



## **CONSTRUCTION PROJECT MANAGEMENT REGISTRATION AND PROJECT PERFORMANCE**

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## DECLARATION

I, the undersigned, hereby confirm that this research report is my own work and that any sources are adequately acknowledged, by referencing in the text and listed in the references list and bibliography. It has not been submitted before for any degree or examination at any other University.

A handwritten signature in black ink, appearing to be 'Tabodi Phirwa', written over a horizontal line.

Tabodi Phirwa

## **ABSTRACT**

Project management is no longer seen as just a management based approach but as a profession in its own right. It is, however, still common that individuals practice project management without, necessarily, being registered with the profession creating a crossing of professional jurisdiction. Existing literature or lack thereof indicates shallow investigation into project management registration and its impact on project performance.

This report compares the project performance of registered and non-registered construction project managers in the South African built environment. A mix method approach was applied where the quantitative data was collected and complimented by qualitative data that aimed to solicit perceived factors that may influence improved project performance. Using a cross-sectional survey interview consisting of a semi-structured questionnaire, data were collected from project management practitioners and professionals with the relevant knowledge and experience. The survey solicited 578 responses, with only 402 being regarded as complete survey responses. There respondents were sourced from the various professional councils that fall under the South African Built Environment.

The results indicate no significant differentiation between the project performance of registered construction project managers and those who are not registered as construction project managers. On the job experience is considered a vital factor influencing project performance from a project manager's perspective. Responses also indicate a variance in the perceived importance of construction project management registration. Despite the primary motivation behind registration having been expressed as "competitive advantage", registration was considered most effective when used in combination with education, training and the understanding of project management knowledge areas.

### Key words:

Construction project management; profession; professional; project performance.

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## **CHAPTER ONE: INTRODUCTION**

### **1.1 Professional, professionalization and professionalism**

Project Management is considered a relatively new profession when compared to other more traditional professions such as medical practice, law and engineering (Muzio et al., 2011). There are, however, restrictions as to when Project Managers can use the title of “Professional” (Council for the Built Environment, 2001).

The word “professional” is widely used to claim identity in the construction industry (Brown & Phua, 2011). It commonly refers to people who provide specialised services to a project, with particular reference to the professional team. The professional team would generally include architects, engineers, lawyers and project managers who are regarded as having expert knowledge in their chosen professions.

Professional values bring forth common ideals that are based on competencies of the practitioner, and are produced by professionalization that is gained through education, training and apprenticeship, and sometimes guaranteed by licensing (Evetts, 2011). According to Ressler (2011), the main theme around professionalization had been the focus on the individual or occupational development over a period of time with the aim of legitimising and maintaining a particular standardised body of knowledge (Edkins et al., 2014; Hodgson & Paton, 2015).

According to Evetts (2011), some researchers view professionalization merely as a way of creating a barrier to a particular market and developing a monopoly of control of specific work as well as creating occupational dominance. This view was further compounded by the claim that the professionalization process promotes the practitioner’s personal occupational fulfilment in terms of salary, status as well as power and protection of occupational jurisdiction (Evetts, 2011).

Professionalism has been referred to as an ideology in which behavioural rules have been set out, relating to a profession's presentation, proper relations with clients and even characteristics linked with social interaction and punctuality (Muzio & Kirkpatrick, 2011). Evetts (2011) agreed with this concept by identifying professionalism as being used to construct a profession's identity, promoting its image with clients or customers and using it as a bargaining tool with government to secure and maintain its self-regulatory duties. This perceived value has been greatly accepted by occupational groups because it has been seen as having the ability to improve an occupation's status and rewards for practitioners as well as the respective professions as a whole (Evetts, 2011).

## **1.2 The construction industry and construction project management**

Construction in the wider sense comprises several different sectors: classically building (of which there are several subsectors from housing to commercial office development), civil engineering and process engineering- otherwise referred to as engineering construction. Buildings are structures consisting of the substructure for example foundations and superstructure for example walls and roofs. Civil engineering tends to be the interconnecting parts of the built environment referring to infrastructure (roads, harbours, dams etc.). Process plants generally relate to the processing of fluids, gases or other forms of materials in the relevant sectors (Morris 2004:5)

Project Management in construction is unique in its own right. Unlike the construction design process, which requires specialist knowledge of engineers and architects to carry out the actual process, project managers do not necessarily have to be appointed in order for the project management functions to be carried out (Walker, 2015). In the construction industry, there is the need to understand that there is a point of differentiation between the two terms "project management" and "project managers" as the former may occur without the latter, since project management functions are carried out by people in other industry professions (Walker, 2015). For example, engineers or architects acting as representatives of the client are usually

practising project management in a bid to improve on their professional roles and responsibilities.

### **1.3 Project performance measured by time, cost and quality**

The need to employ project management is to improve project performance, both in terms of the process and final product. The basic and traditional project performance outcomes are measured against time, cost and quality (Basu, 2014, Ebbesen, & Hope, 2013 and Pollack-Johnson & Liberatore, 2006). Research findings by Mir and Pinnington (2013), continue to argue that in the modern day context these three basic forms of measurement are insufficient to measure overall construction project performance and that consideration should be given to client satisfaction, health and safety, and many more attributes. Due to the varying perspectives on project performance criteria, no standard form of project performance measurement has been agreed upon to date; although time, cost and quality are still being extensively used to measure project outcome (Rashvand & Majid, 2014).

### **1.4 The relationship between project management registration and project performance.**

Extensive research is available on topics examining what individual or combination of factors that contribute to delivery and non-delivery of expected project outcomes (Anantatmula, 2010; Atkinson, 1999; Chan & Chan, 2004; Chan, Scott & Chan, 2004; Edem-Fotwe & Mcaffer, 2000; Hwang & Ng, 2013; Idrus, Sodangi & Husin, 2011; Mir & Pinnington, 2013; Rashvand & Majid, 2014; Thi & Swierczek, 2010 and Zhang & Fun, 2013). Studies are available relating to a project manager in his own capacity, the skills and attributes needed to carry out successful projects (Ahsan & Khan, 2013; Chou & Yang, 2012; Crawford, 2005; Creasy & Anantatmula, 2013; Kissi, Ahadzie & Badu, 2014; Madter, Brookes & Bower, 2012 and Toor & Ofori, 2008).

Within literature there has not been a direct link between project management registration and the success of a projects performance in the context of the built

environment. However, Catonio et al. (2013) carried out a study to determine the influence of project management certification on project outcomes relating to the triple constraint within the Information Technology industry. Empirical evidence analysed through the comparison of certified and non-certified project managers in the aforementioned study resulted in project management certification deemed to be too small of a component to have a significant effect on project outcomes. The results were based on the inability to differentiate between the project performances of certified and non-certified project managers.

Catanio et al. (2013: 8) raised the question, "What impact does project management certification programs and experience have on project managers' abilities to successfully complete projects in terms of meeting the traditional triple constraint?" Catanio et al.'s (2013) study was undertaken with reference to the I.T (Information Technology) profession using the triple constraints based on time, cost and scope as performance measurements.

Morris et al. (2006), referred to whether certification has resulted in improved project outcomes; although, the aim of that research was not to answer that particular question but rather to explore the role of formal bodies in defining the project management profession. Morris et al. (2006) affirmed that there has been a lack of research in the area of relating certification to improved project outcomes. Crawford (2005), concluded that the project management standards are extensively and effectively being used and developed further. Crawford (2005), claims that researchers have not questioned or even reported on the continuous assumption that there is a positive influence of professional standards on organisational and project performance.

Against this background, empirical evidence is needed to determine the difference in performances of registered and non-registered project managers within the construction industry, in terms of time, cost and quality.

## 1.5 Background to the research problem

In the construction industry, project managers or people tasked to carry out project management functions have tended to be sourced from engineering disciplines, showing the industry's reliance of experienced technical practitioners to execute project management functions (Matter, Brookes, Bower & Hagan, 2012; Rwelamila & Purushottam, 2012). This suggests that there is a significant reliance on the individual's experience factor in managing projects in construction and it is apparent that there is a possibility of project managers not being fully aware of good project management practices (Rwelamila & Asalan, 2010).

Rwelamila and Purushottam (2012) expressed a need for project management competence to serve as a fundamental building block in achieving project success. Research findings have attributed project failures, in part, to lack of project management competence although empirical evidence has not been provided to support this (Rwelamila & Purushottam, 2012). The assumption of the basic need for project management competence is supported by Rwelamila and Purushottam's (2012: 7) definition of competence as "a set of characteristic endowments that give an individual the capability to be effective or superior performer when given task. Project management competence, therefore, is the effective or superior performance by an individual (project manager) when managing a project to successfully achieve its objectives."

The concept of "System of Professions" highlights a key aspect of professional jurisdiction which links a profession and its work (Ressler, 2011). The application of the term jurisdiction relating to specific professions is expressed as the "right to perform work as the profession sees fit, to exclude others from doing the same work and to publicly define tasks being performed" (Ressler, 2011:152).

The reference of this system indicates that "each profession claims a jurisdiction on the basis of its associated body of expert knowledge" (Ressler, 2011: 152). This is interpreted in such a way that the engineering, architecture, quantity surveying and project management professions each have their own jurisdiction, yet engineers,



architects and quantity surveyors practice project management without necessarily being registered professionally by project management institutions.

Edkins et al. (2014) stated that project management has developed into a profession in its own right and, as a result, is no longer just a practice-based management approach aimed at delivering an outcome in a project form. The notion is supported by other notable researchers who have opined that “project management is increasingly being seen not merely as something a person does, but something a person is – a recognisable work identity” (Hodgson & Paton, 2015:3). Due to its traditional practice however other people still see project management solely as execution orientated discipline and practice it as such (Edkins et al., 2014).

Ressler (2011) indicated that disputes may continuously arise when a disturbance is created in one profession by one or more other occupations. The concept of disturbance is highlighted in the system of professions stating that “disturbance is created when one occupation attempts to claim another’s jurisdiction or when external forces (such as technological change) create new jurisdictions or destroy existing jurisdictions” (Ressler, 2011:152).

The event of having a disturbance within a profession creates a battle of jurisdiction between occupations, which may have an end result that will impact on the prosperity of a profession (Ressler, 2011). Project management being the profession disturbed in this instance of having individuals from other professions, for example engineers claiming project management related roles.

The problem is then formed around the need to have registered professionals; specifically, in the construction project management profession and not have other built environment professionals practising project management without being professionally registered (that is registration with a project management body). Hence, professional registration in project management would provide the jurisdiction for practitioners.

## **1.6 Research Problem**

The non-registration in the project management profession, of construction project managers, employed in the construction project management role promotes jurisdictional crossing (Abott 1988; Ressler, 2011; Rwelamila & Purushottam, 2012). The reliance on other built environment professionals without professional jurisdiction, to practice and serve the function of a project manager, could potentially diminish project performance in the current built environment (Abott 1988; Ressler, 2011; Rwelamila & Purushottam, 2012).

Through this problem the research question was phrased as,

- What is the difference in project performance between those construction project managers registered under the project and construction management profession and those not registered under the project and construction management profession.

## **1.7 Research Aim**

The purpose of this study is to compare the project performance of registered construction project managers against non-registered construction project managers in order to address the issue of professional jurisdiction and the potential disturbance of the project management profession.

The aim acknowledges that non-registered construction project managers may be experienced in practicing project management. However, they are not registered with a project management body even though the South African Council for the Project and Construction Management Professions' (SACPCMP) Act 2000 (Act No. 48 of 2000) requires only those that are registered to perform work identified under the Act. Further acknowledgement of people who are registered under other built environment profession, such as, engineers, architects and quantity surveyors, are the professionals who are practising project management without necessarily being registered with a project management body.

Industry practitioners may also have obtained registration in more than one professional category; for example registration with engineering as well as project management bodies.

The intended outcome of this comparison will assist in differentiating project performance of registered and non-registered construction project managers. This will further demonstrate the influence, or lack thereof, of professional registration in construction project management on project performance in South Africa.

### **1.8 Research objectives**

The objectives of this study include to:

1. Investigate whether construction project management registration guarantees better/improved project performance;
2. Investigate whether the experience of non-registered construction project manager outweighs that of registered construction project managers in terms of improved/better project performance; and
3. Determine the perceived importance or lack thereof, of project management registration and its influence on project performance.

### **1.9 Assumptions**

Project management standards provide guidelines for the full project management life cycle and processes, indicating that a project manager can have an impact on project performance throughout a project's life cycle (Chan & Chan, 2004; Chan, Scott & Chan, 2004; Mir & Pinnington, 2014).

Project management is a key organisational capability in the modern construction sector. The development of this organisational capability, through knowledge and competence development, is appealing to practitioners as well as researchers due to its application (Madter et al, 2012).

The measurement of construction project performance is widely determined under the iron-triangle consisting of time, cost and quality (Olawale & Sun, 2015; Pollack-Johnson and Liberatore, 2006)

In terms of knowledge, skills and ability, the professional status of construction project managers' forms part of competency of the individual project manager. Other competence areas are, amongst others, behavioural skills, leadership skills and emotional intelligence (Anantatmula, 2010; Catanio et al., 2013; Creasy & Anantatmula, 2013; Fisher, 2011; and Hwang & Ng, 2013)

Through registration project managers obtain professional jurisdiction required in each individual profession to carry out their role as construction project manager. Registration formally recognises skills, qualifications and experience in the project management profession (Morris et al., 2006).

In reference to project outcomes, a highlight of potential critical success factors and their grouping, describes external environment; project manager and team members; organisation and the project itself as having an impact on project performance one way or the other (Thi et al., 2010). The foregoing study indicates that there have been findings which indicated that a project manager's experience has an insignificant impact on project performance, when looked at in isolation. For the basic fact that registered professionals are assessed not only on experience but knowledge as well (Council for the built environment, 2001) leads to the assumption that profession specific registration and/or industry experience should have an impact on project performance, and the two variables have been categorised, by the researcher, as project manager related factors.

The non-registered project managers have been regarded as merely serving a project function and have not fully embodied the profession of project management in its entirety. This may have an impact on the profession itself i.e. performance of employed construction project managers (Rwelemila & Asalan, 2010).

### **1.10 Delineation**

This research report focused on professional status of project managers (obtained through registration with a project management body) and construction project management related experience.

Project performance criteria was limited to cost, time and quality and did not seek to explore other criteria such as customer satisfaction, sustainability, health and safety and other criteria that have been discussed in the literature review.

The researcher did not make a differentiation between construction project managers working in consulting firms and construction organisations.

Furthermore no determination was made on whether the registration status of the construction project manager may have an influence on the performance of the organisation they are employed by. An employing organisation may or may not influence a construction project manager's performance on construction projects; however, they will not be included because they are outside the scope of this study. Similarly, project types, that is private or government, civil or commercial and so on will not be specifically mentioned within the this study.

Coverage of construction project managers did not include those who are practicing construction project management outside of the Republic of South Africa.

### **1.11 Limitations**

Access and sample size of non-registered construction project managers provided a difficult hurdle because there is no direct database for them in isolation. The distribution of the survey relied heavily upon other Built Environment Councils where these non-registered construction project managers may be registered.

The researcher could not control the extent to which non-registered construction project managers have received project management training in order to be placed in project management positions. The non-registered construction project managers may have received some form of project management training without particularly being professionally registered as construction project managers. This may have an impact on research findings relating to whether registered construction project managers' project performance is better than that of non-registered construction project managers.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

The role of this literature review was to assess and understand the existing research surrounding the areas of interest, that is, construction project management registration and project performance (Boote & Beile, 2005). The purpose of conducting the literature review was to interpret previous studies in order to determine what has been previously researched, further resulting in the establishment of the aim and objectives of this research study as a whole (Boote & Beile, 2005).

This chapter provided an overview of project management in construction to provide the logic behind this research project. Furthermore this chapter provided details surrounding the following topics:

- Defining the professional construction project manager;
- Project management registration; and
- Project performance – cost, time and quality

This literature review was focused on research outcomes of previous studies, as well as, construction industry practices and applications recorded in the literature analysed. Randolph (2009: 2) expressed that “an outcomes-orientated review may help identify a lack of information on a particular research outcome, thus establishing a need for an outcome study.” This was the logic followed regarding the potential outcomes of construction project management registration in terms of project performance. Literature on construction industry practises and applications have been incorporated, as well to establish construction project management registration as a need that is currently not being met (Randolph, 2009:3).

## **2.2 Overview: Project management in construction**

Professionalism in project management is still looked at as a relatively unexplored area (Konstantinou, 2015). This is surprising considering that project management has already developed as a profession, although researchers argue that this profession does not tick all the boxes in terms of traditional professions for example medicine and law, and that it should be referred to as a semi-profession (Morris, Crawford, Hodgson, Sheperd & Thomas, 2006). The fact remains that bodies of knowledge, professional organisations, professional standards, codes of conduct and ethics have been developed to legitimise this expert occupation as a profession (Ahsan, Ho & Khan, 2013).

### **2.2.1. The System of Professions**

The literature behind the system of professions was described by Abbott (1988), which highlighted the fundamental aspect of professional life is built up from the competition that naturally arises between professions. This thought was further broken down by emphasising that the control of a profession's knowledge and its application allows its dominance over outsiders who attack or pose a threat to that control.

Abbott (1988) further describes the history of professions and how they develop. Abbott (1988) purports that each profession in society forms part of an interdependent system where each profession has its own tasks under defined lines of jurisdiction.

Within this system of professions, Abbott (1988: 4) sought to define professions being "organised bodies of experts who applied esoteric knowledge to particular cases. They had elaborate systems of instruction and training, together with entry by examination and other formal prerequisites. They normally possessed and enforced a code of ethics or behaviour." Abbott (1998) attributes the development of professions to the process of jurisdictions becoming vacant, whether the originators have become completely dismembered from them or lost a considerable amount of control of those jurisdictions.



The value created by a profession has been referred as professionalism which is reached through the characterised traits described as organisation, education and ethics (Abott, 1988). The ideology of professionalism is further characterised by levels of trust to which the client has in the professionals expertise as well the professional towards both client and colleagues. Abott (1988) argued that the perspectives aforementioned do not always go hand in hand although the attribute of professionalism tends to be highly punted by various institutional forms, such as professional associations, licensure and code of ethics, amongst others. The reasons brought forward by Abott (1988) on the lack of symmetry with regards to the value of professionalism, were based on professions tendencies of dominance and autonomy as well as the apparent inherent goals of economic monopoly.

### **2.2.2 Control in professions**

The control in a profession has largely been driven by two principles, namely

- Technique; and
- Abstract knowledge, Abott (1988).

The techniques within a profession describe the particular ways in which tasks or activities are carried out which allow any occupation to obtain specific licensure or develop an ethics code (Abott, 1988). However the knowledge system, governing a profession allow it redefine its problems and tasks, defend them from external forces encroaching and take control of new problems (Abott, 1988) Furthermore, abstract knowledge enables sustainability within the competitive system of professions.

The idea of control of a profession further expressed by Abott (1988: 9) as “its emphasis on a knowledge system and its degree of abstraction, which is its ultimate currency of competition between professions.” A key note in addition to his is that the degree of abstraction of knowledge necessary for the sustainance of a profession may vary with time and place within the system of professions (Abott, 1988).

When exploring the concept of a professions control, Abbott (1988), highlighted that any resultant conflict professions have with each other, arises from the content of the professions and their control of the work. Essentially, it is the differentiation in types of work that generally creates the differentiation between the professions to a large extent (Abbott, 1988).

### **2.2.3 Jurisdiction and sources of disturbances**

Through the control of a profession's work, the idea of a professional life, a link between a profession and its work is created, which is referred to as jurisdiction (Abbott, 1988). It is prevalent in most professions that the activities and tasks are attached to a system of knowledge that formalises the skills on which the work is carried out (Abbott, 1988).

The sources of disturbances within the system of professions have been identified as external and internal which have an impact on professional jurisdiction (Abbott, 1988). The external sources are known to directly disturb the system by creating gaps where new work or task areas are subsequently created, resulting in the development of new jurisdictions and/or breaking down existing jurisdictions (Abbott, 1988). Abbott (1988), expressed this entry and exit movement has not been limited to new tasks, but also a probability of a group of professional entering or leaving the system. The term, enclosure is characterised by this type of movement, where a group has been able to claim certain jurisdiction over a function or task that had been previously deemed to be common to various professions at a given time (Abbott, 1988).

This condition of enclosure is closely associated with the project management profession within the construction industry context. Abbott (1988: 95) clearly describes this condition being "the emergence of specialities in several professions, performing similar sets of work but retaining the original allegiance. Eventually these groups make common cause and consider forming a new profession, enclosing their common work as a single jurisdiction independent of their parents." Abbott (1988) expressed that ultimately, with the occurrence of a disturbance a profession carries a

particular ability to maintain its jurisdiction, which is highly dependent on its professional knowledge system as well as its internal structure.

#### **2.2.4 Project manager knowledge, skills and abilities**

In the modern day working environment, considering higher complexity projects, achieving more with less resources in shorter time periods, the investment into human resources has become a basic success factor in the delivery of projects (Uhlir, 2012). With the function of project management having transformed into a profession, a common focus of the performance of a project has been aimed at the project manager (Uhlir, 2012).

Sommerville and Craig (2010: 133), expressed that “project managers stem from various backgrounds, possess relevant skills and competencies and are required to govern a project throughout its life cycle.” The accepted role of the project manager is ultimately adopted as the individual who is held accountable for the delivery of the project and its unique nature and determined standards (Sommerville & Craig, 2010).

Project managers are expected to have particular knowledge, skills and abilities in order to effectively meet prescribed project objectives and ensure accepted levels of project performance to prescribed standards (Ahsan et al., 2013, Chan et al., 2004 and Edum-Fotwe & McCaffer, 2000). According to Rwelamila and Purushottam (2012), construction industry research has indicated that, amongst others, one of the reasons that projects do not perform as expected is due to incompetent project managers being assigned to the role of leading projects. It is important to indicate that the idea of competence needs to be looked at from two basic types of skill sets. Important skills required by construction project managers are specific skills; for instance, those that are applied solely in the construction project context; that is technical skills, and then the general skills, being those that are usually applicable from one project to another; for example, leadership skills (Hwang & Ng, 2013). A common discussion among researchers has been that “the knowledge areas required by project managers, in practice, transcends the scope covered by

accreditation bodies” and as such, “are likely to be more complex and diverse than in most other industries” (Hwang et al, 2013: 274).

When linking project performance as a function of the project manager, much literature has been recorded based upon the success or failure factors of projects. Crawford (2000), breaks down a key aspect of project success in project management to the competence of the project manager. Crawford (2000) opined that overall competence in the role of the project manager of an individual is crucial to successful project delivery and furthermore, a project manager would need to have demonstrated competence in the specified areas that would have the largest and critical impact on project performance.

Recent literature has attempted to identify the influential personal characteristics of the so called, effective project managers, but findings have indicated that these characteristics have played a minor role (Crawford, 2000). Findings have suggested that larger focus has been placed on the required knowledge and skills rather than the personality characteristics and behaviours of the project manager. Although literature has quite often highlighted project success as a matter of perception, Crawford (2000: 6) purports that the review of research based literature regarding this topic has demonstrated a common thread that “the competence or knowledge, skills and attributes of the project manager are critical to project success.”

The South African Council for the Project and Construction Management Professions (SACPCMP) is a council under the Council for the Built Environment (CBE), which provided for the standard services to be performed by construction project managers for work executed within the borders of South Africa. The Identification of work policy document was drafted to outline the standard services provided by a construction project manager through a project’s life cycle and the document also included core competencies of a construction project manager to deliver project performance (SACPCMP, 2009).

The core competencies required by the SACPCMP are prescribed as

- Knowledge of construction science;
- Knowledge of construction processes;
- Knowledge of the design process and;
- Knowledge of financial and cost factors.

Furthermore, the SACPCMP has set out the core services provided by a construction project manager, and have included the various project stages in which these tasks are performed, refer to Annexure A: SACPCMP Notice – Part 2.

### **2.2.5 The influence of professional registration**

A common occurrence within the construction project management field is that a lot of people end up becoming project managers by accident (Rwelamila & Asalan, 2010). The problem has been that the common career path in becoming a project manager was through the expertise in technical speciality, such as, an engineer, quantity surveyor, architect or any other built environment expert occupation (Rwelamila & Asalan). The result of this being people carrying out project management practice without necessarily being registered under a project management body (Morris et al., 2006).

Existing literature for example, Edum-Fotwe and McCaffer (2000), Hodgson and Paton (2015), Ma et al. (2014), have underscored the impact of project management professionalization on both the profession and the project orientated organisations rather than the performance of projects. In this particular instance the perceptions of project managers' performance (registered and non-registered) have been expressed in terms of the project manager as a selected project role player.

In reference to the sentiments expressed above, a research study, (Hodgson & Paton, 2015: 6) carried out in the United Kingdom (in the defence and engineering context) presented comments of project managers' uncertainty of the impact of registration on a project manager's performance. An experienced, non-registered

project manager, commented, “I’m not sure what (the APM – Association for Project Management) are all about. What are they doing? What are they saying? What are they giving me that is going to make me better? What am I going to learn?” Project managers with this viewpoint tend to be uncertain about the current impact and/or potential influence of professional registration on their ability to deliver improved project outcomes. The general view of those practising project management, is that there is higher value in having mastered the technical aspects in engineering projects as compared to the association in project management institutions (Hodgson & Paton, 2015). There are, however, project managers who do find value in formal qualification, such as professional accreditation against a Body of Knowledge (Hodgson & Paton, 2015). Project managers with this standpoint perceive professionalization as a means to career progression.

Ma et al. (2014) claimed that there is no difference in the way that certified or non-certified project managers deliver construction projects to clients in terms of budget, time and specifications based on the opinions of nine interviewees holding senior positions in the construction field. Ma et al. (2014) went on to maintain that the technical expertise and skills that have been developed by individuals can compensate for the shortfall in what other project managers refer to as a “paper qualification.” This sentiment is further expressed by Uhler (2012) with the viewpoint that certificates are seen as a way to prove competence or confirmation of personal individual professional competences without necessarily guaranteeing an individual’s success in delivery project outcomes. However Uhler (2012) recognised certification as a tool for differentiation.

Although Uhler (2012) presented literature regarding the effect of the project management certification process on the development of the project management profession, there developed the clear idea of how professionalization, including education, training and certification played role in the improvement of the quality of work. The underlying theory has been based on an expert occupation’s tend towards standardised work. This standardised work would have been driven by a profession’s prior and long life learning, influence of professional institutions, certification and

recertification, transferring of knowledge and skills therefor creating competition and aspiration towards improved service (Uhlir, 2012). Uhlir (2012) interpreted these drivers as the “pre conditions of quality improvement.”

Catanio et al. (2013) research findings suggest that project management certification is too small of a component to have a significant impact on the common performance measures of time, cost and quality within the context of the Information Technology industry. This reality caused by practitioners’ tendency to prioritise technical expertise knowledge and industry knowledge over being registered or certified (Catanio et al. (2013) and Ma et al. 2014).

Chou and Yang (2012: 46) refer to the purpose of the PMBOK Guide (Project Management Body of knowledge Guide) as “to improve project outcomes (e.g. performance, satisfaction and success), a PMBOK Guide was developed by the Project Management Institute to identify general project management knowledge, processes, techniques, tools and skills. This however has not been supported by empirical research. Crawford’s (2000: 13) earlier research indicated “there is little direct relationship between perceived workplace performance and performance against either project management standards or previous research findings.”

### **2.2.6 The application of project management in construction**

Research by Morris (2004), reviewing management as a professional discipline and examining its relevance in the construction, IT, defence-aerospace and pharmaceutical drug development uncovers a few shortcomings of the application of the management of projects within the project based industries aforementioned. Morris, 2004, claims that although the study is based for the United Kingdom and USA context, the deductions may also hold true for other countries.

Deductions by Morris, 2004: 8, made from the brief analysis specifically relating to the construction industry express the following;

- Project management does not emerge significantly as a central discipline in construction. (it has assumed to be as an extension of site management or cost surveying)
- Actual project based management practices in construction generally encompass a wider scope than those prescribed by the traditional PMBOK model
- Neither PMI nor APM certified membership has any real clout in the construction industry

Rwelamila and Asalan (2010) suggested that people practising project management without sufficient training in project management have a low understanding of project management when placed against those who are proven to have obtained significant project management training. This finding followed the researcher's previous study indicating that having technical expertise being the overbearing factor of an effective project manager and has received more important consideration than deserved. The research does not explicitly indicate that those registered as professional project managers perform better than those not registered as professional project managers. However one can certainly conclude that being a registered construction project manager is certainly a proof of having received significant project management training (Rwelamila & Asalan, 2010). Registered professionals are considered to have sufficient technical expertise and experience including with the project management knowledge areas.

Research objectives from Ma et al. (2014) were to address issues relating to the competency of construction project managers and determining their prevalent skills, difficulties that they face, and the perceived need for training and certification. A summary of interviews, in an Australian based study (where nine participants of senior positions in the construction field with extensive experience in project management) provided qualitative information. When asked the question, "In terms



of project performance, is there any major difference between certified and non-certified project managers” the response from the participants is that they had not perceived any difference (Ma et al., 2014). This viewpoint typifies the general perception of industry participants. There is, however, insufficient research evidence indicating that the ability to master a “discrete body of knowledge” or area of “exclusive competence” can result in improved project performance (Morris et al., 2006).

## **2.3 Defining the Professional Construction Project Manager**

An important consideration of this study is not to prove or disprove whether project management is a profession or not, but to discuss the idea of being considered a “professional” and the concept of professionalization through certification, professional development, professional standards and competence, industry regulations and relevant ethical constructs.

### **2.3.1 Legislation**

The starting point is the South African Council for the Project and Construction Management Professions’ (SACPCMP) Act 2000 (Act No. 48 of 2000). The Act defines a professional as – a person who is registered in terms of section 19 (2) (a) which states that,

19 (2) – the council must register the applicant in the relevant category and issue a registration certificate to the successful applicant in the prescribed form if, after consideration of application, the council is satisfied that the applicant – (a) in the case of a person applying for registration as a professional – (i) has demonstrated his or her competence as measured against standards determined by the council for the relevant category of registration; and (ii) has passed any additional examinations that may be determined by the council (Council for the Built Environment, 2001: 83-84).

The Act has further stipulated that the use of the title of Professional Construction Project Manager is limited to those registered under the category of Professional Construction Project Manager. There is an inconsistency in regulation 26, Identification of work.

Regulation 26 (3) A person who is not registered in terms of this Act may not – (a) perform any kind of work identified for any category of registered persons.

26 (4) Subsection (3) (a) may not be construed as prohibiting any person from performing work identified in terms of this section, if such work is performed in the service of or by order of and under the direction, control, supervision of or in association with a registered person entitled to perform the work identified and who must assume responsibility for any work so performed (Council for the Built Environment (CBE), 2001: 86).

Unfortunately, these seemingly, different positions of the SACPCMP and CBE create a gap in practice and such gaps are very difficult to track and regulate, but the classification of a Professional Construction Project Manager is quite clear according to the SACPCMP Act 2000.

### **2.3.2 Linking the sociology of professions to project management**

Extensive research has been done on the sociology of professions and its significance in the modern era with a lack of emphasis on project management and the project manager (Konstantinou, 2015). Three main ideas have been developed in order to arrive at the point of professional consideration. Evetts (2013) described these ideas as profession, professionalization and professionalism. The general understanding of a profession is that it is a service occupation that is knowledge-based in which practitioners qualify for from the completion of tertiary education and on-the-job training and experience. Professionalization is seen as a process to reach a professional level through set standards, education, training and qualification, and ethical and value implementation for practice. Professionalism is seen as a value

system in occupational and organisational contexts which is much more complex with more theoretical concepts (Evetts, 2013). Hodgson (2005) indicated that professionalism enables practitioners to use their judgement to break what is considered best practices without comprising on the professional standards set out.

Hodgson (2005) underscored that the project management profession has adopted the characteristics of traditional and legitimate professions, with the aim of professionalising the expert occupation. This has been done by organising projects to require project management as an occupation, developing a standardised body of knowledge, and by institutions providing accredited training programmes (Hodgson, 2005).

Hodgson (2005: 57) ascertained that “an essential part of the professionalization project involves the constitution and mobilisation of project management as a discipline, which is built upon an abstract and purportedly objective body of rules; that is, the project management body of knowledge.”

Another view, in which the term professional is adopted, in an organisational perspective, is that to be professional is not just a title that is limited to certified practitioners but a reference to the mind-set where practitioners do more than is required in order for activities to be done properly (Hodgson, 2005).

This research study agrees with the general and accepted description of project management that states that project management is no longer seen as just a management based approach but as a profession in its own right. Therefore the professional construction project manager's scope should be a clearly defined one. Simply stated project management in the construction context, is a professional discipline that encompasses the art and science of planning, coordinating and control of a project, from inception to completion, with the purpose of meeting client objectives (Kissi, Ahadzie & Badu, 2014). Walker (2015) highlighted a key notion about classifying work as a project in construction; that is, construction projects are generally executed for the client. Walker (2015) reinforced that the title of project manager applies to managing the project as a whole, with the underlying objective of

achieving client project objectives and, as such, any separation of the project manager from direct responsibility to the client would make the title difficult to justify.

Adoption of the definition of the professional has been taken to be “*one who applies a body of knowledge and techniques acquired through training and experience, has service orientation and distinctive ethics, and a great deal of autonomy and prestige*” (Hughes, 2013: 30); although there has been no mention of certification in general definitions.

In terms of this study, the term professional construction project manager will mean a practitioner who has been registered to act as a professional construction manager, under the relevant project management institutions. This differentiates from those who carry out project management functions while still in the process of professionalization or those practitioners practising based on cross-disciplinary experience but, nonetheless are certified and/or registered in other built environment occupations. It is however possible for one to be a registered professional engineer or quantity surveyor and at the same time, be registered as a professional construction project manager. This study will consider occupational construction industry experience and the current employment of the individual in order to correctly categorise the individual as a registered or non-registered construction project manager.

## **2.4 Who drives professional project management registration?**

The focus of this study is on comparing the project performance of the registered and non-registered construction project management. This section is dedicated to exploring the driving forces behind obtaining registration. Considering the construction industry main stakeholders including- clients (private or public), professional organisations and institutions or project managers, the question was raised: who is the main driving force behind the process of professional project management registration?

The South African Council for Project and Construction Management Professions (SACPCMP) was established to provide for statutory professional certification, registration and regulation of Project and Construction Management Professions in order to protect public interest and advance construction and project management education (SACPCMP, 2009: 59)

Different perspectives have been brought to the fore by different researchers. Toor and Ofori (2008) summed it up and discussed how Academia (i.e. educational institutions), industry (i.e. employing organisations), professional bodies, government agencies and the practitioners themselves, should each be focusing on professional development at two critical stages in the practitioners careers. These include, through their educational life as well as their professional life. This position was supported by Edum-Fotwe and McCaffer (2000) as well as Soderlund (2004), who opined that businesses are currently organising their activities as projects. Ling and Lee (2012) suggested that construction professionals should take the initial responsibility of career development into their own hands by applying effective career development strategies into practice. Notably Crawford & Pollack (2007: 88) have stressed that:

“the push for professional registration comes from practitioners who have the skill they want recognised, graduates looking for project management specific work, companies selling project management services who wish to demonstrate a certain level of staff competency, and from purchasers of services looking for assurance of the competence of the people they employ.”

Madter et al. (2012) offered a different opinion by positing that, in the construction sector, organisations should take the initiative due to the criticality of projects to these organisations and, as a result, the ability of organisations to effectively deliver projects is internally linked to an organisations project management capability and capacity.

Muzio et al. (2011), however, suggested that the shift of an occupation's primary focus on technical expertise, to practitioners that are professionally registered, has

been driven by various professional institutions, such as project management associations.

Ma et al., (2014) purported that the essential driver of professional certification for project managers in Australia, is the creation of employment opportunities and the ability to stand out where a client has set it out as a requirement.

Due to the nature of the construction industry, the best results have tended to come from full stakeholder cooperation and participation, it can be concluded that the driving force of professional development should stem from the different stakeholders' perspectives and not just an individual standpoint.

## **2.5 What are the advantages of being registered with a professional body?**

In order to link the professional construction project manager to project performance another important consideration was to establish what the advantages of professional status are.

According to Muzio et al. (2011), the basic advantages of professional status can be listed under the following areas:

- Knowledge claim – formal credentials on the mastery of an official body of knowledge and being part of a developed structure of continuing professional development that values practical competence;
- Membership structure – recognition that practitioners from various professional background with industry experience and technical expertise may join professional bodies;
- Legitimation claims - the provision of commercial benefits that, affiliation to a professional body of a project manager, may deliver to clients as well as value and worth brought to the market; and
- Jurisdiction – the profession's application into global markets through the standardisation of knowledge i.e. in the case of the Project Management Institute

Morris et al. (2006) agreed and further advocated that certification of project managers provides them with status and recognition that is valued by industry people and this will further increase the influence of professional bodies and project managers alike. Even though the use of professional standards only describe the basic or minimum requirements for project management practice, there lies a basic assumption that those who do, in fact, meet these standards will perform more effectively than those who do not (Crawford, 2005).

Hodgson (2005) provided a key benefit of professionalization, from the point of view of an organisation's senior management, in which case project management procedures and methodology are so embedded within employees or practitioners that they would not require constant monitoring. This view is in line with the perception that the characteristic of a profession is that the profession allows the practitioner autonomy to certain degrees (Evetts, 2013; Hughes & Hughes, 2013).

Crawford and Pollack (2007) related the advantages of professionalization to commercial advantages where obtaining professional status may serve as a guarantee of career progression for project management practitioners. Crawford and Pollack (2007: 88) also opined that this advantage could "provide stakeholders with a sense of confidence based on the certified competence of project personnel, which in turn can translate into greater income for personnel who meet such standards."

## **2.6 Routes to professional status**

The extensive development of professional project management organisations has created the opportunity of certification of project managers by these professional bodies. Remer and Ross (2014) positioned the US-based Project Management Institute (PMI) and the UK-based International Project Management Association as two of the most established project management organisations offering certification to practitioners. These two professional organisations have an international appeal and including in in South Africa, with the PMI and IPMA having local member

association organisations called the Project Management Institute South Africa and Association for Project Management South Africa (APMSA) respectively. The South African Council for the Project and Construction Management Professions is a locally constituted professional organisation which registers practitioners in South Africa. The relevant categories in these organisations are listed as follows:

- PMI (PMISA) – Certified Associate in Project Management & Project Management Professional
- IPMA (APMSA) – Certified Project Management Associate, Certified Project Manager, Certified Senior Project Manager and Certified Project Director
- SACPCMP – Candidate Construction Project Manager and Professional Construction Project Manager

The general purpose of the different professional organisations, according to Project Management Professional (PMP) handbook (2015) and SACPCMP Registration Policies and Guidelines (2009) is to:

- Review education and experience – requirements are measured against formal education and/or experience
- Testing competence through the proper application of Project Management concepts drawn from the Body of Knowledge and industry specific knowledge and technical expertise
- Continuous professional development

There are clearly defined routes to obtain registration in the relevant categories offered by the SACPCMP, for which individual may follow. The initial route is measured by an assessment of an individual's accredited qualifications combined with their industry specific experience. The condition to obtaining professional construction project management registration in this instance is that the individual applying for registration must undergo and pass a professional interview. Only once the individual has passed this interview will they be registered as a professional construction project manager under the SACPCMP (SACPCMP, 2009)



The second route accommodates those individuals with accredited qualification but without the relevant experience. In this case the council allows those without the relevant experience a given time (maximum of 4 years) to undergo training with guidance from a registered professional. The aim is for the candidate to provide a report as well as an up to date record of their training to serve as a proof of evidence, to be eligible to be considered for the professional interview. Again once the interview is passed the candidate then is registered as a professional construction project manager (SACPCMP, 2009)

The third route is when an individual has non-accredited qualifications with or without the relevant experience. This route provides a two-step process to reach professional registration. The initial step requires passing a Test of Professional competency prior to being assessed through the Professional interview and through passing the interview being registered as a professional construction project manager (SACPCMP, 2009).

The fourth route considers those individuals with formal qualifications but with some relevant experience. The process puts focus on those individuals considered to have substantial industry knowledge and experience for consideration. This involves a rigorous process to evaluate and ensure an applicant's credentials to ultimately reach professional registration (SACPCMP, 2009).

The fifth route is purely academic aimed at those individuals who are involved in teaching accredited courses, training and carrying out research within the Built Environment. (SACPCMP, 2009).

There has been an increasing trend in professional and engineering circles to place greater emphasis on official credentials. These credentials commonly come in the form of certificates, which provide documented recognition by a professional body that an engineer or other professional has the qualifications and technical knowledge to be a practitioner in that field (Remer, 2009)

## 2.7 The role of professional institutions/bodies

Crawford & Pollack (2007) identified the need of the formation of professional institutions stemming from project managers wanting to occupy and defend their exclusive use in a specific area of competence, namely Project Management.

Lester (2013) suggested that professional governing bodies focus on certifying members as fit for practice, defining the standards of practice and being responsible for maintaining the minimum standard of continuous competence. Initially, the associations were developed on the basis of primarily sharing information through conferences, seminars, journals and market but with the growth and development of the PMI and the IPMA, the focus has encompassed programs to certifying that practitioners meet the set standards (Morris et al., 2006).

In the specific case of project management, the standards set out by professional institutions are used for the purpose of certification and credentialing and not just for adhering to state regulations of providing a license to practice such as in the case of the engineering profession (Crawford & Pollack, 2007).

In the South African context, the Council for the Built Environment (CBE) was established along with the Built Environment (BE) councils for the following professions established under it:

- Architecture;
- Engineering;
- Landscape Architectural;
- Quantity Surveying;
- Project and Construction Management; and
- Property Valuers'.

The CBE has resorted to the implementation of the concept of “reservation of work” to the different CBE councils. This allows “provisions in legislation that reserve certain aspects of work or functions for persons who comply with specific

competency requirements, for example, those registered under a certain professional body and within certain categories.” (Council for the Built Environment, 2007:1-2)

Project Management institutions such as the PMI, APMSA, SACPCMP and the PMSA all share a similar purpose. The institutions state that their fundamental purpose is to promote, advance and regulate the project management profession. The Association of Construction Project Manager (a voluntary association of specialist project management professionals) includes recommendation of an appropriate fee scale as one of its purposes. Each purpose is carried out through certain objectives and guidelines relevant to each institution. There is however no claim made by institutions as to how any of their influence will impact how project managers perform on projects.

## **2.8 The measurement of project performance through time, cost and quality**

The undertaking of construction works as projects has given rise to the essential control of project performance outcomes namely time and cost (Olawale & Sun, 2015). Pollack-Johnson and Liberatore (2006) expressed that these two concepts should not be looked at without incorporating quality measurement into the picture.

According to Chou & Yang (2012), successful projects are projects that the final actual cost is lower than budgeted and the actual progress is faster than expected, anything other than that is a failure.

These three project performance measures namely cost, time and quality, have together been used as the traditional performance measures in the construction industry, and have commonly been referred to as “the iron triangle” or “the triple constraint”. Time Management, Cost Management and Quality Management are also key knowledge areas in the PMBOK, among others. Based on the 2008 edition of the PMBOK Guide, there are nine Knowledge areas overall but there has not been any prioritisation of most important to least important (Zwikael, 2009).

Researchers have argued that the use of these three measures of project performance is outdated in the modern environment, in which projects are carried out and as a result areas such as sustainability, satisfaction, business success, health and safety, and technical performance need to be integrated (Ebbesen & Hope, 2013). The problem that arises though is that with a range of different possible additions to the basic measures, no standard measurement constraints have been developed in addition to the iron-triangle to the extent that the time, cost, quality constraint is still being widely used even though modification is required (Ebbesen & Hope, 2013). In addition some practitioners have tended to substitute quality for scope management; however, Ali and Kamaruzzan (2010) have distilled that the constraints should, alternatively, be referred to as four fundamental constraints including time, cost, quality and scope. The quality-scope overlap is also supported by Ebbesen and Hope's (2013) who view that quality is a component of scope; hence, the replacement of quality with scope in the iron-triangle.

### **2.8.1 Cost**

It is known that, in general, construction projects involve large amounts of cost investments, whether for private or public clients; therefore, the control of the budget is essential to the client, any of the client's representatives or agents as well as the contractor (Olawale & Sun, 2015). Large projects require critical focus on delivering the project on schedule and within budget (Potts, 2008). Variables such as unclear scope, financing and payment issues, inaccurate estimates as well as planning optimism and deficiency have been found to be some of the most common causes of projects overrunning their budgeted cost (Olawale & Sun, 2015). It is essential not to limit project cost to the tender sum but to also include costs such as those that develop due to variations as well as any modification during the construction process including cost arising from legal claims, throughout the project life-cycle (Chan & Chan, 2004). This, however, has to be tied together with what is expected from the Project Manager and his role in the management of cost on construction projects. The areas to be developed under cost management are resource planning, cost budgeting, cost estimating and cost control (Ali & Kamaruzzaman, 2010).

Furthermore, project costs are to be measured against the total budgeted cost, the cumulative budget cost, cumulative actual cost and cumulative earned value. Olawale and Sun (2015) submitted that in the UK construction industry practitioners use a combination of past experience and established calculations in order to determine initial project time; although, those in consulting companies tend to rely more on experience and contractors tend to rely more on calculation techniques. The same study stressed that project cost is determined by relying more on the calculation-based techniques and a combination of calculation techniques and past experience rather than relying on solely on experience. In the modern construction environment, the use of software packages, such as Primavera, Microsoft Projects and project costing software, are now commonly used to plan and control project time as well as cost (Olawale & Sun, 2015). Potts (2008) discussed that a project management system, such as the system used in the Heathrow Terminal 5 project, can indicate the performance of a project, relative to set target, on both programme and cost. And that this performance measurement allows the identification of certain trends as well as the possibility of highlighting instances where performance is not planned resulting in informed management decisions to be taken to keep a project on track. Trying to deal with cost overruns in practice has also been found to be a bit problematic as practitioners tend to move costs around by seeking under-spent activities or work packages and relocating them to the overrun (Olawale & Sun, 2015). This practice would cause problems where the initially planned costs of an under-spent activity occur, in the execution of the project, after reallocation to an overrun. In a descriptive study by Ali and Kamaruzzaman (2010) it was established that other common project manager skill factors, impacting project cost, are:

- Inaccurate/poor estimation of original cost;
- Construction cost underestimation;
- Improper project planning;
- Poor project management (site supervision & management);
- Lack of experience (relating to contractors); and
- Poor contract management.

It is important to note that this study reflects the part of the Malaysian building industry and the aim is to highlight some of the potential project cost influences.

A notable example illustrated by Potts (2008) was the Scottish Parliament in Edinburgh which was completed 20 months late and £390 million over-budget.

Potts (2008: 9-10) concerns with issues relating to project management were similar to those already mentioned by Ali and Kamaruzzaman (2010) with some expansion to them including:

- Inadequacy of the original budget, which at the feasibility stage was no more than indicative;
- Inadequacy of the brief;
- Inadequate management of risk;
- Lack of involvement of key stakeholders, for example Ministers, in procurement selection and approval of revised budget;
- Insufficient time in the programme for the planning and design phase;
- Poor level of communication between the key players;
- Inadequacy of the cost plan, designs were developed without the cost plan;
- Failure to finalise the draft project execution plan – a key document in the control process;
- Disregard by architect of constraints of the brief and budget; and
- Ineffective monitoring systems by the project team demonstrating a lack of control over the whole process.

Potts (2008: 10) underscored the concerns above, according to Lord Fraser, the author of the Scottish Parliament's report, as being that:

"The programme was propelled by the client obsession with early completion. It appears not to have been completely grasped throughout the project that if the quality and unique complexity of the building was of overriding importance, the programme and the timing of completion would be affected significantly and extra cost inevitably occurred."

### **2.8.2 Time**

The control of time in construction projects is related to the control of the schedule or programme which is a predetermined objective of delivery (Olawale & Sun, 2015).

Project time is closely associated with project cost when looking at the perspective of time overruns, as any additional time to complete a project will have direct impact on the project cost (Memon, Rahman, Abdullah & Aziz, 2011). It is, however, common in practice that whenever and wherever the project is behind the set schedule, the corrective measures put in place are usually reactive rather than proactive; thus, reducing the corrective measures' effectiveness (Olawale & Sun, 2015).

The measure of time is the duration for completing a project which should enable the product to be used by a date determined by the client's future plans (Chan & Chan, 2004). The most basic approach in determining the performance of a project in terms of time is to look at progress measured against the baseline construction programme, which is the initially planned programme (Memon et al., 2011).

### **2.8.3 Quality**

Quality as the third constraint to consider is included because, in practice, one cannot assume that quality will be uniform throughout project execution as there are different levels of quality that should be performed for each task (Pollack-Johnson & Liberatore, 2006). Construction Project Managers do face decisions surrounding the

quality levels required for a project and further, being able to manage and control them.

### **2.8.3.1 Perspectives of quality**

Pollack-Johnson & Liberatore (2006: 534) have construed quality in various ways as follows:

- “A dynamic state associated with products, services, people, processes and environments that meet or exceed specifications”;
- “The product-based view is that quality is found in the features and attributes of a product”;
- “The user-based view states that if the customer is satisfied, the product has good quality”;
- “The manufacturing-based view is that if the product conforms to requirements or design specifications, it has good quality”; and
- “The value-based view asserts that if the product is perceived as offering good value for the price, it has good quality”.

The attempt to select a single definition of quality has proved to be particularly difficult in the construction sector because construction projects incorporate all of these perspectives (Pollack-Johnson & Liberatore (2006). Construction projects can be viewed as the provision of a product in which parts are manufactured for a particular user which should result in added value (Pollack-Johnson & Liberatore (2006). This gives rise to the need to adopt some sort of an all-inclusive definition or a standard approach to quality measurement in construction.

Due to the fact that quality management is one of the knowledge areas covered in the Project Management Body of Knowledge (PMBOK), quality management and quality assurance standards are applied by industry practitioners are (Pollack-Johnson & Liberatore, 2006; and Zwikael, 2009). The PMBOK provides quality management processes rather than defines what quality is, but this; nonetheless,



support the notion that quality is measurable. The three quality management processes listed under the PMBOK include (Pollack-Johnson & Liberatore, 2006):

- Quality planning: indication of how identified project quality standards will be achieved;
- Quality assurance: the application of qualities and processes required to meet the requirements set out; and
- Quality control: monitoring quality activities and processes to assess results and creating informed decision making for minimising or eliminating unsatisfactory performance in meeting requirements.

In order for project quality to be achieved, the project manager and the client, should in a combined effort with other project participants, set the rules by which objective and subjective quality criteria will be measured (Pollack-Johnson & Liberatore, 2006). Therefore, quality can be measured by breaking down the determined quality objective into its critical areas and tying these in with the different project activities (Pollack-Johnson & Liberatore, 2006)

Chan and Chan (2004: 214) have also brought to the fore the idea that quality is, essentially, a subjectively assessed constraint and, as a result, adopted the following definitions of quality:

- “In the construction industry, quality is defined as the totality of features required by a product or services to satisfy a given need; that is, fitness for purpose”; and
- “The meeting of specification defined as workmanship guidelines provided to contractors by clients or client’s representatives at the commencement of project execution.

The above definitions and perspective of measuring quality are adopted by the researcher as providing a clear and simple manner in which project quality is measured.

Basu (2013) opposed this view that quality is simply and clearly definable. Basu (2013) adopted the alternative viewpoint by arguing that the Project Management Body of Knowledge and previous research fail to clearly define quality. Basu (2013) further claimed that the lack of clarity surrounding the concept of quality, generally serves as a source of project disputes. Vague and variable statements are usually given when trying to find out what is meant by the term quality (Basu, 2013). Construction sector participants refer to the activities related to quality management systems, often recommended by bodies of knowledge, and the achievement of project quality is reached by merely ticking the boxes (Basu, 2013). Basu (2013: 181) implies that the generic definition of quality should be avoided because if it cannot be defined, it would be difficult to determine its intended purpose and therefore cannot be applied to deliver successful construction projects, as a result this definition should be applied, “quality is the consistent conformance to customer expectations.”

#### **2.8.4 Combination of cost, time and quality**

Looking at this outcome-focused definition, it is important to note that the “triple-constraints” should not be looked at in isolation but rather more holistically as one may have an impact on another and even the other two. Ali & Kamaruzzaman, (2010) argued that cost management is less effective compared to time management because, more often than not, any extension of time on a project will have direct impact on project cost and any changes on costs could have a single point of impact.

The iron-triangle highlights that while other constraints in project management and project performance have been developed, cost, time and quality have been consistently included in these alternatives (Chan & Chan, 2004)

Generally the standards set and recommended by the bodies of knowledge are considered the minimum requirements for each constraint (Basu, 2013). Standards are set as a guideline in which industry practitioners abide by and refer to, as a result construction industry participants who consistently exceed the minimum

requirements develop a good performance reputation with clients and thereby create a competitive advantage for themselves.

Through review of literature, Chou and Yang (2012) expressed that various project management knowledge areas impact project outcomes and also form key factors in the performance of projects. Knowledge areas such as communications management, cost management, scope management, quality management, progress management and external areas such as the use of information technology and exceptional product and service quality are included as key factors (Chou & Yang, 2012).

In a study by Zwikael (2009) to determine the importance of the PMBOK's knowledge areas, the findings in Table 2.1 were derived for different industries.

**Table 2.1:** Ranking of knowledge areas' relative to importance in each industry type

KNOWLEDGE AREAS	CONSTRUCTION AND ENGINEERING	SOFTWARE	PRODUCTION	COMMUNICATIONS	SERVICES	GOVERNMENT
Integration	1	6	3	3	7	8
Scope	9	9	8	8	8	9
Time	7	1	6	1	1	2
Cost	2	5	9	4	2	5
Quality	6	2	2	2	6	3
Human Resources	3	3	7	9	5	6
Communications	5	7	1	6	9	4
Risk	4	4	5	7	4	1
Procurement	8	8	4	5	3	7

Zwikael (2009) advanced that construction and engineering projects have a relatively low level of risk and that project scope is also relatively stable. Zwikael (2009: 100) further emphasised that “completing the project on time and within budget is extremely important” and “integration and cost knowledge have highest importance in meeting schedule and cost targets.”

While the findings in Table 2.1 do not seem to directly support the assumption of the use of the iron-triangle as the main or basic measures of project performance in construction, it can be assumed that if time, cost and quality are the three main project constraints, it would be reflected by the ranking of time, cost and as being in the top three knowledge areas.

## **CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY**

### **3.1 Research design**

The philosophical view for this study has been adapted, to greater extent, from that of Catanio et al.'s (2013) study. This research followed an epistemological approach with the intention of determining the acceptable knowledge in the field of the professional registration of construction project managers. A positivist viewpoint was appropriate with the intention of fulfilling similar research objectives as those set out by Catanio, et al., (2013). The main difference between this study and Catanio et al.'s (2013) was that Catanio et al.'s (2013) was contextualised in a different industry, that is, Information Technology. The data collected in this study was used in an attempt to search for causal relationships within the data and create law-like generalisations (Saunders et al., 2012). Similar to Catanio, et al.'s (2013) approach, this study sought to test the hypotheses expressed further in this section.

A mixed method approach was used to carry out this research. The quantitative aspect of this research design forms the larger portion of this study and this is deemed to be the most appropriate method. The mixed method approach was based upon the application of a concurrent embedded design (Creswell, 2003). The application of this strategy within the design, allowed the researcher to include a qualitative question within a predominantly quantitative method of data collection, particularly in the questionnaire.

The application of a quantitative approach was to form a data base from which particular characteristics of the population can be inferred (Saunders et al., 2012). This method is best suited when determining the relationship of the variables such as those presented in this study, that is, the professional status of construction project managers and its potential influence on project performance.

The strategic aim was to adapt questions that were clearly expressed, as in the study by Catanio et al. (2013), to ensure that data was collected in a standard manner (Saunders et al., 2012). This method allowed for concepts to serve as an

explanation of how being a registered construction project manager may influence project performance in terms of improved project time, cost & quality measures (Bryman, 2012). Furthermore, the measurement of the concept, that is, project performance allowed for the precise identification of what the study aimed to achieving, as well as what was not covered. All the relevant concepts were measurable, with a consistency of measurement and a precise estimation of the degree of relationship between concepts achieved through this design (Bryman, 2012).

The qualitative aspect of this study was used in the data collection stage, with the use of a semi-structured questionnaire in an attempt to compliment the quantitative data and to support the interpretation and conclusion processes respectively (Saunders, et al., 2012).

As expressed by Babbie (2013), surveys have been frequently used as a mode of observation within the social sciences and may be applied to descriptive, explanatory and exploratory research purposes. The survey provided a sample of population that was studied to determine its characteristics in order to infer that the entire population has those characteristics (Kothari, 2004)

This research focused on studying the situation or problem (system of professions and jurisdiction) in order to explain the relationship between variables – cause and effect relationships (Saunders et al., 2012). This was an explanatory study which applied the use of a semi-structured questionnaire to obtain opinions and attributes of the population. The hypotheses were stated as follows:

- Hypothesis 1: Registered construction project managers have the jurisdictional capacity to produce better project performance than non-registered construction project managers; and
- Hypothesis 2: Non-registered construction project managers project experience outweighs that of registered construction project managers, which may result in improved project performance.

Registered and non-registered construction project managers formed the initial basis of comparison followed by the experience of these professionally registered and non-registered construction project managers. Performance measures of project time, cost and quality management are all measurable in terms of the PMBOK as well as other relevant bodies of knowledge. A single philosophical viewpoint was taken for simplification of the research (Saunders, et al., 2012). The hypotheses were, thereafter, to be tested for confirmation as being true or false, which has the potential of development of new theory that may also be researched in future studies (Saunders, et al., 2012).

A deductive approach to the research was applied in order to attempt to explain the causal relationships between the registration and lack thereof of construction project managers and the influence on achieving improved project time, cost and quality performance. The variables that will be measured quantitatively are project time management, project cost management, project quality management and experience levels. Similar to Catanio et al. (2013) experience will be measured the number of years in the occupation and project experience (project value as well as number of projects undertaken and completed).

Crawford and Pollack (2007) undertook a study where part of the research was aimed at the applicability of project management knowledge areas across engineering and construction, IS (information system) /IT (information technology) and telecommunication. A key finding is that “the overall level of project management knowledge appears to be generic across industry sectors” (Crawford & Pollack, 2007: 93). This finding contributes and supports the adaption of Catanio et al.’s (2013) research approach for this current study.

### **3.1.1 Research Strategy and Technique**

The questionnaire was developed using the online platform, called Qualtrics and distributed through email lists of the respective professional built environment councils in South Africa. The relevant councils including SACPCMP, ECSA, SACAP

and SACQSP, forwarded the participant information sheet, including the link, which potential respondents followed to attend to the questionnaire.

The use of the anonymous survey distribution option on Qualtrics allowed an anonymous survey link to be distributed to the potential respondents and no personal pieces of information were sought.

The data were reported through Qualtrics using reporting options including cross tabulation to determine the significance of the tested variables.

The use of a semi structured questionnaire with 18 questions, each for registered and non-registered construction project managers, to collect data and analyse using Chi square test to check whether two variables are associated (Saunders et al., 2012). The variables tested were registration/non-registration and project performance as well as project manager experience.

### **3.1.2 Questionnaire Development**

The choice of questions on the questionnaire were influenced by those from Catanio et al. (2013) and were adapted to meet the local and industry context of this study. The questionnaires were sent out by the administrators of the various councils, to the email addresses of those professionals listed on the database of each Built Environment Council profession. The researcher can make the assumption that questions were completed directly by the targeted sample, increasing the reliability of answers received.

The questionnaire comprised of 17 closed ended questions, for each categorised project manager, with the 18th question aimed at gathering broader opinions/perceptions of respondents (Saunders et al 2012). The intention of the use of a questionnaire was the application this explanatory research study. In this research the independent variables are assumed to be construction project management registration, non-registration and industry specific experience. The dependant variable is assumed to be project performance, measured against cost,



time and quality which are assumed to be affected by aforementioned independent variables. Theories surrounding professionalism, professionalization and project performance have been discussed in the literature review to attempt to decipher the variables discussed.

Each set of questions were drawn up to obtain particular data, namely:

- Question 1 – to obtain informed consent in order to proceed to the rest of the questionnaire;
- Questions 2 to 7 – to obtain background information and to pre-qualify respondents into categorised project managers;
- Questions 8 to 17 and 18 to 27 – to distinguish the attributes of registered and non-registered construction project managers; and
- Question 28 – to source opinions of construction project managers on important factors influencing project performance.

The questions were presented in manner that would be a mirror image to both registered and non-registered construction project managers in order for the data to be comparable. Due to the common understanding a single each project is undertaken as a unique project, project types were not differentiated within the questionnaire. For a general comparison, project value ranges were used as adopted from the Construction Industry Development Board's grading of contractors grading indicating the upper limits of the tender value range.

The types of data variables collected in the questionnaire included:

- Opinion – perceptions from built environment professionals on importance of project management registration and industry experience
- Attributes – built environment professionals formal training, project management registration, years of industry experience, number of projects completed within specified cost, time and quality parameters

The final question posed in the survey, Question 28, was used as a control measure to determine other factors that were considered or perceived to be more important to project performance, other than the registration with a project management body. This was the qualitative aspect of the mixed method approach and contributed to the findings.

The questions posed in the questionnaire are attached in Appendix C. The questions were adapted from Catanio et al. (2013).

### **3.1.3 Population**

The choice of this sample frame was based on the indication from literature that those in the profession of project management have been commonly selected from other occupational backgrounds due to their technical expertise, project and industry experience. In order to reach the anticipated levels of responses the councils below were selected as the most appropriate for their database.

The sample frame consisted of the following:

- Construction Project Managers in South Africa (SACPCMP);
- Registered professional Engineers (ECSA), Architects (SACAP) and Quantity Surveyors (SACQSP) practicing Project Management

Each of the councils that form part of the Council for the Built environment are governed by their respective policies of the identification of work. Each council outlined and described the core services provided and core competencies required to carry out the identified work in each profession.

The councils have recognised the potential overlap in the scope of work carried out by professionals registered under the various councils. For example, work identified under the construction project management profession being performed by a professional registered under ECSA. The SACPCMP have expressed the standpoint that “a person who is registered as a professional under the professions’ Acts, other

than the Project and Construction Management Professions Act may apply for registration with the SACPCMP, provided that such person can show proficiency in the core competencies and scope of core services for a professional construction project manager or professional construction manager, as the case may be" (Council for the Built Environment, 2011: 17). These sentiments were interpreted indicating that professional registration in one profession does not automatically translate to competency in another within the built environment professions.

The analysis of data only included those that indicated that they were currently or had been previously employed as project managers in the span of their careers within the South African construction industry. Questions 1 to 4 on the questionnaire subjected respondents to this qualification.

#### **3.1.4 Sample size**

The researcher encountered a limitation in determining the exact number of non-registered construction project managers currently practicing in the South African construction industry. Within the other built environment professions, an unknown number of professional could be practising project management or are employed as project managers. As such, the two main approaches were to:

- Source registered construction project managers from the current database of the SACPCMP; and
- Non-registered construction project managers were sourced from other professional council database, that is, Engineering, Architecture and Quantity Surveying.

From this pool, the researcher sought to obtain a minimum 100 respondents (50 registered construction project managers and 50 non-registered construction project managers) (Catania et al., 2013 and Saunders et al., 2012:266). The online software program, Qualtrics had recorded a total of 578 surveys that were started, with only 402 being regarded as complete survey responses. The number of responses from registered construction project managers ranged from 63 – 69 and the number of

responses from non-registered project managers ranged from 274 – 351 per question answered.

Research, for example, Baruch & Holtom (2008) had purported that the main reasons that potential survey participants do not respond or do not participate in surveys are:

- Circumstances under which questionnaires are not delivered to the selected sample; and
- Reluctance, of the selected sample, to respond

Identified reasons leading to the reluctance include that potential participants consider themselves too busy and/or they do not perceive the research study to be relevant and/or problems being experienced with the relevant questionnaire return address (Baruch & Holtom 2008). Scholars have advocated the use of web-based survey methods (among other specific tactics) to mitigate low survey response (Baruch & Holtom 2008).

The use of the Qualtrics tool as well as the participant information sheet, which includes the aims and objectives of this research study, was applied in order to limit the effect of the aforementioned concerns.

### **3.1.5 Sampling Technique**

A probability sampling technique (Stratified random sampling) was adopted, where the population was divided into two strata, namely registered construction project managers and non-registered construction project managers (Saunders et al., 2012:271)

### 3.1.6 Data Collection

The approach used was indicative of the collection process:

- The use of a semi-structured questionnaire to collect primary data;
- Data collected through cross sectional time horizon;
- Data collected throughout November to December 2015, for the pretesting, and January 2016, for the final survey: and
- Data analysis was performed throughout February 2016.

See Appendix D for survey start and end dates as well as response rates during the periods.

### 3.1.7 Data Analysis – Chi-square Test

The Chi-square test was used to determine if categorical data showed dependency or the two classifications were independent (Kothari, 2004: 233). The test was used to provide a non-parametric statistic designed to be used when data are not normally distributed. This test is was applicable because is often used with categorical data (Saunders et al., 2012). Categorical is data whose values cannot be measured numerically but can either be classified into sets/categories or placed in rank order.

The test was used to determine the likelihood of having a construction project management registration guaranteeing improved project performance, in terms of cost, time, and quality. The technique was used to test the significance of association between two attributes or variables (one independent and the other dependent). No rigid assumptions were necessary in respect of the type of population. This research proceeded with the hypothesis that the two attributes are dependent, meaning that project management registration could guarantee improved project performance.

The Chi-square test calculated the probability that the data in the determined comparison table, could occur by chance alone (Saunders et al., 2012). The online software Qualtrics carried out the statistical analysis automatically. A probability of 0.05 means there is only a 5 percent likelihood of the data in the comparison table occurring alone, and this occurrence was termed “statistically significant”. Meaning a probability of 0.05 or smaller meant that researcher was 95 percent certain that the association between the variables tested could not have occurred by chance factors alone.

### 3.1.8 Ethical Considerations

The starting point was the consideration that the research study was to involve participants/respondents in the data collection process. The major concern to adhere to research ethics was the gaining of informed consent and voluntary agreement of those participating as well as maintaining anonymity and confidentiality of those who have agreed to participate in the questionnaire (Saunders et al., 2012).

Participant information sheets were distributed to the identified samples for the purpose of providing the potential participants with the relevant information in order for them to give informed consent for survey participation. A brief description was included in the participant information sheet to provide participants with a basic overview of what the research seeks to achieve. Voluntary participation and informed consent were indicated by the potential participants' action of following the survey link provided within the participant information sheet. The first question on the survey asked whether the participant has received the adequate information relating to this research project and, following, select whether they consent to participating in the survey or not.

Horner and Minifie (2011) expressed key contemporary aspects that were applied to ethical considerations which included:

- Data reporting;
- Data retention;
- The potential future uses of data collected by researchers; and
- Policies governing intellectual property and the sharing of data.

The large number of issues researchers' face in terms of data reporting have been highlighted in sequence by Horner and Minifie (2011: 337) as including:

- Failing to include the number of eligible participants;
- Reporting of missing data points inaccurately;
- Failing to report all pertinent data;
- Failing to report negative results;
- Allowing research sponsors to influence reporting of results;
- Labeling graphs inappropriately;

- Reporting percentages rather than actual numbers;
- Reporting results of inappropriately applied statistical tests;
- Reporting differences when statistical significance is not reached;
- Reporting no difference, when power is inadequate;
- Performing multiple comparisons without correction;
- Splitting data into multiple publications;
- Using terminology without precise definitions;
- Reporting conclusions not supported by the data;
- Ignoring citations of prior work that challenge stated conclusions; and
- Inflating research results for the media.

Accepted practices were, consequently, used for obtaining and analysing the research data. These practices included an informed research design, appropriate level of data collection, and a relevant descriptive and analysis of any statistical data gathered which are presented in the findings chapter (Horner & Minifie, 2011). The data reported reflect the actual number of respondents and responses which were further converted in to percentages in the findings. In addition to adhering to the practices, the author has no conflict of interest to report findings (Hodgson & Paton, 2015).



## 3.2 Research Methodology

This research study was based on a problem that was identified through the review of literature. As the basis this section will discuss the processes followed for the literature review. Furthermore this section provides the details on how ethical clearance was obtained, how the pre-testing process of the questionnaire was executed and the corrective measures taken to ensure the data collected would result in the research objectives being met.

### 3.2.1 Literature Review

A qualitative literature review was undertaken which followed the steps similar to those expressed by Randolph (2009: 10); that is:

1. Create an audit trail;
2. Define the focus of the review;
3. Search for the relevant literature;
4. Classify the documents;
5. Create summary databases
6. Identify constructs and hypothesised causal linkages;
7. Search for contrary findings and rival interpretations; and
8. Use colleagues or informants to corroborate findings.

An excel spreadsheet, of which the template was provided by the university, allowed the researcher to follow the above-mentioned process during the stage of conducting the literature survey by breaking down the analysis of each article or source of literature read. With reference to step 8, the literature survey was shared with the researcher's supervisor and not colleagues or informants.

The literature review comprised of articles covered through an "exhaustive review with selective citation" (Randolph, 2009: 4). Peer reviewed academic journals, books, professional journals and reports were mainly covered in the literature review due their usefulness and availability within the university library and online (Saunders et al., 2012). A majority of the searches for literature to review were

accessed online. The exclusion of trade journal or magazines, newspapers, non-refereed academic journals was due to their potentially bias perspective (Saunders et al., 2012)

The preceding sections of the literature review represent the researcher's understanding of literature in the fields of construction project management registration as well as project performance. This attempt is made in order to build upon and learn from existing research while examining the strengths and weaknesses of prior research (Boote & Beile, 2005)

### **3.2.2 Obtaining Ethical Clearance**

This research study involved the collection of data from human participants therefore ethical clearance was required from the Human Research Ethics Committee (Non-medical); The University of the Witwatersrand (2013).

The Participant Information sheet was one of the crucial documents required by the HREC (non-medical), which was submitted along with the research proposal. As per the guidelines, The University of the Witwatersrand (2013:2), the participant information sheet was used to:

- inform the potential participant what the research is about;
- express the researcher's intentions; and to
- relay to the potential participant what is required from them.

The other critical aspect of obtaining ethical clearance was the researcher's ability to obtain informed consent from potential participants. The method used in this research, to obtain informed consent was in line with the standard set in the "consent for use of data gathered on-line" (The University of the Witwatersrand, 2013:3)

An initial ethics clearance was submitted to the School of Construction Economics and Management ethics committee, which revisions needed to be made in relation to the participant information sheet. Clarity on the process of obtaining informed consent was required prior to being granted ethical clearance. The appropriate

revisions were made with the research supervisor's comments and approval and then ethical clearance granted by the school ethics committee (see Appendix B).

Having secured the ethical clearance certificate the researcher is able to express that the ethical risks involved in this research have certainly been minimized and the interest of the research participants have been accounted for (University of the Witwatersrand, 2014: 4).

### **3.2.3 Pretesting**

Pretesting was conducted prior to actual data collection in November 2015. The Participant Information sheet, which had a hyperlink to the online survey, was sent through email to the intended professional groups under the selected South African built environment councils.

The initial survey produced 74 responses with only 57 surveys completed. The respondents in the specified categories were 42 registered construction project managers and 11 non-registered construction project managers. This brings the total actual response down to 53. This occurred on the assumption of the researcher that some respondents may have decided to skip certain questions and proceed to the end of the survey.

The purpose of having created and sending out the initial survey link was to test whether the data collection instrument (i.e. the questionnaire), would practically serve its purpose of obtaining the necessary reliable data required to fulfil the research objectives set out. The factors influencing the reliability of a research instrument have been noted as including the clarity of the questions and the ability to filter the correct questions to the correct respondents. These translate into separating questions targeted specifically at registered construction project managers and non-registered construction project managers to allow for comparison.

This initial survey link was distributed to Construction Project Managers on the SACPCMP database and Candidate and Professional Architects on the SACAP

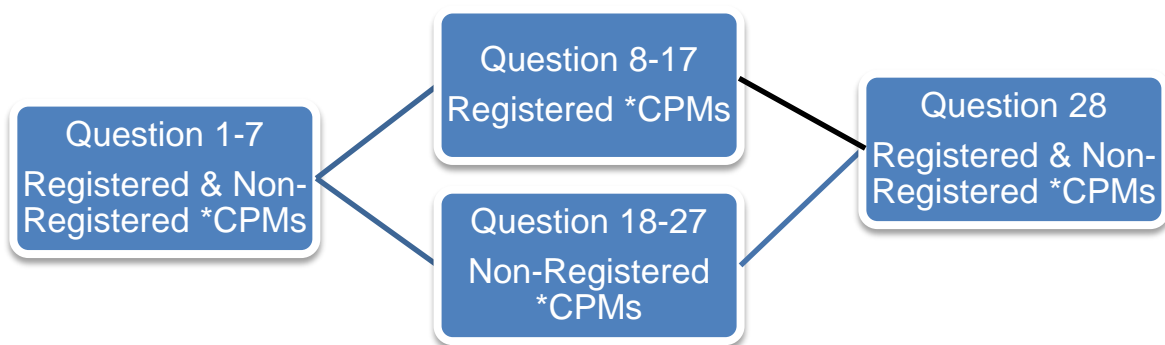
database. The SACQSP did not distribute the survey link through their database as the council has resolved not to do so as per their policy but, nonetheless, referred the researcher to the ASAQS. The process followed by the ASAQS was that the link was posted on the website for potential respondents to electively participate. The initial survey received 74 responses as presented in Appendix E (exported from Qualtrics).

From Appendix E, issues and comments highlighted during the pretesting include:

- Initial question did not give sufficient clarification to warrant informed consent;
- Repetition for registered construction project managers (the flow of the survey was problematic); and
- A respondent with vast project management experience noted that the range of number of completed projects as well as the range for project value was too low

The responses from the pretesting were not used in the subsequent analysis due to the non-usability of the data collected caused by the inability to separate responses of registered and non-registered respondents. The pretesting was found to be repetitive due to the structural problem in the survey question format. The questionnaire was initially set up in such a way that both categories of project managers would answer Questions 1-7. Following Questions 8-17 were directed strictly to registered project managers while Questions 18-27 were directed strictly to non-registered project managers. Question 28 was directed to both categories of project managers (please refer to Appendix E), which resulted in a total of 18 questions for each category.

The intended flow of responses to the questionnaire is indicated in the ensuing Figure 3.1:



**Figure 3.1: Questionnaire structure**

\*Note: CPMs serves as an abbreviation for construction project managers

The transition for registered project managers was intended to be an automated transition from Question 17 to 28. However this did not occur, due to a technical error, causing registered project managers to complete all responses for both categories of project managers, further contaminating the required data. This was then addressed through the steps explained in the subsequent section.

### **3.2.4 Modified questionnaire**

Changes made to Trial/Initial survey:

- Initial question was rephrased to give a clear indication of informed voluntary participation. Allowing those who felt they have received adequate information regarding this research study to skip to the end of the survey, thus non-participation; and

- Added “skip logic” at the end of Question 17, thus allowing registered construction project managers to be directed to Question 28 after answering Question 17, to create separation of responses from non-registered and registered project managers (please refer to Appendix F)

From Appendix F, issues and comments highlighted in the modified version of the online questionnaire include:

- Clear indication not given on legal requirement for professional registration;
- Question of relevance to mechanical, electrical, ICA, industrial ICT disciplines and service providers;
- More focus to be given to PMI PMPs based on the PMP being highly recognised globally and assumption that there are more PMP's in South Africa than Professional Construction Project Managers;
- Clarification on the role of a Construction Project Manager with comparison to a Resident Engineer as applicable to certain types of contracting options/strategies; and
- Survey specific – one comment regarding the question numbers not being visible and two comments regarding clarification on Question 21 and that respondents could not go back to view Question 4.

The modified questionnaire received 578 responses. A look at Appendix F will indicate a significant improvement of responses from the initial 74 to the resultant 578 responses, from both start to end dates and the improved quality of data.

There was a difference in the number of responses indicated by the question of occupational background. The largest number of respondents was from the Engineering profession. This result may have been caused by the manner in which the questionnaire was distributed by each council, which was largely influenced by their differentiated methods of operating procedures.

### 3.2.5 Validity of results

In Chapter Four the results revealed that the actual number of respondents, 64-69 of registered was approximately 4.5 times less than that of non-registered construction project managers. Saunders et al. (2012: 266) presented the accepted practice where probability sampling is adopted, “a minimum number of 30 for statistical analysis provide a useful rule of thumb for the smallest number in each category within an overall sample”. In circumstances where the whole population can be determined, data should be collected from all the existing cases and commonly, larger samples of a population lower the likely error in making generalisations about the population (Saunders et al., 2012).

Having a comparatively lower response sample of registered construction project managers may have a significant impact on the statistical inferences made by the researcher, where the sample represents all the cases in which data was collected (Saunders et al., 2012). In terms of this study, this would open the possibilities that a slight change in responses from registered construction project managers may significantly impact the findings.

The researcher was unable to determine the size of population for this study but the sample size determined was based on previous research as well as existing literature, that is Catanio et al. (2013) and Saunders et al. (2012). The intention being that the sample would be representative of the population. The result is that the margin of error has not been determined in this particular regard but is likely to be higher because of the “smaller relative proportion of the total population sampled” (Saunders et al., 2012: 267)

## CHAPTER FOUR: FINDINGS

### 4.1 Introduction

This chapter presents the breakdown of the data collected through the questionnaire. All the data was used to provide a point of comparison for registered and non-registered construction project managers within the South African built environment. The findings were presented in relation to the objectives of this study, which were to:

1. Investigate whether construction project management registration guarantees better/improved project performance;
2. Investigate whether the experience of non-registered construction project manager outweighs that of registered construction project managers in terms of improved/better project performance; and
3. Determine the perceived importance or lack thereof, of project management registration and its influence on project performance.

Appendix F provided an indication of exactly how many responses were collected for each specific question. The initial target of a minimum 100 respondents, as adapted from Catanio et al.'s (2013) was reached, however there was a noticeable difference in the response sample size between registered and non-registered construction project managers.

The online software program, Qualtrics has recorded a total of 578 surveys that were started, with only 402 being regarded as complete survey responses, resulting in a completion rate of approximately 69.5%. The cross-tabulation function within Qualtrics was used to give an accurate number of respondents, in each category of construction project management registration and non-registration, for comparison to be conducted. The number of responses from registered construction project managers ranged from 63 – 69 and the number of responses from non-registered project managers ranged from 274 – 351 per question answered. These numbers reveal that there were between 4-5 times more responses from the non-registered construction project managers. Surveys



in which respondents had dropped-out or where the respondents' capacity was not that of a project manager, which make up the balance of the total, were not used in the analysis and discussion of findings.

There is an evident fluctuation of the number of respondents in the various questions. This occurrence is assumed to be the result of individuals deciding to skip certain questions for reasons that may be linked to the lack of clarity or understanding of the questions presented.

Each table in the subsequent sections indicate the total number of respondents (N), in that particular cross tabulation as well as the representative percentage of respondents within that particular sample.

#### 4.2 Initial filter of respondents

The tables presented in this section indicate the background information of the respondents and the way in which they were filtered.

**Table 4.1:** Respondent consent

Question	Are you currently registered as a construction project manager with a project management body		
		Yes (registered) N= 69	No (non-registered) N=349
Have you received adequate participant information regarding the background, aim and objectives of this research as communicated through the administrator together with the link to the questionnaire and also voluntarily consent to participating in this survey? (Note: all respondents will remain anonymous)	Yes	100%	100%
	No	0%	0%

The responses received in Table 4.1 indicate that the responses used in the data collected were all in accordance with the research design in terms of the ethical consideration. This was a key factor in assuring the validity of the results

respondents answered the questions being aware of the aim and objectives of this study

**Table 4.2:** Registration status

Question		Are you currently registered as a construction project manager with a project management body	
		Yes (registered) N=69	No (non-registered) N=352
Are you currently registered as a construction project manager with a project management body (locally or internationally)?	Yes	100%	0%
	No	0%	100%

Table 4.2 validates the number of respondents that confirmed their registration status and indicating the ceiling of the sample sizes for comparison. As mentioned in the introduction of this chapter the respondents were as presented as:

- 69 registered construction project managers
- 352 non-registered construction project managers

From this response rate it is assumed that in the South African built environment there is a likelihood of there being a larger number of those active non-registered construction managers than there are registered construction project managers.

**Table 4.3:** Registration status and current employment

Question		Are you currently registered as a construction project manager with a project management body	
		Yes (registered) N=69	No (non-registered) N=350
Are you currently employed as a Project Manager on Building and/or Civil engineering projects?	Yes	81.16%	49.14%
	No	18.84%	50.86%

**Table 4.4:** Registration status and previous employment

Question		Are you currently registered as a construction project manager with a project management body	
		Yes (registered) N=69	No (non-registered) N=351
Have you been employed as a Project Manager on Building and/or Civil engineering projects?	Yes	92.75%	70.37%
	No	7.25%	29.63%

Table 4.3 and Table 4.4 qualified the individuals relevant to the study in order for the appropriate data to have been collected and analysed. The findings indicate that even though some individuals had indicated their informed consent and registration status, they are responses would not be reflected in the rest of the forthcoming data due to not having ever been employed as construction project managers. This remained evident in the number of responses in the questions relating to project performance and project manager experience.

**Table 4.5:** Registration status and occupational background

Question		Are you currently registered as a construction project manager with a project management body	
		Yes (registered) N=69	No (non-registered) N=350
What is your occupational background?	Architecture	1.45%	0%
	Engineering	88.40%	85.14%
	Quantity Surveying	0%	0.57%
	Construction Management	7.25%	7.71%
	Other	2.90%	6.57%

The questionnaire was sent to the various built environment councils in South African and the findings prove that project managers within the construction industry are sourced from other professions. The number of construction project managers, whether registered or non-registered are indicated to have been sourced from the Engineering profession. Table 4.5 shows the majority percentages of professionals, 88.40% and 85.14% of the respective project manager categories, have been sourced from the engineering profession. Other categorised responses included branches of engineering, property development as well as environmental scientist occupational backgrounds. This finding confirms that project managers are sourced from other built environment professions.

### **4.3 Investigate whether construction project management registration guarantees better/improved project performance.**

The first objective of this research project is to investigate whether construction project management registration guarantees improved or better project performance. A cross tabulation between the respondents that indicated that they are currently registered or not registered as Construction Project Managers, compared with their project performance revealed the following, presented in Table 4.6 – Table 4.8.

This comparison, in Table 4.6 to Table 4.8, was intended to give an indication whether a significantly larger number of projects managed by registered construction project managers have met the iron-triangle constraints.

**Table 4.6:** Registration status and project schedule

Question		Are you currently registered as a construction project manager with a project management body?	
		Yes (registered) N=64	No (non-registered) N=283
How many projects have you completed within the original planned time schedule?	1	14.06%	17.67%
	2-4	34.38%	31.10%
	5-7	14.06%	12.37%
	8-10	9.38%	9.19%
	10+	28.13%	29.68%

The comparison of registered and non-registered construction project managers in the upper limit category (10+) of projects completed within the original time schedule reveals the representative percentages of 28.13% and 29.68% respectively. The percentage of non-registered construction project managers is slightly higher by 1.55%, suggesting that within the sample, non-registered construction project managers deliver more projects within the original time schedule. However this difference is not significant (Chi-squared = 2.40, degrees of freedom =4, p-value 0.66).

**Table 4.7:** Registration status and project cost

Question		Are you currently registered as a construction project manager with a project management body	
		Yes (registered) N=65	No (non-registered) N=284
How many projects have you completed within the original cost budget?	1	18.46%	16.90%
	2-4	27.69%	27.46%
	5-7	18.46%	14.79%
	8-10	12.31%	13.38%
	10+	23.08%	27.46%

The comparison of registered and non-registered construction project managers in the upper limit category (of 10+) projects completed within original cost budget, reveals the representative percentages of 23.08% and 27.46% respectively. The percentage of non-registered construction project managers is higher by 4.38%, suggesting that non-registered construction project managers deliver more projects within the original cost budget. However this difference is not significant (chi-squared = 3.24, degrees of freedom =4, p-value 0.52).

**Table 4.8:** Registration status and project quality

Question		Are you currently registered as a construction project manager with a project management body	
		Yes (registered) N=65	No (non-registered) N=286
How many projects have completed within original quality specifications?	1	6.15%	13.29%
	2-4	32.31%	25.17%
	5-7	15.38%	12.59%
	8-10	12.31%	13.64%
	10+	33.85%	35.31%

The comparison of registered and non-registered construction project managers in the upper limit category (of 10+) projects completed within original quality specifications, reveals the representative percentages of 33.85% and 35.31%,

respectively. The percentage of non-registered construction project managers is higher by 1.46%, suggesting that non-registered construction project managers deliver more projects within the quality specifications. However this difference is not significant (Chi-squared = 3.83, degrees of freedom =4, p-value 0.43)

By testing the significance of the three scenarios, through the chi-squared test, the researcher to accepted the null hypothesis:

Registered construction project managers do not necessarily deliver better project performance, in terms of time, cost and quality, than non-registered construction project managers.

#### **4.4 Investigating whether the experience of non-registered construction project managers outweighs that of registered construction project managers**

The second objective was to investigate whether the experience of non-registered construction project managers outweighs that of registered project managers in terms of number of years employed, number of projects completed and value range of projects completed all in relation to better/improved project performance.

**Table 4.9:** Registration and non-registration against project manager experience

Question		Are you currently registered as a construction project manager with a project management body?	
		Yes (registered) N=69	No (non-registered) N=323
How many years have you been employed as a project manager on building and/or civil engineering projects?	Within 1 year	4.35%	14.55%
	Over 1-4 years	13.04%	23.84%
	Over 4-7 years	15.94%	14.86%
	Over 7-10 years	17.39%	10.53%
	Over 10 years	49.28%	36.22%

The comparison of registered and non-registered construction project managers, in Table 4.9, with regards to the upper limit category (over 10 years) of being employed as a project manager on building and/or civil engineering projects revealed the representative percentages of 49.28% and 36.22% respectively. The percentage of registered construction project managers was higher by 13.06%, suggesting that registered construction project managers within the sample are likely to have more experience in the project manager position than non-registered project managers. They relatively high percentages of construction project managers, in both categories, indicate a potential significance between the employment of individuals in the project management position and their experience represented by the number of years employed in the afore-mentioned position (Chi-squared = 12.50, degrees of freedom =4, p-value  $0.01 < 0.05$ ).

**Table 4.10:** Registration and projects completed

Question		Are you currently registered as a construction project manager with a project management body	
		Yes (registered) N=65	No (non-registered) N=291
How many projects have you completed as a project manager?	1	12.31%	9.97%
	2-4	30.77%	19.59%
	5-7	15.38%	15.46%
	7-10	7.69%	9.97%
	10+	33.85%	45.02%

The comparison of registered and non-registered construction project managers in the upper limit category (10+) of the number projects completed as a project manager, revealed the representative percentages of 33.85% and 45.02% respectively. The percentage of non-registered construction project managers was higher by 11.17%, suggesting that non-registered construction project managers within the sample are more likely to complete more projects than registered project managers. However there is no resemblance of a significant relationship between the project manager, categorically, and the actual number of total projects completed (chi-squared = 5.49, degrees of freedom =4, p-value 0.24).



**Table 4.11:** Registration and value of completed projects

Question		Are you currently registered as a construction project manager with a project management body	
		Yes (registered) N=66	No (non-registered) N=288
Which project value range represents the value of projects you have managed most as a project manager?	R0 – R650000	3.03%	8.33%
	R650000 – R2 mil	1.52%	12.15%
	R2 mil – R4 mil	1.52%	6.25%
	R4 mil – R6.5 mil	1.52%	5.21%
	R6.5 mil – R13.5 mil	12.12%	11.46%
	R13.5 mil – R40 mil	24.24%	17.36%
	R40 mil – R 130 mil	18.18%	17.01%
	R130 mil – no limit	37.88%	22.22%

The comparison of registered and non-registered construction project managers in the upper limit category (R130 mil+) of the value range of projects completed as a project manager revealed the representative percentages of 37.88% and 22.22% respectively. The percentage of registered construction project managers was higher by 15.66%, suggesting that registered construction project managers within the sample are responsible for higher value projects than non-registered. However there is no resemblance of a significant relationship between the project manager and the value range of projects completed (Chi-squared = 12.09, degrees of freedom =7, p-value 0.10).

Experience is generally considered, within literature, as a key factor to influencing the project manager's ability to deliver projects within the original time schedule, cost budget and quality specifications. Where experience is mentioned, the number of years spent in a particular area or position, constitutes experience over the number of projects completed or even the value range of projects. This ideal of experience is indicated in the results of the findings.

Even though there is a significant relationship between the employment of a project manager and their experience, specifically relating to the number of years, the results justify the researcher accepting the ensuing null hypothesis:

Experienced non-registered construction project managers are not proven to have greater project experience than registered construction project managers.

#### **4.5 Determining the perceived importance or lack thereof, of project management registration and its influence on project performance.**

The third objective is to determine the importance and influence of construction project management registration on project performance, through perceptions, formal training and primary motivation.

**Table 4.12:** Registration status and perceived importance

Question		Are you currently registered as a construction project manager with a project management body?	
		Yes (registered) N=69	No (non-registered) N=351
Please indicate your perceived importance of professional registration with a project management body on construction project performance (0 being not important at all, 10 being extremely important)	0	1.45%	5.70%
	1	0.00%	1.42%
	2	1.45%	5.70%
	3	0.00%	2.56%
	4	2.90%	3.99%
	5	13.04%	22.22%
	6	5.80%	7.69%
	7	8.70%	11.11%
	8	18.84%	13.39%
	9	21.74%	9.69%
	10	26.09%	16.52%

The comparison of registered and non-registered construction project managers, in Table 4.12, with regards to rating their perceived importance of professional registration with a project management body, revealed the majority representative percentages of 26.09% as extremely important and 22.22% neutral, respectively. The status, registered or non-registered, of a construction project manager is significant to their perceived importance of professional registration. Registered

construction project managers are, inclined to rate registration as extremely important as they are registered. Non-registered construction project are neutral as they are indifferent and currently not registered. (Chi-square = 21.33, degrees of freedom =10, p-value  $0.02 < 0.05$ ).

**Table 4.13:** Registration status and project management training

Question		Are you currently registered as a construction project manager with a project management body	
		Yes (registered) N=66	No (non-registered) N=303
Have you received any formal Project Management training (e.g. higher education, certified training courses) prior to attaining professional registration in project management or prior to working as a project manager?	yes	81.82%	68.98%
	no	18.18%	31.02%

In the attempt to validate the influence of professional registration on project performance, the question of whether respondents had received any formal project management training prior to attaining professional registration or working as a project manager, was posed. Table 4.13 indicates the representative percentages for respondents who have received formal training are 81.82% and 68.98% for registered and non-registered construction project managers respectively. The percentage of registered construction project managers was higher by 12.84% suggesting that they are more likely to be formally trained than their non-registered counterparts. However there is no significance between a project managers status and their likelihood of having received formal project management training (Chi-square = 0.28, degrees of freedom = 1, p-value = 0.60)

**Table 4.14:** Registration and primary motivation

Question		Are you currently registered as a construction project manager with a project management body?	
		Yes (registered) N=63	No (non-registered) N=301
What was/would be your primary motivation for obtaining Project Management registration	Financial incentive	1.59%	6.98%
	Job requirement	28.57%	16.28%
	Personal satisfaction	19.05%	16.61%
	Occupational competitive advantage	44.44%	49.50%
	Other	6.35%	10.63%

Even though non-registered project managers have indicated that they were neutral when rating the importance of professional registration, the primary reason serving as motivation to become a registered professional in construction project management was the same as registered construction project managers. Table 4.14 highlighted the primary motivation as being “Occupational competitive advantage”. The representative percentages were 44.44% and 49.50% for registered and non-registered construction project managers respectively. The percentage of non-registered construction project managers was 5.06% higher suggesting that even though they have given professional registration a neutral rating of importance, many have considered professional registration for the main purpose of individual occupational competitive advantage over their peers.

The use of an open-ended question allowed the researcher to further validate the influence of registration and/or experience on project performance by soliciting views from registered and non-registered construction project managers without distinction. Construction Project managers were asked to discuss other factors, outside of registration with a project management body, which may be more important to project performance.

Having categorised the responses under certain factors (see Appendix G), the survey revealed that 49 out of 189 responses related to understanding Project

Management knowledge areas (i.e., Project Integration, Scope, Time, Cost, Quality, Human Resource, Communications, Risk and Procurement Management) as the most important factor; 44 out of 189 responses related to experience; 24 out of 189 related to Competence/Qualification/Technical Expertise of the Project Manager; 5 out of 189 responses related to training and development; 12 out of 189 responses related to Client requirements, satisfaction and client type; 14 out of 189 responses related to Emotional Intelligence, Management/Leadership skills; 8 out of 189 responses related to Safety, Health and Environment factors. Other varying factors included:

- Value Engineering;
- Public Participation;
- Understanding project life-cycle processes;
- Specific project environment;
- Organisational structure;
- Business acumen and commercial awareness;
- Contract administration;
- Ethics;
- Socio-Economic factors; and
- Documentation.

The perceived importance of experience as an important factor was still buttressed by some comments from respondents as follows:

*“Experience in the field of the project is more important and valuable than a professionally registered Project Manager. Professionally registered Project Managers must be an add-on to an existing knowledge base in the field of the project.”*

*“There is no substitute for experience. Registration does not guarantee competency.”*

Other respondents justified experience in combination with other factors such as:

*“A basic technical qualification (e.g. Civil engineering degree), and practical experience in the application of the qualification. Experience, specifically in the field of project management which you are doing (e.g. Civil Engineering construction). Sound judgement and an ability to be objective, but decisive, which is obtained from experience.”*

*“Registration with a Professional body does not make a Project Manager good, bad, or indifferent (Much as registration with ECSA does not suddenly make one a good Engineer). The most important factors for Project Management performance in my view are: / Individual traits - leadership, respect earned with Project team, and approach to Project Team, Client and Sub-contractors/suppliers / Experience / Technical knowledge and understanding of the Project.”*

The findings also revealed that there is no significant difference between registered and non-registered with regards to project performance; however, there is a clear difference in perceived importance of the experience of the project manager over their registration status.

This point is further supported by comments and findings relating to formal project management training received by non-registered project managers as substantiated as follows:

*“I am a degreed PrEng working on large mining and industrial projects for a multi-national. / For a person working their way up the ranks with no engineering or other relevant degree PM&CM certification is a must. / It provides a solid academic background to what they experience daily doing their job. / The questions do not allow for alternative (to certification) PM & CM training. There are many roads to becoming a good PM or CM. Certification is a good route to follow (and creates opportunities for those who were not fortunate enough to get higher education or make a career change later in life) but so is getting a relevant degree or BTech “*

*“Key factors include on-the-job experience, recognition that ECSA Professional registration is probably adequate for performing the role of project manager. Post-graduate certificate diplomas and workshops”*

*“Education and practical experience is important. I see Registration as just a piece of paper.”*

In an attempt to validate the influence of experience and professional registration on project performance, the results indicate that no one factor is more important than the other. However, the difference in perceptions of the importance of one factor over the other is evident, notwithstanding the inclusion and combination of other factors which may influence project performance.

## **CHAPTER FIVE: DISCUSSION OF FINDINGS**

### **5.1 Introduction**

The data collected through the online survey strategy provided sufficient information in order for the research objectives to be met. This chapter combines the findings obtained in the literature review with those obtained through collection of primary data to discuss the comparison carried out of the project performance of registered and non-registered construction project managers.

### **5.2 Investigate whether construction project management registration guarantees better/improved project performance.**

Having categorised the independent variable into two, registered and non-registered construction project managers against the dependent variable project performance, a comparison of the categorised construction project managers was carried out.

The results of data compared relating to the project managers' attributes were not significant. The findings resulted in an inability to differentiate between the project performance of registered and non-registered construction project managers.

In the Republic of South Africa, the SACPCMP Act no. 48 of 2000 has been in effect since the year 2000. In comparison with the old age construction industry, this legislation can be seen as fairly new. The act serves to regulate the professionals carry out work defined under the scope of a construction project manager. Due to the history of the project management profession, and the application of the project management function/practices in construction, registration in this professional category may be seen just as a formality. This owing to the fact that individuals are, in terms of legislation, required to obtain professional jurisdiction for something that they have been practising for years without the categorical title.



There is a clear exploitation of the loophole in the SACPCMP Act of 2000, which identifies and limits the use of the title “Professional Construction Project Manager.” Practitioners may view this only as a title, hence still allow them to be employed and perform project management functions as Construction Project Managers, without registration to a particular project management body.

There might be a claim of lack of awareness by practitioners, which is reflected in the findings. It is alarming that though there is legislature prescribing professional jurisdiction for project management in the South African construction industry, a high rate of respondents selected “Occupational Competitive Advantage” as a primary motivator to being or obtaining project management registration. This observation is furthermore indicative in the large difference between the number of respondents that are not registered and those that are registered under a project management body. The disparity creates an assumption that in reality, there are indeed a larger number of those employed as project managers but do not have the professional jurisdiction obtained through professional registration in project management, than those who do. A low rate of respondents attributed job requirement or listed legislature as a primary motivator to obtaining professional registration.

The high rate of non-registered construction project managers had indicated that they had received some sort of formal training prior to taking on the role project manager. This training may result in the placement of those non-registered project managers on par with their counterparts in relation to acquired knowledge of the project management knowledge areas and effective application of tools and techniques. This consideration may add to the inability to prove that professional registration in project management may guarantee improved performance.

Three project management knowledge areas have been the focus of project performance in this research study. The other six fundamental project management knowledge areas not considered may have accounted for the inability to differentiate project performance between registered and non-registered construction project managers. The decision to limit project performance to the three performance measures has been justified but has created a prevalent gap in the comparison undertaken. Three out of nine project

management knowledge areas may have been insufficient to provide a full picture of the basis of comparison.

### **5.3 Investigating whether non-registered construction project manager experience outweighs that of their counterparts**

This objective was set out to determine whether the occupational experience of one of the categorised construction project managers could differentiate the project performance of the other.

Although a significant relationship exists between the number of years of employment in the project manager role and the registration and non-registration of the project manager, the findings do not indicate that the experience of the non-registered project manager outweighs that of the registered project manager and potentially resulting in improved project performance of the non-registered project manager.

Having attempted to draw a line between the experience of the categorised project managers proved futile and might have been affected by the nature of the project management application in the construction industry. Literature and empirical data in this study purport that all project managers are sourced from experienced and technically advanced individuals from various built environment backgrounds.

The inability to differentiate the level of experienced lies in an assumption made from the above-mentioned information. Those professional employed in project management positions, are placed there due to their experience, training, knowledge and technical expertise, whether registered or non-registered. These factors are also considered when assessing readiness for professional registration and also employment as a construction project manager. Assuming the scope and role of a registered and non-registered construction project manager are the same, then they are measured against the same or similar standards, therefore those with or without professional registration may have the same or similar levels of experience in the project manager role.

The inability to differentiate between the two types of construction project managers raises possible questions that need to be raised to employers. Employers are certainly not making it a job requirement, in all instances, for construction project managers to be registered prior to employment. Furthermore how many of these employers would be driving home the issue of professional registration if both counterparts are taken to have indistinguishable levels of project experience.

#### **5.4 Validating the influence of project management registration on project performance**

The research findings supported the literature, in terms of the factors that influence project performance that being knowledge, skill, qualifications and experience amongst others. Industry practitioners believe that no one factor can ultimately influence the outcomes of a project. This research study was able to spark debate over what factors are considered important over other factors. The findings suggest that these factors cannot be looked at in isolation but in combination. A direct link between construction project management was not established through the undertaking of this study. The reason being that although registration through a project management body may provide legal capacity, professional jurisdiction and certification in the profession, other professionals can obtain training and knowledge in application of project management functions without being registered.

The data collected indicates the registered and non-registered construction project managers are indistinguishable in terms of project performance. The attempt to validate the influence of registration on project performance was based on the opinions and perceptions of previously and currently employed construction project managers.

The majority of the sample of project managers expressed that occupational competitive advantage serves as primary motivation for attaining registration. Interpretation of this view meant that the individuals believed that, with all things

equal, there is a way to differentiate construction project managers. However the differentiation would be made in terms of employability or the selection of an individual in the role of a project manager and not necessarily the performance of projects that they manage.

Those individuals, who solely practice project management in construction as a function, should not look at registration as merely a way to get ahead for the individual, but as an opportunity to advance the profession of construction project management. The platform created by professional bodies to provide for professional registration creates a network of professionals with a vast amount of industry experience, whom, with a large degree of participation may propel the profession to unlimited heights of service to a community. Registration should serve as a commitment to continuous improvement of performance through knowledge sharing, best practice implementation, high level standard setting and the overall prosperity of the profession.

## **CHAPTER SIX: Conclusion, recommendations and future research**

### **6.1 Summary**

This study compared the project performance of two categorised construction project managers working in the South African built environment:

1. Registered construction project managers and
2. Non-registered construction project managers

#### **6.1.1 Addressing the problem statement**

The reason for conducting the comparison was based on the concept of the “System of Professions”. Within the system of professions, there has been reference to jurisdiction of profession which links a profession and its work. Part of the literature review purported that the project managers employed on construction projects are typically sourced from other built environment professions, such as Engineering, Quantity Surveying and Architectural professions and this was evident in the data collected. The problem was identified on the basis that a profession and its prosperity may be affected through the disturbance created when the profession's jurisdiction is not adhered to. The comparison was made to determine whether there is a differentiation between the project performances of those registered project construction managers who are deemed to have acquired professional jurisdiction against those non-registered construction project managers.

Part of the literature expressed that within the South African built environment, legislature should govern the use of the term ‘Professional’ to describe an individual who is registered under a particular institution and is deemed to “legally” fit to provide services as per a specific profession. However, the reality, due to the nature of the construction industry, is that individuals who are not particularly registered to a body of a specific profession may be employed to serve multiple professions as a result of having the relevant experience and/or on the job training. This is clearly indicated with regards to the high number of active construction project managers, registered and non-registered, within the built environment.

### 6.1.2 Addressing the objectives

The first objective to investigate whether professional registration results in improved project performance was carried out. The results were however, proved against this initial thought. There was ultimately no absolute differentiation between the project performances of a registered against a non-registered construction project manager.

The second objective was to investigate whether the work experience of those non-registered construction managers would lead to improved project performance over those registered construction project managers. The outcomes of this comparison lead to the conclusion that is no differentiation between the project outcomes of the categorised project managers. A highlight of this comparison however indicated that there is a significant relationship between a project manager's experience, in years, in that position and the employment of that person in that position i.e. the higher the number of years of experience the more the likelihood of being employed in the project manager position.

The third objective was to validate the influence of project management registration on project performance. Perceptions of the importance of registration proved to be different from the categorised project managers although the motivators for registration prove to be the same. The majority of registered construction project managers viewed registration to be very important while non-registered project managers were neutral on the matter.

Having noted the gap in literature to differentiate the project performance of registered and non-registered construction project managers through the gathering and presentation of empirical data, this research study was able to meet its aim through its objectives. Although the results indicate that there is no significant differentiation of project performance between the two aforementioned types of construction project managers, the results, nonetheless, provide valuable insight into the perceptions of active built environment project managers regarding professional registration and experience in the industry. Comments made on other factors considered to be more important than professional registration indicate the varying degree of opinions which should, essentially, be continuously expressed

to incite debate to further create knowledge surrounding the progression of the construction project management profession.

## **6.2 Implications of results**

A possible factor in the inability to differentiate the project performance of both categorised construction project managers was the aspect of overlap. This overlap of functions or work between professions would be created by the nature and requirements of projects undertaken within the built environment and roles defined for the project manager. The professional councils that fall under the South African Council for the Built Environment recognise the occurrence of dual registration in more than one profession under the professions Act. It is also recognised in the SACPCMP's identification of work policy that there are possibilities that a professional may not need to register under the Project and Construction Management professions Act. This condition occurs when the outlying professional is registered in terms of any of the professions' Act, performs the scope of services or the type of work identified by the Council of the Built Environment for professionals of the applicable council i.e. SACPCMP and published it in the Government Gazette. This grants the categorised non-registered project managers an option not to be registered while still being able to provide the service of a construction manager hence negating the importance of registration. However, the individual without construction project management registration would still be required to prove their competence with regards to the project manager role. This in theory would place non-registered and registered construction project managers on par and making it difficult to differentiate the project performance of the two.

The findings indicated that the majority of non-registered individuals in the construction project management profession had in fact received some form of formal project management training, therefore providing for the required competence in the construction project management field.

It is evident that the issue surrounding professional jurisdiction, particularly to project management in construction is an ongoing event, although there is no particular evidence in this case that the profession itself is ultimately being

affected. The professional councils, i.e. the SACPCMP should determine how effective their approach has been in terms of carrying out the purpose of providing for statutory professional certification, registration and regulation of Project and Construction Management Professions in order to protect public interest and advance construction and project management education.

The implications of the results of this research study have been found to be:

- Lack of alignment of the purpose of construction project management registration between the SACPCMP and active construction project managers
- The value of registration not being realised
- Continuous reliance on other built environment professionals to fill the role of a construction project manager

The implications result from the lack of differentiation between the project performance of non-registered and registered construction project managers. Individuals may not appreciate the need to be registered, where the outcomes of project performance will remain the same. This approach may result in the slow progression or stagnation over the long term for the construction project management profession as a whole.

Without clear alignment of the purpose of registration, professionals will continue to rely on experience and acquired training without necessary registration as per the project and construction management Act, making it difficult for the SACPCMP, in particular, to realise their purpose.

### **6.3 Recommendations**

Based on the findings of this study, the following recommendations were made:

- Non-registered construction project managers should seek to attain registration for professional jurisdictional purposes; and
- Registered and non-registered should use the advancement of the profession as a primary motivator



- The SACPCMP should provide stricter and clearer regulations for those non-registered construction project managers under the project and construction management professions Act, making it a necessity to register in order to perform the core services of a construction project manager.

The findings were unable to differentiate the project performance of registered and non-registered construction project managers. Therefore the recommendations were made on a different perspective that should be taken on having attained professional registration. A perspective that recognises project outcomes as only a part of the whole and not as the main priority, in order to achieve prosperity.

#### **6.4 Future research**

A glance at the primary motivators behind individuals attaining or potentially attaining professional registration status, gave insight to legislation proving to be considered as a motivator. A look at the ratio of registered against non-registered construction project managers in this case 111:363 or 1:3 (including sample population from trial survey), resulted in the researcher having concluded that there are generally more non SACPCMP-registered construction project managers in the South African built environment practicing project management than registered project managers. Further investigation to determine accurate figures, would provide insight as to why this might be the case in the context of the South African built environment.

Consideration of the information presented above may lead to the question of the influence or impact that procurement strategies, particularly relating to prevalent contracting strategies, have on the demand and/or supply of registered construction project managers within the built environment. This approach may provide possible answers and insight to the lack of perceived importance of professional registration by active non-registered construction project managers even when guided by legislature.

Furthermore this research study also highlighted the primary motivators behind professional registration. It would be beneficial to the literature for future research to aim to uncover the barriers or obstacles surrounding professional registration.

An explanation to provide answers as to why would an individual with the relevant recognised education/training coupled with the appropriate experience, not seek to obtain professional registration in construction project management. Other gaps identified through the research relating to the growth rate and trends surrounding registration particularly in the construction industry and how effective the professional bodies have been in terms of their aim and objectives.

## **6.5 Conclusion**

The responses gathered from professionals with various occupational backgrounds, support the fact that individuals from other professions, do become employed in the role of Project Manager. Relating the findings to the research problem, it can be concluded that although individuals from other built environment professions (i.e., registered engineers, architects and quantity surveyors) practice project management purely as a function, the problem of tainting the profession through crossing of professional jurisdiction is negated due to no significant difference in the project performance of registered and non-registered construction project managers. The findings of this research study, seemingly maintained the opinion of Morris et al., 2006, by not providing evidence that construction project management registration, under the assumption that it indicated the ability to master a discrete body of knowledge, could have resulted in improved project performance. The results also maintained the viewpoint of Ma et al. (2014) in that the claim was upheld that the technical expertise and skills developed by an individual could compensate for the shortfall in what other project managers call a paper qualification, that being construction project management registration.

## **6.6 Significance of this study**

The significance of this study has been to add to the lack of research relating to the registration of construction project managers in the South African built environment and its link to project performance. The study highlights the perceptions of active construction project managers, on the importance of professional registration as well as other factors that may influence project performance within the construction industry. This insight provided allows those

involved in driving professional registration to further assess the need and relevance for registration according to the project and construction management professions Act and assess the levels of industry participation as a whole.

### **6.7 limitations of this study**

This research had inherent limitations which included:

- The context was applied to the South African construction industry;
- Project performance was based on time, cost and quality; and
- Project managers for the sample population were sourced from available databases of the various Council for the Built Environment professions

The aforementioned aspects to this research limit the extent to which the conclusions may be generalised although the findings are in line with similar research carried out as well as literature reviewed.

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## **8. List of appendices**

Appendix A: Ethical Clearance Certificate

Appendix B: Proposed survey questionnaire

Appendix C: Survey responses start dates

Appendix D: Pretesting

Appendix E: Modified Version of Online Survey

Appendix F: Q28 Categorised responses

## **Appendix A: SACPCMP Notice – Part 2**

### **Part 2: Professional Construction Project Manager Scope of core services for a professional construction project manager**

- (1) For the purpose of this notice, a professional construction project manager manages the life cycle of a construction project from conception to completion including the management of related professional services.
- (2) The scope of core services for a person registered as a professional construction project manager or for a person acting as principal consultant or principal agent, when such person acts as construction project manager, principal consultant or principal agent, is set out in Table 1 below:

Table 1: Scope of core services for a professional construction project manager, principal consultant or principal agent

<b>Stage 1: Inception</b>	
1.	Facilitate development of a clear project brief
2.	Establish the procurement policy for the project
3.	Assist the client in the procurement of necessary and appropriate other consultants including the clear definition of their roles and responsibilities
4.	Establish in conjunction with the client, other consultants and all relevant authorities, the site characteristics, rights and constraints for the proper design of the intended project
5.	Define the consultant's scope of work and services
6.	Conclude the terms of the agreement with the client
7.	Facilitate a schedule of the required consents and approvals
8.	Prepare, co-ordinate and monitor a project initiation programme
9.	Facilitate client approval of all Stage 1 documentation
<b>Stage 2: Concept and viability</b>	
1.	Assist the client in procurement of the other consultants

2.	Advise the client on the requirement to appoint a health and safety consultant
4.	Agree format and procedures for cost control and reporting by the other consultants
5.	Prepare a documentation programme and indicative construction programme
6.	Co-ordinate concept and viability documentation for presentation to the client for approval
7.	Facilitate approval of the concept and viability by the client
8.	Facilitate approval of the concept and viability by statutory authorities
<b>Stage 3: Design development</b>	
1.	Agree and implement communication processes and procedures for the design development of the project
2.	Assist the client in the procurement of the necessary other consultants including the clear definition of their roles and responsibilities
3.	Prepare, co-ordinate, agree and monitor a detailed design and documentation program
4.	Conduct and record consultants' and management meetings
5.	Facilitate input required by health and safety consultant
6.	Facilitate design reviews for compliance and cost control
7.	Facilitate timeous technical co-ordination
8.	Facilitate client approval of all Stage 3 documentation
<b>Stage 4: Documentation and procurement</b>	
1.	Recommend and agree procurement strategy for contractors, subcontractors and suppliers with the client and the other consultants
2.	Prepare and agree the procurement programme
3.	Advise the client, in conjunction with the other consultants on the appropriate insurances
4.	Co-ordinate and monitor preparation of procurement documentation by consultants in accordance with the project procurement programme
5.	Manage procurement process and recommended contractors for approval by the client
6.	Agree the format and procedures for monitoring and control by the quantity surveyor of the cost of the works
7.	Co-ordinate the assembly of the contract documentation for signature
<b>Stage 5: Construction</b>	

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1.	Arrange site handover to the contractor
2.	Establish the construction documentation issue process
3.	Agree and monitor issue and distribution of construction documentation
4.	Instruct the contractor on behalf of the client to appoint subcontractors
5.	Conduct and record regular site meetings

6.	Monitor, review and approve the preparation of the construction programme by the contractor
7.	Regularly monitor performance of the contractor against the construction
8.	Adjudicate entitlements that arise from changes required to the construction programme
9.	Receive, co-ordinate and monitor approval of all contract documentation provided by contractor(s)
10.	Agree quality assurance procedures and monitor implementation thereof by the other consultants and the contractors
11.	Monitor preparation and auditing of the contractor's health and safety plan and approval thereof by the health and safety consultant
12.	Monitor preparation of the environmental management plan by the environmental consultant
13.	Establish procedures for monitoring scope and cost variations
14.	Monitor, review, approve and issue certificates
15.	Receive, review and adjudicate any contractual claims
16.	Monitor preparation of financial control reports by the other consultants
17.	Prepare and submit progress reports
18.	Coordinate, monitor and issue practical completion lists and the certificate of practical completion
19.	Facilitate and expedite receipt of occupation certificates
<b>Stage 6: Close-out</b>	
1.	Co-ordinate and monitor rectification of defects
2.	Manage procurement of operations and maintenance manuals, guarantees and warranties
3.	Manage preparation of as-built drawings and documentation
4.	Manage procurement of outstanding statutory certificates
5.	Monitor, review and issue payment certificates
6.	Issue completion certificates
7.	Manage agreement of final account(s)
8.	Prepare and present the project close-out report



### **Competencies for professional construction project manager, principal consultant or principal agent**

1. (1) A person registered as a professional construction project manager must possess the following technical competencies:

- (a) Knowledge of construction science which includes –
  - (i) understanding structures;
  - (ii) understanding construction and building sciences;
  - (iii) understanding construction and building finishes;
  - (iv) knowledge of building materials;
- (b) knowledge of construction processes which includes –
  - (i) site, plant and equipment;
  - (ii) form work systems;
  - (iii) quality management;
  - (iv) health and safety management;
  - (v) environmental management;
  - (vi) organisational and management structures;
  - (vii) general building sequences;
  - (viii) general output and production factors;
  - (ix) basic knowledge of building trades;
- (c) knowledge of the design processes which includes –
  - (i) sequence of design processes;
  - (ii) time required for design processes; and
- (d) knowledge of financial and cost factors which includes -
  - (i) financial processes; and
  - (ii) cost of construction.

(2) A person who acts as a principal consultant should have project management competencies which includes the knowledge and ability to -

- (a) facilitate the development of a clear brief;
- (b) clearly define the roles and responsibilities of the consulting team;
- (c) prepare letters of appointment for the procurement of consulting team;
- (d) establish and implement time management processes on projects with respect to but not limited to the following;
  - (i) prepare, co-ordinate and monitor a project initiation programme;
  - (ii) prepare indicative construction programme;
  - (iii) prepare documentation programme/schedule;
  - (iv) prepare procurement programme/schedule;
  - (v) agreed contract programme;
  - (vi) co-ordinate documentation programme with contract programme;
- (e) establish and recommend professional indemnity requirements;
- (f) monitor and co-ordinate quality management of the design processes;
- (g) establish and implement communication management processes including the preparation of agenda, chairing and preparing minutes of all necessary meetings on the project;
- (h) coordinate and monitor cost control by the cost consultant;
- (i) coordinate and monitor the preparation of procurement documentation;
- (j) facilitate and monitor the preparation of the health and safety specifications;
- (k) facilitate the preparation of all conditions of contracts;
- (l) manage the pre-qualification, tendering, adjudication, recommendation and appointment processes.

(3) A person who acts as a principal agent on construction projects should have project management competencies which includes -

- (a) the ability to take responsibility for and perform the role of principal agent on construction projects;
- (b) knowledge and understanding of the basic principles of law of contracts;
- (c) knowledge and understanding of construction contracts;
- (d) the ability to build good relationships between client, consulting and construction teams;
- (e) the ability to establish and implement time management processes on contracts with respect to and not limited to the following:
  - (i) agree and monitor contract programme and working programmes;
  - (ii) monitor and review construction progress and programme updates;
- (f) the ability to establish and implement quality management processes on contracts including quality control by the consulting and contracting teams;
- (g) the ability to establish and implement cost management processes on contracts including the issuing, costing and implementation of site instructions and variations;
- (h) the ability to co-ordinate and monitor interface between all contractors;
- (i) the ability to facilitate and monitor implementation of health and safety plan;
- (j) the ability to facilitate and co-ordinate the production of the health and safety file;
- (k) the ability to manage, resolve and certify progress and contractual claims;
- (l) the ability to co-ordinate and monitor completion and handover processes including and not limited to :

- (i) oversee and co-ordinate preparation and issue of defects lists;
- (ii) monitor implementation of remedial work by contractors;
- (iii) oversee and facilitate the agreement of final accounts; and
- (iv) expedite and co-ordinate project close out.

### **Performance of construction project management work**

2. (1) A person who actively practices construction project management work identified in item 4, by regularly and consistently carrying out such work, for reward and accruing professional responsibility to a client or an employer for the performance of such work must, in addition to any other requirement contemplated in the Project and Construction Management Professions Act –

- (a) be suitably qualified and registered by the SACPCMP in the category contemplated in section 18(1)(a)(ii) of the Project and Construction Management Professions Act; and
- (b) possess the required competencies contemplated in item 5.

Any person who lectures in construction project management or a component thereof at a higher education institution that is established, deemed to be established or declared as a public higher education institution under the Higher Education Act, 1997 (Act No 101 of 1997) or at a public college as defined in the Further Education and Training Colleges Act, 2006 (Act No. 16 of 2006), is deemed to perform the scope of core services referred to in item 4.

- 3. Any person who is employed by an organ of state and whose conditions of service require of that person to manage or project manage a construction project is deemed to perform the scope of core services referred to in item 4.

## Appendix B: Ethical Clearance Certificate

### School of Construction Economics & Management

University of the Witwatersrand, Johannesburg -PO Box 20, Wits 2050, South Africa • Tel: +27 (0)11 717 7652/77669  
 Fax: +27 (0)11 717 9729 Email:CEM@wits.ac.za



#### SCHOOL OF CONSTRUCTION ECONOMICS AND MANAGEMENT RESEARCH ETHICS COMMITTEE

#### CLEARANCE CERTIFICATE

PROTOCOL NUMBER CEM/15/11/04/MRR

#### PROJECT TITLE

CONSTRUCTION PROJECT MANAGEMENT  
 REGISTRATION AND PROJECT PERFORMANCE

#### INVESTIGATOR(S)

Tabodi Phirwa  
 (ST NO. 0705807G)

#### SCHOOL/DEPARTMENT

SCHOOL OF CONSTRUCTION ECONOMICS AND  
 MANAGEMENT

#### DATE CONSIDERED

8<sup>th</sup> December 2015

#### DECISION OF THE COMMITTEE

Approved conditionally with respect to the declaration

#### EXPIRY DATE

11<sup>th</sup> December 2017

#### DATE

11<sup>th</sup> December 2015

#### CHAIRPERSON

(Dr. E Heron)

cc: Dr. O. Babatunde

#### DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary Mrs. M. Sithole at the SCEM reception desk.

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to completion of a yearly progress report.**

  
 Signature

Date

11 / 12 / 2015

## **Appendix C: Proposed Survey Questionnaire**

### **Construction Project Managers & Project Performance Web-based Questionnaire**

**Q00** Have you received adequate participant information regarding the background, aim and objectives of this research as communicated through the administrator together with the link to the questionnaire and also voluntarily consent to participating in this survey? (Note: all respondents will remain anonymous)

- ☐ Yes
- ☐ No

**If YES,**

**Participants proceed to the list of questions in the proposal.**

**If NO,**

**Participants are taken to the “Thank you for your participation” page**

**Registered and non-registered Construction Project Managers**

**Q1** Are you currently employed as a Project Manager on Building and/or Civil engineering projects?

- ☐ Yes
- ☐ No

**Q2** If your answer to Q1 is No, have you been employed as a Project Manager on Building and/or Civil engineering projects?

- ☐ Yes
- ☐ No

**Q3** What is your occupational background?

- ☐ Architecture
- ☐ Engineering
- ☐ Quantity Surveying
- ☐ Construction Management
- ☐ Other (Please Specify) \_\_\_\_\_

**Q4** How many years have you been employed as a Project Manager on Building and/or Civil engineering projects?

- ☐ Within 1 year
- ☐ Over 1 to 4 years
- ☐ Over 4 to 7 years
- ☐ Over 7 to 10 years
- ☐ Over 10 years

**Q5** Please indicate your perceived importance of professional registration with a project management body on construction project performance (0 being not important at all, 10 being extremely important)

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10

**Q6** Are you currently registered as a construction project manager with a project management body (locally or internationally)?

- ☐ Yes
- ☐ No

If your answer to Q6 is No, please skip to Q17

### **Registered Construction Project Managers only**

**Q7** Have you worked as a Project Manager prior to attaining professional registration in Project Management?

- ☐ Yes
- ☐ No

**Q8** Have you received any formal Project Management training (e.g higher education, certified training courses) prior to attaining professional registration in Project Management?

- ☐ Yes
- ☐ No

**Q9** Which institution Project Management body are you currently registered with?

- ☐ PMI (Project Management Institution)
- ☐ IPMA (International Project Management Association)
- ☐ SACPCMP
- ☐ Other (please specify) \_\_\_\_\_

**Q10** How many years has it been since your first Project Management certification?

- ☐ Within 1 year
- ☐ Over 1 - 4 years
- ☐ Over 4 - 7 years
- ☐ Over 7 - 10 years
- ☐ Over 10 years

**Q11** What was your primary motivation for obtaining Project Management registration?

- ☐ Financial Incentive
- ☐ Job Requirement
- ☐ Personal Satisfaction
- ☐ Occupational Competitive advantage
- ☐ Other (please specify) \_\_\_\_\_



**Q12** How many projects have you completed as a registered Project Manager?

- ☐ 1
- ☐ 2 - 4
- ☐ 5 - 7
- ☐ 7 - 10
- ☐ 10 +

**Q13** Which project value range represents the value of the projects you have managed the most as a registered Project Manager?

- ☐ R 0 - R 650 000
- ☐ R 650 000 - R 2 mil
- ☐ R 2 mil - R 4 mil
- ☐ R 4 mil - R 6.5 mil
- ☐ R 6.5 mil - R 13.5 mil
- ☐ R 13.5 - R 40 mil (
- ☐ R 40 mil - R 130 mil
- ☐ R 130 mil - no limit

**Q14** How many projects have you completed within the original planned time schedule?

- ☐ 1
- ☐ 2 - 4
- ☐ 5 - 7
- ☐ 8 - 10
- ☐ 10 +

**Q15** How many projects have you completed within the original cost budget?

- ☐ 1
- ☐ 2 - 4
- ☐ 5 - 7
- ☐ 8 - 10
- ☐ 10 +

**Q16** How many projects have you completed within original quality specifications?(please move to Q28 after answering this question)

- ☐ 1
- ☐ 2 - 4
- ☐ 5 - 7
- ☐ 8 - 10
- ☐ 10 +

**Non-Registered Construction Project Managers only**

**Q17** Have you considered attaining professional registration in Project Management while working as a Project Manager

- ☐ Yes (
- ☐ No

**Q18** Have you received any formal Project Management training (e.g. higher education, certified training courses) prior to working as a Project Manager?

- ☐ Yes
- ☐ No

**Q19** Which Project Management body would you consider registering as a project manager with?

- ☐ PMI (Project Management Institution)
- ☐ IPMA (International Project Management Association)
- ☐ SACPCMP (South African Council for Project & Construction Management Professions)
- ☐ None
- ☐ Other (please specify) \_\_\_\_\_

**Q20** How many years have you had your first certification in your background occupation (in reference to Q3)?

- ☐ Within 1 year
- ☐ Over 1 - 4 years
- ☐ Over 4 - 7 years
- ☐ Over 7 - 10 years
- ☐ Over 10 years

**Q21** What would be your primary motivation for obtaining Project Management registration?

- ☐ Financial Incentive
- ☐ Job Requirement
- ☐ Personal Satisfaction
- ☐ Occupational Competitive advantage
- ☐ Other (please specify) \_\_\_\_\_

**Q22** How many projects have you completed as a Project Manager?

- ☐ 1
- ☐ 2 - 4
- ☐ 5 - 7
- ☐ 7 - 10
- ☐ 10 +

**Q23** Which Project value range represents the value of the projects you have managed the most as a Project Manager?

- ☐ R 0 - R 650 000
- ☐ R 650 000 - R 2 mil
- ☐ R 2 mil - R 4 mil
- ☐ R 4 mil - R 6.5 mil
- ☐ R 6.5 mil - R 13.5 mil
- ☐ R 13.5 - R 40 mil
- ☐ R 40 mil - R 130 mil
- ☐ R 130 mil - no limit

**Q24** How many projects have you completed, as a Project Manager, within the original planned time schedule?

- ☐ 1
- ☐ 2 - 4
- ☐ 5 - 7
- ☐ 8 - 10
- ☐ 10 +

**Q25** How many projects have you completed, as a Project Manager, within the original cost budget?

- ☐ 1
- ☐ 2 - 4
- ☐ 5 - 7
- ☐ 8 - 10
- ☐ 10 +

**Q27** How many projects have you completed, as Project Manager, within original quality specifications?

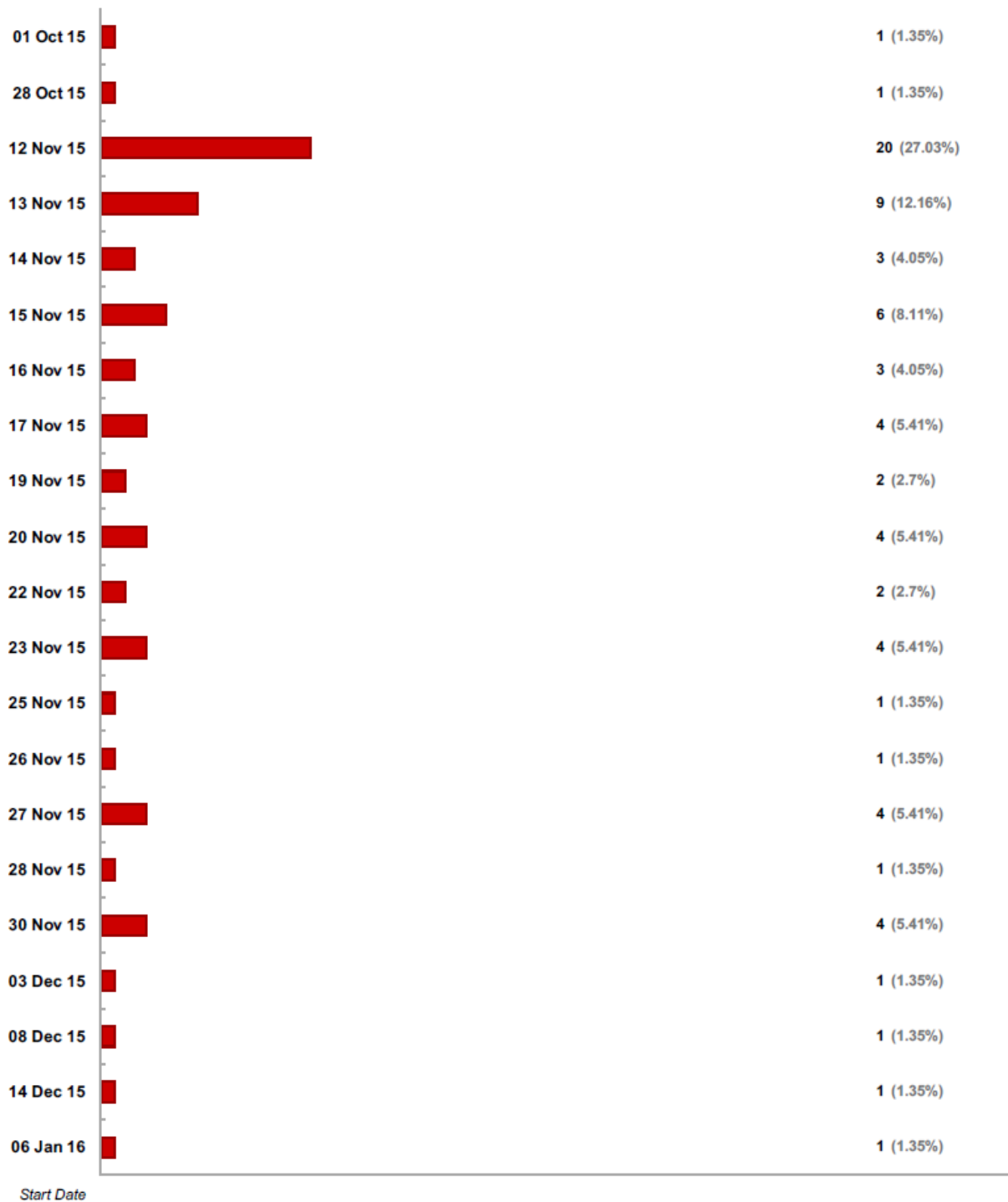
- ☐ 1
- ☐ 2 - 4
- ☐ 5 - 7
- ☐ 8 - 10
- ☐ 10 +

**Q28** Please discuss other factors that you consider may be more important to project performance (in terms of time, cost and quality) than registration with a project management body.

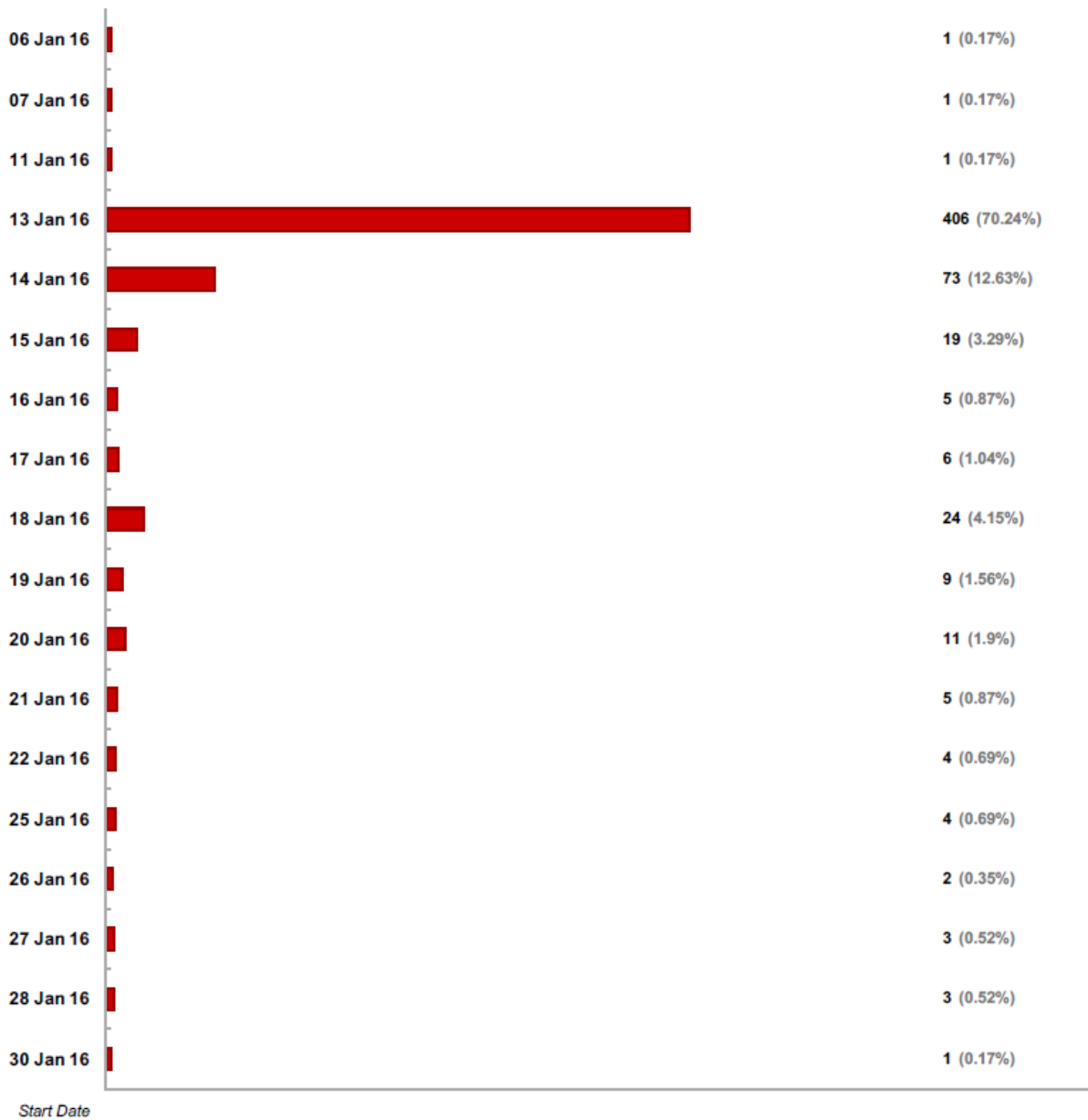
**Thank you for your participation!**

### Appendix D: Survey Response Start Dates

Initial Survey Response Rate from Start to End Date (1 Oct 2015 – 6 Jan 2016)



## Modified Version Response Rate Start to End Date (6 Jan 2016 – 30 Jan 2016)



Total Responses 578

**Appendix E: Pretesting****Initial Report****Last Modified: 12/22/2015****1. Have you received adequate information regarding this research project and consent to participating in this survey?**

#	Answer	Response	%
	Total	0	0%



Statistic	Value
Min Value	-
Max Value	-
Mean	0.00
Variance	0.00
Standard Deviation	0.00
Total Responses	0

**2. Are you currently employed as a Project Manager on Building and/or Civil engineering projects?**

#	Answer	Response	%
1	Yes	37	70%
2	No	16	30%
	Total	53	100%



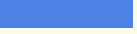


Statistic	Value
Min Value	1
Max Value	2
Mean	1.30
Variance	0.21
Standard Deviation	0.46
Total Responses	53

### 3. Have you been employed as a Project Manager on Building and/or Civil engineering projects?

#	Answer		Response	%
1	Yes		45	85%
2	No		8	15%
	Total		53	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.15
Variance	0.13
Standard Deviation	0.36
Total Responses	53

### 4. What is your occupational background?





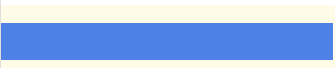
#	Answer		Response	%
1	Architecture		3	6%
2	Engineering		26	49%
3	Quantity Surveying		15	28%
4	Construction Management		6	11%
5	Other (Please Specify)		3	6%
	Total		53	100%

#### Other (Please Specify)

Construction Project Management  
Civil Controller  
construction project manager









Statistic	Value
Min Value	1
Max Value	5
Mean	2.62
Variance	0.93
Standard Deviation	0.97
Total Responses	53

### 5. How many years have you been employed as a Project Manager on Building and/or Civil engineering projects?

#	Answer		Response	%
1	Within 1 year		5	9%
2	Over 1 to 4 years		4	8%
3	Over 4 to 7 years		4	8%
4	Over 7 to 10 years		3	6%
5	Over 10 years		37	70%
	Total		53	100%

Statistic	Value
Min Value	1
Max Value	5
Mean	4.19
Variance	1.93
Standard Deviation	1.39
Total Responses	53

### 6. Please indicate your perceived importance of professional registration with a project management body on construction project performance

#	Answer		Response	%
0	0		4	8%
1	1		0	0%
2	2		0	0%
3	3		2	4%
4	4		0	0%
5	5		5	9%
6	6		3	6%
7	7		1	2%
8	8		11	21%
9	9		8	15%
10	10		19	36%
	Total		53	100%



Statistic	Value
Min Value	0
Max Value	10
Mean	7.66
Variance	8.50
Standard Deviation	2.92
Total Responses	53

**7. Are you currently registered as a construction project manager with a project management body (locally or internationally)?**

#	Answer	Response	%
1	Yes	42	79%
2	No	11	21%
	Total	53	100%

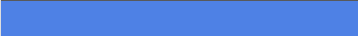

Statistic	Value
Min Value	1
Max Value	2
Mean	1.21
Variance	0.17
Standard Deviation	0.41
Total Responses	53

**8. Have you worked as a Project Manager prior to attaining professional registration in Project Management?**

#	Answer	Response	%
1	Yes	39	98%
2	No	1	3%
	Total	40	100%




Statistic	Value
Min Value	1
Max Value	2
Mean	1.03
Variance	0.03
Standard Deviation	0.16
Total Responses	40

**9. Have you received any formal Project Management training (e.g higher education, certified training courses) prior to attaining professional registration in Project Management?**

#	Answer		Response	%
1	Yes		30	75%
2	No		10	25%
	Total		40	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.25
Variance	0.19
Standard Deviation	0.44
Total Responses	40

**10. Which institution Project Management body are you currently registered with?**





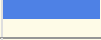
#	Answer		Response	%
1	PMI (Project Management Institution)		3	8%
2	IPMA (International Project Management Association)		0	0%
3	SACPCMP		31	78%
4	Other (please specify)		6	15%
	Total		40	100%

**Other (please specify)**

Both SACPCMP and PMI  
SACPCMP  
University of Pretoria  
both pmi and sacpcmp  
PMI & SACPCMP  
PMP Wits





Statistic	Value
Min Value	1
Max Value	4
Mean	3.00
Variance	0.46
Standard Deviation	0.68
Total Responses	40

### 11. How many years has it been since your first Project Management certification?

#	Answer		Response	%
1	Within 1 year		5	13%
2	Over 1 - 4 years		4	10%
3	Over 4 - 7 years		3	8%
4	Over 7 - 10 years		19	49%
5	Over 10 years		8	21%
	Total		39	100%

Statistic	Value
Min Value	1
Max Value	5
Mean	3.54
Variance	1.68
Standard Deviation	1.29
Total Responses	39

## 12. What was your primary motivation for obtaining Project Management registration?

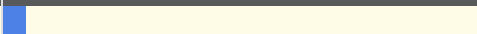


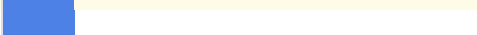

#	Answer		Response	%
1	Financial Incentive		0	0%
2	Job Requirement		6	15%
3	Personal Satisfaction		7	18%
4	Occupational Competitive advantage		20	50%
5	Other (please specify)		7	18%
	Total		40	100%

### Other (please specify)

I was told by my company it was a requirement  
 Legal compliance  
 legal requirement  
 Threat that it may become a requirement to work  
 Legal requirements  
 legislative requirement  
 Required for Government work

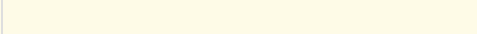
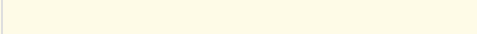



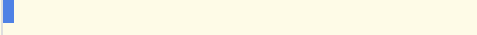


Statistic	Value
Min Value	2
Max Value	5
Mean	3.70
Variance	0.88
Standard Deviation	0.94
Total Responses	40

**13. How many projects have you completed as a registered Project Manager?**

#	Answer		Response	%
1	1		2	5%
2	2 - 4		4	10%
3	5 - 7		6	15%
4	7 - 10		6	15%
5	10 +		22	55%
	Total		40	100%






Statistic	Value
Min Value	1
Max Value	5
Mean	4.05
Variance	1.59
Standard Deviation	1.26
Total Responses	40

**14. Which project value range represents the value of the projects you have managed the most as a registered Project Manager?**

#	Answer		Response	%
1	R 0 - R 650 000		0	0%
2	R 650 000 - R 2 mil		0	0%
3	R 2 mil - R 4 mil		1	3%
4	R 4 mil - R 6.5 mil		0	0%
5	R 6.5 mil - R 13.5 mil		2	5%
6	R 13.5 - R 40 mil		8	20%
7	R 40 mil - R 130 mil		12	30%
8	R 130 mil - no limit		17	43%
	Total		40	100%

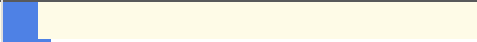




Statistic	Value
Min Value	3
Max Value	8
Mean	7.03
Variance	1.26
Standard Deviation	1.12
Total Responses	40

#### 15. How many projects have you completed within the original planned time schedule?

#	Answer		Response	%
1	1		3	8%
2	2 - 4		8	20%
3	5 - 7		5	13%
4	8 - 10		4	10%
5	10 +		20	50%
	Total		40	100%

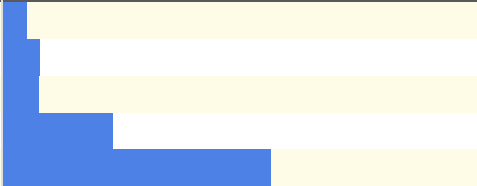
Statistic	Value
Min Value	1
Max Value	5
Mean	3.75
Variance	2.09
Standard Deviation	1.45
Total Responses	40

#### 16. How many projects have you completed within the original cost budget?

#	Answer		Response	%
1	1		3	8%
2	2 - 4		4	10%
3	5 - 7		7	18%
4	8 - 10		6	15%
5	10 +		20	50%
	Total		40	100%


Statistic	Value
Min Value	1
Max Value	5
Mean	3.90
Variance	1.78
Standard Deviation	1.34
Total Responses	40

**17. How many projects have you completed within original quality specifications? (please move to Q28 after answering this question)**

#	Answer		Response	%
1	1		2	5%
2	2 - 4		3	8%
3	5 - 7		3	8%
4	8 - 10		9	23%
5	10 +		22	56%
	Total		39	100%

Statistic	Value
Min Value	1
Max Value	5
Mean	4.18
Variance	1.41
Standard Deviation	1.19
Total Responses	39

**18. Have you considered attaining professional registration in Project Management while working as a Project Manager**

#	Answer		Response	%
1	Yes		34	89%
2	No		4	11%
	Total		38	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.11
Variance	0.10
Standard Deviation	0.31
Total Responses	38






**19. Have you received any formal Project Management training (e.g. higher education, certified training courses) prior to working as a Project Manager?**

#	Answer	Response	%
1	Yes	25	61%
2	No	16	39%
	Total	41	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.39
Variance	0.24
Standard Deviation	0.49
Total Responses	41



## 20. Which Project Management body would you consider registering as a project manager with?

#	Answer		Response	%
1	PMI (Project Management Institution)		7	17%
2	IPMA (International Project Management Association)		1	2%
3	SACPCMP (South African Council for Project & Construction Management Professions)		25	61%
4	None		3	7%
5	Other (please specify)		5	12%
	Total		41	100%

### Other (please specify)

I am already registered with SACPCMP and PMI

Already registered with SACPCMP





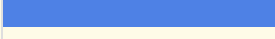
Very dependant on the type of project work being done and the Contry in which the work is being completed.

All

PMI & SACPCMP





Statistic	Value
Min Value	1
Max Value	5
Mean	2.95
Variance	1.30
Standard Deviation	1.14
Total Responses	41

### 21. How many years have you had your first certification in you background occupation (in reference to Q3)?

#	Answer		Response	%
1	Within 1 year		2	5%
2	Over 1 - 4 years		5	13%
3	Over 4 - 7 years		3	8%
4	Over 7 - 10 years		7	18%
5	Over 10 years		23	58%
	Total		40	100%

Statistic	Value
Min Value	1
Max Value	5
Mean	4.10
Variance	1.63
Standard Deviation	1.28
Total Responses	40



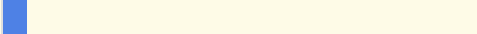


### 22. What would be your primary motivation for obtaining Project Management registration?

#	Answer		Response	%
1	Financial Incentive		0	0%
2	Job Requirement		6	15%
3	Personal Satisfaction		10	26%
4	Occupational Competitive advantage		20	51%
5	Other (please specify)		3	8%
	Total		39	100%

Other (please specify)
Legal Compliance
legal Requirement
legislative requirement






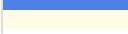
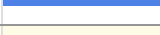
Statistic	Value
Min Value	2
Max Value	5
Mean	3.51
Variance	0.73
Standard Deviation	0.85
Total Responses	39

### 23. How many projects have you completed as a Project Manager?

#	Answer		Response	%
1	1		2	5%
2	2 - 4		3	8%
3	5 - 7		2	5%
4	7 - 10		6	15%
5	10 +		26	67%
	Total		39	100%






Statistic	Value
Min Value	1
Max Value	5
Mean	4.31
Variance	1.43
Standard Deviation	1.20
Total Responses	39

#### 24. Which Project value range represents the value of the projects you have managed the most as a Project Manager?

#	Answer		Response	%
1	R 0 - R 650 000		0	0%
2	R 650 000 - R 2 mil		1	3%
3	R 2 mil - R 4 mil		2	5%
4	R 4 mil - R 6.5 mil		0	0%
5	R 6.5 mil - R 13.5 mil		3	8%
6	R 13.5 - R 40 mil		7	18%
7	R 40 mil - R 130 mil		11	29%
8	R 130 mil - no limit		14	37%
	Total		38	100%

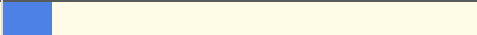




Statistic	Value
Min Value	2
Max Value	8
Mean	6.68
Variance	2.33
Standard Deviation	1.53
Total Responses	38

#### 25. How many projects have you completed, as a Project Manager, within the original planned time schedule?

#	Answer		Response	%
1	1		3	8%
2	2 - 4		6	16%
3	5 - 7		3	8%
4	8 - 10		9	24%
5	10 +		17	45%
	Total		38	100%

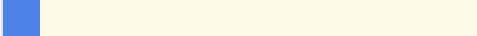



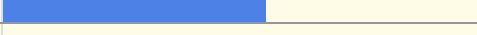
Statistic	Value
Min Value	1
Max Value	5
Mean	3.82
Variance	1.88
Standard Deviation	1.37
Total Responses	38

**26. How many projects have you completed, as a Project Manager, within the original cost budget?**

#	Answer		Response	%
1	1		4	11%
2	2 - 4		2	5%
3	5 - 7		7	18%
4	8 - 10		6	16%
5	10 +		19	50%
	Total		38	100%

Statistic	Value
Min Value	1
Max Value	5
Mean	3.89
Variance	1.88
Standard Deviation	1.37
Total Responses	38

**27. How many projects have you completed, as Project Manager, within original quality specifications?**

#	Answer		Response	%
1	1		3	8%
2	2 - 4		3	8%
3	5 - 7		4	11%
4	8 - 10		7	18%
5	10 +		21	55%
	Total		38	100%

Statistic	Value
Min Value	1
Max Value	5
Mean	4.05
Variance	1.73
Standard Deviation	1.31
Total Responses	38

**28. Please discuss other factors that you consider may be more important to project performance (in terms of time, cost and quality) than registration with a project management body.**

**Text Response**

Attitude of project manager & ability to work with others and motivate others.

People management

Resources on the project

The professional ethics around the governance of time, cost and quality could be improved because professionals will be bound by their respective professional code of ethics.

The project manager, unregistered or registered, must be part of the project from the initiation to close-out phases. The PM must be in control of all phases of the project cycle.

Training is very important.. You may be registered but you need to be up to date with new technologies. And contracts. Risk management is an important aspect.

Leadership

Personal ability and people skills.

On site experience is very important. Relevant Qualifications and courses are important Knowledge of project management knowledge areas is important

Stakeholder and Risk Management play a great role in achieving cost, quality and time management.

Skills and experience in the relevant engineering and building fields is an important factor in project performance. You need to have good management, ethnics and people skills as well as a passion for wanting to manage a project successfully from the beginning to the end and of coarse apply the time, cost and quality principles.

Pre-project planning and the establishment of the Project Charter & definitive SOW.

Registration is important if managed and controlled like in ecsa, but if not control and people registering for the sake of putting Pr. lehlohonolo front of their name if frustrating. Governments Department will advertise job or project for project manager and said one must be registered with ecsa,while project managers are registered with SACPCMP.This is an indication that even the government does not recognise it own body.

The quality of the project is based on material used, if the BOQ does not specify the good quality the project quality is jeopardised. Time it become extremely difficult to be within time due to community interference and strikes

The human factor in relation to motivation and individual ability

Correct ongoing mentorship and CPD

Sound scope of work, management support, well resource project and clear owner requirements specification these are critical building blocks for successful project execution. Cost, quality and time are products of the above elements.

Procurement policy - i.e. the current PPPFA does not factor in (weight) salient factors such as competence, past experience, financial capability, etc. and only measures price and preference. The Project Manager then has to deal with contractors who are appointed out of their depth. Does not matter with whom the PM is registered with - the project is off to a bad start from the word go.

My thoughts are that the biggest problems in large projects are: The client/sponsor

does not understand the basic project management principles and not being sufficiently involved. The understanding of front end loading and the purposes of the different phases of a project is poorly understood. To higher level of detail requested for Concept type project work Operational persons are not necessarily good project managers At feasibility stage the Owners team is normally too light and implementation suffers.

#### Communication

Knowledge of building trades. Knowledge of the contract. People skills. A strong mature personality

Client, Consultant and Contractors having the correct team on the project with the decision makers being suitably empowered to make decisions both technically and financially. Collaborative approach to management and control of the project to achieve the best outcomes for all concerned.

None

Education, experience, technical expertise and working knowledge

Proper planning, consistent programming and replanting, and progress tracking.

Proper cost planning and control and taking into consideration the economical factors. Consideration of material and skill availability when designing.

Practical built environment experience, i.e. working on construction sites. Detailed knowledge of critical path of projects and how this is determined Detailed knowledge of the skills of all other professionals in the team

time, cost and quality are all equally important.

Stakeholder management continuous communication

None

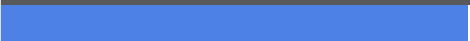
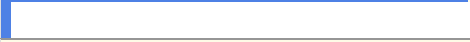
Appropriate knowledge & experience



Statistic	Value
Total Responses	29


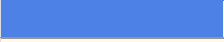
**Appendix F: Modified Version****Initial Report****Last Modified: 01/23/2016**

**1. Have you received adequate information regarding the background, aim and objectives of this research as communicated through the participant information sheet together with the link to this questionnaire and also voluntarily consent to participating in this survey? (note: all respondents will remain anonymous)**

#	Answer		Response	%
1	Yes		538	98%
2	No		11	2%
	Total		549	100%



Statistic	Value
Min Value	1
Max Value	2
Mean	1.02
Variance	0.02
Standard Deviation	0.14
Total Responses	549

**2. Are you currently employed as a Project Manager on Building and/or Civil engineering projects?**

#	Answer		Response	%
1	Yes		229	54%
2	No		199	46%
	Total		428	100%




Statistic	Value
Min Value	1
Max Value	2
Mean	1.46
Variance	0.25
Standard Deviation	0.50
Total Responses	428

### 3. Have you been employed as a Project Manager on Building and/or Civil engineering projects?

#	Answer		Response	%
1	Yes		311	73%
2	No		117	27%
	Total		428	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.27
Variance	0.20
Standard Deviation	0.45
Total Responses	428

### 4. What is your occupational background?

#	Answer		Response	%
1	Architecture		1	0%
2	Engineering		366	86%
3	Quantity Surveying		2	0%
4	Construction Management		32	7%
5	Other (Please Specify)		27	6%
	Total		428	100%

Other (Please Specify)
Property Developer
Construction Project Manager (Refer SACPCMP scope of services)
Prof Eng Technologist
Pr.Eng&Pr.CPM
civil designs and structures to house mechanical and electrical equipment
Mining
Civil Engineering
Project Management Consultant
Civil Engineer
Civil
Project Management and Business Development
Civil engineering
Fire Engineer
Metallurgist
Electrical services
Pr. Engineer
chemical engineer
industrial engineering
draughting and design
ELECTRICAL
RIGGING MANAGEMENT
Civil Engineer
civil engineering technician
Environmental Scientist
Mining

Statistic	Value
Min Value	1
Max Value	5
Mean	2.34
Variance	0.76
Standard Deviation	0.87
Total Responses	428

### 5. How many years have you been employed as a Project Manager on Building and/or Civil engineering projects?

#	Answer		Response	%
1	Within 1 year		51	13%
2	Over 1 to 4 years		86	22%
3	Over 4 to 7 years		60	15%
4	Over 7 to 10 years		46	12%
5	Over 10 years		151	38%
	Total		394	100%

Statistic	Value
Min Value	1
Max Value	5
Mean	3.41
Variance	2.23
Standard Deviation	1.49
Total Responses	394

### 6. Please indicate your perceived importance of professional registration with a project management body on construction project performance.

#	Answer		Response	%
0	0		21	5%
1	1		5	1%
2	2		21	5%
3	3		9	2%
4	4		17	4%
5	5		87	21%
6	6		31	7%
7	7		45	11%
8	8		60	14%
9	9		49	12%
10	10		76	18%
	Total		421	100%

Statistic	Value
Min Value	0
Max Value	10
Mean	6.55
Variance	7.78
Standard Deviation	2.79
Total Responses	421

**7. Are you currently registered as a construction project manager with a project management body (locally or internationally)?**

#	Answer	Response	%
1	Yes	69	16%
2	No	352	84%
	Total	421	100%


Statistic	Value
Min Value	1
Max Value	2
Mean	1.84
Variance	0.14
Standard Deviation	0.37
Total Responses	421

**8. Have you worked as a Project Manager prior to attaining professional registration in Project Management?**

#	Answer	Response	%
1	Yes	59	91%
2	No	6	9%
	Total	65	100%


Statistic	Value
Min Value	1
Max Value	2
Mean	1.09
Variance	0.09
Standard Deviation	0.29
Total Responses	65

### 9. Which project value range represents the value of the projects you have managed the most as a registered Project Manager?

#	Answer		Response	%
1	R 0 - R 650 000		2	3%
2	R 650 000 - R 2 mil		1	2%
3	R 2 mil - R 4 mil		1	2%
4	R 4 mil - R 6.5 mil		1	2%
5	R 6.5 mil - R 13.5 mil		8	12%
6	R 13.5 - R 40 mil		16	24%
7	R 40 mil - R 130 mil		12	18%
8	R 130 mil - no limit		25	38%
	Total		66	100%



Statistic	Value
Min Value	1
Max Value	8
Mean	6.53
Variance	2.78
Standard Deviation	1.67
Total Responses	66

### 10. How many projects have you completed as a registered Project Manager?

#	Answer		Response	%
1	1		8	12%
2	2 - 4		20	31%
3	5 - 7		10	15%
4	7 - 10		5	8%
5	10 +		22	34%
	Total		65	100%




Statistic	Value
Min Value	1
Max Value	5
Mean	3.20
Variance	2.23
Standard Deviation	1.49
Total Responses	65

**11. Have you received any formal Project Management training (e.g higher education, certified training courses) prior to attaining professional registration in Project Management?**

#	Answer		Response	%
1	Yes		54	82%
2	No		12	18%
	Total		66	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.18
Variance	0.15
Standard Deviation	0.39
Total Responses	66

**12. Which institution Project Management body are you currently registered with?**





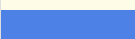
#	Answer		Response	%
1	PMI (Project Management Institution)		24	36%
2	IPMA (International Project Management Association)		0	0%
3	SACPCMP		34	51%
4	Other (please specify)		9	13%
	Total		67	100%



Other (please specify)
AIPM
SACPCMP Application only
Both PMI & SACPCMP
APMG Prince2
ECSA
ECSA
PMSA






Statistic	Value
Min Value	1
Max Value	4
Mean	2.42
Variance	1.25
Standard Deviation	1.12
Total Responses	67

### 13. How many years has it been since your first Project Management certification?

#	Answer		Response	%
1	Within 1 year		8	13%
2	Over 1 - 4 years		15	24%
3	Over 4 - 7 years		12	19%
4	Over 7 - 10 years		10	16%
5	Over 10 years		18	29%
	Total		63	100%

Statistic	Value
Min Value	1
Max Value	5
Mean	3.24
Variance	2.02
Standard Deviation	1.42
Total Responses	63

#### 14. What was your primary motivation for obtaining Project Management registration?

#	Answer		Response	%
1	Financial Incentive		1	2%
2	Job Requirement		18	29%
3	Personal Satisfaction		12	19%
4	Occupational Competitive advantage		28	44%
5	Other (please specify)		4	6%
	Total		63	100%

#### Other (please specify)

Legal requirement in RSA - Act 48 of 2000






Corporate request

Comply with legislation

To Contribute back to the industry by assisting others

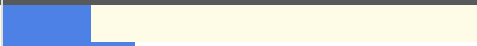
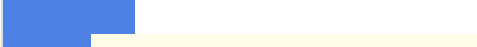
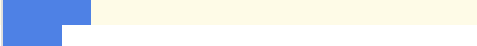

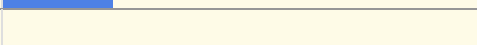
Statistic	Value
Min Value	1
Max Value	5
Mean	3.25
Variance	1.00
Standard Deviation	1.00
Total Responses	63

#### 15. How many projects have you completed within the original planned time schedule?

#	Answer		Response	%
1	1		9	14%
2	2 – 4		22	34%
3	5 – 7		9	14%
4	8 – 10		6	9%
5	10 +		18	28%
	Total		64	100%

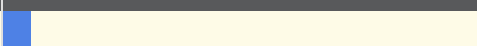

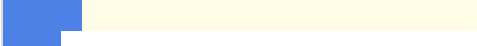

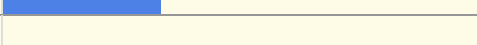
Statistic	Value
Min Value	1
Max Value	5
Mean	3.03
Variance	2.16
Standard Deviation	1.47
Total Responses	64

#### 16. How many projects have you completed within the original cost budget?

#	Answer		Response	%
1	1		12	18%
2	2 - 4		18	28%
3	5 - 7		12	18%
4	8 - 10		8	12%
5	10 +		15	23%
	Total		65	100%

Statistic	Value
Min Value	1
Max Value	5
Mean	2.94
Variance	2.09
Standard Deviation	1.45
Total Responses	65

#### 17. How many projects have you completed within original quality specifications?

#	Answer		Response	%
1	1		4	6%
2	2 - 4		21	32%
3	5 - 7		11	17%
4	8 - 10		8	12%
5	10 +		22	33%
	Total		66	100%

Statistic	Value
Min Value	1
Max Value	5
Mean	3.35
Variance	1.92
Standard Deviation	1.39
Total Responses	66

**18. Have you considered attaining professional registration in Project Management while working as a Project Manager?**

#	Answer	Response	%
1	Yes	203	66%
2	No	105	34%
	Total	308	100%

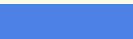




Statistic	Value
Min Value	1
Max Value	2
Mean	1.34
Variance	0.23
Standard Deviation	0.47
Total Responses	308

**19. Have you received any formal Project Management training (e.g. higher education, certified training courses) prior to working as a Project Manager?**

#	Answer	Response	%
1	Yes	213	69%
2	No	95	31%
	Total	308	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.31
Variance	0.21
Standard Deviation	0.46
Total Responses	308

## 20. Which Project Management body would you consider registering as a project manager with?

#	Answer		Response	%
1	PMI (Project Management Institution)		87	29%
2	IPMA (International Project Management Association)		24	8%
3	SACPCMP (South African Council for Project & Construction Management Professions)		138	45%
4	None		46	15%
5	Other (please specify)		10	3%
	Total		305	100%

### Other (please specify)

Any of the above

Various Courses at Universities or Company Structured Courses.

On Site

all can be relevant

ECSA

Not sure

PrEng, ECSA






Do not know

ECSA

Project management is part of Engineering (mostly Civil Eng.) and therefore all project managers need to report to qualified engineers and should not register apart from Engineering.






Statistic	Value
Min Value	1
Max Value	5
Mean	2.57
Variance	1.32
Standard Deviation	1.15
Total Responses	305

**21. How many years have you had your first certification in you background occupation (in reference to Q4)?**

#	Answer		Response	%
1	Within 1 year		37	14%
2	Over 1 - 4 years		60	22%
3	Over 4 - 7 years		45	16%
4	Over 7 - 10 years		27	10%
5	Over 10 years		105	38%
	Total		274	100%

Statistic	Value
Min Value	1
Max Value	5
Mean	3.38
Variance	2.26
Standard Deviation	1.50
Total Responses	274

## 22. What would be your primary motivation for obtaining Project Management registration?






#	Answer		Response	%
1	Financial Incentive		21	7%
2	Job Requirement		51	17%
3	Personal Satisfaction		50	16%
4	Occupational Competitive advantage		152	50%
5	Other (please specify)		32	10%
	Total		306	100%

Other (please specify)
None
If it had to be legislated
Professional discipline and minimisation of risk in the execution phase of projects.
continual skills improvement
Do not see the need
None
None
None
Status
Promoting small business development
None
None
Competency& Excellence
Knowledge sharing
None
None
If potential employer requires it
Client requirement
Professional Responsibility/Recognition
Acknowledgement as part of the Engineering profession
Implementation of systems
Only if it would be of benefit to my firm
No longer required
No interest
Only if deemed required by ECSA or PM body
No advantage at my age
I am not a project Manager
Networking
Reluctant

Statistic	Value
Min Value	1
Max Value	5
Mean	3.40
Variance	1.20
Standard Deviation	1.09
Total Responses	306











**23. How many projects have you completed as a Project Manager?**

#	Answer		Response	%
1	1		31	10%
2	2 - 4		58	20%
3	5 - 7		46	16%
4	7 - 10		29	10%
5	10 +		132	45%
	Total		296	100%

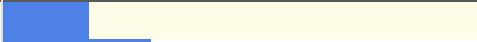
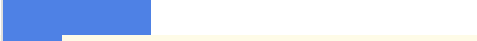



Statistic	Value
Min Value	1
Max Value	5
Mean	3.58
Variance	2.16
Standard Deviation	1.47
Total Responses	296

**24. Which Project value range represents the value of the projects you have managed the most as a Project Manager?**

#	Answer		Response	%
1	R 0 - R 650 000		26	9%
2	R 650 000 - R 2 mil		35	12%
3	R 2 mil - R 4 mil		18	6%
4	R 4 mil - R 6.5 mil		15	5%
5	R 6.5 mil - R 13.5 mil		33	11%
6	R 13.5 - R 40 mil		50	17%
7	R 40 mil - R 130 mil		49	17%
8	R 130 mil - no limit		67	23%
	Total		293	100%

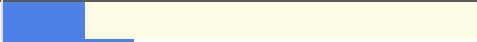
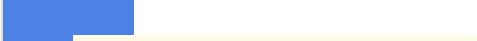



Statistic	Value
Min Value	1
Max Value	8
Mean	5.30
Variance	5.62
Standard Deviation	2.37
Total Responses	293

**25. How many projects have you completed, as a Project Manager, within the original planned time schedule?**

#	Answer		Response	%
1	1		52	18%
2	2 - 4		89	31%
3	5 - 7		36	13%
4	8 - 10		26	9%
5	10 +		85	30%
	Total		288	100%

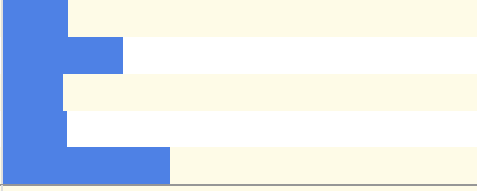
Statistic	Value
Min Value	1
Max Value	5
Mean	3.01
Variance	2.31
Standard Deviation	1.52
Total Responses	288

**26. How many projects have you completed, as a Project Manager, within the original cost budget?**

#	Answer		Response	%
1	1		50	17%
2	2 - 4		79	27%
3	5 - 7		43	15%
4	8 - 10		39	13%
5	10 +		78	27%
	Total		289	100%

Statistic	Value
Min Value	1
Max Value	5
Mean	3.06
Variance	2.18
Standard Deviation	1.48
Total Responses	289

**27. How many projects have you completed, as Project Manager, within original quality specifications?**

#	Answer		Response	%
1	1		40	14%
2	2 - 4		73	25%
3	5 - 7		37	13%
4	8 - 10		39	13%
5	10 +		102	35%
	Total		291	100%

Statistic	Value
Min Value	1
Max Value	5
Mean	3.31
Variance	2.25
Standard Deviation	1.50
Total Responses	291

**28. Please discuss other factors that you consider may be more important to project performance (in terms of time, cost and quality) than registration with a project management body.**

**Text Response**

Over and above time, cost and quality, communication and relationship building are important to completing a project.

It is my experience that professional certification with a PM professional certification body is often a prerequisite with the likes of parastatal governmental agencies, as well as listed corporate organisations, as a matter of governance compliance. I have been privy to projects in which the lead project manager has not held professional certification with the likes of PMI (PMP) or SACPCMP (Pr.CPM or Pr.CM), and the project has been successfully delivered within time, cost and quality parameters. It is my experience that the extent and specific project typology experience of the lead project manager is more important than merely holding the professional certification with the relevant professional certification body. For example, if a client is considering appointing a project manager to manage a complex commercial office block development, it would certainly be more beneficial to appoint a project manager who doesn't hold professional certification, but who has the requisite experience in commercial office block developments, as opposed to a project manager who holds professional certification, but who only has experience in the likes of mining projects. The ultimate purpose of the lead project manager is to ensure that the project is appropriately managed within all stipulated parameters, to the satisfaction of the client and project sponsor.

Business acumen, networking and stakeholder engagement

Experience in the industry Sound inter-personal relationships with project participants, employer, contractor, other professionals Deal with any problems as soon as possible and as fairly as possible to all parties concerned

Experience in industry and disciplines

Successful completion of projects to improve quality of life for less privileged communities.

There is no substitute for experience. The answer is simple experience.

none

Working with your team and using everybody to their strengths.

risk- qualitative and quantitative active monitoring of risks

To do a magnitude project of almost R200 million on a life office building

Competence, understanding the project technically, technical & contract experience.

PM bodies vary. PMI, for example can be done as a theoretical exercise in 1 month, and requires no formal education. SACPCMP supposedly checks on education and experience, but I have seen incompetent people (by their own admission) getting registered.

Competency and authority; correction prioritisation of task importance, allocation and urgency.

Client organisation representatives that qualified, registered and experienced and understand deliverables of project Procurement of suitably qualified, registered and experienced service providers and appointment at the correct tender price Quality of design & tender documentation - (Specifications and Quantities) Suitably qualified

Works Engineers and supervision staff

Objectives in terms of quality and performance need to be set BEFORE the project starts - trying to backtrack to cover gaps is a nightmare.

Experience, Experience, Experience. Mentoring and training of the inexperienced

Making sure that everyone knows what they need to be doing daily. Resolve any and all problems asap.

Procurement e.g. the quality of contractors appointed in the RSA is the most problematic issue at this point in time. I've been doing micro management of main/principal contractors, due to the lack of capacity and the unrealistic expectations of Clients. Contractors do not have appropriate planning and execution capabilities. They need to be forced to appoint experienced Construction Managers instead.

Long term project success

1) Understanding Specifications 2) Understanding the Contract. 3) Being proficient in programming and planning, as well as resource balancing. 4) Proficiency in material quality, procurement and handling. 5) Management of sub-contractors.

Ensuring integrity in all dealings leading to full accountability of finances. Ensuring that the project gives end users expected value. Also ensuring that end users are consulted and given regular feedback on the project. This could avert some of the service delivery protests relating to public projects

experience related to all the components of project, it is structural, civil and equipment knowledge to be installed is of utmost importance.

Scope Definition and understand of at the relevant phase of the project, particularly in Scoping and Pre-feasibility stages. Things develop over time.

The understanding of a complete project life cycle process is a must. I subscribe to the phased approach of executing projects, starting from feasibility up to the execution phase. After the completion of each phase, there must be gate reviews to monitor if the project still meets the original specification of time, cost and quality.

N/A

I am a degreed PrEng working on large mining and industrial projects for a multi-national. For a person working their way up the ranks with no engineering or other relevant degree PM&CM certification is a must. It provides a solid academic background to what they experience daily doing their job. The questions do not allow for alternative (to certification) PM & CM training. There are many roads to becoming a good PM or CM. Certification is a good route to follow (and creates opportunities for those who were not fortunate enough to get higher education or make a career change later in life) but so is getting a relevant degree or BTech Experience in the field of the project is more important and valuable than a professionally registered Project Manager. Professionally registered Project Managers must be an add on to an existing knowledge base in the field of the project.

Health and Safety Planning Clear scope of works Provide training Risk management

Project needs to complete the full project life cycle. Most people in the construction industry just purely do not plan the project. The attitude of construct first, document later approach must stop.

Client-contractor relationship, Contractor should be involved during the conceptual or

design stage of the project and by doing so you will eliminate problems and misunderstanding that arises during implementation phase (e.g scope of work) as it is evident that tendering process alone will not address this aspect.

Relevant technical experience Ability to manage people Leadership skills  
Communication

World financial markets have a significant aspect on availability of finance, often reducing funds available for projects. Quality (to achieve stated objectives), in mineral projects are the most important, followed by cost and time. Scope creep, especially time related as affected by remote site logistics, often the largest impact on the project triangle.

The project manager forms a boundary spanning role between four centres, each of which contributes one way or another to a successful project. These are the client (often factually a financial institution), the operator, the consultant bodies (from metallurgy through structural engineering and others), the fabricators and contractors (including the main contractor (where appropriate)). If the project manager is brought in sufficiently early, at the conceptual stage, and the contractual arrangements match the degree of uncertainty about the relationship between decision events and decision effects, the likelihood of success improves.

As time, cost and quality all have values that can be reduced to cost impacts, the last three questions are intertwined. The question is achieving best value, this differing between the participants..

Professional Registration with an Engineering Body

Please note that I retired in 2005

Knowledgeable client representative

Scope definition Stakeholder involvement (Public participation) Customer satisfaction or delivering project to the customer need

I believe that the PM's personality and people skills are more important than registering with a professional body. Book knowledge, although important, does not guarantee a good PM.

To have a Project Management full course, be willing to learn and be flexible

What does the fourth question from the top of this page mean? Time cost and quality are all more important than registration

Does the product of the project meet user requirement, this question is vital criteria to determine if the project was successful.

professional, skilled contractors

Knowledge of Project Management processes and procedures and constant application of these Compliance governance requirements and application of relevant controls Engineering/technical expertise especially when in an environment where technical support is not strong due to non-availability of personnel with adequate expertise

Have suitable quality check systems in place to monitor work carried out Hands on approach instead of relying on others. If you want something done right ... do it yourself Manage budgets tightly Lead by example Have very good knowledge of Colto, Fidic, GCC, SABS etc.

Working with experienced and skilled staff is more important than registration with project management body.

I have done over 100 projects, so asking a number between 1 and 10 don't give a

accurate idea. About 60% of projects are on budget and mostly the small ones

Achievement of project objectives

Work safety

Applicable Project Management qualification with discipline specific & advanced training (this could be rolled out in-house in collaboration with e.g. Damelin. Project management support office for assistance with mega projects.

Working with experienced and skilled staff to complete a project within time, quality and cost is more important than registration with a project management body

- Proper planning from the project manager. - Organisation culture plays a role in project performance - Type Organisation structure plays a role. - Team work and communication.

Experience in dealing with soft issues.

Soft skills with regards to interacting with the project team (own team, client, outside stakeholders). The ability to read people, situations, emotional intelligence and the ability to adapt to the dynamic nature of a project. The management and understanding of the team diversity (race, religion, creed, gender etc.) is critical to creating a conducive working environment especially in the South African context. The above are very important and although one can get coaching on such skills, they are subject to individuals.

A major factor is whether a PM is involved in the project from the onset. Detailed knowledge of the project, the client, the conditions of the contract plays a very important role. Changes in PM's and other resources has a major impact on all factors. The Client's influence and decisions and in some cases changes in the scope of work has been detrimental. I am Professionally registered with ECSA and that automatically makes me responsible for all decisions I make. I may not undertake work for which I am not competent. Project Management was part of my education and requirements for professional registration. I no longer see the need to register with an additional body.

Of equal importance: - Client satisfaction. - Development of others. - BEEE compliance.

A basic technical qualification (e.g. Civil engineering degree), and practical experience in the application of the qualification. Experience, specifically in the field of project management which you are doing (e.g. Civil Engineering construction). Sound judgement and an ability to be objective, but decisive, which is obtained from experience.

Client satisfaction was attained on all projects.

Strategies utilized to implement project in order to achieving project goals. These include leadership skills, management skills and team work to synchronize activities involved within a project.

Promoting small business development encouraging and stimulating the economy. Small business should be promoted and acknowledged as the principle of economic growth and the unbundling of big business should be considered creating a platform of equality in terms of fees distribution. This will have a lessor impact on tax money spent on grants, which is counter productive. More plates with the same fish and bread should apply and there must not be any discrimination in rules between companies. For example the tax rule of 80% income discriminating against smaller firms, forcing one to become a slave of bigger companies should be scrapped.



SARS must consider job creation within smaller companies and the rule of tax reduction for salaries and training should be the determining factor rather than to force small firms to become slaves. This will enable small business to grow enhancing job creation and rather force bigger companies to become smaller companies within the structure of the company. It is impossible for me to adhere to SARS policy while attending to one project preventing my company to grow, while bigger companies are using these laws against us and using it to their advantage. Policies needs to be addressed and changed ASAP

Extensive early career stage project management exposure on smaller projects.

Mainly involved in rural road and water supply projects,, and 90% civil engineering disciplines in completion of the projects.

Each project should be assessed on its own merits, taking into account the complexities involved, the disciplines involved, which disciplines have the greatest impacts, the dynamics and interactions required between Client and the professional team members, regulatory requirements (e.g. environmental regulations) and many other factors.

Client Factor. As Project Manager your hands are tied wrt firing non-performing stakeholders. In fact depending on some Clients your hands are tied in relation to who is appointed to work on the Project with you. Funding is as per Client convenience and the full budget is rarely provided into your control. Perhaps the only area where there is some comfort would be on the issue of Quality where no matter the Client interference, Quality is difficult for Client to override without considering potential consequences.

Health and safety

I am a PMP as from January 2015. I realise there is a need for a formal certification.

Qualification and experience

The structure (processes and requirements)of the company that employ project managers and the inputs from the client entity

Effective communication between all stakeholders and a common goal or incentive to complete the project early/on time

As the industry leans more towards the commercial side of the business, I find that most of us is not astute enough as far as the Commercial side of the business is concerned.

Project Planning and implementation of such plan will assist for the project to be completed in time, Communication also plays a major role in making sure that time is not wasted by unnecessary differences between the stakeholders of the project.

Financial planning and data must be done and received timeously before the actual start date of the particular item as per the program of works, this will assist in making sure that there is no unnecessary over spending on the project. All the work carried out must be tested for quality by an accredited material laboratory to ensure that the work done is of good quality.

Experience Accepting only projects where upfront planning, scheduling and costing have been done thoroughly The quality of the project team.

Interaction with contractor

Skills capacity (Project management, technical, financial) Politics; Economic;

Financial; Corruption; Project performance risks such as- • Slow decision-making

process by client; • Delay in payment process by client; • Frequent change orders by



client; • Errors and omissions in design drawings; • Unavailability or shortage in specified materials; • Contractor's financial difficulties; • Clarity of drawings and technical specifications; • Shortage in technical staff and skilled labour; • Late delivery of materials; and • Delay in consultant's response to requests for information

Experience Type of project, Green or Brown field Project External environment, economic environment, labor laws company HSE policies etc Discipline, Civil Mechanical or Electrical

competency and skills levels of personnel executing technical work on projects

Important factors to consider - 1. Introduction of BIM software as a core tools 2. Traditional Project Management to recognise soft skills - social/ human behaviour, reading project community dynamics, end user perspective, etc.3. Allow for and understand Women's perspective on Project Management 4. Post project analysis report should be made a critical requirement 5. Long distance PM in the current global environment to be defined, explored and further understood

Time, cost and quality

Experience in the particular projects being run in an industry (such as either civil projects vs. IT development projects) is necessary - the body of knowledge may be common across projects but industry specific experience is a definite advantage. That is why my registrations do not only include PMI but also SACPCMP. Functional experience in the specific field that you are working in is essential - a project manager on civil contracts needs to know about the subjects such as concrete curing construction platforms etc. for example since the junior personnel or sub-contractors sometimes approach the project manager instead of the subject matter expert to give direction on projects.

Nothing beats experience

Communication, recording

Projects generally have tight schedules and budgets coupled to "world class" quality requirements and all companies commit to unrealistic budgets and schedules because it is the only way to win the work. Construction projects have input from engineering (issued for construction drawings) and procurement (equipment and material) both of which have issues in terms of schedule and quality. Registration with a project management body and attending courses and programmes will not address the shortfall in experience in terms of "hands on" construction exposure. Poor performance on construction sites is linked to poor planning of the overall construction logistics which is linked to lack of "real life" experience of the management (adding site welders when the real issue is lack of workfront due to poor planning of shop fabrication is a typical example). Registration and courses appear to drive more paper work and "sharper" commercial practices of the individual companies involved in a construction project with detrimental impact on the overall project performance. Construction projects have become a contractual battlefield rather than a co-ordinated team effort by all parties.

1 experience, 2 knowledge of the project environment, 3 understanding of the client's business objectives

Client ( employer) capacity iro Capability & Understanding of Project Management

The actual capability, experience and competence of the project manager is more important than simply being registered with a professional body.

Project community impact awareness, in particular in South Africa

The client also plays an important role for instance if the government is the client chances of the project not conforming to quality, time and cost are high due to a number of risks associated with government tenders such as award of tenders to incompetent contractors.

Synergy and happiness amongst the subordinates. There are the one who do the actual work and if they are happy, it's very likely you get a quality project and done on time as well.

Issues of Safety Management as well as Environmental Considerations during and after construction

technical understanding of project leadership skills financial skills good professional team assembled legal experts

Experience, with a good knowledge of your sector, is the most important factor that will influence the performance on a project. Registration only gives an indication that the registered person has been evaluated by a third party, so in many instances people without the proper experience, is getting registered based on there report writing skills and not project management performance. I am only registered because it is a requirement by my clients to manage projects.

Have all approved drawings during the project hand over prior to start of projects, having experienced staff from both the contractor and the consulting engineers

Having a very good understanding of the system engineering process.

Continuously applying your project management knowledge, until it becomes second nature to you.

Question ambiguous

Interfacing with multiple disciplines is crucial. I find that projects fail as a result of poor interfacing between these disciplines

Integrity, good industry practice, determination. "always on time and to at least to budget, constructed correctly".

Project Management bodies are a money making thing especially SACPCMP. They are all very expensive and add little value. Experience showed that registration is not an indication of competency. Registration only showed that the person have some theoretical knowledge. It does not indicate that he can use it. The base competency skill set and the ability to manage people are much more important for project management performance. Project Management and construction management is a managerial occupation. Very few people have the capability to be a manager although everybody wants to be a manager.

Registration with ECSA. Minimum of 10 years post registration experience.

Back-office systems and Support, guidance from other PM's, familiarisation with forms of contract (for example, NEC3)

I suggest that you distinguish between Construction Project Management and other Project Managers. Project Management has become a generic term for IT development and other types of non-construction projects, e.g. publicity events. For registration as a Professional Construction Project Manager I would suggest as a pre-requisite a) a 4-5 year university Engineering Degree, plus b) registration as a Professional/Chartered Engineer, plus c) board or university Masters Degree examinations in pre-feasibility, feasibility, procurement, construction risk, safety, health, environmental, cost, contract, programme and quality management and

control, construction and contract law and regulation, professional liability and construction insurance, plus d) 10 years design and construction experience.

Statistic	Value
Total Responses	189

**Appendix G: Q28 Categorised responses**

	<b>Please discuss other factors that you consider may be more important to project performance (in terms of time, cost and quality) than registration with a project management body</b>	<b>Factor</b>
1	Administrative reporting, professional team coordination	Administration & Team Coordination
2	As the industry leans more towards the commercial side of the business, I find that most of us is not astute enough as far as the Commercial side of the business is concerned.	Business Acumen
3	Promoting small business development encouraging and stimulating the economy. Small business should be promoted and acknowledged as the principle of economic growth and the unbundling of big business should be considered creating a platform of equality in terms of fees distribution. This will have a lessor impact on tax money spent on grants, which is counter productive. More plates with the same fish and bread should apply and there must not be any discrimination in rules between companies. For example the tax rule of 80% income discriminating against smaller firms, forcing one to become a slave of bigger companies should be scrapped. SARS must consider job creation within smaller companies and the rule of tax reduction for salaries and training should be the determining factor rather than to force small firms to become slaves. This will enable small business to grow enhancing job creation and rather force bigger companies to become smaller companies within the structure of the company. It is impossible for me to adhere to SARS policy while attending to one project preventing my company to grow, while bigger companies are using these laws against us and using it to their advantage. Policies needs to be addressed and changed ASAP	Business Development

4	Capability	Capability
5	I am a PMP as from January 2015. I realise there is a need for a formal certification.	Certification
6	Client ( employer) capacity iro Capability & Understanding of Project Management	Client Capacity
7	Knowlegable client representative	Client Representative
8	Client Factor. As Project Manager your hands are tied wrt firing non-performing stakeholders. In fact depending on some Clients your hands are tied in relation to who is appointed to work on the Project with you. Funding is as per Client convenience and the full budget is rarely provided into your control. Perhaps the only area where there is some comfort would be on the issue of Quality where no matter the Client interference, Quality is difficult for Client to override without considering potential consequences.	Client Requirements
9	Specific client requirements such as empowerment, community uplifting and procurement regulations.	Client Requirements
10	Client needs is of utmost importance for project hand over	Client Requirements
11	Does the product of the project meet user requirement, this question is vital criteria to determine if the project was successful.	Client Satisfaction
12	I have done over 100 projects, so asking a number between 1 and 10 don't give a accurate idea. About 60% of projects are on budget and mostly the small ones <R15M. Specifications always change if not during manufacture then on site. So less than 25% specifications stay the same.	Client Satisfaction
13	Achievement of project objectives	Client Satisfaction

		on
1 4	Client satisfaction, was attained on all projects.	Client Satisfacti on
1 5	Client satisfaction	Client Satisfacti on
1 6	Of equal importance: / - Client satisfaction. / - Development of others. / - BEEE compliance.	Client satisfacti on, Socio- Economi c Develop ment
1 7	The client also plays an important role for instance if the government is the client chances of the project not conforming to quality , time and cost are high due to a number of risks associated with government tenders such as award of tenders to non competent contractors.	Client Type
1 8	Commercial awareness, document management and control, and safety of construction staff are also crucial for successful project completion.	Commer cial Awarene ss, Docume ntation, Safety
1 9	Over and above time, cost and quality, communication and relationship building are important to completing a project.	Commun ication

2 0	Making sure that everyone knows what they need to be doing daily. Resolve any and all problems asap.	Communication
2 1	communication	Communication
2 2	Communication, recording	Communication
2 3	Communication	Communication
2 5	Competency and authority; correction prioritisation of task importance, allocation and urgency.	Competency
2 6	competency and skills levels of personnel executing technical work on projects	Competency
2 7	Skills, Self Motivation, Management Techniques and Experience	Competency & Experience
2 8	A well defined scope and proper planning reduces the cost. Competent personnel enable a good quality product.	Competency, Planning & Scope Management
2 9	continuous education and development, short courses	Continuous Professional Development

		ment
30	Continual Professional Development (CPD) is important to stay informed of the changing technologies etc	Continuous Professional Development
31	more time spent on planning, compiling of contract documentation that is clear to all, good communication skills, during construction I find that 50% of a manager's time should be spent on site.	Contract Administration
32	Interaction with contractor	Contract or Involvement
33	Objectives in terms of quality and performance need to be set BEFORE the project starts - trying to backtrack to cover gaps is a nightmare.	Deliverables at project initiation
34	Client-contractor relationship, Contractor should be involve during the conceptual or design stage of the project and by doing so you will eliminate problems and mis-understanding that arises during implementation phase (e.g scope of work) as it is evident that tendering process alone will not address this aspect.	Early Contract or Involvement
35	The project manager forms a boundry spanning role between four centres, each of which contributes one way or another to a successful project. These are the client (often factually a financial institution), the operator, the consultant bodies (from metallurgy through structural engineering and others), the fabricators and contractors	Early PM Appointment



	(including the main contractor (where appropriate). if the project manager is brought in sufficiently early, at the conceptual stage, and the contractual arrangements match the degree of uncertainty about the relationship between decision events and decision effects, the likelihood of success improves. As time, cost and quality all have values that can be reduced to cost impacts, the last three questions are intertwined. The question is achieving best value, this differing between the participants..	
3 6	Working with your team and using everybody to their strengths.	EQ
3 7	I believe that the PM's personality and people skills are more important than registering with a professional body. Book knowledge, although important, does not guarantee a good PM.	EQ
3 8	Soft skills with regards to interacting with the project team (own team, client, outside stakeholders). The ability to read people, situations, emotional intelligence and the ability to adapt to the dynamic nature of a project. / / The management and understanding of the team diversity (race, religion, creed, gender etc.) is critical to creating a conducive working environment especially in the South African context. / The above are very important and although one can get coaching on such skills, they are subject to individuals.	EQ
3 9	Interpersonal skills. Apart from ability to apply currently accepted project management tools, project success depends to a great extent on a project manager's ability to focus the efforts of the project team as a whole on the stated project objectives, rather than those that may be uppermost in the minds of individual project members. This entails obtaining commitment from team members to work in a unified fashion, understanding that on occasions this may involve compromise on their part in order to achieve overall success.	EQ
4 0	Personal relationship and EQ	EQ
4 1	Attitude of individuals and team / Competence of team members / Many more issues. / Note that I believe that registration does not necessarily ensure that the PM is successful.	EQ
4 2	Integrity, good industry practice, determination. / "always on time and to at least to budget, constructed correctly".	Ethics
4	Experience in the field of the project is more important and valuable than a professionally registered Project	Exeperie

3	Manager. Professionally registered Project Managers must be an add on to an existing knowledge base in the field of the project.	nce
4 4	Working with experienced and skilled staff is more important than registration with project management body.	Exeperie nce
4 5	The actual capability, experience and competence of the project manager is more important than simply being registered with a professional body.	Exeperie nce & PM compe te nce
4 6	Experience / Accepting only projects where upfront planning, scheduling and costing have been done thoroughly / The quality of the project team.	Exeperie nce & Project Team
4 7	It is my experience that professional certification with a PM professional certification body is often a prerequisite with the likes of parastatal governmental agencies, as well as listed corporate organisations, as a matter of governance compliance. I have been privy to projects in which the lead project manager has not held professional certification with the likes of PMI (PMP) or SACPCMP (Pr.CPM or Pr.CM), and the project has been successfully delivered within time, cost and quality parameters. It is my experience that the extent and specific project typology experience of the lead project manager is more important than merely holding the professional certification with the relevant professional certification body. For example, if a client is considering appointing a project manager to manage a complex commercial office block development, it would certainly be more beneficial to appoint a project manager who doesn't hold professional certification, but who has the requisite experience in commercial office block developments, as opposed to a project manager who holds professional certification, but who only has experience in the likes of mining projects. The ultimate purpose of the lead project manager is to ensure that the project is appropriately managed within all stipulated parameters, to the satisfaction of the client and project sponsor.	Experien ce
4 8	Experience in industry and disciplines	Experien ce

4 9	There is no substitute for experience. The answer is simple experience.	Experien ce
5 0	To do a magnitude project of almost R200 million on a life office building	Experien ce
5 1	Competence, understanding the project technically, technical & contract experience. / / PM bodies vary. PMI, for example can be done as a theoretical exercise in 1 month, and requires no formal education. SACPCMP supposedly checks on education and experience, but I have seen incompetent people (by their own admission) getting registered.	Experien ce
5 2	experience related to all the components of project, it is structural ,civil and equipment knowledge to be installed is of utmost importance.	Experien ce
5 3	Working with experienced and skilled staff to complete a project within time, quality and cost is more important than registration with a project management body	Experien ce
5 4	Extensive early career stage project management exposure on smaller projects.	Experien ce
5 5	Experience in the particular projects being run in an industry (such as either civil projects vs. IT development projects) is necessary - the body of knowledge may be common across projects but industry specific experience is a definite advantage. That is why my registrations do not only include PMI but also SACPCMP. / / Functional experience in the specific field that you are working in is essential - a project manager on civil contracts needs to know about the subjects such as concrete curing construction platforms etc. for example since the junior personnel or sub-contractors sometimes approach the project manager instead of the subject matter expert to give direction on projects.	Experien ce
5 6	Nothing beats experience	Experien ce
5 7	Experience, with a good knowledge of your sector, is the most important factor that will influence the performance on a project. Registration only gives a indication that the registered person has been evaluated by a third party, so in many instances people without the proper experience, is getting registered based on there report writing skills and not project management performance. I am only registered because it is a requirement by my clients to manage projects.	Experien ce

5 8	Have all approved drawings during the project hand over prior to start of projects, having experienced staff from both the contractor and the consulting engineers	Experi ence
5 9	On-the-job experience	Experi ence
6 0	There is no substitute for experience. Registration does not guarantee competency.	Experi ence
6 1	The Human Resource play vary vital part in project performance, if you don't have adequate/experienced skill this will impact on performance of the project.	Experi ence
6 2	The project management of road construction and/or rehabilitation projects is quite unique and differs to some extent from that of building projects, etc. A registered "project manager" without the necessary specific roads experience can lead to all sorts of problems in this industry, and as a senior middle manager I would choose an experienced person over a registered person.	Experi ence
6 3	Registration with a Professional Body is an important facet of being a PM, however the paper does not do the work. Experience gathered by the PM and his team is the key factor in my experience. / Many a project has benefitted from having an highly experienced PM at the helm, supported by an experienced team. / While it is important to employ recently graduated PM's to enable them to develop into successful PM's, nothing can beat hand's on experience. One needs to remember that most of the older successful large scale projects in SA were managed by individuals working as a team, that did not have the benefit of the more recent PM degrees etc. available at UNi or Tech. / It was the norm for Engineering resources to manage the projects. / Registration does not beat experience but will assist in raising the quality of PM's into the future as long as they learn the ropes from a experienced master.[	Experi ence
6 4	There is no substitute for experience. Registration is pointless unless you can demonstrate an ability to handle complex multi-disciplinary projects.	Experi ence
6 5	Experience in the industry / Sound inter-personal relationships with project participants, employer, contractor, other professionals / Deal with any problems as soon as possible and as fairly as possible to all parties concerned	Experi ence & EQ
6 6	Experience, personality & attitude!!	Experi ence & EQ

6 7	Experience Experience Experience. / Mentoring and training of the inexperienced	Experi ence & Mentorin g
6 8	There are unqualified project manager that are not performing on construction sites that are tainting the professions name. All site project managers must have relevant site experience before they may manage construction sites independently. All project managers must complete a successful mentor ship program before they may manage construction sites independently. Professional registration could therefore control the mentor ship training.	Experi ence & Mentorsh ip
6 9	Projects generally have tight schedules and budgets coupled to "world class" quality requirements and all companies commit to unrealistic budgets and schedules because it is the only way to win the work. Construction projects have input from engineering (issued for construction drawings) and procurement (equipment and material) both of which have issues in terms of schedule and quality. Registration with a project management body and attending courses and programmes will not address the shortfall in experience in terms of "hands on" construction exposure. Poor performance on construction sites is linked to poor planning of the overall construction logistics which is linked to lack of "real life" experience of the management (adding site welders when the real issue is lack of workforce due to poor planning of shop fabrication is a typical example). Registration and courses appear to drive more paper work and "sharper" commercial practices of the individual companies involved in a construction project with detrimental impact on the overall project performance. Construction projects have become a contractual battlefield rather than a co-ordinated team effort by all parties.	Experi ence & Planning
7 0	Experience / Type of project, Green or Brown field Project / External environment, economic environment, labor laws company HSE policies etc / Discipline, Civil Mechanical or Electrical	Experi ence & Project Environm ent
7 1	1. Construction management experience i.e. on site. / 2. Programme Management experience on site. / 3. Site Cost control. / 4. Contracts management experience (site contractual application of specs and GCC). / 5. Commonsense application of the knowledge/expertise gained from one's Bachelor's degree.	Experi ence & Qualificat ion

7 2	EXPERIENCE AND GOOD BASIC ENGINEERING DEGREE	Experience & Qualification
7 3	Training & on site experience on actual construction contracts ie experience of the real world	Experience & training
7 4	Relevant technical experience / Ability to manage people / Leadership skills	Experience, Management & Leadership
7 5	1 experience, 2 knowledge of the project environment, 3 understanding of the client's business objectives	Experience, Project Environment, Client Requirements
7 6	on-the-job experience, recognition that ECSA Professional registration is probably adequate for performing the role of project manager. Post-graduate certificate diplomas and workshops	Experience, Qualification & Professional Registration

7		Experience, Training & Development
7	The correct training and experience, including on-going training and development.	
7		Health & Safety
8	Health and safety /	
7	Correct planning of projects is essential to define achievable budget and schedule targets, accounting for realistic project and construction activities. In my view, most projects are considered project management "failures" because cost and time targets were incorrectly and optimistically defined. This requires good industry knowledge and experience, not PM registration.	Knowledge & Experience
9		
8	Strategies utilized to implement project in order to achieving project goals. These include leadership skills, management skills and team work to synchronize activities involved within a project.	Management & Leadership skills
0		
8	Project Management bodies are a money making thing especially SACPCMP. They are all very expensive and add little value. Experience showed that registration is not an indication of competency. Registration only showed that the person have some theoretical knowledge. It does not indicate that he can use it. The base competency skill set and the ability to manage people are much more important for project management performance. Project Management and construction management is a managerial occupation. Very few people have the capability to be a manager although everybody want to be a manager.	Management skills
1		
8	Important factors to consider - / 1. Introduction of BIM softwares as a core tools / 2. Traditional Project Management to recognise soft skills - social/ human behaviour, reading project community dynamics, end user perspective, etc / 3. Allow for and understand Women's perspective on Project Management / 4. Post project analysis report should be made a critical requirement / 5. Long distance PM in the current global environment to be defined, explored and further understood	Modern Tools, EQ, Diversity, Global Environment
2		

8 3	The structure (processes and requirements) of the company that employ project managers and the inputs from the client entity	Organisa tional structure
8 4	Back-office systems and Support, guidance from other PM's, familiarisation with forms of contract (for example, NEC3)	Organisa tional systems, Contract Administra tion
8 5	Business acumen, networking and stakeholder engagement	Other
8 6	Proper planning ie realistic programme, quality check up and maintenance ie tests	Planning
8 7	Procurement eg the quality of contractors appointed in the RSA is the most problematic issue at this point in time. I've been doing micro management of main/principal contractors, due to the lack of capacity and the unrealistic expectations of Clients. Contractors do not have appropriate planning and execution capabilities. They need to be forced to appoint experienced Construction Managers instead.	Procure ment
8 8	Procurement Processes / Skills acquisition	Procure ment
8 9	The procurement system of our local government, they are appointing the Contractor who don't have a knowledge of project management, does have a huge impact on completing the projects within this three constraints.	Procure ment systems
9 0	The quality of the end product produced is important because this has a direct impact on the life cycle cost of the asset generated. The cost of maintenance and later retirement of the asset is a cost that is normally ignored in the project community because there is a focus on the iron triangle, cost, time and quality.	Product Quality
9 1	Professional Registration with an Engineering Body	Professio nal Registrati



		on
9 2	Registration with ECSA. / Minimum of 10 years post registration experience.	Profession nal Registrati on
9 3	professional, skilled contractors	Profession alism
9 4	Proper understanding of built environment by project managers working therein.	Project Environm ent
9 5	Interfacing with multiple disciplines is crucial. I find that projects fail as a result of poor interfacing between these disciplines	Project Integratio n
9 6	The understanding of a complete project life cycle process is a must. I subscribe to the phased approach of executing projects, starting from feasibility up to the execution phase. After the completion of each phase, there must be gate reviews to monitor if the project still meets the original specification of time, cost and quality.	Project Life Cycle
9 7	Project needs to complete the full project life cycle. Most people in the construction industry just purely do not plan the project. The attitude of construct first, document later approach must stop.	Project Life Cycle
9 8	Registered or not, you first need to appreciate the importance of T,C&Q, then plan for it, execute, measure and close the loop, repeat.	Project Life Cycle
9 9	Properly planned and designed project could save time / Competency and skilled labor could save money and not comprising quality.	Project Life Cycle & Compete nce

100	Risk / Communication / Change Management	Project Management knowledge areas
101	Involvement of all stakeholders from inception of the project. Ability to pull all possible levers in terms of directing the project for time cost and quality	Project Management knowledge areas
102	Health and Safety / Planning / Clear scope of works / Provide training / Risk management	Project management knowledge areas
103	World financial markets have a significant aspect on availability of finance, often reducing funds available for projects. / Quality (to achieve stated objectives), in mineral projects are the most important, followed by cost and time. Scope creep, especially time related as affected by remote site logistics, often the largest impact on the project triangle. /	Project management knowledge areas
104	Scope definition / Stakeholder involvement (Public participation) / Customer satisfaction or delivering project to the customer need	Project management knowledge areas
105	Knowledge of Project Management processes and procedures and constant application of these / Compliance governance requirements and application of relevant controls / Engineering/technical expertise especially when in an environment where technical support is not strong due to non-availability of personnel with adequate expertise	Project management knowledge

		e areas
106	Have suitable quality check systems in place to monitor work carried out / Hands on approach instead of relying on others. / If you want something done right ... do it yourself / Manage budgets tightly / Lead by example / Have very good knowledge of Colto, Fidic, GCC, SABS etc	Project management knowledge areas
107	Proper planning from the project manager. / - Organisation culture plays a role in project performance / - Type Organisation structure plays a role. / - Team work and communication.	Project management knowledge areas
108	Effective communication between all stakeholders and a common goal or incentive to complete the project early/on time	Project management knowledge areas
109	Project Planning and implementation of such plan will assist for the project to be completed in time, Communication also plays a major role in making sure that time is not wasted by unnecessary differences between the stakeholders of the project. Financial planning and data must be done and received timeously before the actual start date of the particular item as per the program of works, this will assist in making sure that there is no unnecessary over spending on the project. All the work carried out must be tested for quality by an accredited material laboratory to ensure that the work done is of good quality.	Project management knowledge areas
110	Skills capacity (Project management, technical, financial) / Politics; / Economic; / Financial; / Corruption; / Project performance risks such as- / • Slow decision-making process by client; / • Delay in payment process by client; / • Frequent change orders by client; / • Errors and omissions in design drawings; / • Unavailability or shortage in specified materials; / • Contractor's financial difficulties; / • Clarity of drawings and technical specifications; / • Shortage in technical staff and skilled labour; / • Late delivery of materials; and / • Delay in consultant's response to	Project management knowledge areas

	requests for information / / / /	
1 1 1	Continuously applying your project management knowledge, until it becomes second nature to you.	Project management knowledge areas
1 1 2	Not really necessary so long as one has a working understanding of the project management knowledge areas. / / Effective communication is a key fundamental that all project managers must have. The communication behaviour of project managers is more of an influence to project performance than having been registered with a project management body.	Project management knowledge areas
1 1 3	As a Resident engineer, I only monitor the time schedule and the cost budget. I enforce the quality specifications and propose changes where deemed necessary.	Project management knowledge areas
1 1 4	Proper Planning and execution / The actual / estimated value's of resources / Problem solving (search, identify, predict, decide, execute) that gives a guide to project problem solving	Project Management knowledge areas
1 1 5	Scope management, client satisfaction, project team performance	Project management knowledge areas

1 1 6	Competence, experience, a good team, a tight project brief, corporate support, vendor / supplier support, realistic planning based on a proper understanding of scope, favourable weather conditions, motivated personnel, a realistic execution strategy, good systems and procedures, cooperative client, balanced contract etc etc - in short, I believe just about any factor you could think of eclipses registration with a PM body as an potential indicator of ultimate project success.	Project management knowledge areas
1 1 7	All PMBOK items not just time, cost and quality...stakeholder involvement, comms procurement etc... /	Project management knowledge areas
1 1 8	Other Factors to be considered are the following: / 1) The project agreements in place with labour, as these determine the attitude of the project. Power stations currently been constructed are classic examples. Labour don't care about programmes and schedules when they feel that they need to strike/damage property. This covers items such as: / a) Where outside labour will stay and be fed. / b) Where are the areas from where local labour will be sourced. / c) How they be transported. Who pays for this transport? / d) Will they be paid for the transport time if distances are far or sitting 1 hour + in each direction. / e) How does outside employees living far from site get home on the pay weekends. / f) What happens if an employee passes away while on the project (not work related) and the various traditions that are demanded to be observed. (Note - Example of this was the Pickit Up strike in December, where commitment for company to provide transport to fellow employees was withdrawn and was cited as one reasons for the wild cat strikes). / 2) The size of the project due to the following: / a) As the bigger it is the more effect the above will have. / b) Level of foreign control and therefore expectations on productivity and programming must be understood by all. / c) The position of the projects, as is the case in Burgerfords/Steelport where locals are burning the vehicles/property of those involved in the mines due to the perception that the locals are gaining no benefit from the projects/mining taking place. / 3) Any additional outside factors, such as the state of the local municipalities, with functions as simple as basic water supply have direct bearings on projects, as it is expected for the project to fill the holes that the municipalities don't. / / The type of work done on the various contracts/projects is not really different across the board, what changes is the different type of people and the differing rules on the projects that are allowed. This is what makes the projects different in their outcomes in terms of success.	Project management knowledge areas

1 1 9	Proper project planning is very critical for the success of any project. / Clear project scoping makes it very easy to manage the projects as there will be limited changes during the project implementation stage.	Project Management knowledge areas
1 2 0	Knowledge of the construction industry players, finance, contracting, communication,	Project Management knowledge areas
1 2 1	1. Human resource management / 2. project planning and implementation plan / 3. Communication with stakeholders and management of stakeholders expectation	Project Management knowledge areas
1 2 2	A clearly defined project scope and engagement with the project stakeholders prior and during project execution is paramount.	Project Management knowledge areas
1 2 3	Ensuring that the right resources are on site and adequately managed, but this again goes back to project management.	Project Management knowledge areas
1 2 4	financial management, contractor management, safety management, ohsAct knowledge, procurement, good understanding of all disciplines involved in project, scoping, specification, planning, execution, quality of installation, on time delivery, budgeting, motivation for capex, specialist in own field of expertise, professional registration with ECSA should be written in the Ohsact as a prerequisite for working as a project manager of note! The engineering	Project Management knowledge

	professions are not recognized as project managers although we as engineers is involved in project management as part of our normal engineering duties....and this must change!	e areas
1 2 5	Resource i.e People, Equipment, Time and Maintenance allocation in an Operational environment in which an added Capital Project is planned. / Time Management for Project Team Members. / Procurement Procedures and the delay caused as a result of this to the project completion date	Project Management knowledge areas
1 2 6	Management of risk / Stakeholder alignment and buy in / Knowledge of the approvals / external affairs processes / Construction safety capability / Understanding how your business works / Project Economics	Project Management knowledge areas
1 2 7	Understanding Contract Law, Conditions of Contract, Forex, CPA, Project Specifications, being able to read and interpret construction drawings, understanding payment certificates, etc.	Project management knowledge areas & Technical Expertise
1 2 8	occupational Health and Safety compliance / Scope creep / legal compliance / environmental compliance, e.g water licences, / environmental impact assessments / Choice of Technology / Sustainability and the life cycle of project to meet new changes / Trial and test using prototypes or simulation models. / Innovate way of executing the project to optimize resources / / / /	Project management knowledge areas

1 2 9	Good communication skills / Very good understanding of procurement	Project management knowledge areas
1 3 0	1) Understanding Specifications / 2) Understanding the Contract. / 3) Being proficient in programming and planning, as well as resource balancing. / 4) Proficiency in material quality, procurement and handling. / 5) Management of sub-contractors.	Project Management skills
1 3 1	A major factor is whether a PM is involved in the project from the onset. Detailed knowledge of the project, the client, the conditions of the contract plays a very important role. Changes in PM's and other resources has a major impact on all factors. The Client's influence and decisions and in some cases changes in the scope of work has been detrimental. / / I am Professionally registered with ECSA and that automatically makes me responsible for all decisions I make. I may not undertake work for which I am not competent. Project Management was part of my education and requirements for professional registration. I no longer see the need to register with an additional body. /	Project Manager Appointment
1 3 2	Each project should be assessed on its own merits, taking into account the complexities involved, the disciplines involved, which disciplines have the greatest impacts, the dynamics and interactions required between Client and the professional team members, regulatory requirements (e.g. environmental regulations) and many other factors.	Project Type
1 3 3	Synergy and happiness amongst the subordinates. There are the one who do the actual work and if they are happy, it's very likely you get a quality project and done on time as well.	Project Workforce
2 4	Public participation and satisfaction. /	Public Participation
1 3 4	Nature of projects I deal with are environmental cross-linked to building or engineering projects - ours tend to be smaller budgets and are strongly controlled by externalities such as public participation.	Public Participation



1 3 5	To have a Project Management full course, be willing to learn and be flexible	Qualification
1 3 6	Applicable Project Management qualification with discipline specific & advanced training (this could be rolled out in-house in collaboration with e.g. Damelin. Project management support office for assistance with mega projects.	Qualification
1 3 7	Must have Engineering or Built Environment qualification. This is most relevant when it comes to issues of Quality/Performance and Cost management.	Qualification
1 3 8	I am a degreed PrEng working on large mining and industrial projects for a multi-national. / For a person working their way up the ranks with no engineering or other relevant degree PM&CM certification is a must. / It provides a solid academic background to what they experience daily doing their job. / The questions do not allow for alternative (to certification) PM & CM training. There are many roads to becoming a good PM or CM. Certification is a good route to follow (and creates opportunities for those who were not fortunate enough to get higher education or make a career change later in life) but so is getting a relevant degree or BTech /	Qualification & Certification
1 3 9	Client organisation representatives that are qualified, registered and experienced and understand deliverables of project / Procurement of suitably qualified, registered and experienced service providers and appointment at the correct tender price / Quality of design & tender documentation - (Specifications and Quantities) / Suitably qualified Works Engineers and supervision staff /	Qualification & Experience
1 4 0	A basic technical qualification (eg Civil engineering degree), and practical experience in the application of the qualification. / Experience, specifically in the field of project management which you are doing (eg Civil Engineering construction). / Sound judgement and an ability to be objective, but decisive, which is obtained from experience. /	Qualification & Experience
1 4 1	Qualification and experience	Qualification & Experience

1 4 2	Education and practical experience is important. I see Registration as just a piece of paper.	Qualification & Experience
1 4 3	I agree to the notion that the project manager should have the proper qualification for both the engineering discipline and the project management. / / The professional team members in a building environment project should have both the qualifications.	Qualification & Professional Registration
1 4 4	I suggest that you distinguish between Construction Project Management and other Project Managers. Project Management has become a generic term for IT development and other types of non-construction projects, e.g. publicity events. / For registration as a Professional Construction Project Manager I would suggest as a pre-requisite a) a 4-5 year university Engineering Degree, plus b) registration as a Professional/Chartered Engineer, plus c) board or university Masters Degree examinations in pre-feasibility, feasibility, procurement, construction risk, safety, health, environmental, cost, contract, programme and quality management and control, construction and contract law and regulation, professional liability and construction insurance, plus d) 10 years design and construction experience.	Qualification, Registration, Experience
1 4 5	IDENTIFICATION OR RISK	Risk Identification
1 4 6	risk- qualitative and quantitative active monitoring of risks /	Risk Management
1 4 7	Risk Management	Risk Management
1 4	Risk management due to the fluid nature of the project work environment	Risk Management

8		ment
1 4 9	Work safety	Safety
1 5 0	Safety	Safety
1 5 1	Safety will be the most important factor on a construction project.	Safety
1 5 2	Scope Definition and understand of at the relevant phase of the project, particularly in Scoping and Pre-feasibility stages. Things develop over time.	Scope Manage ment
1 5 3	Issues of Safety Management as well as Environmental Considerations during and after construction	SHE
1 5 4	Health and safety, as well as client requirements.	SHE & Client Require ments
1 5 5	The safety/Health/Environment aspects and compliance to relevant legislation is of utmost importance through out the project life cycle.	SHE & Legislatio n
1 5 6	Successful completion of projects to improve quality of life for less privileged communities.	Socio- Economi c
1 5	Project community impact awareness, in particular in South Africa	Socio- Economi

7		c
1 5 8	CoC and professional knowledge of project to go hand in hand with quality and costing.	Specific Project Knowled ge
1 5 9	Stakeholder involvement and participation	Stakehol der Mangem ent
1 6 0	Probably the most disruptive factor is the assumption that application of fixed rules is an adequate substitute for understanding the discipline being managed and the consequences of decisions made or evaded. A project manager without a discipline is not making a professional contribution, and in that regard the effective contribution to executing the project may as well be secretarial.	Standard isation
1 6 1	Long term project success	Sustaina bility
1 6 2	Technical know how of the engineers is often neglected by Project Managers. This know how is important for delivering on time or trying to catch up with delayed parts of projects.	Technica l Expertise
1 6 3	I have been a qualified and practicing civil engineer for 55 years now and in the 'old days' all civil construction projects were managed by qualified civil engineers (contract management was part and parcel of their job -- there were no such a concept of a 'project manager' being divorced from the engineering function) and the majority of those projects were completed virtually on time and within budget. / Lately, however, this function has been divorced from the engineering function with some negative results. Today's project managers do not have the technical background necessary to properly assess the most beneficial route for the project, especially when something went wrong and crucial technical decisions need to be taken urgently. / A possible solution (taking into account the lack of engineers in SA -- not enough to manage all projects) might be to still have the current project managers, but then to have them reporting to qualified engineer and not directly to the board. (Say 5 project	Technica l Expertise

	managers reporting to one engineer.)	
1 6 4	Technical competence as an engineer	Technical   Expertise
1 6 5	I come from a civil engineering consulting background and to me it is much more important to be able understand the technical nature of the work and the problems that will be encountered and need to be overcome, in terms of time, quality and cost than necessarily being registered with a PM body. / General civil engineering projects seldom include the full spectrum of disciplines encountered in building projects and hence do not require specialised PM services / Civil engineers by necessity manage these general civil engineering projects as a matter of course. / It does not mean that PM services are not required on civil engineering projects when these are large and/or complex	Technical   Expertise
1 6 6	Having a very good understanding of the system engineering process.	Technical   expertise
1 6 7	People knowledge ("emotional intelligence & related traits) / Technical knowledge - in the "built" environment it is quite an advantage if the project manager is technically knowledgeable /	Technical   Expertise & EQ
1 6 8	Ability to motivate teams to perform / Ability to plan and identify technical issues early before they cause a problem to the execution of the works	Technical   Expertise & EQ
1 6 9	Registration with a Professional body does not make a Project Manager good, bad, or indifferent (Much as registration with ECSA does not suddenly make one a good Engineer) / The most important factors for Project Management performance in my view are: / Individual traits - leadership, respect earned with Project team, and	Technical   Expertise

	approach to Project Team, Client and Sub-contractors/suppliers / Experience / Technical knowledge and understanding of the Project	, Experien ce, EQ
1 7 0	technical understanding of project / leadership skills / financial skills / good professional team assembled / legal experts	Technica l expertise , Project Manage ment knowledg e areas
1 7 1	Time, cost and quality	Time, Cost, Quality
1 7 2	A project management body cannot teach nor cannot it ever over see the vast array of projects in the real world. Project management, by it very nature, does not belong to construction only . it can be used in every industry and sector. I have been fortunate to work outside the traditional building and engineering sector where 'projects' were managed to completion and I used basic time cost and quality as a basis to ensure success completion.	Time, Cost, Quality
1 7 3	A Good Project Manager needs to consider three main factors when monitoring a Project: Time, Cost and Quality to keep the Triangular area representing the size of the project. Time and Cost may be adjusted according to the constraints can face the project, but the Quality must remain the same to keep the standard.	Time, Cost, Quality
1 7 4	Development/Training of all other relevant stakeholders within the project environment. They as well need to understand the importance of meeting the project objectives across disciplines....it will make the life of the project management team much easier.	Training & Develop ment
1 7 5	Training on the job by experienced professionals and foremen to gain recognized trade qualifications. Apprenticeships were a slow but sure way that junior tradesmen gained all the skills required to be able to work unsupervised to achieve first class finishes. This method of solid training has all but disappeared and shortcuts taken by contractors, leave projects lacking in finishing skills. /	Training & Experien ce

1 7 6	Experience in dealing with soft issues.	Transfer able skills
1 7 7	Contractors lacking basic construction techniques.	Unskilled workforc e
1 7 8	Ensuring integrity in all dealings leading to full accountability of finances. Ensuring that the project gives end users expected value. Also ensuring that end users are consulted and given regular feedback on the project. This could avert some of the service delivery protests relating to public projects	Value Engineeri ng & manage ment
1 7 9	none	
1 8 0	N/A	
1 8 1	Please note that I retired in 2005	
1 8 2	What does the fourth question from the top of this page mean? / / Time cost and quality are all more important than registration	
1 8 3	Mainly involved in rural road and water supply projects,, and 90% civil engineering disciplines in completion of the projects.	
1 8	Question ambiguous	

4		
1 8 5	This response do not count.	
1 8 6	This response do not count.	
1 8 7	Weather and ROE	
1 8 8	not understand what you are looking for	
1 8 9	Please note that I have not been a Project Manager therefore I have selected 1 in those areas because there is no "NONE"	