies fit with their current and future projects- methodology might need to be scaled up or down to fit with the complexities of current projects. As shown in Figure 5.18 below, slightly more than a quarter, 26.5% of the respondents opposed the above statement- 19.6% disagreed and 6.9% strongly disagreed. However, slightly less than half, 49.1% of the respondents concurred with the above statement – 35.0% agreed and 14.1.0% strongly agreed.

Figure 5.18: Respondents' perceptions on continuous review of their organisations' project management systems

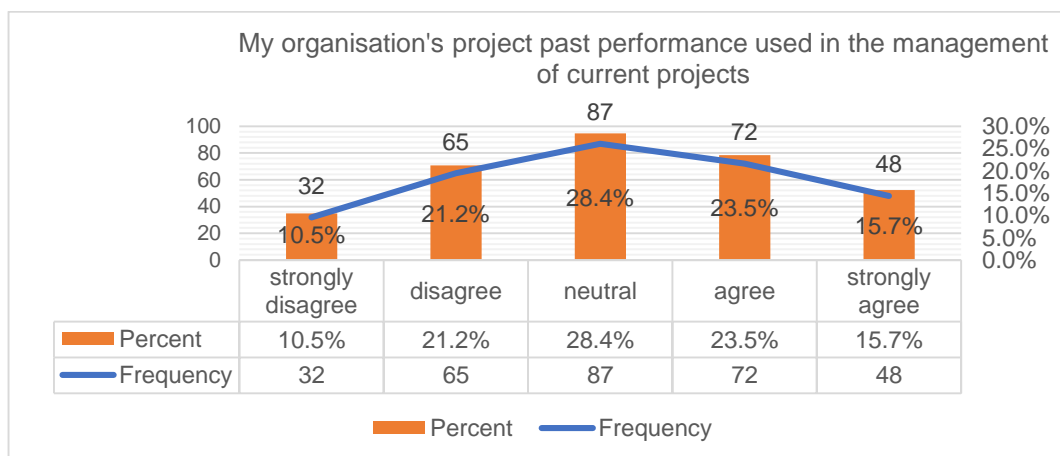


Source (Own construction)

Statement 19 My organisation's project past performance used in the management of current projects.

For an organisation to continuously improvement, it must incorporate the lessons learnt from its past project performance. Although this appears intuitive, it is difficult in a project environment as the project teams are constantly dissolved and different project teams constituted for subsequent projects. Statement 19 sought concurrence with this idea of using historical information in managing current projects. Figure 5.19, shows that 31.7%, indicated the statement did not represent what happened in their organisations – 21.2% disagreed and 10.5% strongly disagreed. On the other hand, 39.2% of the respondents concurred that the above statement represented what happens in their organisations– 23.5% agreed and 15.7% strongly agreed.

Figure 5.19: Respondents' perceptions on the use of historical data in managing projects

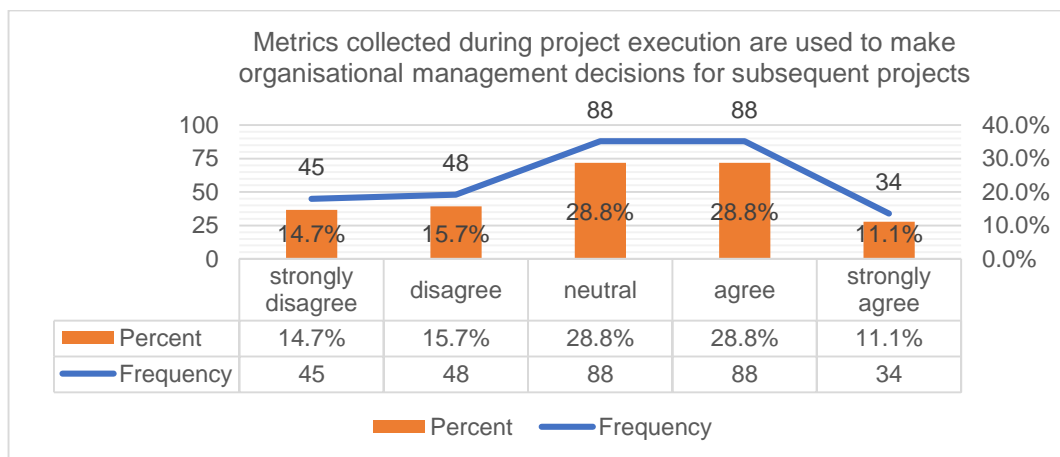


Source (Own construction)

Statement 15 Metrics collected during project execution are used to make organisational management decisions for subsequent projects.

Collection of project metrics is an essential ingredient of continuous improvement. For future project teams to use historical data as alluded to in Statement 19, a system of passing on project metrics must be in place- possibly in form of a file of challenges, successes and lessons learnt in managing current projects. PRINCE2 makes a special provision for this. Statement 15 sought concurrence with the respondents that this was happening in their organisations. Figure 5.20, shows that 39.9% of the respondents thought that their organisations collected project metrics to use in future projects- 28.8% agreed and 11.1% strongly agreed. There were 30.4% contrary responses -15.7% disagreed and 14.7% strongly disagreed.

Figure 5.20: Respondents’ perceptions on whether their organisations collect project data to use in managing future projects



Source (Own construction)

5.3.9.3 Integration of project management into mainstream business and development of project culture

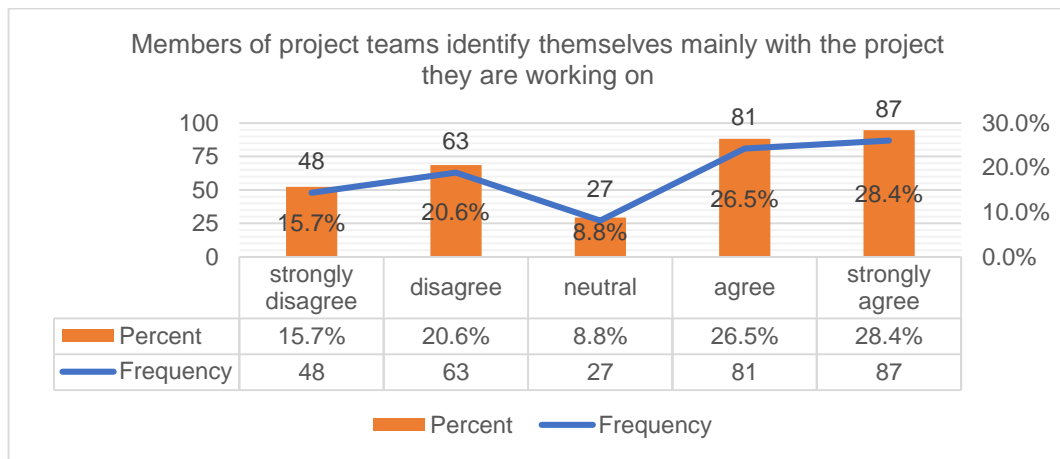
When an organisation has achieved Level 3 project management maturity, a singular project management methodology is adopted by the organisation and project management culture gets entrenched in the organisation. The statements in this section solicited responses to indicate whether the organisations had attained Level 3 maturity.

Statement 3 Members of project teams identify themselves mainly with the project they are working on.

As project management get integrated into the mainstream operations, project team members begin to identify themselves with the current projects rather than their functional disciplines, for example someone who has an IT qualification, but she/he is working as a project manager

will identify more with project management than with IT. Statement 3 sought respondents' concurrence with the notion that project team members identify themselves with their projects. Figure 5.21 shows that more than half, 54.9% of the respondents concurred – 26.5% agreed, and 28.4% strongly agreed. However, 35.3% of the respondents opposed the above statement – 20.6% disagreed and 15.7% strongly disagreed.

Figure 5.21: Respondents' perceptions on whether project members identify themselves with their current project

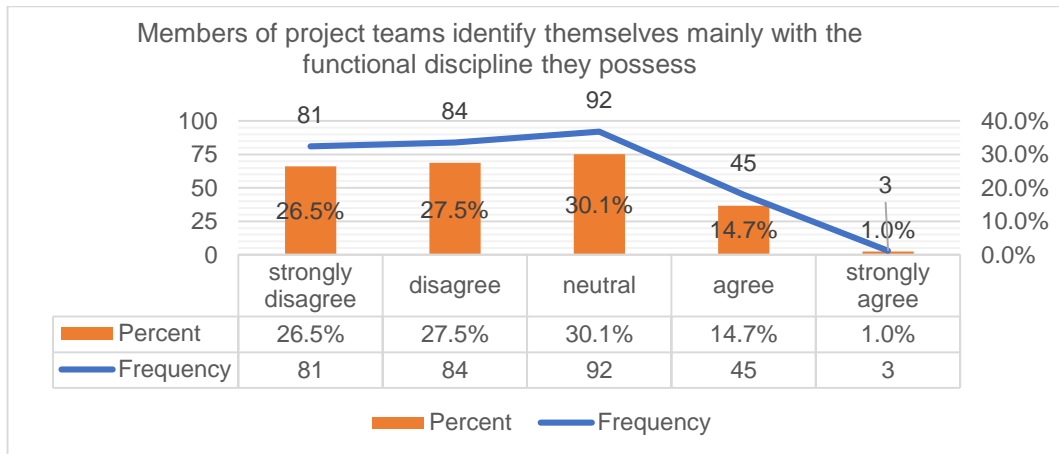


Source (Own construction)

Statement 12 Members of project teams identify themselves mainly with the functional discipline they possess.

Statement 12 is the opposite of Statement 3. Figure 5.22 indicates that 54.0% of the respondents apposed the above statement that members of their project team identify themselves normally with the functional discipline they hold – 27.5% disagreed and 26.5% strongly disagreed. However, only 15.7% of the respondents concurred with the above statement – 14.7% agreed and 1.0% strongly agreed.

Figure 5.22: Respondents' perceptions on whether project members identify themselves with their functional discipline

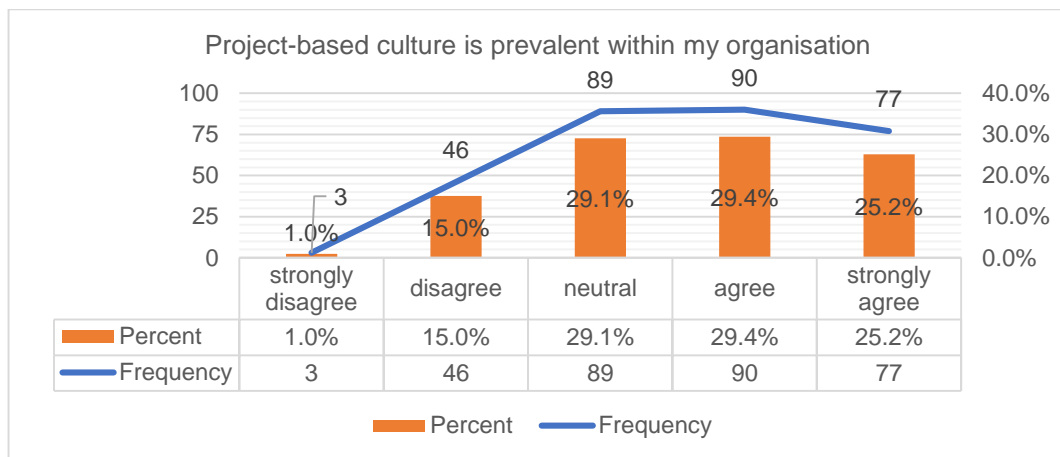


Source (Own construction)

Statement 2 Project-based culture is prevalent within my organisation.

Statement 2 sought concurrence of whether the respondent thought that their organisations had an established project culture. In a project culture, business operations such as change management and strategy implementation are managed through project. Existence of a project culture is a key component of Level 3 maturity. A project culture often arises from the adoption of a single project management methodology across an organisation. A singular methodology facilitates development of some form of organisational lingua franca, common norms, and common values amongst various members of an organisation. Figure 5.23 indicates that 54.6% of the respondents concurred with the above statement that project-based culture is prevalent within their organisation's – 29.4% agreed and 25.2% strongly agreed. However, only 16.0% of the respondents opposed the above statement – 15.0% disagreed and 1.0% strongly disagreed.

Figure 5.23: Respondents' perceptions on presence of a project culture within their organisations



Source (Own construction)

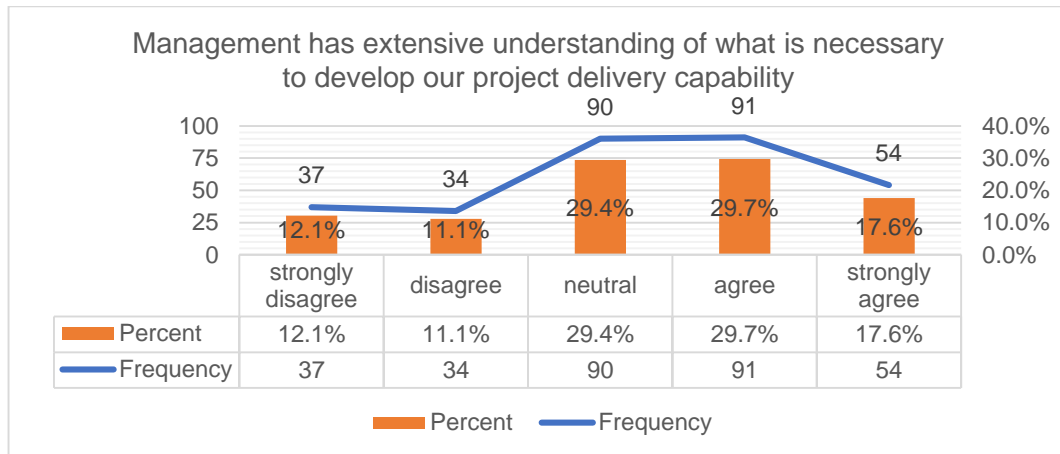
5.3.9.4 Perceptions of the role of management in project management maturity

As per the assertion by Mazibuko, Tait and Jowah (2015: 315), that project managers suffer from an authority gap, project managers are expected to deliver results without having positional power that comes from being able to reward or punish subordinates. Despite this, project managers are well positioned to be the change agents needed for project management maturity growth. For them to effectively achieve this, they need management that understands, provides support and that is committed to seeing through initiatives that promote project management maturity growth. Management understanding, support and commitment is required for any change in maturity level. The statements in this section south respondent concurrence that the type of management outline above is present in their organisations.

Statement 6 Management has extensive understanding of what is necessary to develop our project delivery capability.

Firstly, for project management maturity to improve, there is need for management to have in depth understanding of what is required to successfully launch and see through improvement initiatives. Statement 6 sought respondent agreement that such management existed at the respective organisations. Figure 5.24 below, indicates that 23.2% of the respondents opposed the above statement – 11.1% disagreed and 12.1% strongly disagreed. However, 47.3% of the respondents concurred with the above statement – 29.7% agreed and 17.6% strongly agreed.

Figure 5.24: Respondents' perceptions managements' understanding of what is required to develop their organisations' project management capability

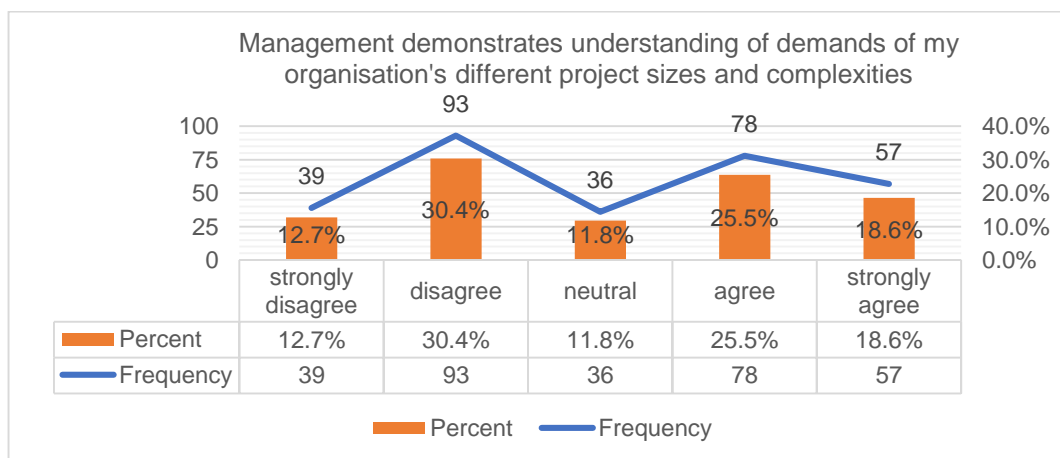


Source (Own construction)

Statement 20 Management demonstrates understanding of demands of my organisation's different project sizes and complexities.

Projects vary in size and complexity, thus the approach taken in managing different projects cannot be the same. Statement 20 sought concurrence with the notion that their management have in-depth understanding of this. Figure 5.25 indicates that 43.1% of the respondents opposed the statement that management demonstrates understanding of demands of their organisation's different project sizes and complexities – 30.4% disagreed, and 12.7% strongly disagreed. However, 44.1% of the respondents concurred the above statement – 25.5% agreed and 18.6% strongly agreed. The findings relating to Statement 20 are inconclusive as almost an equal number of respondents dissented as those who concurred with the statement.

Figure 5.25: Respondents' perceptions managements' understanding of different demands of various projects

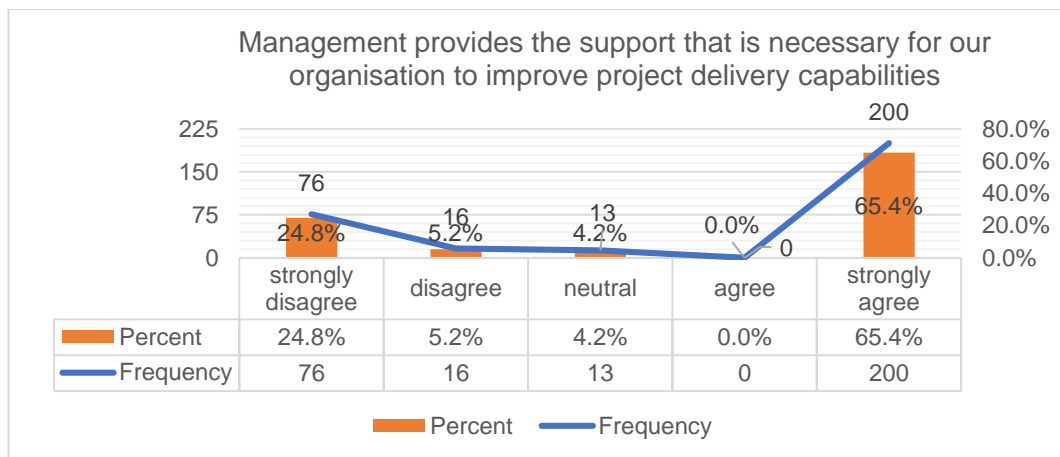


Source (Own construction)

Statement 13 Management provides the support that is necessary for our organisation to improve project delivery capabilities.

Since project managers have an authority gap, they need support of management to implement changes that are required for project management maturity improvement. Statement 13 sought concurrence with the notion that their management have in-depth understanding of this. Management support is a key aspect of Level 3 maturity. Figure 5.26 indicates that 20.0% of the respondents apposed the statement above – 24.8% disagreed and 5.2% strongly disagreed. However, 65.4% of the respondents concurred that management provides the necessary support for their organisation to improve project delivery capabilities – 0.0% agreed and 65.4% strongly agreed. This result shows that there are three times as much management support for project management compared its perceived absence. This might mean that increasingly managers and executives are beginning to recognise project management as a strategic enabler that is worth their support.

Figure 5.26: Respondents’ perceptions of managements’ support for organisational project delivery capabilities improvement



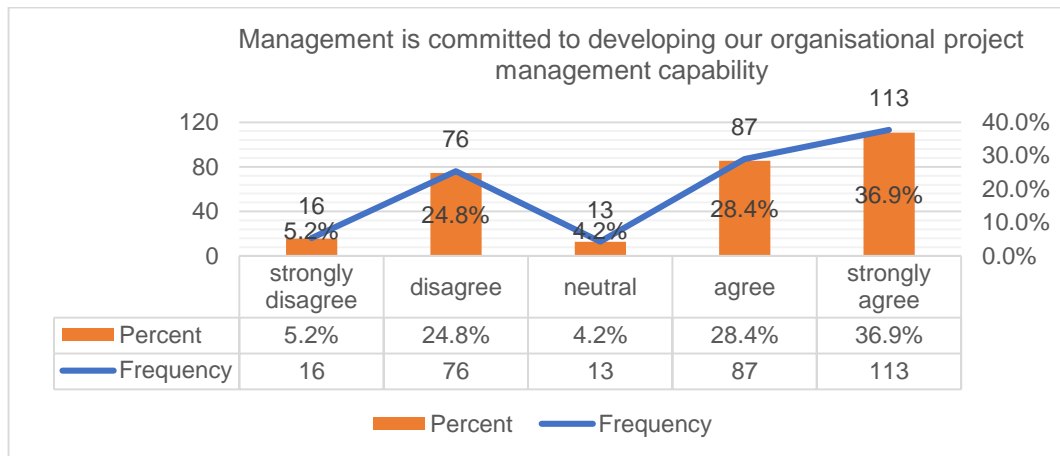
Source (Own construction)

Statement 23 Management is committed to developing our organisational project management capability.

When management is committed to promoting project capability improvement initiatives, the project management is faster and faces less resistance. Statement 23 sought concurrence with the notion that their management was committed to develop their project management capabilities. Figure 5.27 below, indicates that 30.0% of the respondents opposed the above statement – 24.8% disagreed and 5.2% strongly disagreed. However, 61.7%% of the respondents concurred with the above statement – 28.4% agreed and 36.9% strongly agreed. The result indicates a project management friendly management exists in twice as many

organisations compared to where management commitment to project management is lacking. This augurs well for the future of project management in South Africa.

Figure 5.27: Respondents’ perceptions of managements’ commitment to organisational project delivery capabilities improvement



Source (Own construction)

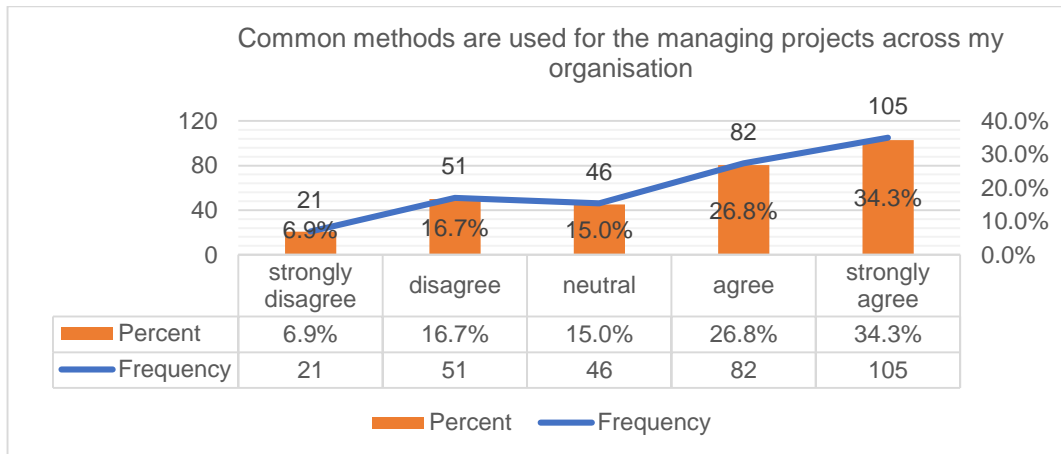
5.3.9.5 Adoption of similar process and common methods as a step towards project management maturity

One of the key indicator that shows that an organisation is beginning to move from ad hoc project management is the adoption of common project management methods across the organisation and the use of common systems. Level 2 organisation will have common systems in place but might use different project management methodologies across its operations. The statements in this section sought respondent agreement on these issues.

Statement 21 Common methods are used for the managing projects across my organisation.

Common methods facilitate sharing of information amongst an organisation’s various unit. It also promotes mobility of project team members. With the use of common methods, the learning curve of project team members is high as they must learn new methods of doing things each time they join a project team. Statement 21 sought respondent concurrence that common methods are used across various units of their organisations. Figure 5.28 indicates that 61.1% of the respondents concurred with the above statement that common methods are used – 26.8% agreed and 34.3% strongly agreed. However, only 23.6% of the respondents opposed the above statement – 16.7% disagreed and 6.9% strongly disagreed. Almost three times as many respondents agreed with the statement as those who expressed various levels of disagreement.

Figure 5.28: Respondents' perceptions on the use common methods throughout their organisations

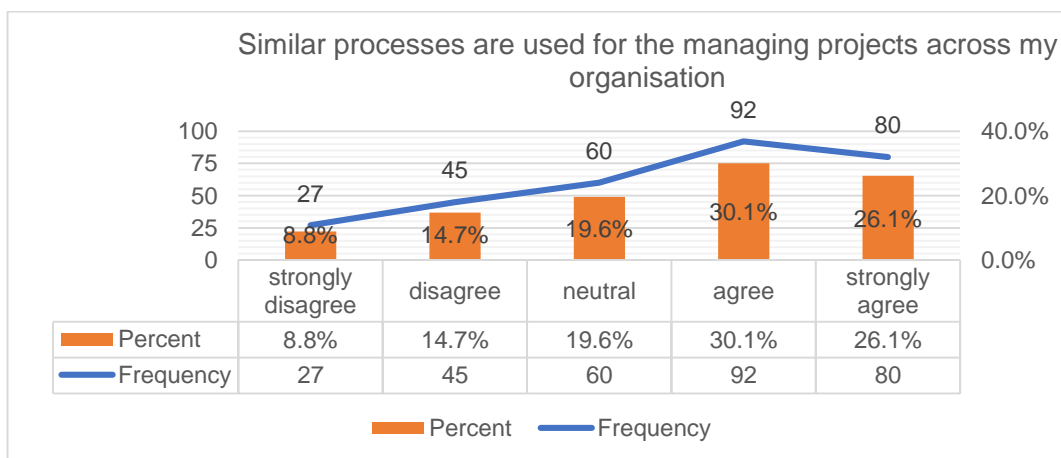


Source (Own construction)

Statement 24 Similar processes are used for the managing projects across my organisation.

As with Statement 21 above, adoption of similar processes facilitates information and project personnel sharing amongst the various operational units of an organisation. Statement 24 sought respondent concurrence that similar processes are used across various units of their organisations. Equally, Figure 5.29 indicates that 56.2% of the respondents concurred with the above statement that similar processes are used – 30.1% agreed and 26.1% strongly agreed. However, only 23.5% of the respondents opposed the above statement – 14.7% disagreed and 8.8% strongly disagreed. Almost twice as many respondents agreed with the statement as those who expressed various levels of disagreement.

Figure 5.29: Respondents' perceptions on the use of similar process and common methods within their organisations



Source (Own construction)

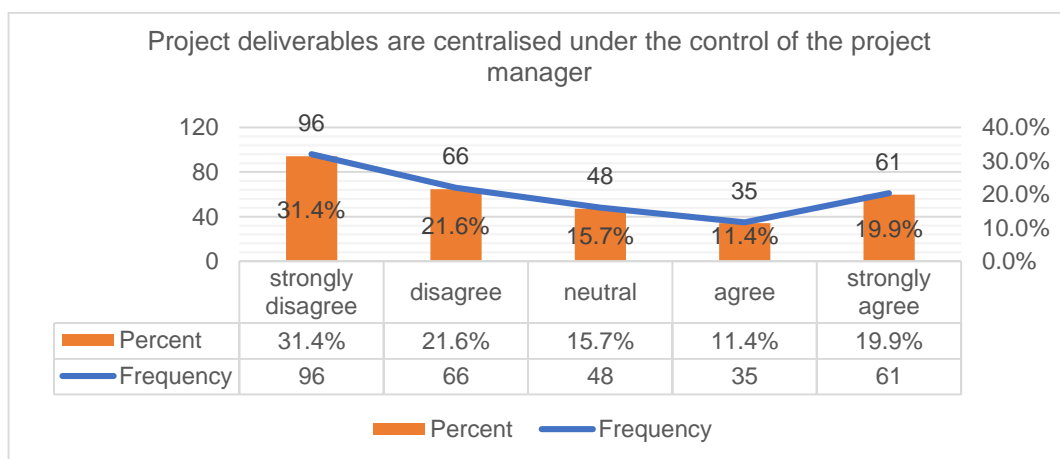
5.3.9.6 Empowerment and decision autonomy of project teams

Once management has accepted project management as a key component of their organisation, they are able to transfer some responsibility to project managers and project teams. Management begins to see project management not as a fad but as a useful tool. This happens as the organisation transitions from Level 2 to Level 3 maturity. The transition cannot happen until trust has developed between project teams and an organisation's management.

Statement 4 Project deliverables are centralised under the control of the project manager.

Once the trust has been established, management stops micromanaging project teams and the project manager becomes answerable for project deliverable. Statement 4 sought respondent concurrence that transference of responsibility happens in their organisations. Figure 5.30 indicates that 53% of the respondents expressed various levels of disagreement with the above statement that similar processes are used – 21.6% disagreed and 31.4% strongly disagreed. However, only 31.3% of the respondents concurred the above statement – 11.4% agreed and 19.9% strongly agreed. This lack of trust would be due to the disastrous consequences of project failure as project are the preferred way of rolling out huge infrastructure and business strategic initiatives.

Figure 5.30: Respondents' perceptions on whether project deliverables are centralised under the control of the project manager in their organisations



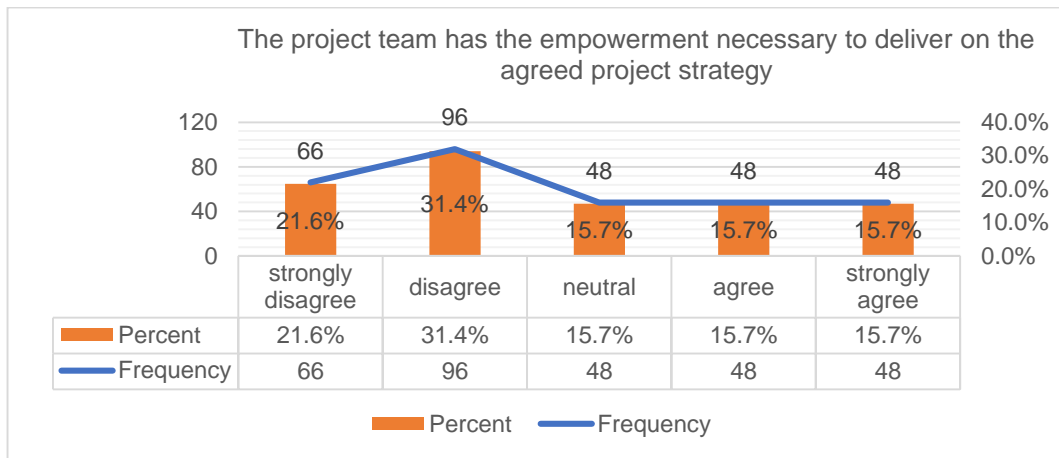
Source (Own construction)

Statement 16 The project team has the empowerment necessary to deliver on the agreed project strategy.

Empowerment of project teams is subject to the same considerations outlined above. Statement 16 sought respondent concurrence that project team empowerment happens in

their organisations. Equally, Figure 5.31 shows lack of project team empowerment- 31.4% total agreement and 53% disagreement with the above statement.

Figure 5.31: Respondents’ perceptions on whether project teams have the empowerment necessary to deliver on the agreed project strategy in their organisations

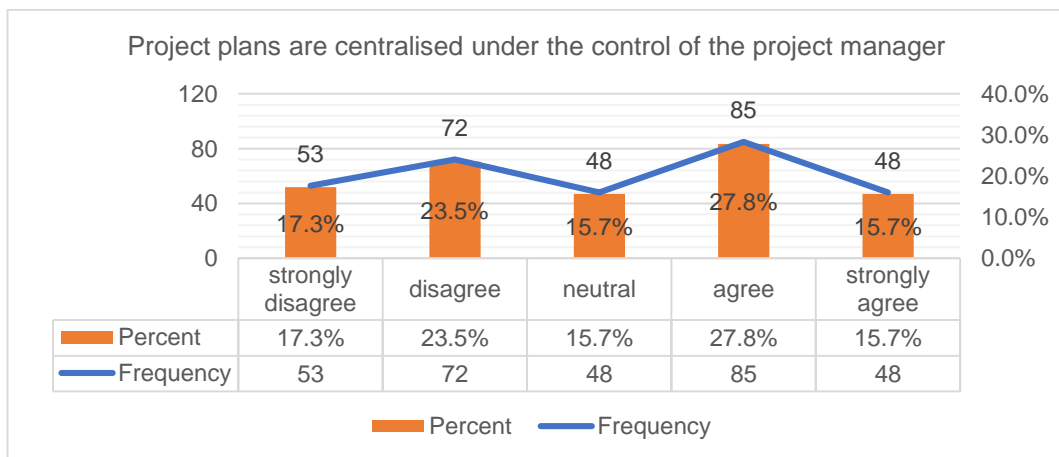


Source (Own construction)

Statement 26 Project plans are centralised under the control of the project manager.

Centralising of project plans under the control of the project manager is subject to the same considerations earlier in this section. Statement 26 sought respondent concurrence that the centralisation of project plans happens in their organisations. As shown in Figure 5.32, the findings are inconclusive- almost an equal number of respondents were on both sides on the aisle: 43.5% agreement and 40.8% disagreement.

Figure 5.32: Respondents’ perceptions on whether project plans are centralised under the control of the project manager in their organisations



Source (Own construction)

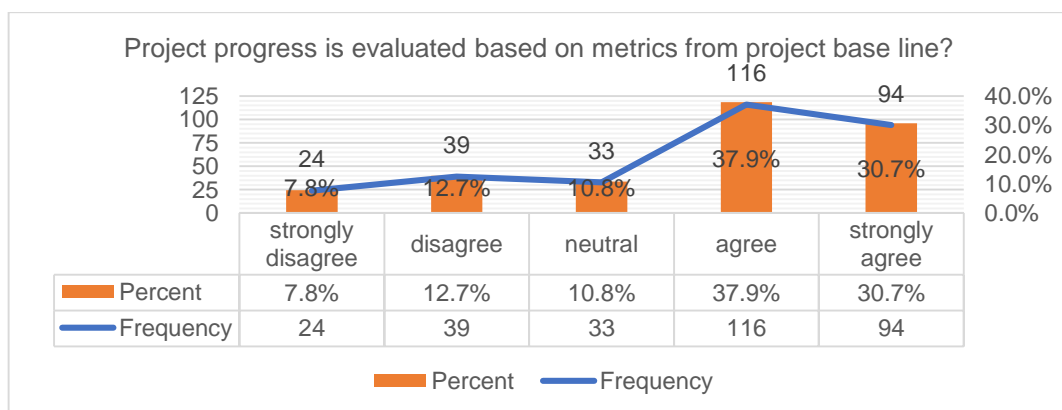
5.3.9.7 Managing scope, schedule, and cost changes during project execution

Kerzner (2013: 56) warned that it is impossible for human beings to completely describe a project in a manner that will prevent scope changes during project execution or to effectively plan a project from start to finish in a manner that they will not be schedule or cost changes. The probability of scope, schedule or cost changes increases with increase in scale and complexity of a project. Mature organisations recognise this, so they develop systems to manage change in the project triple constraints of scope, schedule, and cost. The statements in this section sought respondent concurrence with the notion that their organisations have established change management systems and procedures.

Statement 18 Project progress is evaluated based on metrics from project base line.

Establishment of a project baseline is the foundational step in project execution monitoring and control. The project baseline estimates cost and activities completed in relation to project execution time. Once project execution has started, deviations in cost and schedule are tracked as a way of monitoring project progress. Statement 18 sought respondent agreement as to whether their organisation track project deviations from the baseline. As shown in Figure 5.33, slightly over two-thirds, 68.6% of the respondents concurred with the above statement that similar processes are used – 37.9% agreed and 30.7% strongly agreed. However, only 20.5% of the respondents opposed the above statement – 12.7% disagreed and 7.8% strongly disagreed. Slightly more than three times as many respondents indicated that their organisations tracked deviations from the project baseline as compared to those who indicated that their organisations don't. It is not surprising that most organisations track project deviations from the baseline. The availability of project management software such as Microsoft Project™ and Primavera™ has made project monitoring and project progress reporting easier.

Figure 5.33: Respondents' perceptions on whether project progress is evaluated based on metrics from project base line in their organisations

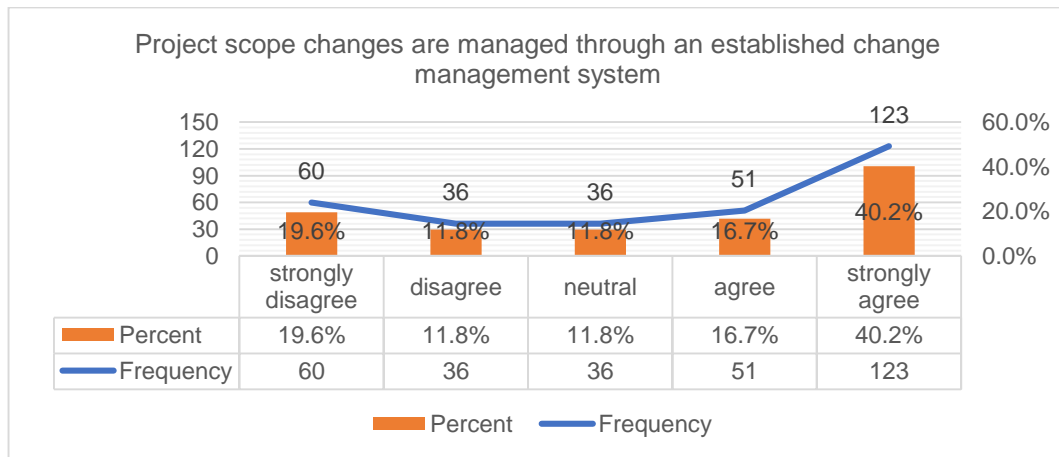


Source (Own construction)

Statement 22 Project scope changes are managed through an established change management system.

Statement 22 sought respondent agreement as to whether their organisation have established project scope change management systems. As shown in Figure 5.34, slightly over half, 56.6% of the respondents concurred with the above statement that similar processes are used – 16.7% agreed and 40.2% strongly agreed. However, 31.4% of the respondents dissented – 11.8% disagreed and 19.6% strongly disagreed. The concurrence-to-dissent ratio is 1.8 to 1, less than the 3 to 1 of Statement 18. This drop in the concurrence-to-dissent ratio indicated that although South African organisation have systems that address scope changes, they are not as successful in managing scope as they are in managing schedule and cost.

Figure 5.34: Respondents’ perceptions on whether their organisations have established project scope change management systems



Source (Own construction)

5.3.10 Project managers power and influence

As project managers often lack authority, they often need to resort to using power and influence to get this done. The statements in this section explore some elements of power and influence that project managers could use to promote initiatives that seek to improve their organisation’s project management capacity.

5.3.10.1 Involvement in planning and decision making

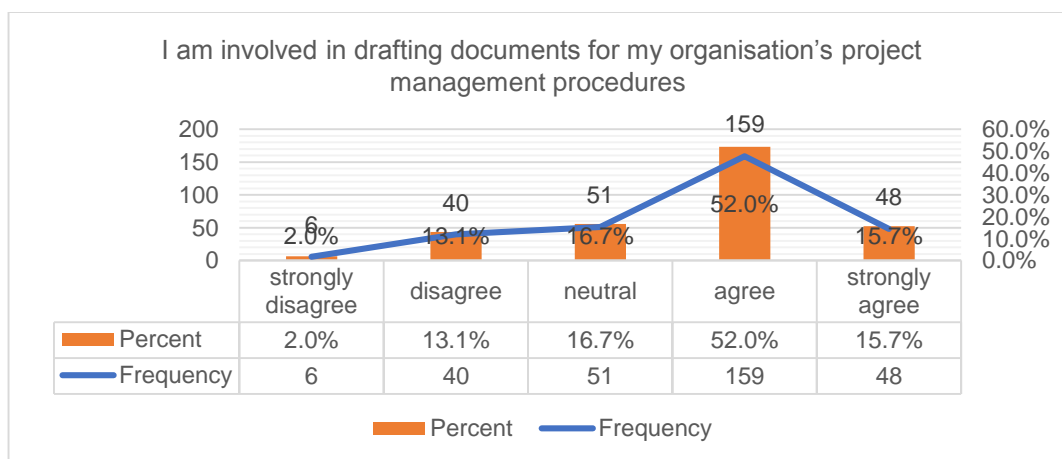
Project managers have an authority gap since they rarely have positional power. They have to use personal power to influence people to get things done. They depend on influence technique such as persuasion to affect policy or decision making. They often are not members of functional the forums or committees. Thus, they sometimes have to influence other through

other individuals a such an executive sponsor. Thus, leadership is a non-negotiable competence for project managers.

Statement 28 I am involved in drafting documents for my organisation’s project management procedures.

Statement 28 sought information on whether the respondents are involved in drafting project management standard procedures for their organisations. This process often facilitates engagement key role players. It is in such environment that project managers can influence gate keepers to unlock resources that can be used to improve an organisation’s project management maturity. Figure 5.35 below shows that slightly more than two thirds, 67.7% of the respondents are involved in drafting project management decisions. Only 15.1% indicated that they are not involved.

Figure 5.35: Survey responses indicating respondent involvement in drafting documents for my organisation’s project management procedures

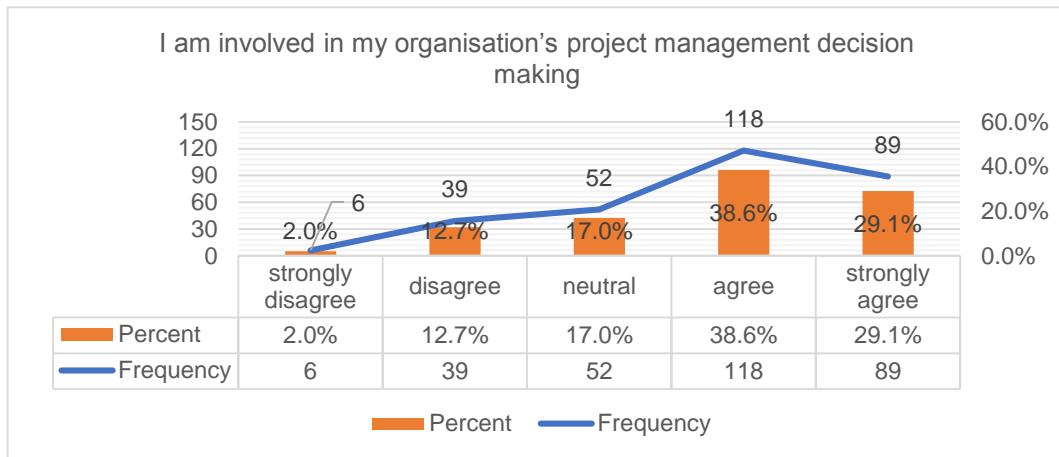


Source (Own construction)

Statement 30 I am involved in on my organisation’s project management decision making.

The rationale behind Statement 30 was the similar to that of Statement 28, this statement sought to find out if the respondents were involved in their organisations’ project management decisions. Similarly, and as shown in Figure 5.36, many of the respondents, 67.7% indicated that they are involved in project management decision-making.

Figure 5.36: Survey responses indicating respondent involvement in their organisation's project management decision making

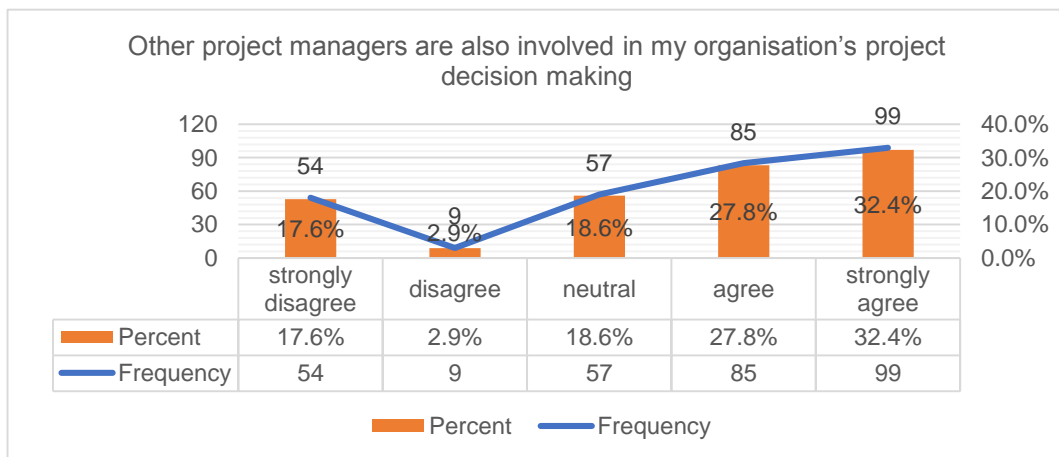


Source (Own construction)

Statement 33 Other project managers are also involved in my organisation's project decision making.

Statement 33 focused on whether other project managers are involved in project management decision making. As shown in Figure 5.37 other project managers are also involved, 60.2% indicated that they were involved. Only 20.5% indicated that they are not involved.

Figure 5.37: Survey responses indicating respondents of other project managers involvement in organisation's project decision making

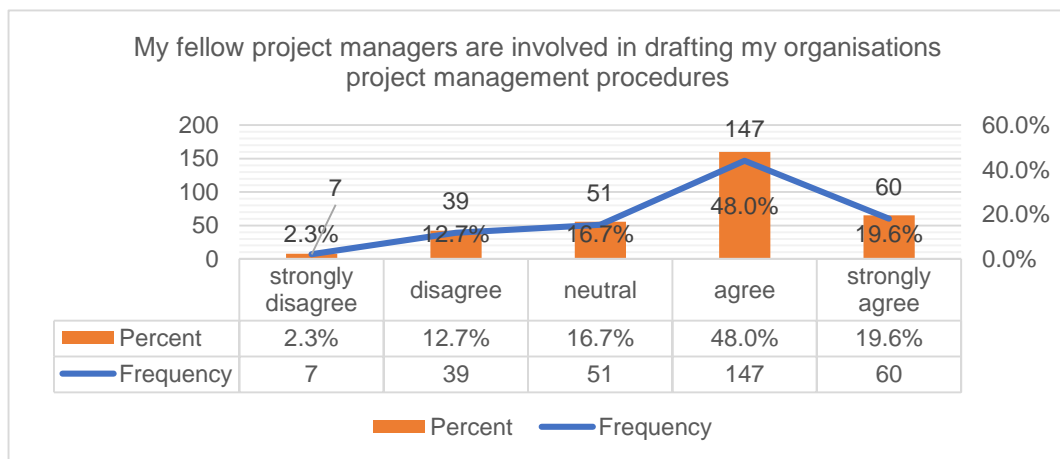


Source (Own construction)

Statement 34 My fellow project managers are involved in drafting my organisations project management procedures.

Statement 34 extended the idea of participation to drafting documents that outline an organisation’s project management procedures. Figure 5.38 shows that sixty-seven percent of the respondents reported that other project managers within their organisations are also involved. Only 15.0% of the respondents indicated that their fellow project managers were not involved in these exercises. These findings, on respondents and their colleagues, seem to indicate that South African organisations provide space for their project managers which they can use to exert influence for the purposes of improving their organisation’s project management maturity.

Figure 5.38: Survey responses indicating respondent’s fellow project manager’s involvement in drafting their organisations project management procedures



Source (Own construction)

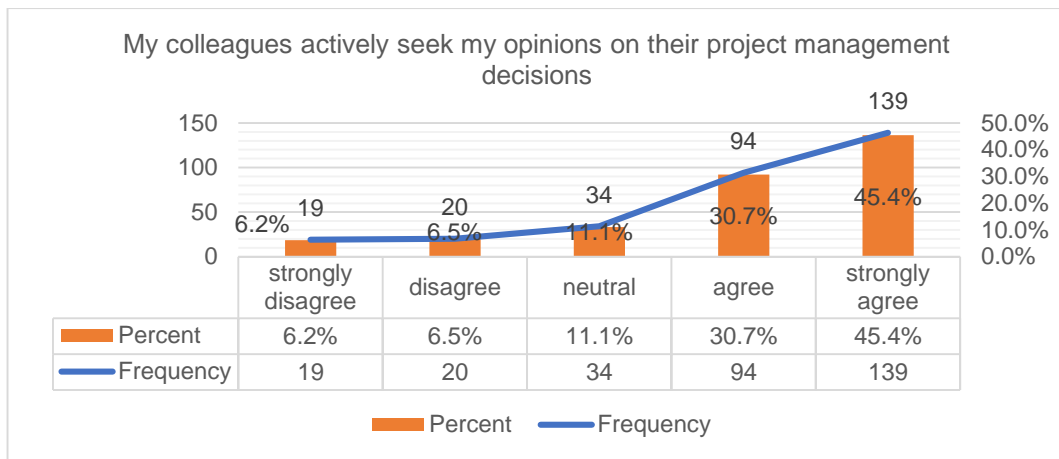
5.3.10.2 The project manager as a leader

Statement in this section sought to test the veracity of the claim that project managers are leaders. The test was deductive with the following premise: leaders have followers. If project managers are leaders, they too must have followers. In the context of the study’s respondents, the followers would be colleagues, subordinates, or superiors.

Statement 27 My colleagues actively seek my opinions on their project management decisions.

Statement 27 sought to find out if the respondents; colleagues followed them. Figure 5.39 shows that 76.1% of the respondents reported that their colleagues actively solicited their advice. Only 12.7% of the respondents reported that their options are not actively sought for.

Figure 5.39: Survey responses indicating lateral influence- colleagues actively seeking respondent opinions

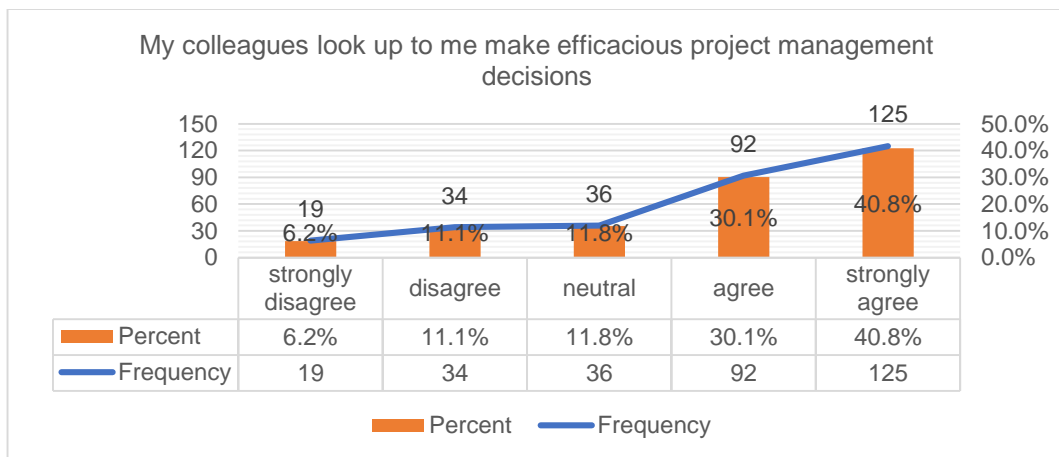


Source (Own construction)

Statement 31 My colleagues look up to me make efficacious project management decisions.

Statement 31 sought to find out if the respondents thought that their decision making was efficacious, and they think that others equally benefitted. Figure 5.40 shows that 70.9% of the respondents reported that their colleagues respected their decision-making capabilities. Only 17.3% reported the contrary.

Figure 5.40: Survey responses indicating lateral influence- colleagues' respect of respondent's decision making



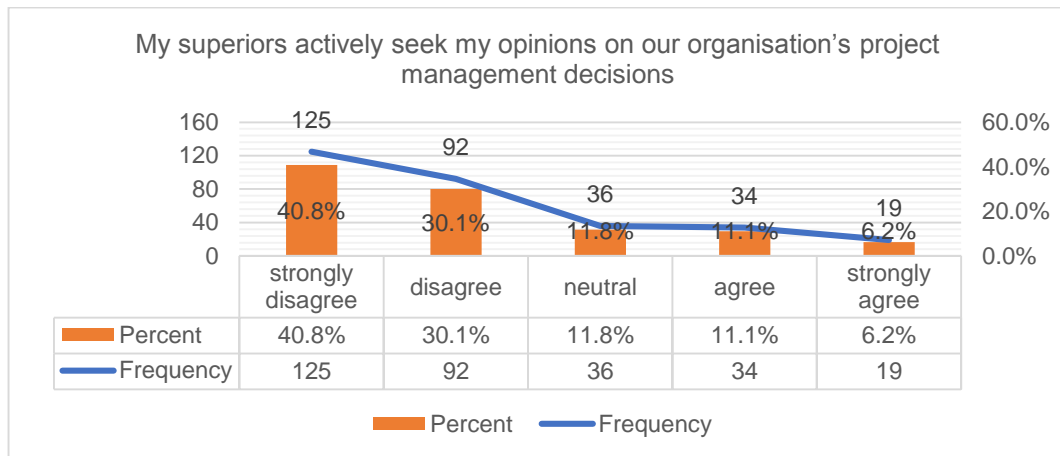
Source (Own construction)

Statement 32 My superiors actively seek my opinions on our organisation's project management decisions.

Statement 32, the study was focusing upward where the respondent's decision making is also sought for by their superiors. Figure 5.41 shows that the lateral mutual confidence in decision making does not extend vertically upwards as 70.9% of the respondents that their do not

actively sought their advice. Only 17.3% of the respondents reported that their superiors actively sought their opinions.

Figure 5.41: Survey responses indicating vertical influence- superiors' respect of respondent's decision making

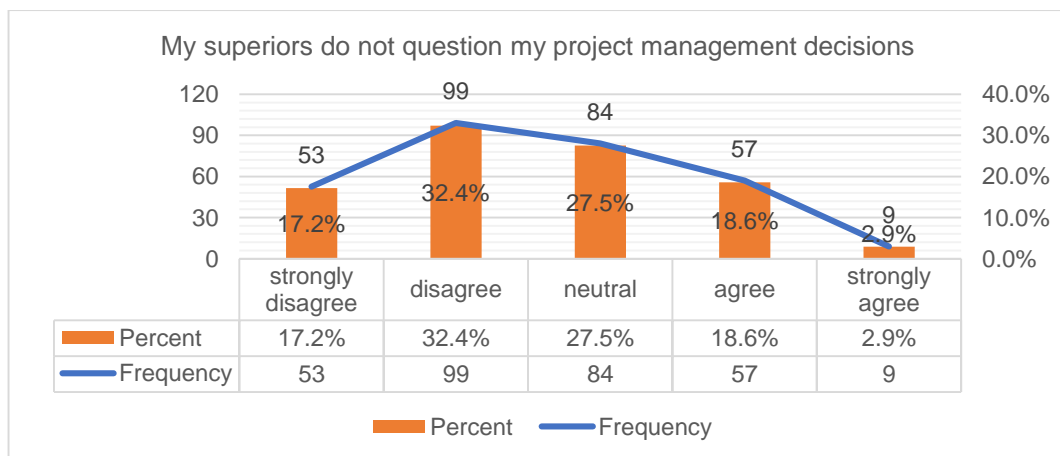


Source (Own construction)

Statement 36 My superiors do not question my project management decisions.

Statement 36 sought to find out if the respondent's superiors trust their project management decision. Figure 5.42 showed that 49.6% of the respondents did not agree with the above statement. Only 21.5% reported that their superiors trusted their project management decision. The concurrence-to-dissent ratio 1 to 2.3, slightly less than half of the respondents reported that their superiors trusted their project management decision making in comparison to those who reported the contrary. Perhaps, this reflects the fact that only 9.7% of the respondents indicated that they had the job title of Senior Project Managers. Only 21.5% of the respondents concurred with the above statement.

Figure 5.42: Survey responses indicating vertical influence- superiors' respect of respondent's decision-making autonomy



Source (Own construction)

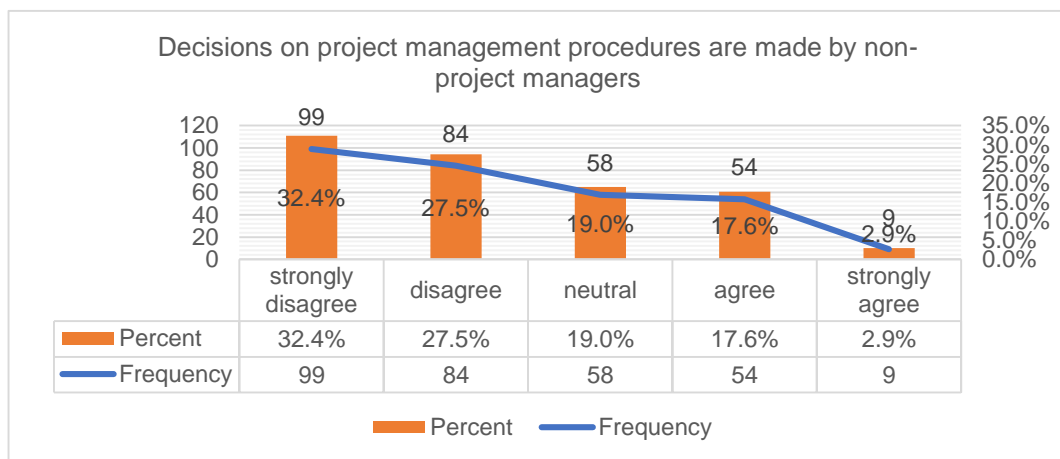
5.3.10.3 Non- project managers involvement in project management

The statements in this section sought to illuminate the extent of non-practitioner participation in project management decision making and process development.

Statement 29 Decisions on project management procedures are made by non-project managers.

Statement 29 sought to shed light on the extent of non-practitioner participation in project management decision making. Figure 5.43 shows that this was not the case in the respondent's organisations as 59.9% of the respondents disagreed with the statement. Only 20.5% indicated that this was the case in their organisations.

Figure 5.43: Survey responses indicating non-project manager's involvement in project decision making

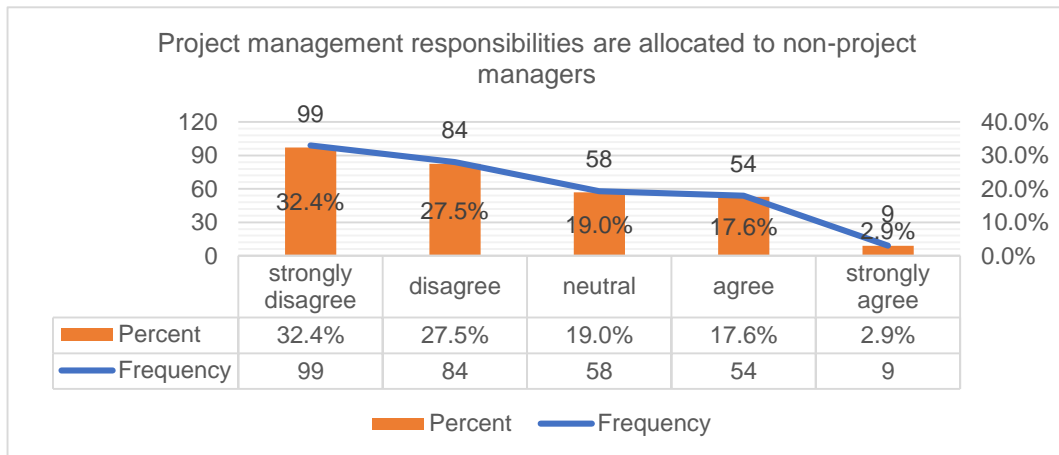


Source (Own construction)

Statement 35 Project management responsibilities are allocated to non-project managers.

Statement 35 sought to shed light on the extent of non-practitioner participation in the development of organisational project management resources such as documentation, procedures, and processes. Similarly, the findings suggest, as shown Figure 5.44, that there is limited non-practitioner participation. Just as in Statement 29, 59.9% of the respondents dissented while only 20.5% consented. It is evident that the above findings that South African project managers exert considerable influence laterally amongst colleagues but to a lesser degree vertically upwards.

Figure 5.44: Survey responses indicating allocation of project management responsibilities to non-project manager's



Source (Own construction)

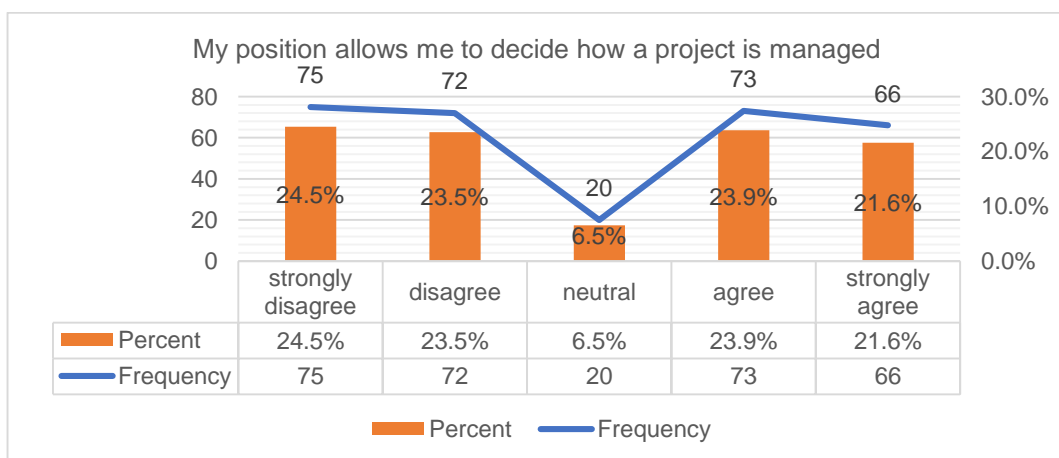
5.3.10.4 The project managers and their perceived power

Project managers do not often have position power. This authority gap does not mean that project managers do not have any form of power at their disposal. They can exercise various other types of personal power such as expert power, informational power, and political power. The statements in this section sought to test the general expectation that project managers rely on personal power to exert influence.

Statement 40 My position allows me to decide how a project is managed.

Statement 40 sought to find out if the respondents had position power. As shown in Figure 5.45, the finding from this aspect of the study were inconclusive – 48.0% dissent versus 45.5% concurrence.

Figure 5.45: Survey responses indicating positional power over project management

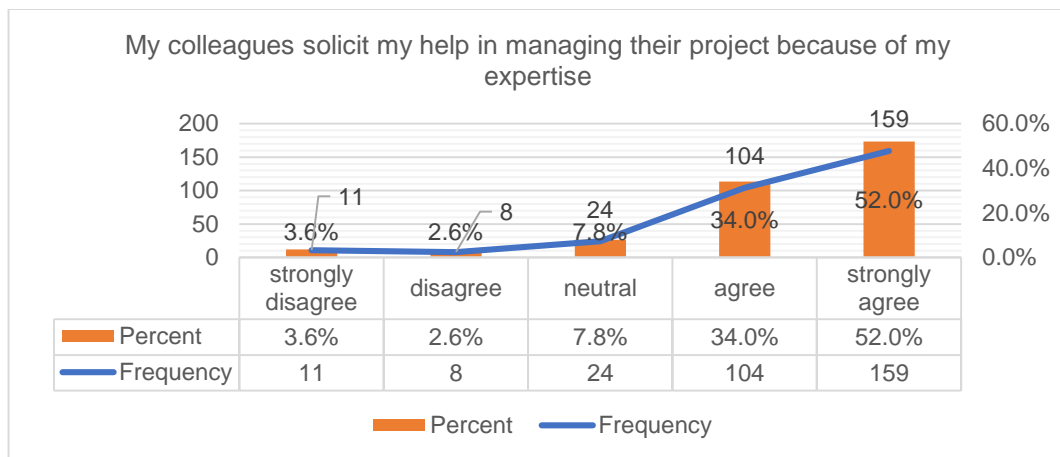


Source (Own construction)

Statement 44 My colleagues solicit my help in managing their project because of my expertise.

Statement 44 was sought to test the perceived use of expert power by the respondents. Figure 5.46 indicates that many of the respondents – 86.0%, agreed with the assertion that their colleagues sought their help because of their expertise/exporter power. Only 6.2% of the respondents disagreed.

Figure 5.46: Survey responses indicating expert power and lateral influence

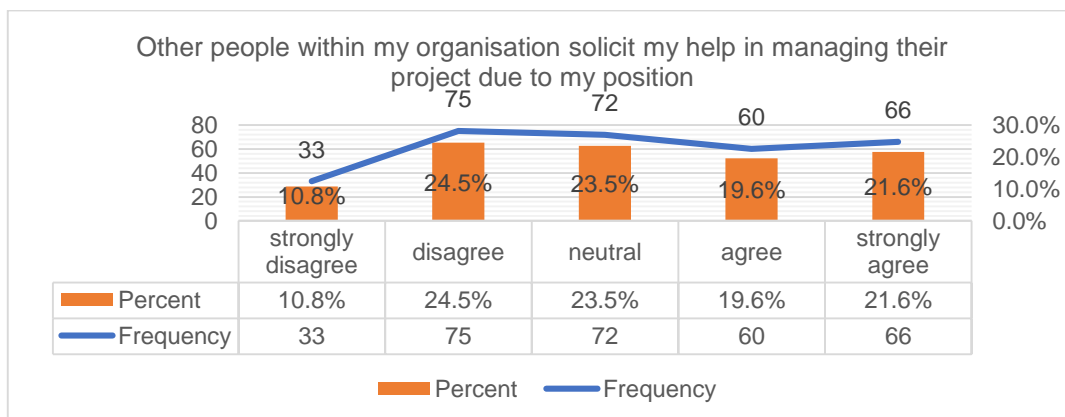


Source (Own construction)

Statement 45 Other people within my organisation solicit my help in managing their project due to my position.

Statement 45 sought to test whether the respondents thought that their work colleagues who solicited help from them due to the respondent’s position within the organisation. Unfortunately, as shown in Figure 5.47, this aspect of the study was inconclusive – the difference between those who concurred and those who dissented was 5.9% - 41.2% agreement versus 35.3% disagreement.

Figure 5.47: Survey responses indicating expert power within the organisation

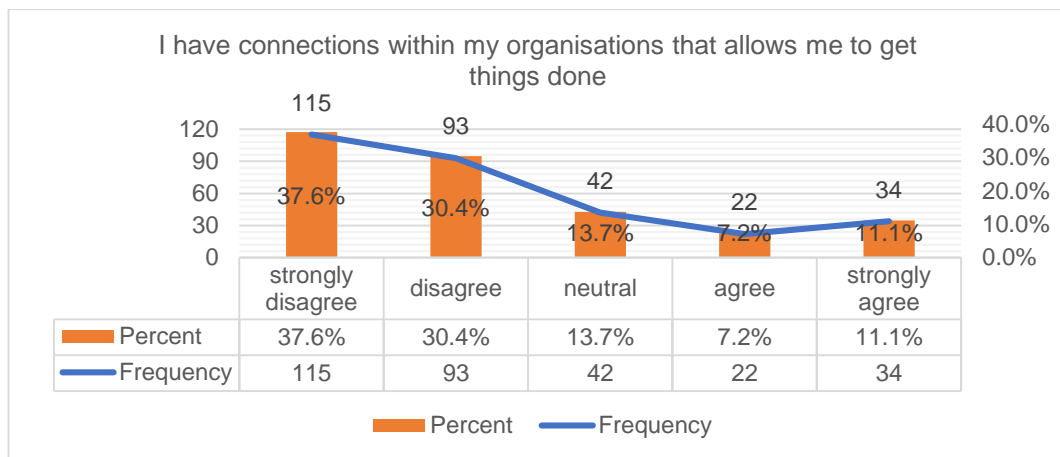


Source (Own construction)

Statement 38 I have connections within my organisations that allows me to get things done.

Statement 38 sought respondent concurrence on whether they used political power to get things done at their organisations. Figure 5.48 shows that 68.0% of the respondents disputed the assertion that they had political power in their organisation – 30.4% disagrees, and 37.6% strongly disagreed. On the other hand, 18.3% of the respondents admitted that they used their connections within their organisations to get things done – 7.2% agreed, and 11.1% strongly agreed.

Figure 5.48: Survey responses indicating use of connection power to get things done



Source (Own construction)

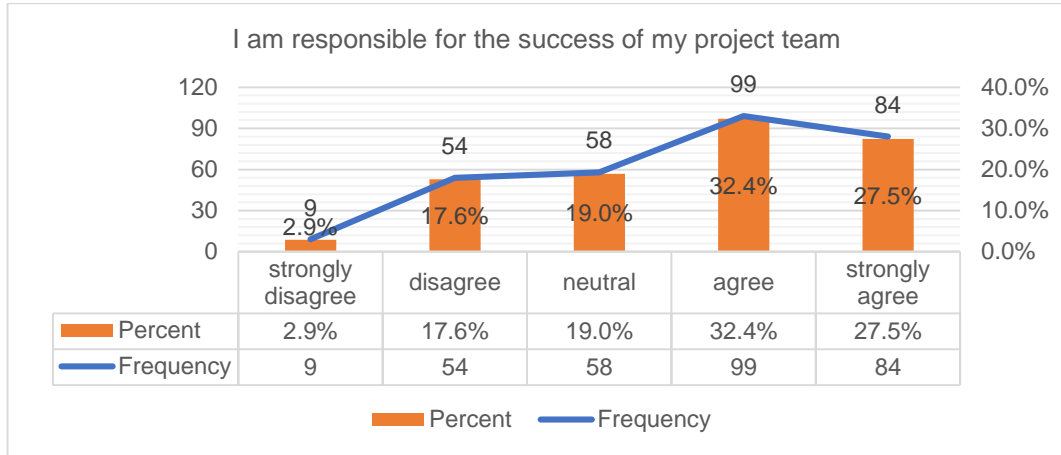
5.3.10.5 The project managers and how they exercise power

The statements in this section will be addressed together as they each provide examples of how project managers exercise power. They also illustrate typical objectives for the exercise of power. The statements are as follows:

Statement 37 I am responsible for the success of my project team.

Statement 37 sought to find out respondent level of responsibility for project team success. Figure 5.49 shows that 59.9%, 32.5% agreed and 27.5% strongly agreed, of the respondents used their personal power to facilitate project success. A smaller proportion of the respondents, 20.5% disagreed with the above statement.

Figure 5.49: Survey responses indicating respondent responsibility for project success

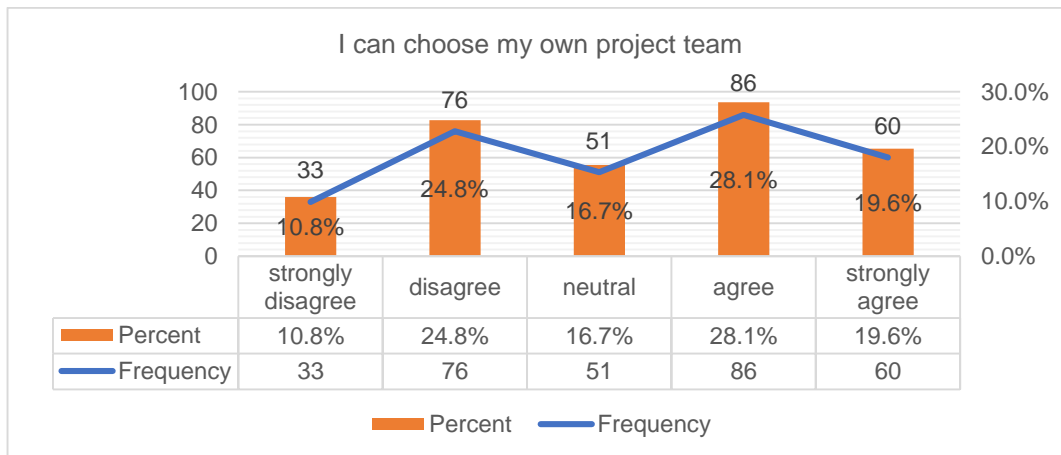


Source (Own construction)

Statement 39 I can choose my own project team.

Statement 39 sought to find out whether the respondents can choose their own project team. As shown in Figure 5.50 below there was not a substantial difference between those who agreed and those who disagreed. The respondents who agreed with the above statement were 47.7% and those who agreed were 35.6%.

Figure 5.50: Survey responses indicating respondent power to choose own project team



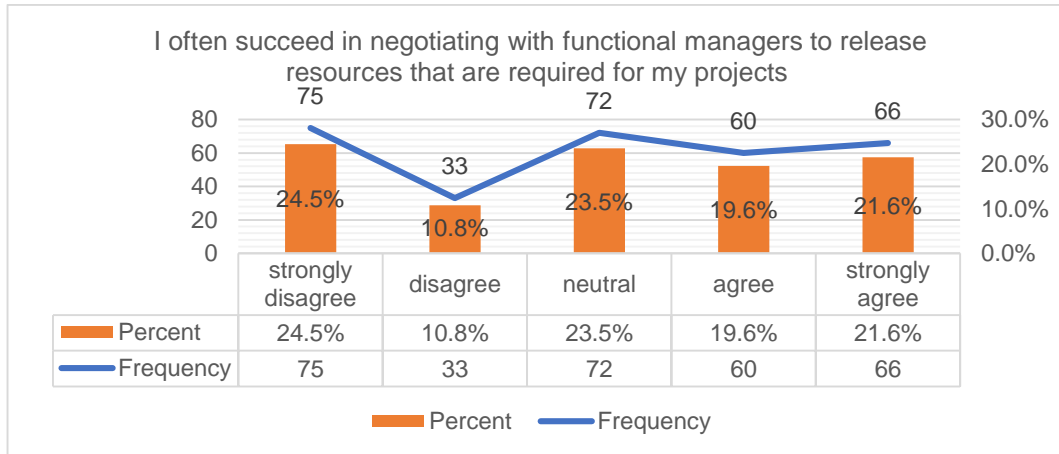
Source (Own construction)

Statement 41 I often succeed in negotiating with functional managers to release resources that are required for my projects.

Statement 41 sought for find out the respondents often succeed in negotiating with functional mangers to release resources that are required for projects. The results were unsuccessful due to marginal difference between those who agreed and those who did not. Figure 5.51 shows the respondents who against with the above statement were 10.8% who disagreed and

4.5% strongly disagreed. Those who supported the above statement were – 19.6% agreed and 21.6% strongly agreed.

Figure 5.51: Survey responses indicating respondent success in use of power and influence to negotiate for resources

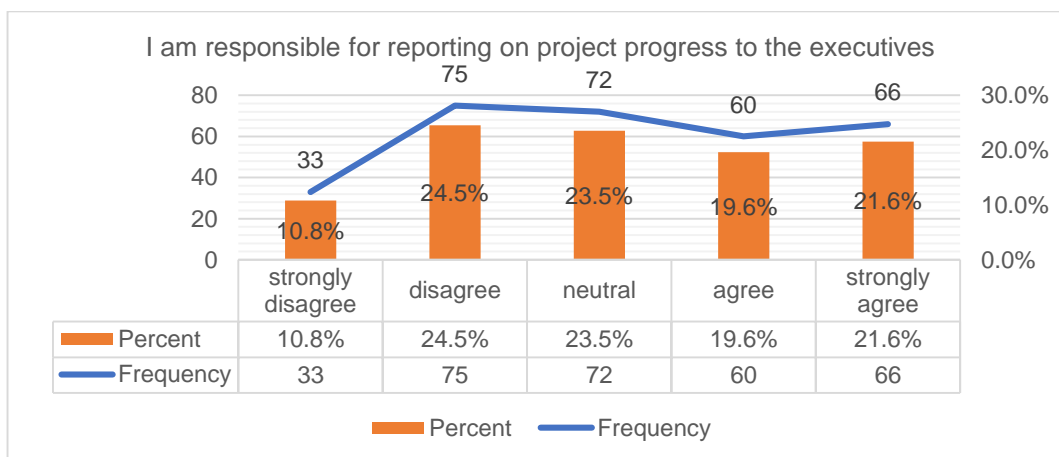


Source (Own construction)

Statement 42 I am responsible for reporting on project progress to the executives.

Statement 42 sought to find out the level of responsibility given to respondents on reporting project progress to the executives. The results from the above statement were unsuccessful due to marginal difference between those who agreed and those who did not. As shown in Figure 5.52, respondents who agreed with the above statement were 35.3%, while only 41.2% agreed with the statement.

Figure 5.52: Survey responses indicating respondent responsibility for project progress reporting

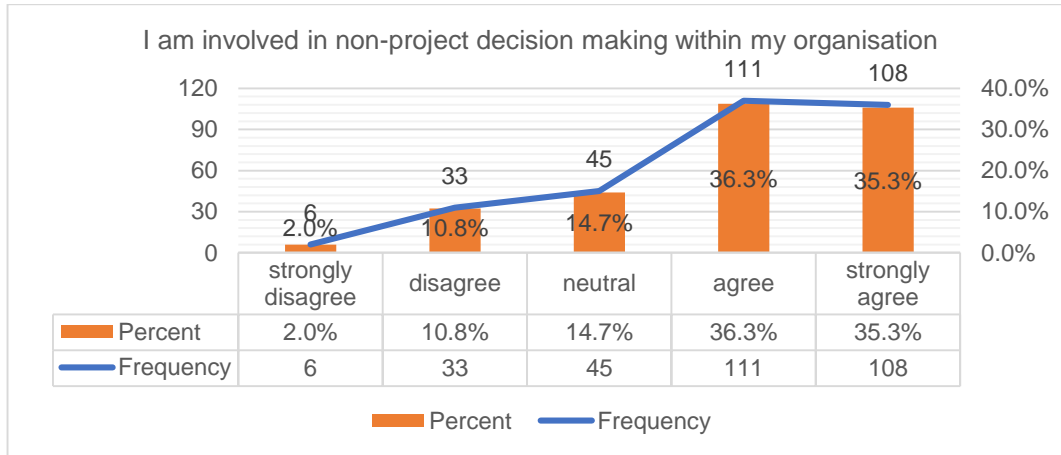


Source (Own construction)

Statement 43 I am involved in non-project decision making within my organisation

Statement 43 sought to find out the level of non-project decision the respondents has in the organisation. As shown in Figure 5.53 below there is a huge difference is the respondents who agreed and those who disagreed. Over seventy percent of the respondents agreed with the above statement, 36.3% agreed and 35.3% of the respondents strongly agreed. 12.8% of the respondents disagreed with 2.0% strongly disagreed and 10.8% disagreed.

Figure 5.53: Survey responses indicating respondents' involvement with non-project decision making within their organisations

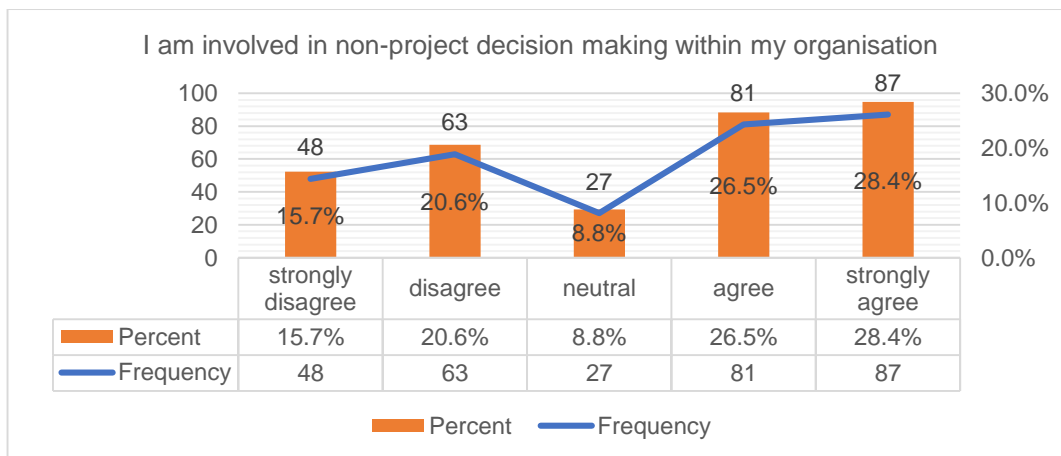


Source (Own construction)

Statement 46 I am regularly asked to mentor new project managers.

Statement 46 sought to find out the level of expert power the respondents use to mentor new project managers. Figure 5.54 shows that the respondents use their expert power to mentor new entrants into the project management field – 54.9% agreement and 36.3% disagreement.

Figure 5.54: Survey responses indicating respondent involvement in mentoring new project managers



Source (Own construction)

5.4 INFERENCE STATISTICAL ANALYSIS AND INTERPRETATION

Inferential statistical analysis enabled the study to go beyond analysing the statements individually and to begin looking for associations and correlations amongst them – statements or groups of statements represented variables. For Section A of the questionnaire (see Appendix A), each statement represented a variable – Statement 1 to Statement 8. For Section B, some statements were aggregated into five variables, each representing a project management maturity level – Statement 9 to Statement 26. Another group of statements were aggregated into a variable representing project managers’ influence - Statement 27 to Statement 66. The last group of statements were aggregated into a variable representing project managers’ power - Statement 37 to Statement 46.

5.4.1 Gender and project managers’ power and project managers influence

Table 5.2 shows that association between gender and project manager’s influence is significant ($p = 0.002$, $\alpha = 0.05$). The table indicates that there is no association between gender and project managers’ power. The correlation coefficient between gender and project managers’ power is negative 0.181, indicating a weak negative correlation. The correlation coefficient indicates that female project managers have less influence than their male counterparts.

Table 5.2: Relationship between gender, project managers’ power and project managers’ influence

			What is your gender?	Project managers' influence	Project managers' power
Spearman's rho	Gender	Correlation Coefficient	1.000	-.181**	-0.095
		Sig. (2-tailed)		0.002	0.096
		N	306	306	306
	Project managers' influence	Correlation Coefficient	-.181**	1.000	.730**
		Sig. (2-tailed)	0.002		0.000
		N	306	306	306
	Project managers' power	Correlation Coefficient	-0.095	.730**	1.000
		Sig. (2-tailed)	0.096	0.000	
		N	306	306	306

** . Correlation is significant at the 0.01 level (2-tailed).

Source (Own construction)

To verify the correlation between gender and project managers’ influence, a further test was conducted to check the role of mediating variables: project management experience, certification, qualification and the number of projects managed recently. Results presented in Table 5.3 below indicate that the relationship is still significant ($p = 0.000 < \alpha = 0.05$) when accounting for the above mediating variables.

Table 5.3: Relationship between gender and project managers' influence considering several mediating variables

Control Variables		What is your gender?	Project managers' influence
Project management certification & Projects managed in the last five years & Highest qualification & Years of project management experience	Gender	Correlation	1.000
		Significance (2-tailed)	0.000
		df	291
	Project managers' influence	Correlation	-0.204
		Significance (2-tailed)	0.000
		df	291

Source (Own construction)

5.4.2 Project manager influence and project management maturity

An analysis was first done to determine the independence of project management maturity from both project managers' influence and project managers' power. The analysis was based on Spearman's rho rather than Chi-Square test as both power and influence were continuous variables. Project managers' power and project managers' influence were computed means of their constituent elements. Table 5.4 shows that both project managers' influence and project managers' power are not independent from project management maturity. Relationship between project management maturity and project managers' influence as indicated by Spearman's rho indicates the existence of a significant relationship between the two ($p = 0.001 < \alpha = 0.05$). Relationship between project management maturity and project managers' power as indicated by Spearman's rho indicates the existence of a significant relationship between the two ($p = 0.000 < \alpha = 0.05$). However, Table 5.4 also indicates a significant association ($p = 0.000 < \alpha = 0.05$) between project managers' power and project managers' influence. The correlation coefficient of 0.730 indicates a strong positive relationship between the two, as the project managers' power increases, project managers' influence also increase. These means that each one of the two, project managers' power or project managers' influence, would be a mediating variable in a relationship one of them and a third variable. Therefore, the researcher checked for non-spuriousness when other of the variables, project managers' power or project managers' influence, were involved.

Table 5.4: Spearman’s correlation for project managers’ power, influence, and project management maturity

			Project managers' influence	Project managers' power	Project management maturity of organisation
Spearman's rho	Project managers' influence	Correlation Coefficient	1.000	.730**	.191**
		Sig. (2-tailed)		0.000	0.001
		N	306	306	306
	Project managers' power	Correlation Coefficient	.730**	1.000	.292**
		Sig. (2-tailed)	0.000		0.000
		N	306	306	306
	Project management maturity of organisation	Correlation Coefficient	.191**	.292**	1.000
		Sig. (2-tailed)	0.001	0.000	
		N	306	306	306
**. Correlation is significant at the 0.01 level (2-tailed).					

Source (Own construction)

The study presented null and alternative hypotheses for variables project managers’ influence and project management maturity. They are restated below for convenience:

- H1_o There is no relationship between a project manager’s influence and an organisation’s project management maturity.
- H1_a There is a relationship between a project manager’s influence and an organisation’s project management maturity.

The null hypothesis (H1_o) cannot be rejected or accepted as either project managers’ power or project managers’ influence might be a mediating variable in the correlation. A further test, a partial correlation with project managers’ power was conducted. Table 5.5 shows that if project managers’ power is considered as a mediating variable, the relationship between project management maturity and project managers’ influence is no longer significant ($p = 0.636 > \alpha = 0.05$). In this case, the null hypothesis is accepted. Findings from this study do not support the existence of a relationship between project managers’ influence and project management maturity.

Table 5.5: Partial correlation of project management maturity and project managers' influence with project managers' power as controlling variable

Control Variables			Project managers' influence	Project management maturity of organisation
Project managers' power	Project managers' influence	Correlation	1.000	0.027
		Significance (2-tailed)		0.636
		df	0	303
	Project management maturity of organisation	Correlation	0.027	1.000
		Significance (2-tailed)	0.636	
		df	303	0

Source (Own construction)

5.4.3 Project manager power and project management maturity

The study presented null and alternative hypotheses for variables: project managers' power and project management maturity. They are restated below for convenience:

H2_o There is no relationship between a project manager's power and an organisation's project management maturity.

H2_a There is a relationship between a project manager's power and an organisation's project management maturity.

Table 5.6 shows that even with project managers' influence as a control variable, the association between project managers' power and project management maturity is significant ($p = 0.004 < \alpha = 0.01$). Since both Spearman's rho and partial correlation testing with project managers' power as a control variable indicate p-values that are greater than the significance level, the null hypothesis is rejected. Findings from this study support existence of a relationship between project managers' power and their organisations' project management maturity. In this study, project managers' power is indicated by the authority that project managers are given to execute project strategy and their responsibility in developing project management procedures and processes. In organisations where project managers' lack power, other stakeholders are responsible for project management strategies and processes.

Table 5.6: Partial correlation of project management maturity and project managers' power with project managers' influence as controlling variable

Control Variables			Project management maturity of organisation	Project managers' power
Project managers' influence	Project management maturity of organisation	Correlation	1.000	0.164
		Significance (2-tailed)		0.004
		df	0	303
Project managers' power	Project managers' power	Correlation	0.164	1.000
		Significance (2-tailed)	0.004	
		df	303	0

Source (Own construction)

To establish the direction of the relationship between project managers' power and project management maturity, a further test was conducted. Linear regression with project managers' power as independent variable and project management maturity. Table 5.7 presents the results of the regression which indicate a weak positive relationship ($R = 0.253$). As project managers' power increases, their organisations' project management maturity increases. It was expected that the regression would a weak positive relationship as other organisational factors also affect project management maturity. Thus, the relationship can be stated as follows: as project managers' power increases, it is likely that their organisation project management maturity also increases. The study did attribute the organisation's project management maturity growth to the increase in project managers' power due to two reasons. Firstly, the study would not establish the temporal order between the two, and secondly, the correlation was too weak for prediction. A correlation coefficient, R , which is greater than 0.5 is required for either group or individual prediction.

Table 5.7: Results of linear regression of project managers' power and project management maturity

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.253 ^a	0.064	0.061	1.066
a. Predictors: (Constant), Project managers' power				
b. Dependent Variable: Project management maturity of organisation				

Source (Own construction)

5.4.4 Project managers' project management experience and project management maturity

Analysis was first done to determine for the independence of project management maturity from both project managers' project management and project management expertise. The analysis was based on Spearman's rho rather than Chi-Square test as both project management experience and technical expertise were continuous variables. Project managers' power and project managers' influence were computed means of their constituent elements. Project management maturity was a categorical ordinal variable. It was established, as shown in Table 5.8, that both project management maturity is not independent from project managers' experience ($p = 0.049 < \alpha = 0.05$) and project managers' technical expertise ($p = 0.0014 < \alpha = 0.05$) at 95 % confidence level.

Table 5.8: Spearman's rho for association between project managers' project management experience, project managers' technical expertise and project management maturity

			Project management maturity of organisation	Project managers' project management experience	Project managers' technical expertise
Spearman's rho	Project management maturity of organisation	Correlation Coefficient	1.000	.113*	-.137*
		Sig. (2-tailed)		0.049	0.016
		N	306	306	306
	Project managers' project management experience	Correlation Coefficient	.113*	1.000	.131*
		Sig. (2-tailed)	0.049		0.022
		N	306	306	306
	Project managers' technical expertise	Correlation Coefficient	-.137*	.131*	1.000
		Sig. (2-tailed)	0.016	0.022	
		N	306	306	306
*. Correlation is significant at the 0.05 level (2-tailed).					

Source (Own construction)

The study presented null and alternative hypotheses for project managers' project management experience and project management maturity. They are restated below for convenience:

- H3_o There is no relationship between a project manager's project management experience and an organisation's project management maturity.
- H3_a There is a relationship between a project manager's project management experience and an organisation's project management maturity.

A partial correlation test with project managers' power was conducted to determine if project managers' power does not influence the significance of the relationship. Table 5.9 indicates that the p-value of the relationship with project managers' power as the control variable is 0.449. This p-value is greater than $\alpha = 0.05$, thus the null hypothesis is accepted. Findings from this study do not support existence of a relationship between project managers' project management experience and their organisation's project management maturity.

Table 5.9: Partial correlation of project management maturity and project managers' project management experience with project managers' power as the control variable

Control Variables			Project management maturity of organisation	Project managers' project management experience
Project managers' power	Project management maturity of organisation	Correlation	1.000	0.044
		Significance (2-tailed)		0.449
		df	0	303
	Project managers' project management experience	Correlation	0.044	1.000
		Significance (2-tailed)	0.449	
		df	303	0

Source (Own construction)

5.4.5 Project managers' project management technical expertise and project management maturity

The study presented null and alternative hypotheses for variables: project managers' technical expertise and project management maturity. They are restated below for convenience:

- H4_o There is no relationship between a project manager's technical expertise and an organisation's project management maturity.
- H4_a There is a relationship between a project manager's technical expertise and an organisation's project management maturity.

It is shown in Table 5.10 below, that the Spearman's rho test produced a p-value of 0.016, indicating a significant relationship at 95% confidence level. A partial correlation test with project managers' power was conducted to determine if project managers' power does not influence the significance of the relationship. Table 5.10 indicates that the p-value of the relationship with project managers' power as the control variable is 0.0000 which is less than the $\alpha = 0.05$, signifying association between project management maturity and project

managers' technical expertise. Findings from this study support existence of a relationship between project managers' project technical expertise and their organisation's project management maturity. The correlation coefficient between the two 0.282, indicating a weak positive correlation. Thus, the relationship can be stated as follows: as project managers' technical increases, it is likely that their organisation project management maturity also increases. The study did attribute the organisation's project management maturity growth to the increase in project managers' technical expertise to two reasons. Firstly, the study would not establish the temporal order between the two, and secondly, the correlation was too weak for prediction. A correlation coefficient, R, that is greater than 0.5 is required for either group or individual prediction.

Table 5.10: Partial correlation of project management maturity and project managers' project technical expertise with project managers' power as the control variable

Control Variables			Project management maturity of organisation	Project managers' technical expertise
Project managers' power	Project management maturity of organisation	Correlation	1.000	0.282
		Significance (2-tailed)		0.000
		df	0	303
	Project managers' technical expertise	Correlation	0.282	1.000
		Significance (2-tailed)	0.000	
		df	303	0

Source (Own construction)

5.4.6 Elements of project managers' attributes that are significant for project management maturity

Analysis was conducted to determine project managers' attributes that contribute to project management maturity. Crosstab analysis of the variables, numbers of projects managed in last five years, project management certification, highest qualification and years of project management experience was conducted to determine the Chi-Square and Fisher's Exact Test p-values in relation to project management maturity. Chi-Square and Fisher's Exact Test were chosen as all the variables were categorical. Table 5.11 shows that an organisation's project management maturity is not independent of its project manager's project management certification, highest qualification, and years of project management experience. Table 5.11 below shows that the relationship between an organisation's project management maturity and the numbers of projects that its project managers manage is not significant (Pearson Chi-Square's $p = 0.259$, Fisher's Exact Test's $p = 0.230$).

Table 5.11: Pearson Chi-Square and Fisher’s Exact Test for project managers’ attributes and project management maturity

		Value	df	Asymptotic Significance (2-sided)	Monte Carlo Sig. (2-sided)		
					Significance	99% Confidence Interval	
						Lower Bound	Upper Bound
Highest qualification*Project management maturity of organisation	Pearson Chi-Square	32.937 ^a	8	0.000	.000 ^b	0.000	0.001
	Fisher's Exact Test	35.218			.000 ^b	0.000	0.000
Years of project management experience*Project management maturity of organisation	Pearson Chi-Square	55.819 ^a	8	0.000	.000 ^b	0.000	0.000
	Fisher's Exact Test	55.880			.000 ^b	0.000	0.000
Project management certification *Project management maturity of organisation	Pearson Chi-Square	48.655 ^a	8	0.000	.000 ^b	0.000	0.000
	Fisher's Exact Test	47.232			.000 ^b	0.000	0.000
Projects managed in the last five years *Project management maturity of organisation	Pearson Chi-Square	9.845 ^a	8	0.276	.259 ^b	0.248	0.270
	Fisher's Exact Test	9.811			.230 ^b	0.219	0.241

Source (Own construction)

5.5 THEMES EMERGING FROM COMMENTS

It is important to provide opportunity for survey respondents to comment on issues or factors that the researcher might have missed in the questionnaire. In the study, Section C provided for respondent questions/comments. It presented the following statement:

Statement 47 Are there any other issues that you would want to bring to the attending of the researcher, please list them in the bullets below:

The text from the responses to the above statement were qualitatively analysed. The following themes emerged from the comments of the respondents:

- Stakeholders are power players in project management whose influence on an organisation’s project management maturity cannot be ignored.
- Management support leads to a good project environment. This theme was addressed in the questionnaire.
- Micromanagement by top managers limits the effectiveness of project managers.
- Profit-driven organisational environments present challenge in developing project management maturity interventions.

- Resource-constrained environments presents challenge in developing project management maturity interventions.

5.6 SUMMARY

This chapter presented results from the study. It presented statistical summaries of the responses to each of the questions. It detailed descriptive percentages and frequencies of responses to each of the questions/statements from the questionnaire. It aggregated responses to derive variables that represented project managers' attributes, project management maturity, project managers' influence and project managers' power. Descriptive analysis of the findings was presented in pie charts, bar charts, and tables. This was followed by inferential analysis of the findings that supported the existence of correlations amongst project manager gender, project managers' power, project management technical expertise and project management maturity. The results from inferential statistical analysis did not support the existence of relationship between project managers' influence and project management experience with project management maturity.

It is important to highlight the contribution which the study makes to existing knowledge on project management maturity. The study indicates that project managers, particularly the power that they have in their organisations, cannot be ignored in initiatives that organisations embark on to improve their project management maturity. The study shows that an organisation's project managers' power and technical expertise have an influence on its project management maturity. Thus, to guarantee project management maturity, organisations must employ project managers who have sufficient technical expertise or develop their project managers and give their sufficient authority to implement the changes that are required for maturity improvement.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENTIONS

6.1 INTRODUCTION

The last chapter provided and discussed the findings of this study. This final chapter considers conclusions and recommendations of this study.

The aim of the study was to examine the relationship between some South African project managers' factors – project manager influence, project managers' power, project managers' project management experience and project managers' technical expertise - and their organisations' project management maturity. To provide a logical path to how the study achieved the above aim, this chapter restates the key aspects of the study. The chapter outlines are restated. Key findings and their interpretations are also restated. The conclusions, and the recommendations follow from the latter.

The study's main research question was as follows: Is there a relationship between project managers' attributes and their organisation's project management maturity? This question guided the analysis and the conclusion drawing. Answering this research question demanded a correlational approach to the study. Before the existence of correlations between various project managers' related factors and project management maturity could be established, tests for variable independent and non-spuriousness were conducted. A positive outcome in both lead to rejection of the null hypothesis, whereas a negative in any one of the test lead to acceptance of the null hypothesis.

6.2 SUMMARIES OF CHAPTERS ONE TO FOUR

The summaries of chapters one to four are restated below for convenience.

Chapter One:

This chapter introduces the study and provides literature review around the definition, development and functioning of project maturity management, discusses the problem statement, states the objectives, research questions, research design and methodology, target population, sample, sample size, sampling method, research instrument, data collection methods, data analysis, ethical considerations, and chapter classification for the entire study.

Chapter Two:

This chapter reviewed the two main categories of project management methodologies: the traditional and agile methodologies. It was not possible to review all the traditional methodologies, therefore, the PMBOK and PRINCE2 were reviewed as exemplars of

traditional methodologies. Traditional methodologies have achieved widespread use, mainly due to their emphasis of preplanning. Standard business practices require a project plan with relevant schedules and costing before approval. Agile methodologies evolved from software development. They allow for faster project implementation and are more sensitive to changing user requirements. Traditional project management considers changes to scope as undesirable. Two agile methodologies were reviewed as exemplars, SDLC and Scrum. It is worth noting that agile methodologies require expert project and technical practitioners and responsive organisations. These are critical to industries such as software development that have a fast-changing environment. It is no wonder that agile methodologies have achieved wide acceptance in the software industry but are yet to achieve the same acceptance in traditional industries such as construction.

Chapter Three:

In this chapter, the origin, purpose, and benefits of conducting project management maturity assessment were discussed. The chapter discussed exemplars of technical, process and organisational project management maturity models. It discussed Kerzner-PMMM as an exemplar of technical delivery models, PMS-PMMM as an exemplar of process models and OPM3 as an exemplar of organisational models. It was highlighted that maturity models are not the silver bullets that would solve all project management problems, there are tools that if properly implemented would assist organisations in their quest for project management excellence. For project management improvements to be effectively implemented, there is need for someone to champion the change. The project manager was identified as that change agent. Project managers do not usually have functional authority or authority gap, they exercise personal rather than positional power. The chapter discussed the various ways which project managers can use to influence change.

Chapter Four:

This chapter introduces and defines the problem statement, research objectives and research questions. It then moves on to the research design and research methodology, compares the two, identifies and discusses in detail the types of research methodologies, their differences and their applications in this particular research, the target population, sample, and sampling techniques. The research instrument, validity, and reliability together with data collection methods and the final data analysis.

6.3 SUMMARY OF FINDINGS

The findings from this study were both quantitative – statistical relationships and qualitative-theme developed from respondent comments. The quantitative findings encompassed the

biographical profile of South African project managers, the state of project management in South Africa and the various relationships between project managers' factors and their organisation's project management maturity. The qualitative findings were derived from the comments of the survey respondents.

6.3.1 Biographical profile of South African project managers

Project management profession is relatively STEM orientated and comprise relatively older, more qualified, and more experienced practitioners. The age distribution of project managers is skewed towards an older population of project managers -media age 37.58. This can be attributed to the fact that most project managers have an undergraduate qualification in other fields. Although the study did not directly ascertain this, it seems that most project managers have an undergraduate qualification within the STEM field as indicated industry they work in. The IT industry is the most significant employer of project management practitioners with 59.1% of the respondents indicating that they are employed in that sector. The second biggest employer was the construction and engineering sector. Both are in STEM. As was shown on page 63 of this report, many project management practitioners have a postgraduate degree (73.5%), followed by those with a degree (18.6%) and lastly those with a diploma (7.8%). Lastly, it seems that project management in South Africa is a relatively male-dominated profession. This might reflect the fact that STEM in South Africa is male-dominated.

6.3.2 The state of project management in South Africa

The study showed that South African project management industry has matured. There has been improvement from what was reported in a PMSA commissioned study by Labuschagne et al. (2013). The study made the following key observations:

- South African organisations are responsive to changes in project resources.
- Twice as many South African organisations use benchmarking in comparison to those who don't practise it. Those who benchmark their performance most benchmark their schedule performance. They compare themselves with other organisations in term of how they fare in terms of completing projects on time.
- South African organisations have an established project culture. Most project team members identify themselves with the projects that they are working on rather than with their functional disciplines.
- There is increase recognition by South African managers and executives of the strategic importance of project management. This is demonstrated by the support which management provide to project managers. Respondents in this study reported that three times as many organisations support project management compared to those that are

perceived not to be enthusiastic in their support. The South African organisations managements are committed to the profession.

- Despite the high levels of support, South African project management practitioners do not feel empowered as they manage projects. Managements retain control over key element of project management such as project plans, project deliverables, and the nature of project strategy execution.

6.3.3 Key inferences that can be made from the study

For project management maturity of South African companies to grow, project managers need to be given authority to develop project management procedures and processes. They also need to be given authority to execute project strategies that promote effective management of cost, time, and schedule. The study found that as project managers' power in an organisation grows, the organisation's project management maturity improves. This is a challenge as most South African organisation have a functional structure.

Perceived maturity of South African organisations is still very low, although, there are pockets of high maturity. 8.2% of the respondents' companies had achieved a perceived maturity of five. 42.2% of the organisations had a project management maturity of three. Most of the organisations were practising aspects of project management and had structures that would support a higher maturity than what they were currently at.

The study tested four hypotheses that sought to relate project managers' attributes, influence and power with their organisations' project management maturity. They hypotheses and a summary of their testing and their findings are outlined below:

Hypothesis 1

- H1_o There is no relationship between a project manager's influence and their organisation's project management maturity.
- H1_a There is a relationship between a project manager's influence and their organisation's project management maturity.

A direct test of association using Spearman's rho between project management maturity and project managers' influence as indicated these are not independent of each other. A further test was conducted to verify is the association was spurious. A partial correlation test with project manager's power as a mediating variable revealed that the above relationship was spurious. Therefore, the null hypothesis was accepted, in South Africa, there is no relationship between a project manager's influence and their organisation's project management maturity.

Hypothesis 2

H2_o There is no relationship between a project manager's power and an organisation's project management maturity.

H2_a There is a relationship between a project manager's power and an organisation's project management maturity.

Both a direct test of association using Spearman's rho and partial correlation test with project managers' power as a mediating variable revealed two things. Firstly, project managers' power and their organisations project management maturity are not independent of each other. Secondly, their relationship is significant. The null hypothesis was rejected. A further correlation test revealed a weak positive relationship between the two. Thus, the relationship can be stated as follows: as project managers' power increases, it is likely that their organisations project management maturity also increases. The study did attribute the organisation's improvement to the increase in project managers' power as the study would not establish the temporal order between the two and the correlation was too weak.

Hypothesis 3

H3_o There is no relationship between a project manager's project management experience and their organisation's project management maturity.

H3_a There is a relationship between a project manager's project management experience and their organisation's project management maturity.

A direct test of association using Spearman's rho between project management maturity and project managers' project management experience as indicated these are not independent of each other. A further test was conducted to verify if the association was spurious. A partial correlation test with project manager's power as a mediating variable revealed that the above relationship was spurious. Therefore, the null hypothesis was accepted, in South Africa, there is no relationship between a project manager's project management experience and their organisation's project management maturity.

Hypothesis 4

H4_o There is no relationship between a project manager's technical expertise and their organisation's project management maturity.

H4_a There is a relationship between a project manager's technical expertise and their organisation's project management maturity.

A direct test of association using Spearman's rho between project management maturity and project managers' technical expertise as indicated these are not independent of each other. A further test was conducted to verify if the association was spurious. A partial correlation test with project manager's power as a mediating variable revealed that the above relationship was indeed non-spurious. Therefore, the null hypothesis was rejected, in South Africa, there is a relationship between a project manager's technical expertise and their organisation's project management maturity. Thus, the relationship can be stated as follows: as project managers' technical expertise increases, it is likely that their organisation project management maturity also increases. The study did attribute the organisation's improvement to the increase in project managers' technical expertise as the study would not establish the temporal order between the two and the correlation was too weak.

6.3.4 Qualitative findings from the study

Five qualitative findings were made from responded comments. They are as follows:

- Stakeholders are power players in project management whose influence on an organisation's project management maturity cannot be ignored.
- Management support leads to a good project environment. This theme was addressed in the questionnaire.
- Micromanagement by top managers limits the effectiveness of project managers
- Profit-driven organisational environments present challenge in developing project management maturity interventions.
- Resource-constrained environments presents challenge in developing project management maturity interventions.

6.4 CONCLUSIONS

The first and third null hypotheses were accepted indicating that the study did not support the existence of relationships amongst project managers' influence and their organisation's project management maturity, as well as project managers' project management experience and their organisation's project management maturity, and project managers' technical expertise and their organisation's project management maturity. The second and fourth null hypotheses were rejected. This indicated that there are non-spurious relationships between project managers' power and their organisation's project management maturity and project managers' technical expertise and their organisation's project management maturity.

The study found that gender plays a role in the power that project managers have. The study found that project managers' power is not independent of gender. Even when possible

mediating variables were introduced, the relationship between gender and project managers' power remained significant. The relationship was not investigated further because it was not the focus of this study.

6.5 RECOMMENDATIONS

The study makes the following recommendations:

- It is recommended that South African organisations should employ project managers who are technically competent, as evidenced by membership of professional bodies such as PMI. In instances where an organisation's project managers are not yet competent, their development is a precursor to project management maturity improvement. Therefore, organisations must actively develop their project managers as part of project maturity improvement initiative.
- If project management maturity of South African organisations is to improve, they must give project managers sufficient authority to develop and implement changes that would be required to improve the organisation's project management maturity.
- Although it was not the focus of the study, the study found that gender is not independent from project managers' power. It is recommended that the role of gender in project manager's power be further investigated.
- The study was limited to members of one project management association. Similar studies are recommended targeting members of all project management associations as well as non-project management associations and professional bodies such as the Council for the Built Environment and IT related associations.
- There were fewer respondents from outside the built environment and IT- from retail, banking, and finance. It is recommended that further work be undertaken to verify if the findings from the study apply to project management in these environments.
- It is strongly recommended that further work should be done to establish whether project managers' power has a causal influence on project management maturity.
- Further work should be undertaken to investigate the role of stakeholders and organisational environments on project management maturity.

6.7 SUMMARY

South African organisations implement many initiatives that unlock value through projects. The projectisation of management is a growing trend, the science and art of managing project - project management has become of strategic importance. In line with this, the study focused on project management maturity as a key indicator of an organisation's ability to effectively manage projects. It reviewed literature of project management, various project management

methodologies and project management maturity models that are used in South Africa. It would not review all the methodologies and maturity models due to their sheer number.

It focused on PRINCE2 and the PMBOK as exemplars of traditional project management methodologies and SDLC and Scrum as exemplars of agile methodologies. For project management maturity models, the study focused on SEI-CMM as the foundational model, the Kerzner-PMMM as an exemplar of technical models, PMS-PMMM as an exemplar of process models and OPM3 as an exemplar of organisational models.

The study followed a correlational survey research design. It collected data from self-identified project managers, through both an online and a manually administered questionnaire. The study received 306 valid responses. Data from the responses was edited, coded, and exported into IBM™ SPSS™ version 24 for descriptive and inferential analysis. Descriptive analysis focused on the distribution statistics of the responses to each item in the questionnaire. Inferential statistical analysis conducted for hypothesis testing using Pearson Chi-Square, Spearman's rho, Fisher's Exact Test, and partial correlation in the presence of a control variable.

The study found that there are non-spurious relationships between project managers' power and their organisations' project management maturity and between project managers' technical expertise and their organisations' project management maturity. The study did not find statistical evidence supporting the existence of relationships between project managers' influence and their organisations' project management maturity, between project managers' project management experience and their organisations' project management maturity, and between project managers' technical expertise and their organisations' project management maturity.

Lastly, the study found that gender plays a role in the power that project managers have. The study found that project managers' power is not independent of gender. Even when possible mediating variables were introduced, the relationship between gender and project managers' power remained significant. The relationship was not investigated further because it was not the focus of this study.

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APPENDICES

APPENDIX A: RESEARCH INSTRUMENT

QUESTIONNAIRE

A correlational study of project management maturity and project managers' attributes and influence in South Africa

The target population for this study is individuals in South Africa who self-identify as being involved in project management. Your participation is voluntary, and your anonymity will be protected. Please do not make any markings that may be used to identify you.

SECTION A: BIBLIOGRAPHICAL INFORMATION

Please indicate your answer by crossing the appropriate box as provided below each question. Cross only one box – if none of them applies please cross other and specify in the space given.

1. How old are you this year?

21 – 25 years	26-30 years	31 – 35 years	36 - 40 years	Other
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If other, please state your age in the space provided:

2. What is your gender?

Male	Female
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3. What is your highest qualification?

Matric	Diploma	Degree	Postgraduate	Other
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If other, please state your highest qualifications in the space provided:

4. In which industry are you currently working in?

Construction	Manufacturing	Banking and Finance	Retail	Engineering	Other
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If other, please state your industry in the space provided:

5. What is your job title in your organisation?

Technician	Administrator	Project manager	Project team member	Other
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If other, please state your title in the space provided:

6. How many years of project management experience do you have?

None	1 - 3 year	4 - 6 years	7 - 9 years	More than 10 years
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7. How many projects have you managed in the last five years?

None	1 - 5	6 - 10	More than 10
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8. List below the type of membership/s you hold – list as many as you have. Please abbreviate them including the board offering the certification. If you have no certification, skip this question.

Professional body name	Membership category/type

SECTION B: PROJECT MANAGEMENT MATURITY AND PROJECT MANAGER ATTRIBUTES

Please rank the following by crossing the most applicable, the rankings are: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree.

		strongly disagree	disagree	neutral	agree	strongly agree
PROJECT MANAGEMENT MATURITY						
1	My organisation benchmarks the cost performance indices of its projects with those of other organisations within our industry.	1	2	3	4	5
2	Project-based culture is prevalent within my organisation.	1	2	3	4	5
3	Members of project teams identify themselves mainly with the project they are working on.	1	2	3	4	5
4	Project deliverables are centralised under the control of the project manager.	1	2	3	4	5
5	My organisation benchmarks its project management procedures with those of other organisations within our industry.	1	2	3	4	5
6	Management has extensive understanding of what is necessary to develop our project delivery capability.	1	2	3	4	5
7	My organisation's strategic expectations guide the way we manage our projects.	1	2	3	4	5
8	All projects are prioritised according to their strategic importance within my organisation.	1	2	3	4	5
9	Project resource allocation is responsive to changes in strategic priorities.	1	2	3	4	5
10	Project goals are changed accordingly when resources change.	1	2	3	4	5
11	My organisation focuses on continuous improvement of project management processes.	1	2	3	4	5
12	Members of project teams identify themselves mainly with the functional discipline they possess.	1	2	3	4	5
13	Management provides the support that is necessary for our organisation to improve project delivery capabilities.	1	2	3	4	5
14	My organisation benchmarks the schedule performance indices of its projects with those of other organisations within our industry.	1	2	3	4	5
15	Metrics collected during project execution are used to make organisational management decisions for subsequent projects.	1	2	3	4	5
16	The project team has the empowerment necessary to deliver on the agreed project strategy.	1	2	3	4	5
17	My organisation benchmarks the performance of its projects with those of other organisations within our industry.	1	2	3	4	5
18	Project progress is evaluated based on metrics from project base line.	1	2	3	4	5
19	My organisation's project past performance used in the management of current projects.	1	2	3	4	5
20	Management demonstrates understanding of demands of my organisation's different project sizes and complexities.	1	2	3	4	5

21	Common methods are used for the managing projects across my organisation.	1	2	3	4	5
22	Project scope changes are managed through an established change management system.	1	2	3	4	5
23	Management is committed to developing our organisational project management capability.	1	2	3	4	5
24	Similar processes are used for the managing projects across my organisation.	1	2	3	4	5
25	My organisation's project management systems are continuously reviewed.	1	2	3	4	5
26	Project plans are centralised under the control of the project manager.	1	2	3	4	5
PROJECT MANAGER'S INFLUENCE						
27	My colleagues actively seek my opinions on their project management decisions.	1	2	3	4	5
28	I am involved in drafting documents for my organisation's project management procedures.	1	2	3	4	5
29	Decisions on project management procedures are made by non-project managers.	1	2	3	4	5
30	I am involved in on my organisation's project management decision making.	1	2	3	4	5
31	My colleagues look up to me make efficacious project management decisions.	1	2	3	4	5
32	My superiors actively seek my opinions on our organisation's project management decisions.	1	2	3	4	5
33	Other project managers are also involved in my organisation's project decision making.	1	2	3	4	5
34	My fellow project managers are involved in drafting my organisations project management procedures.	1	2	3	4	5
35	Project management responsibilities are allocated to non-project managers.	1	2	3	4	5
36	My superiors do not question my project management decisions.	1	2	3	4	5
PROJECT MANAGER'S POWER						
37	I am responsible for the success of my project team.	1	2	3	4	5
38	I have connections within my organisations that allows me to get things done.	1	2	3	4	5
39	I can choose my own project team.	1	2	3	4	5
40	My position allows me to decide how a project is managed.	1	2	3	4	5
41	I often succeed in negotiating with functional managers to release resources that are required for my projects.	1	2	3	4	5
42	I am responsible for reporting on project progress to the executives.	1	2	3	4	5
43	I am involved in non-project decision making within my organisation.	1	2	3	4	5
44	My colleagues solicit my help in managing their project because of my expertise.	1	2	3	4	5
45	Other people within my organisation solicit my help in managing their project due to my position.	1	2	3	4	5
46	I am regularly asked to mentor new project managers.	1	2	3	4	5

SECTION C: OPEN ENDED QUESTIONS

This section is for open ended responses, please put your responses in bullet form.

47. Are there any other issues that you would want to bring to the attending of the researcher, please list them in the bullets below:

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THANK YOU FOR YOUR PARTICIPATION.