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RESEARCH REPORT:

An Exploratory Study to Improving Project Success through Contractor-Project Manager planning in South Africa: A Collaborative Approach



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In partial fulfilment of the requirements for the degree of

Masters of Science

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DECLARATION

I declare that this research report is my own unaided work. It has been submitted for the Degree of Masters of Science in Building (Construction Project Management) at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.

_____

(Signature of Candidate)

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ABSTRACT

One of the causes of projects failing to meet their budget and schedule expectations is poor contractor performance. Small-medium sized contractors in the South African construction industry are faced with challenges such as poor management of cash flows, poor access to credit, not having enough capital to drive the project from their own coffers, challenges in obtaining finance, poor planning, challenges with getting competent staff, poor administrative capabilities, lack of experience and poor education, lack of management skills in general and the influence of the client such as imposing unrealistic deadlines. The competencies of the construction project manager are imperative to achieving project success in terms of meeting budget and time expectations. The specific competency of the construction project manager for handling small-medium sized contractors in South Africa are critical analysis, judgement, resource management, engaging communication and motivation.

This study explores the need for a collaborative planning framework between small medium sized contractors and the construction project manager in South Africa, to address poor technical and managerial skills of small-medium sized contractors.

Table of Contents

RESEARCH REPORT: 1
ABSTRACT 4
CHAPTER 1 – INTRODUCTION 8
1.1 Introduction 8
1.2 Problem Statement 11
1.2.1 Context 11
1.2.2 Empirical substantiation 12
1.2.3 Problem statement 13
1.3 Rationale for study 13
1.4 Aim of study 14
1.5 Research Objectives 14
1.6 Research Questions 14
1.7 Utility in domain 15
1.8 Ethical Considerations 15
1.9 Research scope 16
1.10 Delineation 16
1.11 Limitations 16
1.12 Assumptions 17
CHAPTER 2 LITERATURE REVIEW 18
2.1 Construction in Developing Countries 19
2.2 The South African Construction Industry 20
2.3 Small-Medium Sized Contractors in South Africa 22
2.4 The Project Manager 24
2.5 Definition of Project Success 25
2.6 The Construction Project Environment 25
2.7 The Project Manager's Competencies 26
2.8 Competency versus Competence 30
2.9 Summary 34
CHAPTER 3 – RESEARCH DESIGN 36
3.1 Introduction 36
3.2 Research Philosophy 38

3.2.1 Objectivism 38
3.2.2 Subjectivism 39
3.2.3 Positivism and Postpositivism 40
3.2.4 Interprevist/Constructivist 40
3.2.5 Transformative 41
3.2.6 Pragmatism 41
3.3 Research Design 41
3.3.1 Introduction 41
3.3.2 The Research Approach 41
3.3.3 The Research Paradigm 43
3.3.4 The Data Collection Method 44
3.3.5 The Data Collection Time Frame 45
3.3.6 The Research Setting 45
3.3.7 The Research Population and Sampling Technique 46
3.3.8 The Research Limitations to Design 47
3.5 Research Methodology 47
3.6 Population and Sampling 49
3.6.1 Sampling 49
3.6.2 Population size 50
3.6.3 Sampling Frame 50
3.6.4 Sampling Technique 50
3.6.5 Sampling Size 51
3.6.6 Data Collection 52
3.7 Data Analyses and Interpretation 52
3.7.1 Pattern matching 52
3.8 Reliability and Validity 53
3.9 Ethical Consideration 54
CHAPTER 4 – FINDINGS AND ANALYSIS 55
4.1 Findings 55
4.1.1 Challenges faced by small medium sized contractors in achieving project success 58
4.1.2 The biggest obstacles with regard to the small-medium sized contractor meeting or sticking to the planned programme completion dates 62
4.1.3 Small-medium sized contractors and planning adequately 65
4.1.4 How small-medium sized contractors could plan their projects adequately 68

4.1.5 How project managers perceive small-medium sized contractors execute the construction works 70
4.1.6 Five Most Important competencies/skills required a project manager to handle small-medium sized contractors 72
Preferred style of leadership best suited for small medium sized contractors 75
4.1.8 Professional construction project managers and training institute 76
4.1.9 Collaborative planning between the project manager and the contractor 77
CHAPTER 5 – DISCUSSIONS 82
5.1 Introductions 82
5.2 Challenges faced by small-medium sized contractors 83
5.3 Observations on how small-medium sized contractors execute their projects 84
5.4 Obstacles faced by small-medium sized contractors and not meeting or sticking to the planned programme completion dates 85
5.5 How can small-medium sized contractors adequately plan their projects 86
5.6 Collaborative planning between the Project Manager and the Small-medium sized contractor 87
5.7 Five most important competencies of project managers for handling small-medium sized contractors in South Africa 89
5.8 Preferred style of leadership 90
5.9 Competences of project management training institutes 91
5.10 Competency of the Project Manager 93
CHAPTER 6 – CONCLUSION AND RECOMMENDATIONS 96
REFERENCES AND ANNEXURES 99
References 99
Annexure 1 – Informed consent (see attached) 103
Annexure 2–Approved Ethics Clearance Form (see attached) 104
Annexure 3 – Questionnaires (see attached) 105

CHAPTER 1 – INTRODUCTION

1.1 Introduction

The African construction environment is one characterised by many challenges. It has been categorised by authors such as Du Plessis (2005) as one of the least developed continent. In an earlier article written by the same author, Du Plessis (2001) suggested that dominating the African development, including the construction industry, is the world imported from the West with its order, its advance technology, and its emphasis on economic growth and material wealth. Although the author spoke in terms of general economic development models and the article is more than a decade old, this statement remains relevant in all sectors of the African economy and in 2015. The imposition of models or systems imported from the West into all facets of African industries, with the expectation of a seamless application and implementation, is a naïve approach; one which is ignorant of Africa's current existing failing infrastructures and systems. The management tools and systems used by construction project managers, such as the Project Management Body of Knowledge (PMBOK), are tools developed in Westernised countries, in this case by the Project Management Institute (PMI) with their global headquarters in Philadelphia, Pennsylvania, USA.

The construction environment of developing countries on the African continent is fraught with many difficulties; these difficulties impair several other aspects such as the development of small-medium sized contractors in the region. Some of the challenges experienced with the development of small-medium sized contractors in the North-west of South Africa were identified to be lack of resources for training contractors including funds, poor construction procurement systems, lack of management capacity and resources to equip managers to operate their business enterprises effectively and efficiently. The major problems these small-medium sized contractors in South Africa face are: Government not paying on time, lack of capital and difficulty in arranging guarantees (Thwala and Phaladi, 2009).

In countries like Ghana, the determinants of construction business failure, according to the perspective of small-medium sized building contractors in the region were listed as the suspension of projects of previous government, delay in collecting debts from new political heads, financial demands from political heads, non-payment of interest on delayed payments, assigning incompetent project leader at the site, lack of access to capital, undervaluing of work done, change in government policies, low profit margin due to competition, delay in collecting payments, frauds/pilfering, lack of material control systems, poor monitoring and control, poor estimation practises, awarding contracts to incompetent political party members, poor tendering/selection procedure, high and unstable inflation

and national slump in the economy. A significant portion of the determinants identified as affecting these businesses in Ghana can be categorised as the influence of the Government (Mafinidiwo and Iyagba, 2015).

Malawi appears to be no different; lack of finance, training and business skills, limited skills in construction information technology, and prevalence of unethical conduct amongst some of the stakeholders. The same in Papua New Guinea; level of cash flow, financial skills, poor communication between the contractors and the client's site representative are the major factors affecting the performance of indigenous contractors (Mafinidiwo and Iyagba, 2015).

These current failing infrastructures and systems on the continent are evident. Another common thread weaving through, are the challenges facing small-medium sized contractors on the continent, which is their poor managerial and technical skills. Thwala and Phaladi (2009) found that owners of small-medium sized construction firms in the North-west of South Africa tend to manage their businesses themselves as a measure of reducing operational costs. Thwala and Mvubu (2008) say small-medium sized contractors in South Africa tend not to employ qualified workers; they consider them expensive. However, these contractors fail while doing things all by themselves or with cheap, incompetent workers. They lack skills to properly program projects resources in monthly segments for healthy cash flow; they are not allowed front load due to lack of trust; they do not know how to prepare documents for timely payment; delayed payment; they do not seem to understand terms of contract conditions; they do not know how to use applicable contract performance procedures to deal with clients; they do not get properly trained in this (Thwala and Mvubu, 2008).

The interesting part of this observation by the authors Thwala and Mvubu (2008) is that this ties up with the observations of Ofori (1991) in a research conducted almost two decades earlier. Ofori (1991) states that most construction companies in developing countries are sole ownerships, headed by entrepreneurs without expertise in construction, and with an interest in many other fields. Thus, the firms tend to be transient.

Furthermore, small-medium sized contractors are unwilling to employ qualified personnel. As a result, there are contractors executing construction projects with poor managerial and technical skills, who lack skills such as proper programming of their project resources in monthly segments for healthy cash flows. The implication of this statement is projects failing to meet their budget and schedule expectations as rightly identified by Rwelamila and Purushottam (2012), saying that majority of failed projects across both private and public sectors in Africa were as a result of projects failing to meet their budget and schedule expectations. It is also worth highlighting the continued presence of the situation identified by Thwala and Mvubu (2008) and Ofori (1991).

Another very important component in projects achieving their budget and schedule expectations is having the 'right' project manager on the project. Munns and Bjeirmi (1996) listed some factors which can cause a project to fail and amongst these factors was the wrong person as the project manager, implying the grave importance of the selection of the 'right' project manager on the project. The question becomes who or what is the right project manager?

Rwelamila and Purushottam (2012) assessed various projects across the continent in countries like Tanzania, South Africa, Botswana, Zimbabwe, Zambia, Malawi, Mozambique, and Angola and discovered that project failures across both public and private sectors were as a result of the organisational environment and the skills of the project manager. Project success is often as much the results of the organizational environment (with public and private sectors), as it is of the knowledge and skills of the project manager. Therefore the competency and training of the construction project manager on the project is imperative to the project achieving its budget and schedule expectations.

Project management guides developed in westernised countries such as the PMBOK guide emphasizes the project management processes required to plan, implement and close a project – project management efficiency. Looking at a number of project management books will alert a reader that most authors agree on the project life-cycle phases but not precisely on the actual processes and, hence the skills expected in each phase (Rwelamila and Purushottam, 2012). This profound statement of Rwelamila and Purushottam (2012) supports the argument that the imposition of models or systems imported from the West into all facets of African industries, with the expectation of a seamless application and implementation, is a naïve approach.

Competency frameworks for the project managers such as the project manager's competency development framework (PMCD) by the Project Management Institute (PMI) can be deemed as Western models. These frameworks do not specifically take into consideration the challenges faced by developing countries and as a result they do not address the issues that surround these countries, or as Rwelamila and Purushottam (2012) says on the actual processes and, hence the skills expected in each phase of project management.

To improve construction projects achieving their budget and schedule expectations in developing countries such as those found on the African continent, specifically South Africa, competency frameworks like the PMCD need to be adapted to take into consideration the environment and the surrounding challenges of the South African construction industry.

Du Plessis (2005) puts forward a strong argument stating, what is becoming clear, the two different worlds which is the West and Africa, needs to be reconciled and unified. Du Plessis (2005) also suggested that unifying the two worlds entails taking the best of each to build a new developmental

paradigm or in this case management model. The assumption of this study is that foreign competency frameworks do not take into consideration the environment of developing countries such as South Africa and therefore there is a need for the adaptation of these frameworks, to bridge the existing technical and managerial gaps of small-medium sized construction.

1.2 Problem Statement

1.2.1 Context

Ofori (2003) reports on project performance deficiencies in developing countries, while Dlungwana et al (2002) reports on poor contractor performance in South Africa. Both authors respectively demonstrate that developing countries show more project performance deficiencies, such as cost and time overruns, poor work quality, technical defects, poor durability, inadequate attention to safety, health and environmental issues (Ofori, 2003);and the causes of poor contractor performance being attributed to a lack of concern for the environment, late information and poor management of the design activities, inadequate or poor planning, poor management and low skills level among the workers (Dlungwana et al, 2002). Landoni and Corti (2011) on the other hand describe the project environment in developing countries as difficult due to poor infrastructure and lack of resources; which add to the complexity of the projects in these environments. Therefore projects in developing countries experience difficult project environments, poor contractor performance and project performance deficiencies. The corollary of the preceding statements is that projects operating in developing countries are not successful and that there are challenges that affect the growth and development of construction firms operating in these environments, especially small-medium sized contractors.

For the purposes of this research project success is defined as the project management success, which relates to the achievement of time, cost, quality or other goals set for the management of the project (Muller and Turner, 2010). However, the definition project success will be confined to projects achieving their budget and schedule expectations. The definition of a developing country adopted in this study is according to the 2014 definition of the World Bank. It is worth highlighting that the term developing economies or countries is used for convenience and it is not intended to imply that all economies in the group are experiencing similar development growth or have reached a preferred or final stage of development Ofori (1991).

1.2.2 Empirical substantiation

The menacing effect of the construction project environment in developing countries, as suggested by Dlungwana et al (2002), Ofori (2003) and Landoni and Corti (2011), are evident in recent times despite the fact that some of these articles were published over a decade ago. Difficult project environment, poor contractor performance and project performance deficiencies in developing countries can be said to manifest in the following ways:

1. One of the major causes of business failure for emerging contractors or small-medium sized construction firms in the North-west province of South Africa is the lack of effective management during the early stages of the business. The state of emerging contractors in South Africa continues to be unsustainable even with the existence of supportive programmes (i.e. contractor development and emerging contractor development programme) (Thwala and Phaladi, 2009).

2. Small building contractors in Nigeria are not ready to compete with the large construction firms as a result of lack of funds and poor management competencies, amongst other reasons (Mafinidiwo and Iyagba, 2015).

3. The most important deciding factors in the development of small contractors in Swaziland are to address the issue of access to finance, shortage of skills and adequate support from government must be a priority. Survival, growth and expansion of the small business sector are essential for economic growth and job creation in Swaziland (Thwala and Mvubu, 2008).

4. In Malawi, it is a case of lack of finance, training and business skills, limited skills in construction information technology, and prevalence of unethical conduct amongst some of the stakeholders (Mafinidiwo and Iyagba, 2015).

5. In Papua New Guinea it is a case of the level of cash flow, financial skills, poor communication between the contractors and the client's site representative are the major factors affecting the performance of indigenous contractors(Mafinidiwo and Iyagba; 2015).

These are the empirical substantiation of what Dlungwana et al (2002), Ofori (2003) and Landoni and Corti (2011) reported on their studies; an environment experiencing difficulties with projects, poor contractor performance and project performance. This indirectly or directly means unsuccessful projects and challenges affecting the growth and development of small-medium sized contractors in the region.

1.2.3 Problem statement

Projects in developing countries are complex as a result of its environment. In an earlier study conducted by Ofori (1991), the author highlights the poor technical and managerial skills of contractor's in developing countries as being one of the most important challenges facing the construction industries. Although Ofori (1991) spoke in a broad term, almost coercing all contractors operating in developing countries to conform to this description, about a decade after the publication of Ofori (1991)'s research, Dlungwana et al (2002) concurs with the author's findings. Dlungwana et al (2002) reports problems faced by contractors when delivering construction projects in South Africa as being poor work quality, low productivity, lack of concern for the environment, late information, poor management of the design activities, inadequate or poor planning, poor management and low skills level among the workers. The significance of this observation is an indication of a problem either in progression or in decline, nonetheless, a conspicuous problem. Projects are failing to achieve budget and schedule expectations and contractors have poor technical and managerial skills.

A decade after the publication of Dlungwana et al (2002)'s research and about two decades after Ofori (1991)'s research, Rwelamila and Purushottam (2012) assessed various projects across the continent in countries like Tanzania, South Africa, Botswana, Zimbabwe, Zambia, Malawi, Mozambique, and Angola and discovered that project failures were also as a result of the skills of the project manager. Though Rwelamila and Purushottam (2012) adds a different angle to the problem, by including the skills of the project manager, the issue of project success is a common factor.

The research problem is based on the poor technical – particularly poor planning and poor managerial skill of the small-medium sized contractors in developing countries, specifically in South Africa. The research seeks to explore the applicability of the findings of Ofori (1991), Dlungwana et al (2002) and the rest, as stated above in recent times. It also seeks to explore the relevance of their observations in the South African construction industry; and the role of the construction project manager in bridging the existing technical and managerial gaps of small-medium sized construction contractors.

1.3 Rationale for study

The rationale of the study is the need to improve project success among small-medium sized contractors in the South African construction industry through a collaborative planning framework between the contractor and the construction project manager.

1.4 Aim of study

The aim of this study is to explore how to improve construction project success of small-medium sized contractors within the South African construction industry. It focuses on the role of the construction project manager on construction projects in bridging the existing technical and managerial gaps of small-medium sized contractors on the continent; and the need for a collaborative planning framework between the contractor and the project manager.

1.5 Research Objectives

The objectives of the study are:

1. To investigate the challenges of the construction industry in South Africa.
2. To investigate the challenges small-medium sized contractors face in achieving project success, which is projects achieving their budget and schedule expectations in South Africa.
3. To identify the required perceived competency of the construction project manager in managing small-medium sized construction companies in South Africa.
4. To explore the need for a collaborative planning framework that addresses the technical and managerial gaps of small-medium sized construction firms in South Africa.

1.6 Research Questions

The research questions to be answered in this study are:

1. What is the African construction environment like?
2. What are the challenges associated with construction projects on the African continent, specifically in South Africa?
3. What are the challenges of small-medium sized construction companies on the African continent, specifically in South Africa?
4. What are the challenges of implementing a foreign competency framework in South Africa?

5. What is competence and competency? What competencies are required of a construction project manager in South Africa when handling small-medium sized construction companies?
6. Is there a need for a collaborative planning framework between the construction project managers and the small-medium sized contractor, which addresses the technical and managerial gaps of small-medium sized construction firms in South Africa?
7. What is project success? How can the project manager assist the small-medium sized construction contractors in achieving project success in the planning of the works?

1.7 Utility in domain

This will help construction project managers to work better with small-medium sized construction contractors in South Africa as follows:

1. This will help in bridging the existing technical and managerial gaps of small-medium sized contractors on the continent through the collaborative planning; thereby improving the chances of project success. This will help the clients get value for money as a result of improved successful project delivery through the collaborative planning.
2. The collaborative framework to be proposed could potentially contribute to the existing body of knowledge and which can form the basis for future further research.
3. This would bring to the fore discussions surrounding the role of the construction project manager in contributing to the development of the South African construction industry; and subsequently a new discussion concerning the risk and compensation of the risk associated with this proposed framework.

1.8 Ethical Considerations

The ethical considerations of the study are as follows:

1. The ethical concern of the research pertains to unintentionally undermining the competencies of small-medium sized contractors in South Africa and generalising all small-medium sized construction contractors in South Africa as having poor technical and managerial skills.
2. There is also a concern that construction project managers to be interviewed may be biased in their responses, so as not to portray themselves as being incompetent.
3. Another ethical concern is the unintentional discreditation of project management bodies such as the PMI and their importance as well as their contributions in the African construction industry.

1.9 Research scope

The scope of the research is in the area of the South African construction industry and the challenges that small-medium sized contractor's face. The research explores the construction project manager's competency required in handling small-medium sized contractors within the South African construction industry. This study also recognises the role of the construction project manager on construction projects in ensuring project success; as well as the gaps of small-medium sized contractors in South Africa, especially in the planning of construction works.

1.10 Delineation

A clear delineation is established between the competence and competency of the project manager, the role each plays in achieving project success. Another delineation established in this research is the definition of project success in terms of the overall project achieving its intended objectives and project management success which is achieving budget and schedule expectations. Another delineation established is the different project life cycle phases, focusing on just the planning phase. A clear distinction is made between a construction project manager or the client's project manager, from the contractor's construction manager. The two must not be confused. The construction project manager referred to in the text is the client's representative.

1.11 Limitations

The scope of this research is limited to the project manager's competency, small-medium sized contractors and the planning phase of the construction project in South Africa. This research is limited to examining projects that have adopted traditional project management procedure where the client appoints a project manager as an agent or part of his professional team and enters into a contract with the contractor. The various procurement methods and construction contracts used in South Africa are beyond the scope of this project. Nonetheless, it is recognised that these procurement methods and contracts may impact the role of the project manager and the competencies required of them. Project types assessed is limited to building projects including both renovations and new construction projects in both the public and private sectors.

1.12 Assumptions

1. The assumption made is that the construction project manager and the contractor are critical to the overall project success.
2. Construction project managers have received the critical pre-requisite training in the management of construction projects.
3. Poor project performance by small-medium sized contractors in South Africa is as a result of poor project planning.
4. The construction project manager's experience in managing and planning projects equips the project manager with the right tools to assist with bridging the technical and managerial gaps of small-medium sized contractors in South Africa.
5. The construction project manager has the competence in managing and planning the overall project.

CHAPTER 2 LITERATURE REVIEW

The challenges experienced with the development of small-medium sized contractors in South Africa, otherwise defined as emerging contractors in the study conducted, are the lack of resources for training contractors including funds, poor construction procurement systems, lack of management capacity and resources to equip managers to operate their business enterprises effectively and efficiently (Thwala and Phaladi, 2009).

In other African countries such as in Nigeria, despite government institutional and policy support to enhance the capacity of small and medium scale enterprises, they have fallen short of expectations. In the research conducted on indigenous building contractors in Nigeria and the challenges they face are in the area of working capital management revealed that there is low awareness for the need for working capital management, one man business setbacks, under-capitalization, poor funding and cash flow problems, high cost of construction finance, economic recession, reckless spending and diversion of funds, poor project planning and control (Mafinidiwo and Iyagba, 2015).

The relative lack of success among small and medium sized contractors in Swaziland was as a result of the following problems as: a lack of resources for either large or complex construction work; an inability to provide securities, raise insurance and obtain professional indemnity; the contracts were inevitably packaged in such a way as to exclude small contractors; inadequacy in technical and managerial skills required in project implementation; lack of continuity in relation to type, scale and location of work; an inadequate approach and insufficient knowledge, time and experience required for the whole process of finding work, once found, insufficient understanding of the contract documentation and the preparation and submission of tenders; slow and non-payment by Government after completing a government project(Thwala and Mvubu; 2008)

Critical challenges limiting small business performance in Nigeria revealed: limited access to credit/poor financing, high cost of doing business, inadequate social infrastructure, lack of managerial skills, inconsistent economic policies, and corruption and multiple taxes. Financial related challenges such as high interest rates associated with bank loans, lack of capital equipment, lack of access to funding from commercial banks and failure to give incentives by the government, were identified to be the most critical challenge small building contractors in Lagos, Nigeria face; while it was found that the competence of management has the most significant influence on the continual survival of medium to large construction firms in Nigeria (Mafinidiwo and Iyagba, 2015).

The relative lack of success facing small medium sized contractors in South Africa is as a result of inadequate finance and inability to get credit from suppliers; inability to employ competent workers; poor pricing; tendering and contract documentation skills; poor mentoring; fronting for established

contractors; lack of entrepreneurial skills; lack of technical, financial and contractual, and managerial skills; and late payment for the work done (Thwala and Phaladi, 2009).

In Ghana, the determinants of business failure from the perspective of small-medium scale building contractors are: the suspension of projects of previous government, delay in collecting debts from new political heads, financial demands from political heads, non-payment of interest on delayed payments, assigning incompetent project leader at the site, lack of access to capital, undervaluing of work done, change in government policies, low profit margin due to competition, delay in collecting payments, frauds/pilfering, lack of material control systems, poor monitoring and control, poor estimation practises, awarding contracts to incompetent political party members, poor tendering/selection procedure, high and unstable inflation and national slump in the economy. A significant portion of these determinants affecting these business failures in Ghana can be categorised as the influence of Government (Mafinidiwo and Iyagba, 2015).

It is evident that projects in developing countries are complex as a result of its environment. Projects are failing to achieve budget and schedule expectations and contractors have poor technical and managerial skills. Projects operating in developing countries are usually unsuccessful in terms of meeting their budget and schedule expectations and this is because there are challenges that affect the growth and development of construction firms operating in these environments, especially small-medium sized contractors.

2.1 Construction in Developing Countries

In many developing countries, as elsewhere, the construction industry is unable to attract persons of a high calibre and motivation (Ofori, 1991). According to Ofori (1991) larger contractors are able to recruit better workers as they offer more attractive wages and secure employment. Ofori (1991) also stated that the definition of a large contractor varies from one country to another. For the purposes of this study, large contractors are defined as contractors with an annual revenue of over R50 million; this definition is in accordance to the categorisation of Dlungwana et al (2002). The poor technical and managerial skill of contractors in developing countries is one of the most important problems facing the construction industries of these countries (Ofori, 1991).

The definition of a developing country adopted in this study is according to the 2014 definition of the World Bank which is based on the gross national income (GNI) per capital. As of 1 July 2014, low-income economies were defined as those with a GNI per capita, calculated using the *World Bank Atlas* method, of $1,045 or less in 2013; middle-income economies are those with a GNI per capita of

more than $1,045 but less than $12,746; high-income economies are those with a GNI per capita of $12,746 or more. Lower-middle-income and upper-middle-income economies are separated at a GNI per capita of $4,125. Low- and middle-income economies are sometimes referred to as developing economies. Although the term developing economies or countries is used for convenience; it is not intended to imply that all economies in the group are experiencing similar development or that other economies have reached a preferred or final stage of development. The merits of such categorisation and criteria of developing countries are recognised to have some influence in this topic area but it is beyond the scope of this research.

2.2 The South African Construction Industry

The South African construction industry is an important player in the economy of South Africa (Dlungwana et al, 2002). The industry faces some serious challenges in areas such as employment, slow delivery of public sector projects due to poor capacity– in the public sector institutions and of the contractors – low productivity, poor quality workmanship and low profit margins for contractors (Dlungwana et al, 2002).

Issues highlighted by Dlungwana et al (2002) are evident in an article written by Ofori (1996) on the challenges plaguing the South African construction industry. Ofori (1996) listed these challenges as low labour productivity in construction, undesirable industry practises during the apartheid government (that is the period before 1993), including excessive underbidding and a scramble for work outside practitioners' usual fields of operation, the industry failed to attract high-calibre young people, the drain of construction expertise out of the country and out of the industry resulting in a shortage of skills at many levels. These challenges listed are not peculiar to South Africa an earlier article written by Ofori (1991) reported that the recruitment of skilled workers, as well as the poor technical and managerial skill of contractors, were challenges of developing countries.

In South Africa problems facing small emerging contractors in the contractor development programs according to the CIDB, DPW and CETA (2005) are as follows: usually open adverts are placed in the media calling on people to come out and participate; it is very difficult for a selection process to capture those with the proper drive, passion and ability to work as contractors; this brings wrong people in the programs and drives them easily on the way; the required academic qualification is usually matric or less; no prior technical and managerial skills or experience in construction related fields are required; few matric holders make rare success; most successful contractors have degree or diploma in construction related field, with 5 – 10 years technical and managerial work experience; inadequate training done at short periods in between projects; unsuitable for the contractor's time and

project need; inappropriate trainers; clear-cut grading criteria had been elusive; recently CIDB graded and categorised the contractors (Thwala and Mvubu, 2008).

Contractors tend to not employ qualified workers; they consider them expensive, but they fail while doing things all by themselves or with cheap, incompetent workers; they lack skills to properly program projects resources in monthly segments for healthy cash flow; they are not allowed front load due to lack of trust; they do not know how to prepare documents for timely payment; delayed payment; they do not seem to understand terms of contract conditions; they do not know how to use applicable contract performance procedures to deal with clients; they do not get properly trained in this (Thwala and Mvubu, 2008).

These contractors are usually considered incapable of doing competent work, which imperils their relationship with the client's agent; they do not seem to know how to use applicable contractual instruments regarding instruction, demand for specific performance and payment; they are not properly trained; where they know these rules they fail to use them due to fear of being 'red listed; in an attempt to make huge profit they cut specified quality, do bad work that falls short of the design standards and specifications. Rejection of such work usually leads to non-payment, conflict and in most cases collapse of the contractors; and those that manage to win profitable contracts get only 2% profit if they are able to successfully complete the project; the situation seems discouraging (Thwala and Mvubu, 2008).

In a more recent research, according to the Construction Industry Development Board (CIDB) Small-Medium sized Enterprises Business Conditions Survey of 2014Q4 (October to December 2014), business confidence among small-medium sized enterprises was reported to be at its highest level since the 2nd quarter (April to June) 2009 survey. The business confidence index was measured by qualitative opinion surveys and has been proven both globally and domestically to be a reliable leading indicator of business activity.

The CIDB survey reports an increase in business confidence levels among small-medium sized building contractors in South Africa, in comparison to the survey results of the previous quarter 2014Q3 (July to September 2014). The increase in business confidence was attributed to an improvement in business conditions, building activity, employment and profitability.

The perceived improvement in profitability was linked to less keener tendering competition by contractors. The respondents of the CIDB survey indicated that tendering price competition was tougher than the previous corresponding year 2013Q4.

Business confidence among building contractors with CIDB grading 3 and 4 had more than doubled in comparison to the previous corresponding year 2013Q4. Business conditions were reported to have

improved considerably as building activities had picked up, employment levels had increased and pressure on profitability had subsided as a result of the less keen tendering competition by contractors. The report was similar for building contractors with CIDB grading of 5 and 6; as well as contractors with CIDB grading of 7 and 8 (CIDB Grading presented in Table 2.1).

One of the noticeable improvements in the South African construction industry according to the CIDB 2014Q4 report is the increase in employment levels and the perceived reduced pressure on profitability by the respondents of the report. These are improvements from the Ofori (1996) and Dlungwana et al (2002) report on low profit margins and excessive underbidding, scramble for work outside practitioners' usual fields of operation, loss of skilled workforce, the industry drain of construction expertise out of the industry and country.

Table 2.1: CIDB Contractor Grading

FINANCIAL CAPABILITY		METHOD A			METHOD B
Designation	Upper limit of tender value range	Best Annual Turnover	Largest Contract	Available Capital	Available Capital
1	200 000.00	No requirement	No requirement	No requirement	No requirement
2	650 000.00	No requirement	150 000.00	No requirement	No requirement
3	2 000 000.00	1 000 000.00	500 000.00	100 000.00	No requirement
4	4 000 000.00	2 000 000.00	1 000 000.00	200 000.00	No requirement
5	6 500 000.00	3 250 000.00	1 600 000.00	650 000.00	1 300 000.00
6	13 000 000.00	7 800 000.00	3 250 000.00	1 300 000.00	2 600 000.00
7	40 000 000.00	24 000 000.00	10 000 000.00	4 000 000.00	8 000 000.00
8	130 000 000.00	90 000 000.00	32 500 000.00	13 000 000.00	26 000 000.00
9	99 999 999 999.00	270 000 000.00	100 000 000.00	40 000 000.00	80 000 000.00

2.3 Small-Medium Sized Contractors in South Africa

Upon closer examination of the performance of contractors within the South African construction industry, different sets of observations are made from the CIDB 2014Q4 report. A study conducted by Thwala and Phaladi (2009) on problems facing emerging contractors in the North West province of South Africa found that major problems experienced by these contractors were, lack of adequate capacity to handle the uniqueness, complexity and risks in contracting; lack of effective management during their early stages; lack of basic business management such as poor record keeping and inadequate technical, financial and contract managerial skills. The question becomes the relevance

and applicability of these problems faced by emerging contractors as identified by Thwala and Phaladi in their study in 2009 in the North West province of South Africa, in 2014 in Johannesburg.

The relative lack of success facing emerging contractors in South Africa was a result of inadequate finance and inability to get credit from suppliers; inability to employ competent workers; poor pricing, tendering, and contract documentation skills; poor mentoring; fronting for established contractors; lack of entrepreneurial skills; lack of proper training; lack of resources for either large or complex construction work; lack of technical, financial, contractual, and managerial skills; and late payment for the work done (Thwala and Phaladi, 2009).

According to the authors (Thwala and Phaladi, 2009), emerging contractors were categorised as contractors with a CIDB grading from 1 to 4 (please refer to Table 2.1). The CIDB's definition of "Emerging enterprise" means an enterprise which is owned, managed and controlled by previously disadvantaged persons and which is overcoming business impediments arising from the legacy of apartheid. Therefore according to this definition an emerging contractor could have a CIDB grading as high as 9; however, Thwala and Phaladi (2009) limit the research sample to contractors with CIDB grading between 1 and 4.

The contractor grading designation according to the CIDB is determined by the financial capability and works capability of the contractor. The financial capability relates to the financial history (turnover), the value of completed contracts and the amount of working capital the contractor can muster to sustain a contract, i.e. available capital. Available capital is therefore determined from the liquid cash resources available to the contractor, including bank balances, loans that may be leveraged and any financial sponsorship. The works capability is determined by the largest contract the contractor has undertaken in the class of construction works (in this case, building works), the number of professionals employed and the fulfilment of relevant statutory requirements.

2.4 The Project Manager

It was discovered by Rwelamila and Purushottam (2012) with projects assessed over the continent covering countries like Tanzania, South Africa, Botswana, Zimbabwe, Zambia, Malawi, Mozambique, and Angola that project failures were a result of the skills of the project manager. Pant and Baroudi (2007) defines real success as knowing how to get things done through others. Whilst some may see managing the human issues within a project, as a soft option it is neither soft nor an option, if a project manager wants the project to succeed.

The influence of the project manager on the failure or success of a project as mentioned by Rwelamila and Purushottam (2012) is supported by a few other scholars. Starkweather and Stevenson (2009) explained that some scholars use a systems or process approach in defining project success by emphasising the construct of success, while others emphasise the human related factors or characteristics necessary to achieve such success.

Starkweather and Stevenson (2009) support the argument of Pant and Baroudi (2007) by asserting that the emphasis on human related factors are determinants or inputs of success, in lieu of systems or process data. El-Sabaa (2001) discovered from the raw scores collected from the research conducted that the human skill of the project manager is the most essential skill followed by conceptual and organisational skills, with technical skills being the least important in comparison to the list of other skills.

Tabish and Neeraj (2012) reiterates the importance of human-related factors and project-management actions on projects. Human-related factors and project-management actions play decisive roles in making a project successful. These factors are major driving forces behind each project management success.

Rwelamila and Purushottam (2012) say that there is sufficient evidence to suggest that most people in Africa become project managers by accident. The common path to become a project manager across public and private sectors is through expertise in a technical specialty (e.g., marketing, finance, education, economics, engineering, IT, construction, etc.) Rwelamila and Purushottam (2012). Eight out of ten project managers have technical skills only and are told to run projects. Rwelamila and Purushottam (2012) complain about the confusion of equating technical specialisations with project management competences. The technical part of a project is often the smallest and easiest part. Technical success, they further argue, does not necessarily lead to project success; it is necessary but not sufficient. The research done by El Saab (2001) concurs with this argument stating that the technical skill of the project manager is the least important in comparison to the human, conceptual and organisational skills.

2.5 Definition of Project Success

Delineation between project management success and project success must be established. The relationship between project management and the project success is less dependent than was first assumed. In other to measure project success, a distinction needs to be made between project success and project management activity (Muller and Turner, 2010).

Munns and Bjeirmi (1996) defined a project as being the achievement of a specific objective, which involves a series of activities and tasks that consume resources which has to be completed within a set specification, having definite start and end dates. They also defined project management as the process of controlling the achievement of the project objectives by utilising the existing organisational structures and resources; it seeks to manage, by applying a collection of tools and techniques. Brill et al (2006) supplements the aforementioned definition of project management as "the application of knowledge, skills, tools, and techniques to project activities to meet project requirements" and characterized "high quality projects as those that deliver the required product, service, or result, within scope, on time, and within budget". While Muller and Turner (2010) says project management success relates to the achievement of time, cost, quality or other goals set for the management of the project.

The objectives of project management success and project success are different. The control of time, cost and progress are often associated with the project management objectives and should not be confused with measuring project success (Munns and Bjeirmi, 1996). Project success relates to the achievement of planned business results using the project's outcome (typically a new product or service) and project management relates to the achievement of time, cost, quality or other goals set for the management of the project (Muller and Turner, 2010).

2.6 The Construction Project Environment

Projects in a real time environment tend to unfold as complex adaptive systems and effective project managers need to be the masters and leaders who can act and react in a timely manner without having to resort to time consuming analytical application of context dependent or independent techniques (Thomas and Mengel, 2008). Project Managers need to learn and practice how to lead changes into an unknown future by surfing on the edge of chaos (Thomas and Mengel, 2008).

Rwelamila and Purushottam (2012) mentioned that the majority of failed projects - amongst others – were as a result of inefficient projects. Inefficient projects were defined to be as a result of projects failing to meet budget and schedule expectations, Rwelamila and Purushottam (2012) termed it the African project failure symptom.

Dlungwana et al (2002) identified causes of projects failing to meet their budget and schedule expectations as being a result of poor contractor performance. Poor contractor performance is due to poor work quality and low productivity, poor management of the design activities, inadequate or poor planning, poor management and low skills level among the workers (Dlungwana et al, 2002). On the other hand Munns and Bjeirmi (1996) identified the three problems that occur on a project as being under-costing, overspending and late delivery. They suggested that project planning is needed to overcome these problems.

The study conducted by Hwang and Lim (2013) states that early project planning may not be a first priority due to the lack of a compelling reason to allocate the funds required. As a result, the building sector suffers from poor or incomplete scope definition, recurrently experiencing considerable changes that lead to significant cost and schedule overruns. Instead, a well-executed front-end plan can considerably reduce total project duration and design and construction costs (Hwang and Lim, 2013).

There is also the failure of many contractors to fully acknowledge construction issues like the significance of design integration and construction process, as well as the quality management process. The appointment of the right contractor will not only ensure the overall quality of the project but also offer the opportunity of saving on costs (Alzahrani and Emlsey, 2013).

2.7 The Project Manager's Competencies

The Project Management Institute (PMI) ascertains that the project manager's competencies have a direct effect on the performance of a project; however, the degree or extent of the project manager's impact on the success of the project may vary depending on certain factors such as project types and characteristics, or organizational context (PMCD, 2004).

Thomas and Mengel (2008) criticised the "Project Manager Competency Development Framework" as being a shopping list. It identifies a comprehensive list of knowledge and performance indicators including personal competencies crucial for project management success in addition to the application of project management knowledge. It does not address the learning or development issues around how

these skills, competencies and characteristics are to be acquired, when and at what level or for what kind of project. Project managers are rather left to choose among these lists based on their own best judgment. Edum-Fotwe and McCafer (2000) are of a different opinion. They suggest that to attain professional competency in project management, it is done with the combination of knowledge acquired during training, and skills developed through experience and the application of the acquired knowledge.

Hallgren and Blomquits (2012) criticised the teachings of business schools. The teachings of business schools are a poor portrayal of real life management practise. Although Hallgren and Blomquits (2012) spoke about management in general, the argument can be extended to project management. Hallgren and Blomquits (2012) accused the teachings of business schools as being overly analytical and excessively theoretical refined models that contain marginal real life content and have been identified as the contributing factor of the transfer of irrelevant knowledge.

The competencies of a project manager alone does not guarantee project success but project success requires the project manager with the right competencies as well as organisational project management maturity and capability (PMCD, 2004). Chua et al (2013) notes that project success is not determined exclusively by the project manager's monitoring, and control efforts but rather project success can be increased if inherent characteristics of the project is thoroughly understood. There are many factors that contribute to project success; and Alzahrani and Emlsey (2013) attributes construction projects and their success as being highly dependent on contractors.

Thomas and Mengel (2008) suggests that rather than training project managers to apply tools and techniques, we need to prepare them to diagnose situations, adopt and adapt appropriate tools and techniques as necessary, and to learn continuously. Muller and Turner's (2010) support the argument by profiling the personalities of successful managers. Profiles are often used to relate the profile dimensions to success or failure in a person's leadership position, or alternatively select or develop managers from the match between existing profiles of successful managers and those of candidates for appointment to management positions.

Edum-Fotwe and McCafer (2000) acknowledges that the competencies of the project manager vary in their depth and breadth. This is dependent on the type and scope of the project. The project manager can acquire these competencies through qualification programs but, nonetheless, need to have periods of exercising and applying them in order to transform competencies into expertise.

The technical skill of the project manager was reported by El-Sabaa (2001) to be the least essential skill in comparison to human and conceptual skills. The human skill of the project manager was discovered by El-Sabaa (2001) to be the most essential skill of the project manager. El-Sabaa (2001)

classified the human skill of the project manager into mobilisation, communication, coping with situations, delegation of authority, political sensitivity, high self-esteem and enthusiasm.

Traditional project management competencies critical for project success, are communication between team members and the entire network, vital to support a shared understanding of the project and its goals. Managing projects successfully therefore requires a mixture of skills including interpersonal ability, technical competencies and cognitive aptitude, along with the capability to understand the situation and people and then dynamically integrate appropriate leadership behaviours (Pant and Baroudi, 2007).

Project outcomes are achieved through people, using their knowledge and creativity not through the mere use of techniques or hardware. Relationship skills complement the effectiveness of hard skills. Creating the right relationships with team members and other stakeholders is one of the biggest challenges that face project managers. This requires them to cultivate both hard and soft skills (Pant and Baroudi, 2007).

A thorough study conducted by Mosaics Project Services Pty LTD (2010) revealed that creating a unified team is required to create an environment where outstanding results can be achieved. Pant and baroudi (2007) acknowledged that creating the right relationship with the team and stakeholders is a big challenge for the project manager. Mosaics Project Services Pty LTD (2010) suggests that the project manager should do the following to create a unified team:

1. Make sure adequate time is spent at the pre-planning stage.
2. An attitude of openness and trust is required to make collaborative working successful.
3. Encourage a team focus on “What is best for the Project”.
4. Include all of the organisations engaged on the project including sub-contractors from as far down the supply chain as possible - they do most of the work!
5. Ensure processes exist to resolve technical differences (schedule / cost / scope) – independent experts can be helpful.

The project manager should have enough adaptive capacity to handle the level of environmental complexity and change found on many projects today. The translation of the project manager having enough adaptive capacity is that project managers should have a high degree of self-reference, the ability to thrive on change, a solid foundation in traditional methods and techniques, and the ability to adapt to change and develop new approaches on the fly – called the ‘‘resilience factor”(Thomas and Mengel, 2008).

IT executives nationwide value six critical core competencies in project managers which are leadership, the ability to communicate at multiple levels, verbal and written skills, attitude and the ability to deal with ambiguity and change, as opposed to competencies such as experience, work, history, education and technical expertise according to Starkweather and Stevenson (2009).

This argument by Starkweather and Stevenson (2009) supports El-Sabaas (2001) argument concerning the technical skill of the project manager as being the least essential skill in comparison to human and conceptual skills. The argument by Starkweather and Stevenson (2009) concerning the project managers ability to deal with ambiguity and change also concurs with the recommendations of Thomas and Mengel (2008), which states that the project manager should have a high degree of self-reference and the ability to thrive on change. A summary of the project manager's competencies is presented in the ensuing Table 2.2.

Table 2.2: Dimensions of Leadership, Muller and Turner (2009)

	Application type	Complexity		Importance			Contract type		
	Engineering & Construction	Medium	High	Mandatory	Renewal	Repositioning	Fixed price	Remeasurement	Alliance
IQ									
Critical thinking	High	High	High	High	High	High	High	High	High
Vision	Low	Low	High	Medium	Low	Medium	High	Low	Medium
Strategic perspective	Medium	Medium	High	Medium	High	Medium	High	Low	Low
MQ									
Managing resources	Medium	High	High	High	High	High	High	High	High
Communication	Medium	Medium	High	Medium	High	High	High	Medium	High
Empowering	Low	High	High	High	High	High	High	Medium	Medium
Developing	High	High	High	High	High	High	High	High	Low
Achieving	Medium	Medium	High	Medium	High	Medium	High	Low	High
EQ									
Self-awareness	Medium	High	High	Medium	High	Medium	High	High	High
Emotional resilience	Low	Medium	High	Medium	High	High	High	High	Medium
Intuitiveness	Low	Medium	High	Medium	Medium	High	Medium	Medium	Low
Sensitivity	Medium	High	High	High	High	High	High	High	High
Influence	High	High	High	High	High	High	High	High	High
Motivation	High	Medium	High	High	Medium	High	High	High	High
Conscientiousness	High	High	High	High	High	High	High	High	High

Muller and Tuner (2009) reported that the project manager leadership competency profile differ in some project types in order to be successful. They found that the most eligible leadership profile of project managers of different project types were high expressions of critical thinking (in the IQ sub-dimension), influence, motivation and conscientiousness (EQ sub-dimension) in successful project managers in all types of projects (please refer to all fifteen dimensions of leadership presented in Table 2.2).

Table 2.3: Summary of the Project Manager's competencies

El Saab (2001)	Thomas and Mengel (2008)	Starkweather and Stevenson (2009).	Muller and Turner (2009)
1. Human skills - which are:	1. Adaptive capacity - which are:	1. Leadership	1. Critical thinking
1.1. Mobilisation	1.1. High degree of self-reference	2. Ability to communicate at multiple levels	2. Influence
1.2. Communication	1.2. Ability to thrive on change	3. Verbal and written skills	3. Motivation
1.3. Coping with situations	1.3. Solid foundation in traditional methods and techniques	4. and ability to deal with ambiguity and change	4. Conscientiousness
1.4. Delegation of authority	2. Ability to adapt to change and develop new approaches on the fly - resilience factor		
1.5. Political snesitivity			
1.5. High self-esteem			
1.4. Enthusiam			
2. Conceptual skills			
3. Technical skills			

2.8 Competency versus Competence

The project management institute's (PMI) project manager competency development framework (PMCD) uses the words competency and competence interchangeably. According to the PMCD's definition of competence, it is broken into the three separate dimensions including project management knowledge, project management performance and personal competency. Project management knowledge is what the individual project manager brings to a project-related activity through their knowledge and understanding of project management. Project management performance is what the project manager is able to demonstrate in their ability to successfully manage the project or complete project-related activities. Finally, the personal competency of the project manager is the core personality characteristics underlying a person's capability to do a project or project-related activity. Competency in this case is viewed as a subset of competence.

Similar to the PMCD's definition is the definition of Le Deist and Winterton (2005). Le Deist and Winterton (2005) categorised competence into three dimensions. The first dimension is cognitive competence, second is functional competence and third is social competence. Cognitive competence is defined as an individual's knowledge and understanding of their job or task. Functional competence is the individual's skill applied to their job or task. Finally, social competence is the behavioural and attitudinal contribution of an individual towards their job or task.

Combining the definition of the PMCD and Le Deist and Winterton (2005), the project management knowledge of the project manager can be referred to as the project manager's cognitive competence. The project management performance of the project manager can be referred to as the project manager's functional competence. Finally, the personal competency of the project manager can be referred to as the social competence of the project manager. Madter et al (2012) says competency is solely the personal attributes found in the underlying dimension of behavioural action.

Madter et al (2012) also says that the collection of knowledge, personal attitudes, skills and relevant experience needed for a project manager to be successful in a certain function is called competence, which is in contrast to what PMCD and Le Deist and Winterton (2005) are in favour of. They say competence can be broken down into three dimensions; in which competency is a subset of competence and not a subset of behavioural action as Madter et al (2012) suggests.

Muller and Turner (2010) take on a completely different approach to competency. They associate the personal characteristics of the manager – which according to the aforementioned definition of competency can be called social competence or personal competency of the manager – with their leadership style. They focus on the competency of the manager by dividing competency, which can also be referred to as social competence or personal competency, into fifteen dimensions of leadership.

Muller and turner (2010) state that, managers are more likely to perform better or to stay longer in their position if their personal characteristics meet the requirement of the position. A popular way to identify the personal characteristics of the manager is by profiling the personalities of successful managers. Profiling provides the idiosyncratic combination of behavioural, temperamental, emotional and mental attributes of the leader, in order to derive a person's particular leadership style.

Cheng et al (2005) suggested that the overall competence and competency of the project manager can be identified by adopting a holistic approach. This holistic approach focuses on the job role – i.e. looking at the project management performance and the project management knowledge; and the characteristics of the individual which is the person's behaviour underpinning competent performance.

Cheng et al (2005) says there are two approaches to overall competence of the project manager. The first approach to competence is the attribute based approach, which simply means that competence can be defined as encompassing knowledge, skills, attitudes and behaviour; which PMCD and Le Deist and Winterton (2005) termed personal competency and social competence. So essentially, the overall competence of the project manager can be identified through their personal competency or social competence.

The second view or approach according to Cheng et al (2005) is performance-based which assumes that competence can be inferred from demonstrated performance at pre-defined acceptable standards in the workplace. What this implies is that the overall competence of the project manager can be identified through their functional competence or project management performance.

Le Deist and Winterton (2005) mentions that these attributes used – which is the competency of the individual, the behaviour as a whole –, in accomplishing work are bound to the work context regardless of the level of competence, that is, the level of performance or functional competence and the level of knowledge or cognitive competence attained. In work situations individuals acquire situational or context-dependent knowledge and skills.

Le Deist and Winterton (2005) argue that the competency or behaviour of the project manager on a project is context-dependent or situational and is regardless of the level of competence attained by the project manager.

So in reviewing the arguments put forward thus far on competence and competency, Cheng et al (2005) says you can either classify the project manager by attribute based approach also known as personal competency by PMCD and social competence by Le Deist and Winterton (2005); or by the project manager's performance also known as project management performance by PMCD and functional competence by Le Deist and Winterton (2005). While Muller and Turner (2010) say managers are more likely to perform if their personal characteristics meet the requirement of the position. Although, Rwelamila and Purushottam (2012) make a strong call for project management competence as a starting point for achieving project success.

Merging the arguments put forward by Cheng et al (2005) and Le Deist and Winterton (2005) implies that the behaviour or personal competency of the project manager in various contexts or situations is regardless of the level of cognitive competence (or the project management knowledge competence) and the functional competence (or the project management performance competence) attained. The variable factor context and situational dependent is the behaviour of the project manager on the project. Therefore it is necessary to focus on the attribute based approach according to Cheng et al (2005), which is the knowledge, skills, attitudes and behaviour, of defining the project manager's

competence. Thus, it is worthwhile to take the approach suggested by Muller and Turner (2010), by examining the personal characteristic of the project manager and their associated leadership style, effective in various contexts or situations. Muller and Turner (2010) further stated that project performance can be impaired on some types of project if project managers do not adapt their leadership style to the type of project.

The merits of the various styles of leadership and their definitions are recognised to have some influence in this topic area but it is beyond the scope of this research. In one of the few works on construction leadership in a developing country, transformational leadership was found to be the major style for construction projects in a developing country. It was found that transformational leadership generated better leadership outcomes than either the transactional or *laissez-faire* styles. Transformational leadership produces higher work quality and volume, as well as creative problem-solving by subordinates (Ofori and Toor, 2012). This argument is somewhat supported by Muller and Turner (2010), they suggested that transactional leadership and concern for process is more important on relatively simple projects, but transformational leadership and concern for people, is necessary on more-demanding projects.

Ofori and Toor (2012) introduced a different leadership construct, which is the idea of authentic leadership. “Authentic leaders” are thought to possess the highest level of integrity, a deep sense of purpose, courage, genuine passion and leadership. This construct is supported by Thomas and Mengel (2008) who stated that project managers need to develop the emotional and spiritual skills and capabilities to create buy-in and provide orientation even in complex, unknown and uncertain environments. The importance of vision, values, and beliefs are required from project managers in complex environments.

Authentic leadership is the most suitable construct for construction industries in developing countries where vision is critical, hope, dedication and tenacity are needed, human relationships matter, doing things with the heart is important and the different (and often conflicting and competing) interests of many stakeholders must be considered in all endeavours (Ofori and Toor, 2012). However, Ofori and Toor (2012) also noted that this style of leadership appeared to encompass too many "positive" elements and seemed too good to be realistic.

The control of time, cost and progress are often the project management objectives and should not be confused with measuring project success (Munns and Bjeirmi, 1996). Successful project management, according to Munns and Bjeirmi (1996) requires:

1. Planning with a commitment to complete the project;
2. Careful appointment of a skilled project manager;

3. Spending time to define the project adequately;
4. Correctly planning the activities in the project;
5. Ensuring correct and adequate information flows;
6. Changing activities to accommodate frequent changes on dynamic;
7. Accommodating employees' personal goals with performance and rewards;
8. And making a fresh start when mistakes in implementation have been identified.

The focus on the article by Munns and Bjeirmi (1996) is on planning with a commitment to complete the project and the careful appointment of a skilled project manager for successful project management on the project. Rwelamila and Purushottam (2012) say that traditional project management in Africa is often conducted through intuitions and experience. In a majority of cases, individuals are appointed as project managers because they have qualifications in the same field as the project's core business but no real experience in the management of a project. Appointing project managers based on their technical expertise and project managers running projects based on intuition and experience has led to some serious deficiencies and failures; although no other study has empirically provided a causal link between the project failures and lack of project management competence. Menches and Hanna (2006) say that intuitively, most contractors also believe better planning can lead to more successful project performance but the evidence has been mostly anecdotal.

As a last paragraph before the summary, discuss competence/competency in the lights of the project manager and the contractor to establish a case for this study's premise on "improving project success through contractor-project manager planning in South Africa: a competency framework approach".

2.9 Summary

Small-medium sized contractors in developing countries such as those found on the continent are generally unsuccessful because of low awareness for the need for working capital management, one man business setbacks, employing incompetent staff, under-capitalization, poor funding and cash flow problems, high cost of construction finance, economic recession, reckless spending and diversion of funds, poor project planning and control,

The challenges that small medium sized contractors face in their development are the lack of resources for training contractors including funds, poor construction procurement systems, lack of management capacity and resources to equip managers to operate their business enterprises effectively and efficiently limited access to credit/poor financing, high cost of doing business, inadequate social infrastructure, lack of managerial skills, inconsistent economic policies, and

corruption and multiple taxes. The conclusion is that small-medium sized contractor in developing countries such as those on the African continent lack technical and managerial skills, as a result, projects are not meeting their budget and schedule expectations

The skill of the project manager affects the successful delivery of the project management objectives such as cost and time control. The personal competency or social competence of the project manager affects the perceived competence of the project manager. The personal characteristic or competency of the project manager on a project is context-dependent and situational so therefore profiling the personal characteristic of the project manager is essential to their performance. Planning with a commitment to complete the project also affects the successful delivery of the project management objectives such as cost and time.

How can project success, of small-medium sized contractors within the South African construction industry, be improved? How can the construction project manager on construction projects play a role in bridging the existing technical and managerial gaps of small-medium sized contractors on the continent?

For the purpose of this research, the definition of the small-medium sized contractor will be in accordance to the illustrations presented in Table 2.4 by Dlungwana et al (2002). Dlungwana et al (2002) illustrates a simplified structure of South African contractors; and the CIDB grading for general building contractors (GB). Contractors with a grading designation of 1 to 7 fall under the category of small-medium sized contractors in South Africa according to Dlungwana et al (2002) illustrations presented in Table 2.4.

Table 2.4: Structure of the Contractors in South Africa, Dlungwana et al (2002)

Category	Economic Sector	Annual Turnover	Management Skills Level
SMALL	Formal	Less than R 10 Mill	Very Poor & Fair
	Informal		
MEDIUM	Formal	R 10 Mill - R 50 Mill	Poor, Fair, Good & Very Good
	Informal		
LARGE	Formal	Above R 50 Mill	Fair, Good & Very Good

CHAPTER 3 – RESEARCH DESIGN

3.1 Introduction

Research can be defined as a systematic investigation or inquiry whereby data is collected, analysed and interpreted in some way in an effort to understand, describe, predict or control an educational or psychological phenomenon or to empower individuals in such contexts. In relation to the research topic, the investigating methods and research paradigm or methodology utilised in unravelling the research problem is described in this section. Research is influenced by the researcher's theoretical framework, with theory being used to establish relationships among or between constructs that explain a phenomenon, by going beyond the local event and trying to connect it with similar events (Mackenzie and Sally, 2006).

The research methodology of a research can also be called the paradigm of the research. A paradigm is a loose collection of logically related assumptions, concepts, or propositions that orient thinking and research or the philosophical intent or motivation for undertaking a study (Mackenzie and Sally, 2006).

Some researchers define the paradigm of a research as three elements: a belief about the nature of knowledge, a methodology and criteria for validity. Some researchers prefer to discuss the interpretive framework in terms of 'knowledge claims'; epistemology or ontology; or research methodologies rather than referring to paradigms. The paradigm of research can also be described as the theoretical framework and it influences the way knowledge is studied and interpreted. The paradigm choice of this research sets down the intent, motivation and expectations for this research (Mackenzie and Sally, 2006).

Research methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically. In it we study the various steps that are generally adopted by a researcher in studying the research problem along with the logic behind them. It is necessary for the researcher to know not only the research methods/techniques but also the methodology. Researchers not only need to know how to develop certain indices or tests, how to calculate the mean, the mode, the median or the standard deviation or chi-square, how to apply particular research techniques, but they also need to know which of these methods or techniques, are relevant and which are not, and what would they mean and indicate and why. Researchers also need to understand the assumptions underlying various techniques and they need to know the criteria by which they can decide that certain techniques and procedures will be applicable to certain problems and others will not (Kothari, 2004).

Research methods or techniques refer to the methods researchers use in performing research operations. In other words, all those methods which are used by the researcher during the course of studying his research problem are termed as research methods. Since the object of research, particularly the applied research, is to arrive at a solution for a given problem, the available data and the unknown aspects of the problem have to be related to each other to make a solution possible. Keeping this in view, research methods can be put into the following three groups (Kothari, 2004):

1. In the first group we include those methods which are concerned with the collection of data. These methods will be used where the data already available are not sufficient to arrive at the required solution;

2. The second group consists of those statistical techniques which are used for establishing relationships between the data and the unknowns;

3. The third group consists of those methods which are used to evaluate the accuracy of the results obtained.

A good research design is often characterised by adjectives like flexible, appropriate, efficient, and economical and so on. Generally, the design which minimises bias and maximises the reliability of the data collected and analysed is considered a good design. The design which gives the smallest experimental error is supposed to be the best design in many investigations. Similarly, a design which yields maximal information and provides an opportunity for considering many different aspects of a problem is considered most appropriate and efficient design in respect of many research problems (Kothari, 2004).

The purpose of a research may be exploratory, descriptive, explanatory or policy oriented. These categories are not mutually exclusive; they are a matter of emphasis. As any research study will change and develop over time, you may identify more than one purpose (Harvard, 2015).

An exploratory research involves the exploration of new phenomena. This kind of research is used to obtain a better understanding, test the feasibility of a more extensive study, or determine the best methods to be used in a subsequent study. For these reasons, exploratory research is broad in focus and rarely provides definite answers to specific research issues. The objective of exploratory research is to identify key issues and key variables. For example, one outcome might be a better system of measurement for a specific variable. If you define your study as exploratory research, then you need to clearly define the objectives (Harvard, 2015).

Descriptive research seeks to provide an accurate description of observations of phenomena. For example, in a case of obtaining information about a national population, the object of the collection of census data is to accurately describe basic information about the national population at a particular

point in time. The objective of much descriptive research is to map the terrain of a specific phenomenon (Harvard, 2015).

Explanatory studies look for explanations of the nature of certain relationships. Hypothesis testing provides an understanding of the relationships that exist between variables. The degree of uncertainty about the research problem determines the research methodology (Harvard, 2015).

Policy oriented research focus on the question 'How can problem X be solved or prevented?' For example, the writer may wish to investigate such problems as high rates of labour turnover, how the firm can prevent collusive fraud, how to introduce an e-commerce operation in the company and so on. Note that policy-oriented research requires explanatory level research to back it up in a conclusive manner. Policy-oriented research requires a theoretical foundation (Harvard, 2015).

3.2 Research Philosophy

In the process of developing the interpretive framework, the researcher's theory of knowledge and perception of reality must be established; theory of knowledge can also be referred to as the epistemology, while the perception of reality is referred to as the ontology (Lynch, not dated). There are two main approaches to social science, namely a subjectivist view or an objectivist view, see figure 1 below (Lynch, not dated).

3.2.1 Objectivism

The objectivists approach sees the researcher as being able to set aside their own set of interests, values, and skills and so on in the choice of the research methodology (Lynch, not dated. Objectivists believe that they are independent of the subject of research and they neither affect nor are affected by the subject of the research (Lynch, not dated). Objectivists identify causal explanations and fundamental laws that explain regularities in the research. To achieve this end, the generalisation of results from ample sample sizes is necessary, utilising a hypothetico-deductive process (Lynch, not dated). Hypothetico-deductive process entails the formulation of hypotheses developed from the researcher's conceptualisation of a particular phenomenon. The approach involves the quantitative operationalisation of concepts, which involves reductionism, that is, the problem is reduced to its smallest elements (Lynch, not dated).

3.2.2 Subjectivism

While the subjectivists, believe that reality is socially constructed and is dependent on social actors. They argue that researchers cannot distance themselves from what is being observed, the study's subject matter or the methods of study. In other words, the researcher is value-laden with inherent biasness reflected by their background, status, interests, beliefs, skills and values. Subjectivists argue that the involvement of the researcher should be actively encouraged. They also focus on the meaning of social phenomena rather than its measurement. Their goal is to understand and to explain a problem in its contextual setting (Saunders et al, 2012). Subjectivists do not perceive that it is a question of causality but rather it is a question of the meaning individuals attach to a given situation. It is pointless to categorise phenomena into causes and effects because phenomena are engaged in a process of continuous creation (Lynch ,not dated). This argument by Lynch (not dated) is essentially supported by Saunders et al (2012), who reckons that subjectivism asserts that social phenomena are created from the perceptions and consequent actions of social actors.

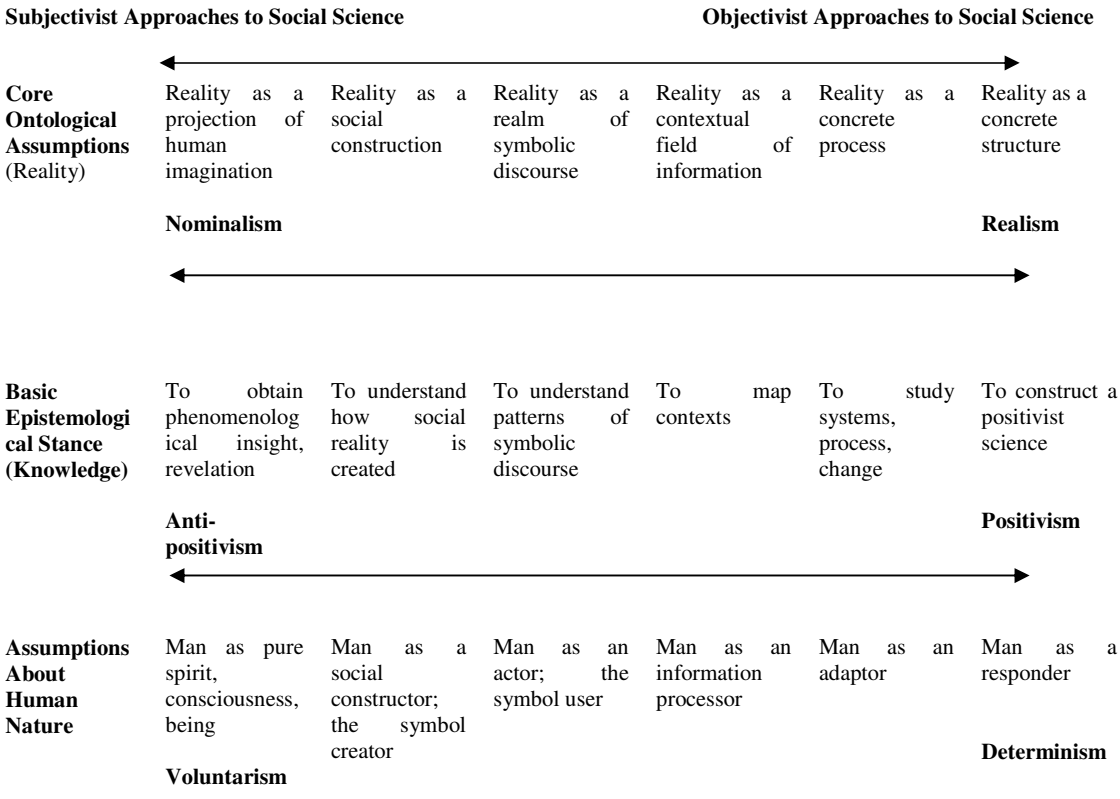

Figure 1 Network of Basic Assumptions Characterising the Subjectivist-Objectivist Debate within Social Science

Under these two approaches are a number of theoretical paradigms, which highlights the various ways knowledge is studied and interpreted, some of these are discussed in this section: positivist (and postpositivist), constructivist, interpretivist, transformative, emancipatory, critical, pragmatism and deconstructivist (Mackenzie and Sally, 2006).

3.2.3 Positivism and Postpositivism

Positivism is sometimes referred to as 'scientific method' or ' science research', is based on the rationalistic, empiricist philosophy and reflects a deterministic philosophy in which causes probably determine effects or outcomes. Positivism may be applied to the natural world, that there is a method for studying the social world that is value free, and that explanations of a casual nature can be provided. Positivists aim to test a theory or describe an experience "through observation and measurement in order to predict and control forces that surround us" (O'Leary, 2004). Positivism was replaced after World War II (Mertens, 2005) by postpositivism.

Postpositivists work from the assumption that any piece of research is influenced by a number of well-developed theories apart from, and as well as, the one which is being tested. Postposivitisim is intuitive and holistic, inductive and exploratory with findings that are qualitative in nature; this conflict with the widely used definition provided by Mertens (2005) stating that positivism and postpositivism are commonly aligned with quantitative methods of data collection and analysis (Mackenzie and Sally, 2006).

3.2.4 Interprevist/Constructivist

The interprevisit/constructivist paradigm suggests that "reality is socially constructed" (Mertens, 2005). The interpretivist/constructivist researcher tends to rely upon the "participants' views of the situation being studied" (Creswell, 2003) and recognises the impact on the research of their own background and experiences. Constructivists do not generally begin with a theory (as with postpositivists) rather they "generate or inductively develop a theory or pattern of meanings" (Creswell, 2003) throughout the research process. The constructivist researcher is most likely to rely on qualitative data collection methods and analysis or a combination of both qualitative and quantitative methods (mixed methods). Quantitative data may be utilised in a way, which supports or expands upon qualitative data and effectively deepens the description (Mackenzie and Sally, 2006).

3.2.5 Transformative

Transformative researchers "believe that inquiry needs to be intertwined with politics and a political agenda" (Creswell, 2003) and contain an action agenda for reform "that may change the lives of the participants, the institutions in which individuals work or live, and the researcher's life" (Creswell, 2003). Transformative researchers may utilise qualitative and quantitative data collection and analysis methods in much the same way as the interpretivist/constructivists. However, a mixed methods approach provides the transformative researcher structure for the development of "more complete and full portraits of our social world through the use of multiple perspectives and lenses" (Somekh and Lewin, 2005), allowing for an understanding of "greater diversity of values, stances and positions" (Somekh and Lewin, 2005) (Mackenzie and Sally, 2006).

3.2.6 Pragmatism

Pragmatist researchers focus on the 'what' and 'how' of the research problem (Creswell, 2003). Early pragmatists "rejected the scientific notion that social inquiry was able to access the 'truth' about the real world solely by virtue of a single scientific method" (Mertens, 2005, p.26). While pragmatism is seen as the paradigm that provides the underlying philosophical framework for mixed-methods research (Tashakkori and Teddlie, 2003; Somekh and Lewin, 2005) some mixed-methods researchers align themselves philosophically with the transformative paradigm (Mertens, 2005). The pragmatic paradigm places "the research problem" as central and applies all approaches to understanding the problem (Creswell, 2003). With the research question 'central', data collection and analysis methods are chosen as those most likely to provide insights into the question with no philosophical loyalty to any alternative paradigm (Mackenzie and Sally, 2006).

3.3 Research Design

3.3.1 Introduction

The research design for this study is described in this section. The theoretical framework of this research will influence the way knowledge is studied and interpreted; thus must be clearly defined.

The researcher's philosophical stance and approach to the research problem is a subjectivist approach. There are social-actors behind the occurrence of the phenomenon observed – that is construction projects executed by small-medium sized contractors on the African continent, specifically in South Africa, are failing to meet their budget and schedule expectations; this is established in the literature review and there are social actors responsible for this occurrence.

3.3.2 The Research Approach

To achieve the research objectives of this study, an exploratory approach will be used. These objectives are: investigating the challenges associated with the construction industry of developing

countries on the African Continent, specifically South Africa; the challenges of small-medium sized contractors in achieving project success in terms of budget and schedule expectations; the appropriateness of implementing a foreign competency framework among project managers in South Africa; identifying the perceived specific competency of the construction project manager in managing small-medium sized construction companies in South Africa; and the need for a framework that addresses the specific competency needs of construction project managers on projects with small-medium sized construction firms in South Africa.

The justification behind opting for an exploratory research is because the key variables of the research have been defined from previously published studies and have been identified in the literature reviews, see Table 3.1. These key variables are: projects in developing countries experience difficult project environments, poor contractor performance (poor technical and managerial skills) and project performance deficiencies (projects failing to meet their budget and schedule expectations); and the importance of the construction project manager in delivery a successful project (to budget and time expectations).

Table 3.1: Choosing a research approach, (Harvard, 2016).

	Exploratory Research	Descriptive Research	Explanatory Research
Degree of Problem Definition	Key variables not defined	Key variables are defined	Key variables and key relationships are defined
Possible Situations	"Quality of service is declining and we don't know why."	"What have been the trends in organisational downsizing over the past ten years?"	"Which of two training programs is more effective for reducing labour turnover?"
	"Would people be interested in our new product idea?"	"Did last year's product recall have an impact on our company's share price?"	"Can I predict the value of energy stocks if I know the current dividends and growth rates of dividends?"
	"How important is business process re-engineering as a strategy?"	"Has the average merger rate for financial institutions increased in the past decade?"	"Do buyers prefer our product in a new package?"

In other to achieve the research aim of the study which is to explore how to improve construction project success of small-medium sized contractors within the South African construction industry by exploring the role of the project manager in bridging the existing poor technical and managerial gaps of small-medium sized contractors South Africa; as well as exploring the need of a collaborative planning framework between the contractor and the project manager, this research will be an interprevisit/constructivist paradigm, see Table 3.2 below.

Table 3.2: Research Paradigm, (Mackenzie and Sally, 2006).

Positivist/ Postpositivist	Interpretivist/ Constructivist	Transformative	Pragmatic
Experimental Quasi-experimental Correlational Reductionism Theory verification Causal comparative Determination Normative	Naturalistic Phenomenological Hermeneutic Interpretivist Ethnographic Multiple participant meanings Social and historical construction Theory generation Symbolic interaction	Critical theory Neo-marxist Feminist Critical Race Theory Freirean Participatory Emancipatory Advocacy Grand Narrative Empowerment is sue oriented Change-oriented Interventionist Queer theory Race specific Political	Consequences of actions Problem-centred Pluralistic Real-world practice oriented Mixed models
Adapted from Mertens (2005) and Creswell (2003)			

3.3.3 The Research Paradigm

The interpretivist/constructivist researcher, as discussed earlier, tends to rely upon the participants' views of the situation being studied and recognises the impact of their background and experiences on the subject matter. To obtain a well rounded and rich insight into the social actors behind the phenomenon observed, the views of the parties associated with the phenomenon are essential. The perspective and experience of these parties would contribute to unravelling the research problem. It would appear pointless to categorise the phenomenon observed into causes and effects; this is because in the opinion of the researcher, the observed phenomenon is one engaged in a process of continuous creation. To effectively unravel and understand the research problem, a richer perspective into the drivers of the occurrence or social actors of the phenomenon should be explained.

The paradigm and the research question should determine which research data collection and analysis methods (qualitative/quantitative or mixed methods) will be most appropriate for a study. In this way researchers are not quantitative, qualitative or mixed methods researchers, rather a researcher may apply the data collection and analysis methods most appropriate for a particular research study (Mackenzie and Sally, 2006). A useful way to distinguish between the two methods is to think of qualitative methods as providing data in the form of words (or maybe visually), and quantitative methods as generating numerical data. However, it is a mistake to assume that there must be a strict black and white dichotomy (Harvard, 2016). It may in fact be possible for any and all paradigms to employ mixed methods rather than being restricted to one method, which may potentially diminish and unnecessary limit the depth and richness of a research project (Mackenzie and Sally, 2006).

3.3.4 The Data Collection Method

Quantitative and qualitative methods of data collection are often employed in support of each other on research projects. The qualitative researcher may use historical numerical data to support a particular finding, for example. Similarly, qualitative data can provide rich information about the social processes in specific settings (Harvard, 2016).

According to Table 3.1 below, the most appropriate data collection and analysis method for an interprevisit/constructivist research is qualitative. Qualitative methods of data collection focus on all relevant data whether immediately quantifiable in a standardized scale or not. It is important to note that it is not just non quantitative research. Qualitative research provides the individuals' own accounts of their attitudes, motivations and behaviour. It offers richly descriptive reports of individuals' perceptions, attitudes, beliefs, views and feelings, the meanings and interpretations given to events and things, as well as their behaviour; displays how these are put together, more or less coherently and consciously, into frameworks which make sense of their experiences; and illuminates the motivations which connect attitudes and behaviour, the discontinuities, or even contradictions between attitudes and behaviour, or how conflicting attitudes and motivations are resolved in particular choices made. Qualitative data is particularly useful when it comes to defining feelings and attitudes (Harvard, 2016).

Table 3.3: Research Paradigm and Research Methods, (Mackenzie and Sally, 2006).

Paradigm	Methods (primarily)	Data collection tools (examples)
Positivist/ Postpositivist	Quantitative. "Although qualitative methods can be used within this paradigm, quantitative methods tend to be predominant . . ." (Mertens, 2005, p. 12)	Experiments Quasi-experiments Tests Scales
Interpretivist/ Constructivist	Qualitative methods predominate although quantitative methods may also be utilised.	Interviews Observations Document reviews Visual data analysis
Transformative	Qualitative methods with quantitative and mixed methods. *Contextual and historical factors described, especially as they relate to oppression* (Mertens, 2005, p. 9)	Diverse range of tools - particular need to avoid discrimination. Eg: sexism, racism, and homophobia.
Pragmatic	Qualitative and/or quantitative methods may be employed. Methods are matched to the specific questions and purpose of the research	May include tools from both positivist and interpretivist paradigms. Eg Interviews, observations and testing and experiments

Methods for collecting qualitative data include observation, participant observation, interviewing, focus groups and case studies. Observation and participant observation is the systematic observation,

recording, description, analysis and interpretation of people's behaviour. In participant observation, the researcher participates to some degree in the lives and activities of the people being observed.

Interviews can be conducted using unstructured and semi-structured interviews (qualitative research) or by using structured interviews (covered under quantitative data collection methods). When using semi-structured interviews, the researcher may encourage an informal conversation covering certain themes and questions; questions may vary from one interview to the next. Semi-structured interviews are primarily used in explanatory research to understand the relationships between variables, perhaps as have been revealed by some prior descriptive research. Additionally, semi-structured interviews are used in exploratory studies to provide further information about the research area. Unstructured interviews, sometimes called in-depth or non-directive interviews, are designed to explore in depth a general area of research interest. Focus groups are excellent research tools. Focus groups are forms of group 'interviews' – but there are differences. The researcher acts as a facilitator rather than an interviewer. A case study the logic is that all cases start the same and then a sample of six cases is taken that represents the extremes of possibilities or critical incidents.

This exploratory qualitative research will use a semi-structured interview process to collect data. The data collected will be extrapolated using an abductive process. According to Saunders et al (2012), this approach involves moving from theory to data and then data to theory or vice versa. Notably there is a wealth of literature within this subject area of the project manager's competencies, and limited amount of literature within the context of South Africa.

3.3.5 The Data Collection Time Frame

The time dimension of research can be cross-sectional or longitudinal. Longitudinal Research involves data collection at multiple points in time. Longitudinal studies may take the form of: Trend study which looks at population characteristics over time; Cohort study traces a sub-population over time; Panel study traces the same sample over time. Longitudinal studies are often more likely to identify causal relationships between variables (Harvard, 2016).

Cross-sectional studies or one-shots are those in which data is gathered once, during a period of days, weeks or months. Many cross-sectional studies are exploratory or descriptive in purpose. They are designed to look at how things are now, without any sense of whether there is a history or trend at work (Harvard, 2016). In terms of the time dimensional approach to the data collection process for this study, a cross-sectional data collection method will be utilised. The period for data collection will be a maximum of two months.

3.3.6 The Research Setting

Research setting can be conducted either in contrived or non-contrived settings. A contrived setting is the creation of an artificial environment in which the events are strictly controlled. The researcher is

looking to establish a cause and effect relationship beyond any reasonable doubt. For this reason, the study participants will be carefully chosen and the stimuli manipulated.

By contrast, a non-contrived setting is the natural environment in which events normally occur. Field studies and field experiments are examples of non-contrived settings. A field study is a study carried out in the natural environment with minimal interference from the researcher. A field experiment researches into the causal relationship set in the natural environment with some manipulation of the variables. A non-contrived setting will be used for the data collection process of this study; the natural environment being the South African construction industry and the population construction project managers practising in South Africa.

3.3.7 The Research Population and Sampling Technique

Selecting a sample depends on the research questions and objectives of the research. It also depends on the need for face to face contact and the geographical area over which the population is spread, as this affects the sampling choice. There are two kinds of sampling techniques probability and non-probability (Saunders et al, 2012). Probability sampling is based on the concept of random selection. It is also known as 'random sampling' or 'chance sampling'. Under this sampling design, every item of the population has an equal chance of inclusion in the sample. Whereas non-probability sampling is 'non-random' sampling; it is that sampling procedure which does not afford any basis for estimating the probability that each item in the population will be included in the sample (Kothari, 2004).

Probability sampling includes the following random sampling which can be divided into simple sampling and stratified sampling. If a population from which a sample is to be drawn does not constitute a homogeneous group, stratified sampling technique is generally applied in order to obtain a representative sample. Under stratified sampling the population is divided into several sub-populations that are individually more homogeneous than the total population (the different sub-populations are called 'strata') and then we select items from each stratum to constitute a sample. Since each stratum is more homogeneous than the total population, we are able to get more precise estimates for each stratum and by estimating more accurately each of the component parts; we get a better estimate of the whole.

Other types include cluster sampling and multistage sampling. Non-probability sampling include quota sampling, purposive sampling, volunteer sampling which can be broken into snowballing sampling and self-selection sampling, and convenience sampling (Saunders et al, 2012). Sometimes less rigorous methods of sampling may be acceptable for qualitative studies, such as incidental or quota samples, but these methods do not guarantee a representative sample (Marshall, 1996).

3.3.8 The Research Limitations to Design

One of the key variables defined and obtained from the literature review is the role of the construction project manager in the successful delivery of construction projects. One of the aims of this study is to explore how the project manager can bridge the gap of the poor technical and managerial skills of small-medium sized contractors. Thus this research is limited to the perspective of the construction project manager on the challenges of small-medium sized contractors and achieving budget and time expectations.

It was also identified in the literature review that the planning phase is critical in the contribution of the successful delivery of projects. Munns and Bjeirmi (1996) and Menches and Hanna (2006) respectively stated that project planning by the project manager is needed to overcome under-costing, overspending and late delivery of projects; and most contractors believe better planning can lead to more successful project performance

This study will therefore be focused on obtaining the perspective of the South African construction project managers on the challenges of small-medium sized contractors and the reasons they fail to deliver successful projects; and also exploring the possibilities of adapting the project manager's competency framework to bridge the gap of the identified poor technical and managerial skills of small-medium sized contractors in South Africa through a collaborative planning framework.

The study will be limited to the planning phase of the construction project life cycle of both the project manager and contractor. The construction project type will be limited to examining projects that have adopted a traditional project management procurement procedure where the client appoints a project manager as an agent or part of his professional team and enters into a contract with the contractor. The project types are also limited to building projects which includes both renovations and new construction projects; as well as projects in both public and private sectors. The other various procurement methods and project types used in South Africa are recognised as being valid, but they are beyond the scope of this research. The data collection sample will be conducted on professional construction project managers and projects based in Johannesburg, completed within preceding 5 years or at least 90% complete and which also involved small medium sized contractors.

3.5 Research Methodology

As stipulated in the research design, semi-structured interviews are primarily used in explanatory research to understand the relationships between variables, perhaps as have been revealed by some prior descriptive research. The entire population of this research consists of professional construction project managers based and practising in South Africa. In other to generate the sampling frame, a combination of sampling techniques was employed in this study and it involved a two part process.

The first part of this research was conducted through a face to face semi-structured interview with the identified participants. These participants were identified using a self-selection sampling method and were carefully selected on the basis of an already existing working relationship with the researcher. The self-selection sampling technique was to later become a snow-balling method, obtaining contacts and references of the colleagues of the participants interviewed. This first part process also served as a pre-testing tool of the research instrument adopted for this study. The second part of the data collection process was a semi-structured interview questionnaire. The data collection time frame coincided with the annual builders break in South Africa 2014 and hence the data collection was progressing at a slow rate. It meant that the stipulated data collection time frame period would not be met at the rate the data collection was progressing. This necessitated a revision of the research instruments adopted for the research. The subsequent and second process involved using a stratified random sampling method to obtain data. The revised research instrument involved converting the semi-structured face to face interview into a semi-structured questionnaire.

In accordance to the ethical practise of conducting this research, the South African Council of Project and Construction Management Professionals (SACPCMP) were contacted to obtain an informed consent to access their database. The reason behind accessing the database of the SACPCMP is to gain access to the identified sample frame and thus the participants. The SACPCMP granted the permission to access their database (See Appendix 1 for informed consent of the SACPCMP and Appendix 2 for ethics clearance).

Questionnaires (see Appendix 3 for example of the semi structured interview questionnaire) were sent out to the database of the SACPCMP; which consists of 1559 as of December 2014, professional construction project managers and professional construction managers including candidates of the respective titles mentioned. The first sets of questionnaires were sent out on the 5th of December 2014 via the database of the SACPCMP. A response period of about two weeks was allocated for the collection of data, in which a low response was received. A total of 8 successfully completed questionnaires out of a required sample size of 25 project managers, were received which equates to a response rate of 32%.

One of the reasons for the low response rate could be attributed to the annual builder's break period in South Africa, December 2014. The aim of the questionnaire was to get the perspective and the observations of the project manager with regard to the planning and execution of the works by the small-medium sized contractor. The questionnaire also sought to seek the opinion of the construction project manager concerning the most important competency required by the project manager to manage the small medium sized contractor in South Africa. The list of competency used was as per the 15 dimensions of leadership generated by Muller and Turner (2009). Out of the 15 dimensions of

leadership, the project managers were asked to select the most important competency within each category, emotional competence, intellectual competence and managerial competency.

The selection criteria for this research were professional construction project managers registered with the council (SACPCMP) with a minimum of 10years of experience in the South African construction industry, having worked with small-medium sized contractors in the preceding 5 years before the year 2015. The definition of the small-medium sized contractor was as per the classifications of Dlungwana et al (2002) and the equivalent CIDB grading for each category specified, as discussed in Chapter 2.

The SACPCMP sent out an email by approaching members registered with the governing council (SACPCMP). The SACPCMP was initially approached to gain access to its database in other to setup interviews with the various individuals. The method of data collection was to be in the form of a semi-structured interview. The reasoning behind this method was to eliminate the hassle associated with filling out questionnaires and in the process get more information concerning the issue in the data collection. The second reason was to draw out more information from the project managers by meeting them at a time suitable for them. However this method proved to be quite difficult. The SACPCMP was understandably unwilling to release the database of its members in order to setup interviews. The initial snowballing convenience sampling adopted progressed at a slow rate due to the resistance of the SACPCMP to release the information of its members and coincidental alignment of the South African Annual builder's break holiday in December with the data collection period; and the data collection method was revised to a stratified random sampling.

3.6 Population and Sampling

3.6.1 Sampling

In this study, a sample size of 5 to 25 participants was recommended for semi-structured/in depth interviews by Saunders et al (2012). For a true random sample to be selected the characteristics under study of the whole population should be known and for the random sample to be a representative sample, the research characteristics should be normally distributed within the population. The competence of the professional construction project manager, which is defined as the population for this study, registered with the SACPCMP and surveyed, can be assumed to be normally distributed within the sample frame. The basis for this assumption is that the 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. In addition, according to the registration criteria for professional construction

project managers, individuals with a suitable qualification and a minimum of 8 years of working experience within the field of construction can be registered under this title.

3.6.2 Population size

The professional construction project managers registered with the SACPCMP forms a subgroup of the stratified random sample. As noted in the research design, stratified random sampling allows subgroups to be studied in greater detail (Marshall, 1996). Although the professional construction project manager forms the entire population of this study, the data collection pool which is the SACPCMP, consists of other registered groups. These registered members of the SACPCMP are not necessarily all located or based in South Africa.

3.6.3 Sampling Frame

The sampling frame is the complete list of identified strata rather than a complete list of individual cases within the population (Saunders et al, 2012). The sampling frame of this research are registered professional construction project managers with the SACPCMP, who have executed projects in Johannesburg with at least 10 years of experience within the field of construction project management and have worked with small-medium sized contractors within the preceding 5 years before 2015. These projects could be completed or projects that are 90% through with achieving practical completion as discussed earlier.

The reason for this selection or strata is because an individual with 10 years of experience in a particular field is considered to be at an intermediate to senior level and thus can classified as being experienced in their field; they are also expected to apply due diligence in the execution of the works.

3.6.4 Sampling Technique

The first sampling technique was a non-probability self-selection sampling method which was also to become a snowballing sampling technique. This first method served as a pre-testing tool of the technique; nonetheless, the data collected from these participants was utilised in this research. The second method was a probability technique; a stratified random sampling method. The data collected from this second method was categorised into the appropriate strata. The certification of an individual as a professional construction project manager by the SACPCMP is a reflection of the relevant experience of the individual in the field of project management and construction. This second method ensures the reliability of the data collected and reduces participant bias. In a random sample the nature of the population is defined and all members have an equal chance of selection. As mentioned earlier stratified random sampling allows subgroups to be studied in greater detail (Marshall, 1996). The stratified random samples provide the best opportunity to generalize the results of the participants to the population, being the professional construction project managers registered with the South African Council of Project and Construction Management Professionals (SACPCMP). An inference of the

interpretation of data collected through this stratified technique can be made to the entire population of professional construction project manager.

The database of the SACPCMP consists of members registered as professional construction managers, professional construction project managers, candidate construction project managers, candidate construction managers and professional construction mentors. The strata of the research data obtained via the council were classified into members who indicated they were registered as professional construction project managers and the rest.

An example of a type of current existing project management certifications is PMP (project management professional) by the PMI. Inferences can be made about the characteristics of all project managers with a PMP certification as being normally distributed within the population. Despite a construction project manager obtaining such certification, South African law requires the individual to be registered with the governing body for the profession, being the SACPCMP. SACPCMP is a statutory body established by section two (2) of the Project and Construction Management Act, 2000 (Act No.48 of 2000). 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. The Council is empowered by Section 19 (2) of the Act 2000, to register the applicant in the relevant category and issue a registration certificate if the applicant has satisfied the relevant educational outcomes by presenting evidence of prior learning in Project and Construction Management. The objectives of the SACPCMP is therefore to provide guidance and frameworks within which the professionals within the Construction Management environment are to operate and ensure that effective guidance policies and frameworks that recognise prior learning are established, consistently applied and implemented by the Council.

3.6.5 Sampling Size

The size of the sample is determined by the optimum number necessary to enable valid inferences to be made about the population.

An appropriate sample size for a qualitative study is one that adequately answers the research question. For simple questions or very detailed studies, this might be in single figures; for complex questions, large samples and a variety of sampling techniques might be necessary (Marshall, 1996). Saunders et al (2012) suggests that for a semi-structured/in-depth interview, a minimum sample size of 5-25 is recommended. As a result of the research design and data collection process, 25 registered professionals with the SACPCMP, with a minimum of 10years experience were targeted to be interviewed. The optimum sample size depends upon the parameters of the phenomenon under study, for example the rarity of the event or the expected size of differences in outcome between the intervention and control groups (Marshall, 1996).

3.6.6 Data Collection

The first data collection method was a semi-structured face to face interview, which was later revised to the second method being a semi-structured questionnaire interview sent via email. The information collected was to obtain the perspectives professional construction project managers and their observations with managing and working with small-medium sized contractors in South Africa. The definition of small medium sized contractors used in this study is defined and discussed in chapter 2, see Table 2.4.

3.7 Data Analyses and Interpretation

Saunders et al (2012) outlines two analytical procedures applicable to qualitative analysis. These analytical procedures examine how the deductive perspective of the participants which underpins research, impacts upon processes for analysing qualitative data.

3.7.1 Pattern matching

The data collected was interpreted using pattern matching. The research was designed to test the theoretical proposition of the literature review by generating theory inductively (Saunders et al, 2012). This involves predicting a pattern of outcomes based on theoretical propositions obtained from the literature review, to explain what the researcher aims to find from analysing data. The theories developed from the literature review, which are based on previous studies conducted in similar topic areas, were tested for their adequacy and applicability with the data collected as a means to explaining the findings.

The extrapolation of the data was a four step explorative process as follows:

1. The research started off with an inductive approach identifying issues and generating theories from existing literature, through the literature review. Theories such as the lack of technical and managerial skills, specifically poor planning, of small-medium sized contractors in developing countries and so on. Chapter 4 goes into depth discussing the data of the study.
2. The subsequent step utilised a deductive approach by means of a semi-structured face to face and email interview conducted with the participants. The theories established in the literature review were tested against the responses of the respondents. During this process, new theories were also identified from the information collected.
3. The third step was the identification and classification of the responses received. The responses were separated into three categories. The first category was respondents registered with the council under the title of professional construction project manager (PrCPM). The second category was respondents registered with the council but did not disclose their specific title and the final category was respondents not registered with the council. The reason behind this

classification is that the council registers members who have the accredited qualifications and relevant experience under the following categories: PrCPM (Professional Construction Project Managers), PrCM (Professional Construction Managers), Pr CMentor (Professional Construction Mentor). Members with the accredited qualifications but without the required relevant experience are registered as CPM (Candidate Construction Professional Manager) and CM (Candidate Construction Manager). The first category of respondents fell within the sampling criteria of this study. The responses of the second and third category of respondents were used as a control group in this study.

4. The final step was content analysis and comparison of each category of respondents.

3.8 Reliability and Validity

The possible threats that could affect the reliability of the data collected are participant bias and researcher's bias (Saunders et al, 2012). To reduce participant bias, the data collected was interpreted using pattern matching against previous studies. The responses of the participants are tested against the theoretical proposition of the literature review. This ensures the validity of the opinions of the participants. To ensure the reliability of the data collected the selection criteria of the participants sort to obtain the opinions of experienced individuals within the field of the study. The sample criteria were professional construction project managers registered with the council (SACPCMP) with a minimum of 10years of experience in the South African construction industry, having worked with small-medium sized contractors in the preceding 5 years before the year 2015. The council considers an individual with 8 years or more years of experience in the construction industry as eligible to apply for the category of professional construction project manager and is therefore deemed to be experienced within that category.

In other to reduce the threat of the researcher's bias, studying a random sample provides the best opportunity to generalize the results (Marshall, 1996) of the opinions of the participants, construction professional project managers, on what the challenges of implementing a foreign competency framework among project managers, specific competency needs of small and medium sized construction contracting firms in South Africa and the need for a framework that addresses the specific competency needs of small and medium sized contracting firms in South Africa, to the population being the South African construction industry.

This qualitative study has an inteprevists/constructivists's paradigm which means that the researcher or participant cannot entirely distance themselves from what is being observed. Therefore, to some degree the opinions of the participants and formation of the theories tested is value-laden and is

reflected by the background, status, interests, beliefs, skills and values of the social actor/researcher and participants. The research focuses on the meaning of the social phenomenon observed rather than the measurement of it. It focuses on understanding and explaining the problem in its contextual setting. As suggested by Lynch (not dated), an appropriate sample size which adequately answers the research question suffices. For simple questions or very detailed studies, this might be in single figures as stated by Marshall (1996).

3.9 Ethical Consideration

The ethical considerations of the research conducted were as follows:

1. No motivation in the form of financial compensation was planned to be used as a form of incentive to collecting data. Financial incentives in collecting data can be perceived as influencing the potential responses of the participants.
2. Only registered council members of the SACPCMP were sampled to maximise the validity of the findings of this research. It is worth noting that findings of this research also include the opinion of one non-registered SACPCMP participant collected during the convenience sampling phase.
3. Research was planned to maintain an unbiased and objective approach both in the conduct and reporting of the findings of the study.
4. Informed consent of the participants to the research was obtained through SACPMCP prior to collection of data and individually from the face to face interviews.
5. The identities of all the eventual participants were protected in other to avoid any form of prejudice and bias as well as not to be judgemental of any particular respondent.
6. Due diligence was exercised to ensure that all ideas not the ideas of the researcher of this paper will be referenced in other to avoid plagiarism

CHAPTER 4 – FINDINGS AND ANALYSIS

4.1 Findings

The profiles of the respondents are presented in Table 4.1. There were a total of 25 respondents to the interviews done via face to face and email correspondence. The respondents can further be classified according to their years of experience.

Table 4.1: Respondents profile

No.	Respondents – Project Managers	Years Of Experience in building within the construction industry in South Africa?	Experience in building within the construction industry in South Africa- Yes or No?	Worked with small-medium sized contractors in the past 5 years in Johannesburg - projects completed to date or 90% completed?	Registered with the Council – Yes or No?	Project Management Qualifications
1	Project Manager 1	15 years	Yes	Yes	Yes	Pr. CPM (SACPCMP)
2	Project Manager 2	17 years	Yes	Yes	Yes	Pr. CPM (SACPCMP)
3	Project Manager 3	17 Years	Yes	Yes	Yes	ECSA and SACPCMP
4	Project Manager 4	30 years	Yes	Yes	Yes	Pr CPM (with part MSc PM) (SACPCMP)
5	Project Manager 5	38 years	Yes	No	No	None indicated
6	Project Manager 6	34 years	Yes	Yes	Yes	BSc (Eng), PMP, SACPCMP
7	Project Manager 7	44 years	Yes	Yes	Yes	PMP
8	Project Manager 8	40 years	Yes	No	Yes	PrEng. PrCPM (SACPCMP)
9	Project Manager 9	20 years	Yes	No	Yes	Engineer
10	Project Manager 10	28 years	Yes	Yes	Yes	Pr. CPM (SACPCMP)
11	Project Manager 11	42 years	Yes	Yes	Yes	Pr CPM (SACPCMP),Pr Eng
12	Project Manager 12	25 years	Yes	Yes	Yes	Pr.CPM (SACPCMP)
13	Project Manager 13	45 years	Yes	Yes	Yes	PM Certification and Diplomas
14	Project Manager 14	9 years	Yes	No	Yes	SACPCMP
15	Project Manager 15	35 years	Yes	Yes	Yes	Pr.CPM (SACPCMP)
16	Project Manager 16	40 years	No	No	Yes	B Sc, GDE, SACPCMP
17	Project Manager 17	35 years	Yes	Yes	Yes	Hons B Eng, Pr Eng, Pr CPM
18	Project Manager 18	25 years	Yes	Yes	Yes	PMP
19	Project Manager 19	31 years	Yes	Yes	Yes	Pr.CPM (SACPCMP)
20	Project Manager 20	16 years	Yes	No	Yes	PMP
21	Project Manager 21	32 years	Yes	Yes	Yes	Pr. CPM, B.Sc. Eng and MBA
22	Project Manager 22	17 years	Yes	No	Yes	SACPCMP
23	Project Manager 23	14 years	Yes	Yes	Yes	PMBOK training and SACPCMP
24	Project Manager 24	40 years	Yes	Yes	Yes	M Sc Building
25	Project Manager 25	22 years	Yes	Yes	Yes	Pr CPM (SACPCMP)

Figure 4.1 classifies the respondents according to their years of experience. The highest representations of demographics are respondents who fall within the category of 16 to 20 years of experience and 31 to 35 years of experience within the Construction Industry.

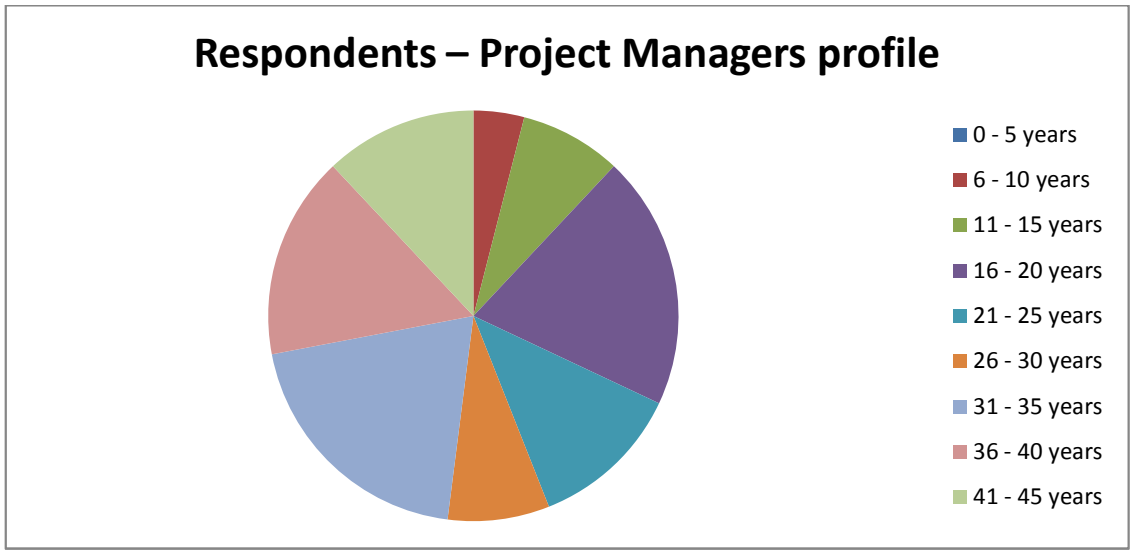

Figure 4.1: Pictorial representation of respondent's demographics according to their years of experience.

The required sampling frame for this research was as follows: registered professional construction project managers with the SACPCMP, project managers who had executed projects in Johannesburg with at least a minimum of 10 years of experience in the building industry and had worked with small-medium sized contractors within the past 5 years. These projects should have been completed or should have been 90% through with achieving practical completion.

Table 4.2 is a summary of the classification of the respondents according to the various sampling criteria. Consequently, there were a total of 24 respondents out of the 25 were registered with the SACPCMP. All respondents excluding PM5 were registered with the SACPCMP. PM1, PM2, PM4, PM8, PM10, PM11, PM12, PM15, PM17, PM19, PM21 and PM25 indicated that they were registered as a professional construction project manager. PM3, PM6, PM7, PM9, PM13, PM14, PM16, PM18, PM20, PM22, PM23 and PM24 had not indicated that they were registered as a professional construction project manager. This indication is vital as the SACPCMP registers its members under the following categories: PrCPM (Professional Construction Project Managers), PrCM (Professional Construction Managers), Pr CMentor (Professional Construction Mentor). Members with the accredited qualifications but without the required relevant experience are registered as CPM

(Candidate Construction Professional Manager) and CM (Candidate Construction Manager). All the respondents excluding PM16 had executed projects in Johannesburg with small-medium sized contractors. PM1, PM2, PM3, PM4, PM6, PM7, PM10, PM11, PM12, PM13, PM15, PM17, PM18, PM19, PM21, PM23, PM24 and PM25 had all worked on projects with small-medium sized contractors within the past 5 years, which were either completed or 90% completed.

Table 4.2: Respondents' composition based on size of firm and professional registration

No.	Respondents	Categorisations according to Descriptions	Number of respondents
1	PM1 to PM 25 excluding PM 5	Registered with SACPCMP	24 out of 25 Project Managers (96%)
2	PM1, PM2, PM4, PM8, PM10, PM11, PM12, PM15, PM17, PM19, PM21 and PM25	Number of project mangers registered with SACPCMP that indicated they were registered as a professional construction project manager (Pr.CPM)	12 out of 24 Project Managers (50%)
3	PM3, PM6, PM7, PM9, PM13, PM14, PM16, PM18, PM20, PM22, PM23 and PM24	Number of project mangers registered with SACPCMP that did not indicate they were registered as a professional construction project manager (Pr.CPM)	12 out of 24 Project Managers (50%)
4	PM1 to PM 25 excluding PM16	Experience in building within the construction industry in South Africa- Yes	24 out of 25 Project Managers (96)%
5	PM1, PM2, PM3, PM4, PM6, PM7, PM10, PM11, PM12, PM13, PM15, PM17, PM18, PM19, PM21, PM23, PM24 and PM25	Worked with small-medium sized contractors in the past 5 years in Johannesburg - projects completed to date or 90% completed? - Yes	18 out of 25 Project Managers (72)%
6	PM5, PM8, PM9, PM14, PM16, PM20 and PM22	Worked with small-medium sized contractors in the past 5 years in Johannesburg - projects completed to date or 90% completed? - No	7 out of 25 Project Managers (28)%

According to the above criteria listed, respondents PM1, PM2, PM4, PM10, PM11, PM12, PM15, PM17, PM19, PM21 and PM25 fit the sampling requirements of this study. A total of 11 respondents qualified for the sampling criteria. These respondents were registered as professional construction project managers, had worked with small-medium sized contractors in the past 5 years in Johannesburg, on projects that were either 100% complete or at least were 90% completed and had a minimum of at least 10 years of experience in the South African construction industry. Respondents were grouped according to their years of experience in the building industry. The responses of respondents PM3, PM5, PM13, PM14, PM16, PM18, PM20, PM22, PM23 and PM24 were included in this research. The responses of this category of respondents were used a control group.

4.1.1 Challenges faced by small medium sized contractors in achieving project success

Out of 25 respondents interviewed either through a face to face and email interview, 24 responded to the question on the challenges faced by small medium sized contractors in achieving project success. PM23 was the only respondent that did not answer this question. See Table 4.3for the most common keywords used to express the challenges faced in achieving project success (within the planned budget and time), according to the opinions of the respondents.

To summarise the responses of the respondents, small-medium sized contractors don't plan adequately because they don't focus on the projects end result of on time and on schedule, they don't plan their resources and they don't have the ability to program the works such as estimating of costs and activity durations. They also have procurement issues in terms of timeous programming and scheduling of how to get their materials to site. The structure of their site team is also another challenge for them. It is an issue of getting competent staff especially in a contract management position and in a foreman position. The administrative capability of the contractors is another challenge as they do not have administrative competence. They do not understand the contracts they sign; they do not have enough time devoted to monitoring, controlling and timeously ordering of materials. Their education and experience is also a challenge as they have insufficient experience and commitment to learn. They also suggested that the influence of the client poses a challenge to the contractor such as imposing unrealistic deadlines, late or none payments and their attitude in general. Another challenge mentioned was the lack of support of the client in disciplining the contractors.

4.1.1.2 Capital and cash flow management

This study found that capital and cash flow management was the biggest challenge faced by small-medium sized contractors in achieving project success while executing projects in Johannesburg with a total of 13 and of 24 respondents identifying this challenge. PM1 and PM15 noted that contractors don't have enough capital to drive the project from their own coffers and have poor access to credit. PM8 and PM12 stated that it is a challenge of obtaining finance, managing cash flows and poor access to credit. PM10 andPM17 described the challenge as contractors having "limited cash flow" and "cash flow management". PM13 stated that they do not have the ability to do cash flows. PM6 elaborated by saying it is as a result of a lack of financial discipline and access to finance. PM 9 took it a little bit further by giving more details on the actions of the contractor's poor cash flow management by saying "lacks back…office support, vehicles and has to pull cash out of the project to pay for previous outstanding debts to keep the wolf from the door". PM5 also discussed the issue, stating that cash flow management was top of the list with the challenges these contractors faced "…linked to this is the tightness of

the programme. The faster a programme is the greater the turnover per month and therefore the higher the cash demand per month. Project managers don't always realise the impact of speed on the demand for cash flow." Finally PM14, PM16 and PM11made a general statement respectively saying "financial resources", "poor management" and "lack of management skills" are a challenge.

Table 4.3: Small-medium sized contractors, challenges faced in achieving project success in South Africa.

No.	Keywords - challenges faced by Small-Medium sized contractors in achieving success	Frequency of Occurrence
1	Capital and cash flow management	13 out of 24 Project Managers (54%)
2	Inadequate planning	12 out of 24 Project Managers (50%)
3	Inadequate resourcing	8 out of 24 Project Managers (33%)
4	The administrative capabilities of the contractor	6 out 24 Project Managers (25%)
5	Education and experience of the contractor	4 out 24 Project Managers (17%)
6	Client influence on the project	3 out of 24 Project Managers (13%)
7	Others - SMME; quality plans, environmental and ISO compliance; making sure tendered rates are achievable and allowing some margin for profit and growth; strikes by construction workers	1 out of 24 Project Managers (4%)

4.1.1.2 Inadequate planning

The second biggest challenge facing small-medium sized contractors in achieving project success on projects executed in Johannesburg is inadequate planning. A total of 12 out of 24 (50%) respondents mentioned this challenge. PM21 and PM10 acknowledged that these contractors do not plan adequately to the end of the project. PM21 noted that it is a "lack of focus on the projects end result of on time on schedule" and PM10 concurred by stating: "planning the job until finish". They also don't plan the project ahead i.e. before the project commences, as noted by PM7 "proper planning of the project ahead". PM19, PM20 and PM22 respectively identified the challenge as planning of resources, lack of planning skills and poor planning. Some project

managers (PM4, PM1, PM13 and PM17) went as far as saying it is not just inadequate plan but a lack of project programming. The estimating of costs and activity durations, lack and no ability to program the works and to do cashflows.PM1 informed that "…procurement issues in terms of timeous programming and scheduling of how to get their materials to site" is a challenge faced by small-medium sized contractors in South Africa in achieving project success (in terms of cost and time).PM8 described it as being a challenge of realistic programming of the works. Finally PM14 made a general statement saying planning of resources is a challenge.

4.1.1.3 Inadequate resourcing

The structure of the site team, getting competent staff and managing these staff is a challenge for these contractors. A total of 8 out of 24 (33%) respondents mentioned challenges faced by small-medium sized contractors in achieving project success are as a result of inadequate resourcing. PM1 stated that adequate resourcing in terms of the structure of the site team is a concern and hence a challenge. PM2 stated that it is a matter of "getting competent staff". He added on more details based on his observations saying that "managing staff…is the main issue especially in a contract management position and in a foreman position…workers take instructions very well from someone who has got very good experience". PM6, PM8, PM10, PM14, PM17,PM20, PM22 and PM25concurred by respectively saying it is a challenge of site resources overstretched and poor capabilities of the personnel, procurement of transport, materials and labour skills, having limited statutory personnel (like NQF 5, safety officers and construction managers), in-experienced construction workers, skilled site staff, lack of organisation skill and staffing, taking on more jobs without good resources and losing experienced workers, a lack of professional employed staff members.

4.1.1.4 The administrative capabilities of the contractor

A total of 6 out of 24 (25%) respondents mentioned that the challenges faced by small-medium sized contractors in achieving project success are as a result of the administrative capabilities of the contractor. Small-medium sized contractors do not understand contracts; they do not have enough time devoted to monitoring and controlling. PM1 observed that these contractors do not have the administrative capabilities to "…to actually understand the contract they have signed and how to administer that contract during the process of construction on site". PM4 mentioned that they do not devote enough time to monitoring and control.

PM5 elaborated by giving a different perspective on the matter stating that "…smaller contractors are more likely to be subservient to a project manager than the larger contractors. This leads to various behaviours that cause difficulties:

1. They accept changes that go beyond their capability to process them in the budget and time without complaining or issuing contractual notices.

2. They get or accept instructions that they contractually don't have to accept i.e. acceleration
3. They accept failure and design responsibility that is not theirs in terms of the contract.
4. They deal in verbal communication too much.
5. They get confused by the practical completion, works completion and final completion process specifically with reference to the project manager creating "sections" when completion is defined as "works as a whole".
6. They sometimes lack technical skills and rely on advice and guidance from the design team which can be slow.
7. Many don't understand the contract and are abused in terms of the contract.
8. Many feel intimidated to issue clause 29 notices for delay and they try and do this only when penalties are applied at the end.
9. Some smaller contractors don't apply the right plant to the task and try and "make a plan". This creates difficulties with respect to: it creates safety issues, it can cause delays and it can cause quality failures.
10. Smaller contractors don't always have the muscle to control or manage their sub-contractors. This can manifest in terms of: incorrect contractual procedures and being held with their backs against the wall in terms of pressure from sub-contractors that are large corporate i.e. a small house builder might be the main contractor but he is dealing with PG Glass which is [an] international corporate."

PM17 attributed the challenge to the timeously ordering of materials, reporting and senior management of contractor not attending site meetings; with PM20 agreeing with this by saying it is a lack of procurement skills. Finally, PM25 ended off by saying that it is a lack of administration competence.

4.1.1.5 Education and experience of the contractor

A total of 4 out of 24 (17%) respondents mentioned that the challenges faced by small-medium sized contractors in achieving project success are as a result of their education and the experience of the contractor. PM11 attributed this challenge to the fact that these contractors have insufficient experience and the commitment to learn. PM14 said that this is because of the education level of the contractor and the dishonesty of contractors, with contractors looking for easy money. PM18 concurred by saying it is a challenge of lack of education and the challenge of communication from these contractors. Finally, PM24 said it is a "lack of practical experience – learning information off by heart at university – not able to apply same in practise".

4.1.1.6 Client influence on the project

A total of 3 out of 24 (13%) respondents mentioned that the challenges faced by small-medium sized contractors in achieving project success are as a result of the client's influence on the project. PM4 and PM19 mentioned that the challenge that these contractors face was as a result of the client limitations such as imposing unrealistic deadlines, late or none payments and their attitude. While on the other hand, PM25acknowledged the influence of the client but contradicted the above by mentioning it is a lack of support of the client to discipline contractors.

Other challenges mentioned were SMME, mentioned by PM1; quality plans, environmental compliance and ISO compliance by PM3;it is an issue of making sure tendered rates are achievable and allowing some margin for profit and growth, as mentioned by PM8 and finally repeated strikes by construction workers, by PM14.

4.1.2 The biggest obstacles with regard to the small-medium sized contractor meeting or sticking to the planned programme completion dates

There were 24 respondents out of a total of 25, to the question on what the biggest obstacles are and in their opinion, with regard to the small-medium sized contractor meeting or sticking to the planned programme completion dates. PM20 did not respond to this question.

To summarise the responses of the respondents the observations on how small-medium sized contractors execute their projects are poor planning, lack of technical skills, a need for mentorship, quality, attitude of the contractor and slow site establishment. The most observed challenge that small-medium sized contractors experience during the execution of their projects were planning, followed by lack of technical skills and so on.

They revealed that poor planning was as a result of small-medium sized contractors not looking at the implication of their cash flow or fully executing any task. It is a case of taking on the assignment without having pre-planned the execution and resources required.

They add that small-medium sized contractors are willing to succeed but lack (in most cases) the technical and management skills required to succeed as well as the lack of discipline and respect for professionals. Small-medium sized contractors have the potential to become established contractors but with the correct leadership. These contractors tend to cut corners and compromise on quality during the execution of their construction projects, poor quality means work to be redone.

They acknowledge the brilliance of some of these contractors. One in ten of these contractors are brilliant but for the rest, it is difficult to make them understand the importance of finishing within time and quality. The good ones have professional backup while for the rest it is a struggle. Things such as

site establishment are usually slow and real completion of tasks left very late in the project cycle. These contractors start slow because they need the first payment certificate to get funds, to kick off the Project.

4.1.2.1 Poor planning and programming of resources

A total of 10 out of 24 (42%) respondents mentioned that the obstacles faced by small medium sized contractors in meeting or sticking to the planned programme completion dates were as a result of the poor planning and programming of resources. PM1 stated that the problem starts at the beginning during tender stage "they would submit certain resources during tender stage but in reality, on ground, once the project has been handed over we see a different set of resources being ceded for the project; usually this would be more junior staff than what they had represented on paper during the tender process. The problem starts right there in terms of having that experience on site, so it escalates to delays being anticipated on the project". PM5 attributed the problem to the misunderstanding of the resources needed for the project. PM7 concurred by saying it is a matter of poor resource planning. PM9 added on by saying it is the inability to mobilise themselves at the beginning of the project, they lose time that cannot be won back. PM10, PM19 andPM22 emphasised planning by saying it is an issue of proper planning, poor planning and a lack of planning. PM11 highlights that these contractors over estimate their own ability and hence as a result of this they experience difficulty in accepting their ability to meet target dates. PM23 and PM13 were a little more specific by saying it is an issue of their inability to manage the programme and apply the required resources to meet the planned project requirements; as well as no ability to program the works.

4.1.2.2 Cash flow management and access to credit

A total of 7 out of 24 (29%) respondents mentioned that the obstacles faced by small medium sized contractors in meeting or sticking to the planned programme completion dates were as a result cash flow management and access to credit. PM4, PM6 and PM17 believed respectively it is an issue of cash flows, cash and cash flow management problems. PM8elaborated it is a lack of adequate cost controls and slack cash flow management. PM12 attributed the issue to poor access to credit and this is often caused by improper management and poor ethics.PM13 said they do not have ability to do cash flows and PM25said it is a lack of financial planning.

4.1.2.3 Experience and expertise of the contractor

A total of 6 out of 24 (25%) respondents mentioned that the obstacles faced by small-medium sized contractors in meeting or sticking to the planned programme completion dates is as a result of the experience and expertise of the contractor. PM5 said that these contractors make technical mistakes due to lack of expertise and lack of the right equipment for the job. PM14 and PM18 believed it is an issue of education; they are not educated enough to understand that this is business "…not a means of exploiting workers and subcontractors" and it is a lack of

"…education and understanding schedules, cash flows, budgets etc." PM15 said they lack experience, while PM24 went further by saying it is a lack of practical experience and that the contractors learn information off by heart at university and are not able to apply same in practice. PM21 says that it is a problem of understanding the project requirements.

4.1.2.4 Client and professional team influence on the project

A total of 2 out of 24 (8%) respondents mentioned that the obstacles faced by small-medium sized contractors in meeting or sticking to the planned programme completion dates is as a result of the client and professional team influence on the project. PM5 added on by giving a different perspective on the matter by saying that "most delays in the construction industry point back at the professional team or the client. Smaller contractors have difficulty putting pressure on these people".PM8 concurred with the above and expatiated, stating that the poor performance of municipal and government clients in processing claims and making payments, acts as an obstacle for the contractor to achieve planned completion date. In the South African context, over regulation and client-caused delays in appointments have significant cost implications that are often not taken into account by these contractors.

4.1.2.5 Others – Administrative discipline, Communication, Retaining skills, Supervision and Management problem

PM2 believed that they do not hold enough meetings to communicate goals of the bigger project "the lines of communication, in terms of what needs to be done by them, is not communicated by them (small medium sized contractors)".PM3 attributed the problem to retaining skills. PM25 said it is a lack of administrative discipline and lack of experienced staff/supervision. PM16 said it is a problem of management. A total of 1 out of 24 (4%) respondents mentioned that the obstacles faced by small medium sized contractors in meeting or sticking to the planned programme completion dates were as a result of the administrative discipline of the contractor, poor communication, retaining skills on site, a lack of experience supervision or staff and management problems, as listed above.

4.1.3 Small-medium sized contractors and planning adequately

An outstanding 22 out of 25respondents (88%) responded with an affirmative no, on if small-medium sized contractors plan adequately; with2(8%) respondents, PM6 and PM24,indicating that contractors do a superficial planning only and that it wasn't planning that was a problem but implementation of the plan. Only PM5 (making 4% of the total number of respondents) was in disagreement and of a different opinion with the above statement. Table 4.4presented below shows areas small medium sized contractors fall short in planning adequately.

To summarise the observations of the respondents, the areas in which these contractors fall short in planning adequately begins with their attitude and approach to planning, they think first submit a tender and sort planning out later much later, poor estimating of costs and activity durations, inadequate planning, programs are too broad. They are often given the contract budget and programme in advance and they work according to this without understanding the critical path issues and planning of resources. There is a need for mentors to guide these contractors, no hands on management they rely on their workers to make it work, lack of credit facilities and access to machinery/plant.

Small-medium sized contractors have the inability to mobilise themselves at the beginning of the project, inability to manage the programme and apply the required resources to meet the planned project requirements, inability to program the works, cash flow management, a lack of adequate cost control measures, poor access to credit caused by improper management and poor ethics, lack of practical experience, not educated enough to understand business principles, a problem of understanding the project requirements and retaining skills.

The areas in which these contractors fall short in planning adequately are in poor resource and materials supply planning due to lack of credit facilities or access to machinery/plant. They also depend on someone to do the planning for them thus the programme is done by a person not involved with the day to day project activities which leads to unrealistic programmes, no risk mitigation is practised by these contractors, no consideration of client satisfaction and specifications, they focus on early remuneration and not on producing quality product and no allowance for lead time for products

Table 4.4: Areas contractors fall short in planning adequately

No.	Keywords – Areas contractors fall short in planning adequately
1	Not having the required skills
2	Poor attitude and approach to planning
3	Programs too broad
4	Poor planning of stop and start scenario
5	Lack of credit Facilities and access to machinery and plant
6	Estimating costs and activity durations
7	No allowance for lead time for products
8	No consideration for client satisfaction and specifications – Quality
9	No mentor to assist
10	Late payment by client affects cash flow
11	Timeous odering of materials

4.1.3.1 The planning process and execution of the works including their attitude, programs, skills and others

Small-medium sized contractors in Johannesburg have poor attitudes and approach to planning. Their programs are too broad and they have poor planning of stop and start scenario. PM1 believed it is their attitude and approach to planning, "they think first submit a tender and sort planning out later much later".PM3 believed it is an issue of poor planning or execution of construction activities; stop - start scenario. PM4 said it is poor estimating of costs and activity durations, inadequate planning. PM2 mentioned that their programs are too broad by stating that "They don't breakdown their activities into small chunks so that they can manage it properly". In addition, "Setting manageable targets on a daily basis seems to be the problem; most programs are broad".PM2 also added that they do not have somebody to manage people doing the work. PM18observed it as an issue of poor work breakdown schedules; work breakdown schedules, JIT, Quality, cash flows, budgets, etc. PM7 said that the problem could be due to "not enough experience in the planning process".

PM5 said it is the secondary and refined planning that these contractors fall short in "Most contractors do adequate bar charts in my experience. It is in the secondary and refined planning that the process falls down i.e. critical path, resourcing, cash flow." PM14 stated that the contractor depends on someone to do the planning for him; they don't "…take pains to educate themselves". PM16 said they underestimate project scope and planning required. PM20 observed that on one of his projects, "the programme was done by a person not involved with the day to day project activities. This led to unrealistic programme [and] the tracking of the programme could not be done". PM23 said these contractors face these challenges because they do not have

the requisite skill and experience to plan and progress the project and also incorporate changes in the project plan. PM25 said that these contractors are often given the contract budget and programme in advance and they work according to this without understanding the critical path issues and planning of resources.

4.1.3.2 No risk management

Small-medium sized contractors in Johannesburg do not do risk management on their projects. PM8 said no risk management "no risk analysis is done to take into account changes in program caused by factors outside the SMME's control". PM22 agreed by saying the challenge is in the preparation of the works and not having risk mitigation factors.

4.1.3.3 No experience and no mentor

Small-medium sized contractors in Johannesburg don't usually have experience and they need mentors. According to PM13, "they don't have the experience or staff to guide them on the correct way to do the planning. Often the plan[s] are copies of previous plans rehashed to suit the present scope of work." PM15, on the other hand, added that they need a mentor to guide them on how to do it. PM11 opined that small-medium sized contractors had no hands-on management and were not experienced on projects. These contractors rely a lot on their workers to make it work.

4.1.3.4 Financing and access to credit facilities

Small-medium sized contractors in Johannesburg do not always have the ability to finance their projects or access to credit facilities. PM6 believed they plan but financing for plants required is a challenge "the[ir] plan was to carry earthworks & roads before the rains. Finance for the plant was not available, so these works were delayed…"PM25 said it is the lack of credit facilities and access to machinery/plant that plagues these contractors. The contractor falls short in resource and materials supply planning, due to lack of credit facilities or access to machinery/plant. PM17 said employers contribute to problems with cash flow by not paying within contractual time limits.

4.1.3.5 No focus on client satisfaction and quality

Small-medium sized contractors do not focus on client satisfaction and quality. PM10 said that these contractors make no consideration of client satisfaction and specifications. It is easy to do the bulk work, but the finishing off to the Client satisfaction and specification is a concern. PM21 said these contractors focus on early remuneration and not on producing quality product.

4.1.3.6 Ordering of materials, plants and equipment

Small-medium sized contractors do not always allow for lead times in their procurement programs. PM10 attributed this to timeous delivery of materials; they do not always allow for lead time to products, but rather react to the material being finished before trying to procure more.

PM19 also suggested timeous ordering of materials while PM24 said it is a challenge of understanding the duration of activities, ensuring required tools, materials on site at required time. PM8 mentioned that the issue is with the timeous arrival on site of plant, materials and skilled labour. According to PM9, placing orders early which is a function of cash flow. PM12 said it is a challenge of materials and plant acquisition, cash flow and site management. PM13 stressed that "they don't have the experience or staff to guide them on the correct way to do the planning. Often the plan[s] are copies of previous plans rehashed to suit the present scope of work." PM15 stressed that they need a mentor to guide them on how to do it.

4.1.4 How small-medium sized contractors could plan their projects adequately

Out of the 25 respondents, 24 responded giving their suggestions on how small-medium sized contractors could adequately plan their projects. PM23 did not respond to this question. The following suggestions were made:

4.1.4.1Pre-planning and proper programme

Small-medium sized contractors should pre-plan and do proper programmes. PM1 suggested that after submitting, study the drawings to re-plan, to recheck and get ready for the possibility of being awarded that project. Planning should start with the month or two you have waiting to get a result from the tender. That is valuable time that they can use to actually relook at everything with context. PM3 suggested the need for proper programme for the project. PM5 concurred by saying smaller contractors need to be taught critical path. PM7 said properly planned schedule must be handed in before the project commences. The project manager or Engineer must approve it and the schedules revised at regular intervals if necessary. PM10 advised the contractor to take the timeline and plan the tasks properly including float.

4.1.4.2 Employ good and experienced staff

Small-medium sized contractors in Johannesburg should employ good and experienced staff. PM2 gave an in-depth suggestion that these contractors should put a good foreman or contracts manager. A lot of good contracts managers have tertiary education. Most foremen don't have tertiary education "they have so much of experience that if you take the time to sit down with them and say okay I am doing a program, yes it is a computer program but you tell me, you give me a Gantt chart the way you used to do it in the old days, it really helps". Most instances, most of the small contractors are not experienced. Small guys are not: "instead of the contractor or the boss saying, I think this guy is going to take five days – unless the boss has experience – but most instances I have known, most of these guys are not. Small guys are not". PM6 suggested to invest in quality site people including a junior quantity surveyor. PM21 stressed that "in general there is

a lot of staff movements and lack of gaining experience so the concern will only be aggravated into the future when you have highly paid personnel but no experience".

4.1.4.3 Mentorship and Training

Small-medium sized contractors need mentorship and training. PM8 informed that most of them probably never had any formal project management training. Project managers can help by ensuring these contractors understand and can successfully apply the basics of applied project management in their business. PM13 recommended to get mentors to assist with the initial planning. PM15 suggested that they need informal training on how to do basic planning and cost estimating. PM16 responded that they need education and training. PM19 suggested that these contractors get technical assistance from competent people on all levels as well as admin and financial management advice from competent persons. PM20 opined that it all begins with the knowledge of the scope of work and the appropriate skill required for executing the scope. PM22 recommended that there should be training and motivation of their employees. PM24 highlighted the use of mentorship opportunities.

4.1.4.4 Attitude of contractor*

Small-medium sized contractors need to adopt the right attitude. PM18 said these contractors should be open minded, collaborative, have multi-dimensional approach and not just about making money. PM14 had a concern about the personality of the contractor saying "If he is coming to make money at the expense of everyone else, then be assured of disruptions; but if he builds a team with consultants, subcontractors, clients and treat his own workers as his own children, they will rally after him even during the tough times".

4.1.4.5 Client influence

Small-medium sized contractors could leverage off the client's influence on the project to assist them in planning their projects adequately. PM25 said the focus is on the client rather than the contractor, saying "due to most clients being municipal in RSA it is vital that project managers start to play a role contractually in facilitating or mentoring the contracts on behalf of the Municipal Clients in RSA .The municipalities have a lack of competent people to monitor their very own projects". PM9 agreed with the notion that the client has a role to play and they need to budget a separate safety allowance by informing that "clients need to compensate for the contractors inefficiencies by shadowing scheduling, buying capital items direct, loaning and providing establishment items". PM4 took a similar route focusing on the client and saying "maybe clients should set aside some funds for say contractor incubation and provide them with

technical & planning support (starting from before tender stage)". PM17 also emphasized on the role of the employer saying: "employers must assist by paying within contractual time limits".

4.1.4.6 Quality

Small-medium sized contractor need to pay attention to quality. PM11 said to "rather do less well than a lot badly. Quality is to an end product what character is to a person."

4.1.5 How project managers perceive small-medium sized contractors execute the construction works

All 25 respondents gave their observations on how they perceive small-medium sized contractors execute their projects:

4.1.5.1 Poor planning

A total of 11 out of 25 (44%) respondents observed that small-medium sized contractors plan poorly in the execution of their projects. PM2 revealed that these contractors don't plan properly; they don't look at the implication of their cash flow and they don't look at the full implication of executing any task. This argument is supported by PM12 and PM19 respectively stating, that they often take on the assignment without having pre-planned the execution thereof and the resources required; and the projects are poorly executed. PM8 categorised these contractors into those who are organised and those that are not. PM1 added on to this observation by saying that "for the ones that are not experienced, it is a bit chaotic in terms of meeting the various milestones on their program. It stems back to planning from the onset. We found out that they just change the program to achieve an end date but don't really think through the process of how they get those end dates." PM17 described it as "there is no real planning or programming - they just start with the easiest work and leave the difficult part till the end. PM3said it an issue of poor planning, money wasted and no business plan. PM7 concurred by saying poor planning at the initial stages of the contract is a challenge. PM10 alludes to the idea of poor planning by saying that "the majority blindly starts to do as much as possible without taking into account other trades that still have to finish resulting into fruitless work". PM22 says they often take on the assignment without having pre-planned the execution thereof and the resources required. PM23 says there is inadequate planning and management.

4.1.5.2 A lack of technical skills and a need for mentorship

A total of 5 out of 25 (20%) respondents observed that small-medium sized contractors lack technical skills required to execute the project and there is a need for mentorship in the execution

of their projects. PM4 said that these contractors are willing to succeed but lack (in most cases) the technical and management skills; cash is also limited. PM20 and PM25 observed that it was also a case of the lack of coordination, lack of analysis and judgement, lack of discipline and respect for professionals. PM24 agreed by saying there is the willingness but limited ability or resources. PM15 said they have the potential to become established contractors with the correct leadership.

4.1.5.3 Quality

A total of 6 out of 25 (24%) respondents observed that small-medium sized contractors' quality is an issue in the execution of their projects. The in-depth face to face interview with PM2 revealed that "cutting corners and compromising on quality seems to be the big thing nowadays in the industry; look at all the failures it is about quality". This argument is backed up by observations from PM21 who stated that "hap hazard and lack of quality focus" seems to be a problem with these contractors. PM5 was of a different opinion and stated that these contractors have the intention to do a good job but on bigger projects they lose this focus. They place higher emphasis on quality than on time. PM14 disagreed with PM5 saying that one in ten of these contractors are brilliant but for the rest, it is difficult to make them understand the importance of finishing within time and quality. The good ones have professional backup and for the rest, it is a struggle. PM11, without giving much detail spoke of measuring quality and progress.

4.1.5.4 Attitude of the contractor

A total of 3 out of 25 (12%) respondents observed that small-medium sized contractors' attitude is an issue in the execution of their projects. PM5 mentioned that these contractors are generally gullible and allow less overlap. PM9 contradicted this statement by saying it is "stop start trying to satisfy multiple clients by shuffling resources to keep everyone happy". PM13 said that these contractors are reactive rather than proactive.

4.1.5.5 Slow establishment of site

A total of 2 out of 25 (8%) respondents observed that small-medium sized contractors' slow establishment of site is an issue in the execution of their projects. PM6 said that the site establishment are usually slow, real completion of tasks left very late in the project cycle. The observations of PM7 correlates with this statement, saying that these contractors start slow; "the Contractor just need the 1st payment certificate in to receive the preliminaries and general to get funds to kick off the Project".

4.1.6 Five Most Important competencies/skills required a project manager to handle small-medium sized contractors

A total of 23 respondents out of 25 gave their opinion on the 5 most important competencies/skills required by a project manager to handle small-medium sized contractors are the following:

4.1.6.1 Technical Knowledge

The technical knowledge of the project manager was rated to be one of the five most important skill a project manager needs to posses when handling small-medium sized contractors in Johannesburg. PM1 said they should be able to understand the building process so "contractors don't pull…wool over your eyes". PM2 agreed by saying they need to have the technical knowledge in terms of how to assist the contractor "he needs to be able to sit with the contractor to say this is your program, let's break it down".PM4said they should have the technical knowledge of what's being built.PM10 said they should have intimate knowledge of the work process and critical path, with the ability to break down a task into various activities. PM3 and PM25agreed that project managers should have knowledge of construction regulations, knowledge of contracts, construction knowledge, standards and specifications. PM11 said they should know their field of contracting. PM24 opined they should understand the building process. PM6 posited that project managers should have very good understanding of the work details to highlight programme constraints and mitigate them. PM12 stressed that they should enforce technical standards.

4.1.6.2 Relationship Management including Conflict management

The next highly rated skill the project manager needs to possess when handling small-medium sized contractors in Johannesburg, is relationship management including conflict management. PM1 responded that project managers need to "master… relationship management", to handle conflict "conflict management" and should, according to PM17 possess peoples skills. PM14 recommended that the project manager has to create a relationship with the contractor else they become opponents. PM15 agreed that the project manager should have conflict management skills. PM18 underscored, without elaborating, that the project manager should have client or contractor relationships.

4.1.6.3 Planning of the works

The planning skills of the project manager was rated by the respondents as being one of the top five skills the project manager should possess when handling small-medium sized contractors in Johannesburg. PM2 responded that project managers should be able to link the program to try and make these contractors understand how to link the program to cash flow; these contractors don't have cash to execute the works. PM25 advised that the project manager should be competent in programming, resource management of plant, labour and materials handling. PM10 said they should coordinate various tasks to complete the work in sequence and to make sure the contractors stay as close to the programme as possible. PM7 said that the project manager should have access to a planning program. PM11 said they should know how to stay on program. PM10 said they should be able to break down tasks into various activities, coordinate the various tasks to complete the work in sequence. They should make sure the contractor stay as close to the programme as possible and make sure the paperwork is in place.

4.1.6.4 Support and guidance to contractor

Project managers need to provide support and guidance to small-medium sized contractors in Johannesburg. PM6 said project managers need to be authoritative and be a coach with lots of available time. PM1 said they should have the ability to support the contractor during the process of construction "even though you may have his weak points" and document the process of stage 5 (contract administration stage) properly.PM2 said the project manager should be competent in assisting the contractor to plan to break down his program. PM16 said that the project manager should be coaching and mentoring daily planning, budgeting and managing cash flow. PM17 agreed that the project manager must have patience, willingness to assist, skills and time to assist. PM13 said that project managers need patience and mentoring. PM19 said project manager should have patience, willing to give advice, guidance and firmness. PM25 should

4.1.6.5 Communication

Project managers need to possess good communication skills. PM8 said that they should communicate well with all parties. Stay on top of the programme and address deviations as soon as possible. PM14 agreed that communication skills is important, which involves creating a relationship first. PM15 mentioned that the project manager should have communication abilities. PM17 agreed that the project manager should have communication skills. According to PM18 and PM19 project managers should have communication skills. PM`9 also agreed that communication skills are vital.

4.1.6.6 Quality conscious

Project managers should be quality conscious. PM2 said the project manager should not forget quality.PM15 mentioned that there is a need for quality management. PM9 said project managers should be safety conscious and caring but the economy and culture prevents this. PM11 said the project manager should do continuous quality checks. PM18, without going into much detail, suggests that time and quality.

4.1.6.7 Experience and skill

Project managers need experience and skill. PM13 called for the need of experience in the particular field; as well as the necessary qualifications.PM21 said the project manager should have the experience and education. PM21 added that the project manager should be competent in scheduling and time constraints. PM16 said that project managers should have experienced site agents and occupational health and safety compliance. PM11 said they should take on only the work they can handle. PM3 said project managers should be competent in monitoring and control.

PM11 said project managers should know their financial situation. PM5 gave his perspective on the influence of the project manager on the small medium sized contractor by saying "The contractors rely on the project manager to do the right thing whereas on big projects the contractors will force the project manager to do the right thing. The project manager carries the moral compass for the project and must do much of the upward management to the client who often wants[s] to do unethical things. The project manager has to input management and sometimes technical skills to make a success of the project. Unfortunately many project managers are top of the heap without having skills, morals or expertise."

4.1.6.8 Contract Administration

Project managers should be able to administer the contract effectively. PM1 recommended they should be able to "administer the contract properly", as well as the construction "construction administration". PM25 recommended that project manager should be competent in construction administration.

Preferred style of leadership best suited for small medium sized contractors

All the 25 respondents expressed their opinions on the preferred style of leadership best suited for small medium sized contractors. Table 4.5categorises and summarises the responses of the respondents on the style of leadership preferred for small-medium sized contractors in South Africa.

Table 4.5: Leadership style best suited for small-medium sized contractors

Preferred style of leadership for small-medium sized contractors in South Africa	Percentage of Respondents
Mentoring and coaching leadership	20%
Consultative and collaboreative leadership	16%
Participative leadership	8%
A servant leader	8%
Adaptive leadership	8%
Effective communication	8%
Lead by example	8%
Incentivescheme based performance leadership	4%
Training	4%
Country club and task	4%
Leadership management	4%
Personal contact	4%
Project leader	4%

4.1.7.1 Mentoring and Coaching Leadership

20% of respondents said that mentorship and coaching leadership styles are best suited for small-medium sized contractors in Johannesburg. PM6 said Mentoring, coaching and patience while PM11 said assist rather than insist and PM25 coined a different term 'Open door / mentorship'

4.1.7.2 Consultative and Collaborative Leadership

16% of respondents said that consultative and collaborative styles are best suited for small-medium sized contractors in Johannesburg. Consultative and collaborative and some respondents elaborating and saying collaborative - all part of the same to produce a successful project for the employer". PM18 describes it as engagement, consultation, co-operation and PM13 says Making them part of the team.

4.1.7.3 Participative Leadership

8% of respondents said that participative leadership style is best suited for small-medium sized contractors in Johannesburg. PM17 and PM22 said similar things participative management - assist as much as possible

4.1.7.4 A Servant Leader

8% of respondents said that a servitude style of leadership is best suited for small-medium sized contractors in Johannesburg. PM14 believes that one has to be a servant Project Manager. Understand spiritual aspects of human beings. Material accumulation does not make them better contractors. PM20 said a leadership style characterized by empathy and decisiveness and being a servant leader.

4.1.7.5 Adaptive Leadership

8% of respondents believe that an adaptive leadership style is best suited for small-medium sized contractors in Johannesburg. PM8 said that the leadership style needs to be adaptive. Start with delegation for contractor who knows what to do, then participation, then motivation and lastly instructing or directing for contractor that needs to be pushed to get anywhere. PM23 says the project manager needs to be a person who can operate along the full spectrum of the leadership continuum"

4.1.7.6 Effective communication

8% of respondents indicated that effective communication was best suited for small-medium sized contractors in Johannesburg. PM2 and PM12 agree on applying strict ground rules and communicate these clearly and regularly; emphasis being on communication.

4.1.7.7 Lead by example

8% of the respondents believe that the project manager should lead by example. PM1 says the project manager should lead from the front and from the back and PM10 says lead by example. If you want something done you must have a workable execution plan.

4.1.7.8 Others

Other styles of leaderships mentioned by the respondents are as follows: PM3:"Incentive scheme based on performance. Hands on approach" PM7:"Must receive training in planning and must supply proof of the training during tender stage". PM9:"Country club and task". PM15:"Leadership Management". PM16:"Personal contact". PM5: "compassion plays a bigger role…project manager must understand he must be more of a 'project leader' than a project manager"

4.1.8 Professional construction project managers and training institute

A total of 11 out of 25 (44%) positively affirmed that the competences, as listed by their project management training institutes, do take into consideration the South African project environment i.e. the challenges faced with managing a project in South Africa such as frequent strikes of the various industries, the working moral or ethics of the general labourer or employee, the entry method of individuals into the construction industry (i.e. tenderpreneurs). PM3, PM4, PM9, PM10, PM14,

PM15, PM16, PM18, PM19, PM24 and PM25 positively affirmed the above. Some respondents had some reservations with the above statement but agreed nonetheless. These were PM12 and PM13 who respectively said "Perhaps not sufficiently. The challenges associated have only become more prevalent in recent years" and "very few". Respondent PM22 was the only one who disagreed with the statement. PM5 had a completely different opinion on the subject matter, saying "Strangely enough I have mentored a few young project managers refused entry by SACPCMP that have entered via PMI and others. These procedures are generally administrative and if one has the fundamentals of project management, the[n] processing, auditing and procedure is what is added by the competencies of each". Some respondents did not expressly agree or disagree with the statement but they made the following comments about the issue:

PM2: "Have the basics. Every project has different situations - a risk that you need to manage. Managing labourers is or may be a good thing because that's quite frequent in South Africa - So yes it is good to understand how you deal with [small-medium sized contractors in South Africa] but there is a contract in the way you deal with it. I don't think as a project manager you can get involved with the labour relations of a contractor - manage it according to what the contract says". PM6: "Managing in SA - yes. Moral & ethics in tender awards to well placed, but incompetent contractors - Nothing can prepare for this". PM7: "Good understanding of the people on the Project and work relationship for the task /tasks ahead". PM11: "You just learn to plan in advance". PM20: "In my opinion these competencies must be adapted to each situation using leadership skills". PM21: "The requirements take into consideration the needs but do not address the methodology of getting the required experience". PM23: "More localisation of specific knowledge and experience related to the construction industry would be useful". PM10: "as well as experience and constant learning objectives".

4.1.9 Collaborative planning between the project manager and the contractor

A total of 21 out of 25 (84%) respondents agreed that it would be beneficial and it would contribute to the adequate planning of the works, if the project manager assisted the contractor during the planning of the execution of the works before actual construction begins, saying the following:

To summarise the responses of the respondents, often the small to medium contractors do not employ project managers but use site agents without the planning background to handle the projects, to assist in the complete understanding of the scope and the planning and resourcing of the activities, the only way to do this is to have an induction period after the contractor is appointed, it would be beneficial but possibly not practical, we normally attach a learner contractor to an experience contractor to avoid implementation delays, very dangerous, transfer of risk from contract management perspective".

It is to enhance their production in the most cost effective method and playing the charitable benefactor is contrary to that profit motive. At the end of the day small and medium contractor work is relationship driven by a continuity of work only with the continuity can the cash flow and build-up of expertise and competence be solved.

It is very important to go through their detailed program with them in terms of understanding time allocations for various activities. The contractors are given the opportunity after appointment to change the program "so, we ask them now that you are going to be appointed, is there anything you would like to change on that program because you now have the opportunity to make amends if you have made mistakes initially. It is better to sit with them and go through the detailed program, that's what used to happen in the old days, even though the contractor is the master of his own program but the professional team assists in saying that have you looked at all the various facets around the project from a design perspective, from a supply perspective etc. It is quite prudent that the team sits with them to analyse their program properly and if there are any amendments to be made they sign the contract."

The contractor should still develop his own program "the one thing that we need to stay clear as project managers is that the contractor needs to develop his own program. As soon as you start telling him how to execute his work he will come back and say you told me how to do it. You can only advise and then you can record that you advised him. You should never be prescriptive on how he should sequence his work."

Here are some of the other responses: The contractor still has the levy to program the works according to their discretion "however the contractor will listen and adjust his plan anyway." "The day the Contact is signed, the Project Manager is equally responsible for the successful completion of the Project." "Everyone can gain if more upfront planning is done, the challenge is the liability and responsibility shifts to the Project Manager and unless the client is on board to promote this it could get very messy. Then you need to ask, "why is the client doing this work?", it is to enhance their production in the most cost effective method and playing the charitable benefactor is contrary to that profit motive. At the end of the day small and medium contractor work is relationship driven by a continuity of work (where I will pay fairly, and if you mess up the work stops). Only with the continuity can the cash flow and build-up of expertise and competence be solved."

"There are many different ways to implement a project and more than one is correct. The Project Manager would then be able to understand the thinking of the Contractor and assist if apparent flaws exist or info is overlooked." You can only earn it or give it away." "The detailed planning would reveal whether or not the contractor had the ability to perform. This is currently often only discovered several months into the contract." "Unfortunately the courses provided are theoretical and not really related to the civil construction field that I work in. Often the small to medium contractors do not

employ project managers but use site agents without the planning background to handle the projects." "The project manager could mentor the contractor how to do the planning schedule, how to claim for payments etc."

PM17 said that the project manager can then better evaluate the skills level of relevant contractor personnel and identify specific areas of assistance. PM18 assesses capabilities before appointment, open mature engagement, close collaboration required from the very outset to end. PM19 believes that planning of resources and proper programming of the works will be achieved. PM23 says to assist in the complete understanding of the scope and the planning and resourcing of the activities. PM25 believes the relationship between the client and the client representative/consulting engineer and the appointed contractor would improve therefore creative a conducive working environment.

A total of 3 out of 25 (12%) of respondents did not agree that it would be beneficial and it would contribute to the adequate planning of the works, if the project manager assisted the contractor during the planning of the execution of the works before actual construction begins, saying the following:

1. **Who takes the responsibility of the program?**
   Project managers 3, 5 and 24 shared the same sentiment, saying respectively: "Very dangerous, transfer of risk from contract management perspective", "I think it would BUT one has to be mindful of the contractual disturbance one brings about because of that. I am also often appalled by the lack of planning knowledge some PM's have. They have the theory of CPM but really don't understand how long work takes etc. I am not sure it would easily work as a national directive. I don't think PM do nearly enough at programme approval stage. In fact many PM's have no idea what to look at when approving a programme. "

2. **Sceptical about the practicality**
   PM8: "The only way to do this is to have an induction period after the contractor is appointed. Yes it would be beneficial but possibly not practical. We normally attach a learner contractor to an experience contractor to avoid implementation delays"

H. Using the Muller and Turner (2010) model created for profiling the personalities of successful managers, the respondents were asked to rate, within each category, the most important competency required by project managers for small-medium sized contractors. Muller and turner (2010) developed a model used to relate the personalities of successful managers to either the success or failure of the person in the leadership position. Figure 4.2 is a pictorial representation of the responses of the respondents.

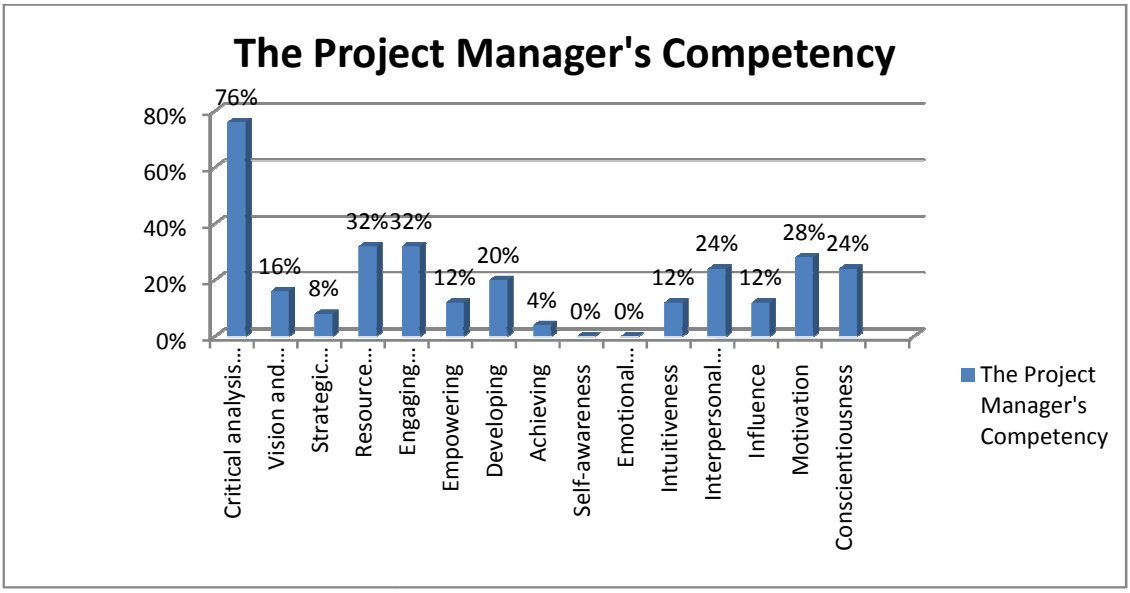

Figure 4.2: Respondents rating of the project manager's competencies

All 25 respondents gave their opinions on what the most important competency, within each category of competency, is required by the project manager for the small-medium sized contractor. According to Figure 4.2 76% of respondents believe that critical analysis and judgement is the most important competence within the category of intellectual competence, while the opinions of the respondents were split for the managerial competence of the project manager. 32% of respondents believe that resource management and engaging communication are the most important for the managerial competence. Finally, 28% of respondents believe that motivation is the most important for emotional competence.

Table 4.6 below is a demographic representation of the respondent's responses according to their years of experience.

Table 4.6: The project manager's competencies categorised according to years of experience.

No.	Respondents – Project Managers	Years Of Experience in building within the construction industry in South Africa?	Intellectual Competence	Managerial Competence	Emotional Competence	Range
14	Project Manager 14	9 years	Strategic Perspective	Engaging Communication	Conscientiousness	6 - 10 years
1	Project Manager 1	15 years	Critical analysis and Judgement	Engaging Communication	Motivation	11 - 15 years
23	Project Manager 23	14 years	Critical analysis and Judgement	Achieving	Motivation	11 - 15 years
2	Project Manager 2	17 years	Critical analysis and Judgement	Engaging Communication	Interpersonal Sensitivity	16 - 20 years
3	Project Manager 3	17 Years	Critical analysis and Judgement	Developing	Motivation	16 - 20 years
9	Project Manager 9	20 years	Critical analysis and Judgement	Resource Management	Conscientiousness	16 - 20 years
20	Project Manager 20	16 years	Critical analysis and Judgement	Engaging Communication	Interpersonal Sensitivity	16 - 20 years
22	Project Manager 22	17 years	Vision and Imagination	Empowering	Influence	16 - 20 years
25	Project Manager 25	22 years	Critical analysis and Judgement	Resource Management	Intuitiveness	21 - 25 years
12	Project Manager 12	25 years	Critical analysis and Judgement	Resource Management	Interpersonal Sensitivity	21 - 25 years
18	Project Manager 18	25 years	Strategic Perspective	Engaging Communication	Conscientiousness	21 - 25 years
4	Project Manager 4	30 years	Critical analysis and Judgement	Developing	Interpersonal Sensitivity	26 - 30 years
10	Project Manager 10	28 years	Critical analysis and Judgement	Resource Management	Conscientiousness	26 - 30 years
6	Project Manager 6	34 years	Critical analysis and Judgement	Developing	Influence	31 - 35 years
15	Project Manager 15	35 years	Vision and Imagination	Empowering	Motivation	31 - 35 years
17	Project Manager 17	35 years	Critical analysis and Judgement	Engaging Communication	Motivation	31 - 35 years
19	Project Manager 19	31 years	Critical analysis and Judgement	Resource Management	Motivation	31 - 35 years
21	Project Manager 21	32 years	Vision and Imagination	Developing	Intuitiveness	31 - 35 years
24	Project Manager 24	40 years	Critical analysis and Judgement	Resource Management	Interpersonal Sensitivity	36 - 40 years
5	Project Manager 5	38 years	Critical analysis and Judgement	Engaging Communication	Intuitiveness	36 - 40 years
16	Project Manager 16	40 years	Critical analysis and Judgement	Empowering	Conscientiousness	36 - 40 years
7	Project Manager 7	44 years	Critical analysis and Judgement	Engaging Communication	Interpersonal Sensitivity	41 - 45 years
8	Project Manager 8	40 years	Critical analysis and Judgement	Resource Management	Influence	41 - 45 years
11	Project Manager 11	42 years	Vision and Imagination	Developing	Motivation	41 - 45 years
13	Project Manager 13	45 years	Critical analysis and Judgement	Resource Management	Conscientiousness	41 - 45 years

CHAPTER 5 – DISCUSSIONS

5.1 Introductions

As stated in the research design, the data collected will be analyzed and interpreted using pattern matching. The extrapolation of the data will be a four step explorative process. The first step is using an inductive process to identify the issues and generate theories from existing literature through the literature review. The next step is using a deductive approach to test theories from existing literature against the data collected. Then, the identification and classification of the data into three categories namely respondents registered as professional construction project manager (PrCPM), respondents registered with the council but did not disclose their specific title and respondents not registered with the council. The final step was content analysis.

The context of the research problems identified by the researcher in developing countries such as those on the African continent are that construction projects experience difficult project environments due to poor infrastructure and lack of resources, poor contractor performance and project performance deficiencies defined as cost and time overruns, poor work quality, technical defects, poor durability, inadequate attention to safety, health and environmental issues. The implication of this statement from the existing literature was that projects operating in developing countries are not being successful in terms of achieving their budget and schedule expectations. The literature also reveals that there are challenges that affect the growth and development of construction firms operating in developing countries such as those in Africa, especially small-medium sized contractors.

The research problem identified are the poor technical – particularly poor planning and poor managerial skill of the small-medium sized contractors in developing countries, specifically in South Africa. The research sought to explore the applicability of the findings of authors such as Ofori (1991), Dlungwana et al (2002) to mention a few from the literature, in recent times. It also sought to explore the relevance of their observations in the South African construction industry as well as the role of the construction project manager in bridging the existing technical and managerial gaps of small-medium sized construction contractors.

The objectives of the research was to investigate the challenges of the construction industry in South Africa; to investigate the challenges small-medium sized contractors face in achieving project success, which is projects achieving their budget and schedule expectations in South Africa; to identify the required perceived competency of the construction project manager in managing small-medium sized construction companies in South Africa; and to explore the need for a collaborative planning

framework that addresses the technical and managerial gaps of small-medium sized construction firms in South Africa.

5.2 Challenges faced by small-medium sized contractors

One of the theories generated from the literature review is that there are challenges that affect the growth and development of construction firms operating in developing countries such as those in Africa, especially small-medium sized contractors.

The findings of this research reports that one of the challenges faced by small-medium sized contractors in South Africa in achieving project success (according to cost and time) is the loss of experienced workers, the lack of professional staff members on the team of these contractors, in-experienced construction workers, lack of organisational skills and repeated strikes by construction workers; though the findings does not categorise the issue of the loss or lack of competent staff into specific demographics such as age, this issue was also reported by Ofori (1996) and Dlungwana et al (2002), the industry fails to attract high-calibre young people.

In the opinions of the first category of respondents (indicated registered as PrCPM) concerning challenges faced by small-medium sized contractors in South Africa in achieving project success (within planned budget and time) are, the management of their cash flows, poor access to credit, not having enough capital to drive the project from their own coffers, challenges in obtaining finance, poor planning, challenges with getting competent staff, poor administrative capabilities, lack of experience and poor education, lack of management skills in general and the influence of the client such as imposing unrealistic deadlines are all challenges small-medium sized contractors face in achieving project success in South Africa.

The above observations of the registered professional construction project managers are also supported by the opinions of the second category of respondents (that is those that didn't indicate they were registered PrCPM). They found that small-medium sized contractors have poor access to credit, limited cash flow, lack of financial discipline, they lack back office support and use the cash flow from one project to settle other outstanding debts. They do unrealistic programming of the works, they don't plan the project ahead before the project commences and have no ability to program the works. These contractors have their site resources overstretched with poor capabilities of the personnel. They have challenges in the procurement of transport, materials and labour skills. They lose experienced workers, they lack professional staff members, they have in-experienced construction workers, they lack organisation skill and experience repeated strikes by construction workers. They also lack procurement skills. The education level of these contractors is also of a concern. The dishonesty of these contractors, looking for easy money, communication skills and lack of practical experience is a

challenge. They also have challenges with having quality plans, making sure tendered rates are achievable and allowing some margin for profit and growth

The final category or analyses was that of PM5 (that is respondent not registered with the SACPCMP).The opinions of PM5 have been included as part of the control group and not discarded, although PM5 doesn't meet the requirements of the sampling criteria, in this study to provide a different perspective on the issues discussed.

Thus, with regards to the challenges faced by these contractors in achieving project success (within planned budget and time); the challenge can be linked to the tightness of the programme. The faster a programme is, the greater the turnover per month and therefore the higher the cash demand per month. The problem is not with the contractor but with the influence and interruption of the project manager, as well as lack of understanding contractual terms and contract, lack of technical skills amongst other factors of these contractors as discussed in the preceding chapter.

These contractors are usually subservient to a project manager than the larger contractors. This leads to behaviour such as accepting changes beyond their capability to process them in the budget and time without complaining or issuing contractual notices, accepting instructions they don't have to accept, accepting failure and design responsibility that is not theirs in terms of the contract, verbal communication, lack of understanding of the contractual terms and contract, lack technical skills and relying on the advice and guidance from the design team which can be slow, challenges with managing their subcontractors and poor planning and use of plants and equipment.

5.3 Observations on how small-medium sized contractors execute their projects

Another theory generated from the literature review was the issue identified by Thwala and Phaladi (2009) as challenges facing emerging contractors in the North-West of South Africa and issues identified as poor contractor performance by Dlungwana et al (2002), are similar with reports of poor management of design activities, inadequate or poor planning can also be interpreted as the lack of adequate capacity to handle the uniqueness, complexity and risks but in contracting, lack of effective management during their early stages and lack of basic business management which are poor record keeping and inadequate technical, financial and contract managerial skills, are similar to issues such as poor management and low skills level among the workers.

The data collected in this study shows that small-medium sized contractors in Johannesburg experience the same challenges as those in the North-West of South Africa.

The first group mentions (that is the registered as PrCPM) there is a lack of discipline and respect for professionals; while on the other hand, the second group mentions that the good contractors have professional backup. Although it is unclear the capacity the term 'professional' is used in both cases, it is worth highlighting the casual link between professional backup and good contractors.

The final category of respondents (that is, not registered with the SACPCMP) gives a different perspective, somewhat contradictory, stating that small-medium sized contractors place higher emphasize on quality than on time. Meanwhile, the second group of respondents state that these contractors tend to cut corners and compromise on quality during the execution.PM5 also states that small-medium sized contractors have the intention to do a good job but on bigger projects they lose this focus and they are generally gullible.

5.4 Obstacles faced by small-medium sized contractors and not meeting or sticking to the planned programme completion dates

A theory generated from the literature review by Thwala and Phaladi (2009) on the challenges of emerging contractors in the North-West is almost a verbatim report about small-medium sized contractors in Johannesburg which are improper management and poor ethics, lack of practical experience, small-medium sized contractors not being educated enough to understand business principles, a problem of understanding the project requirements

Planning was observed to be the biggest challenge faced by small-medium sized contractors in executing their projects, irrespective of the question on obstacles faced by small-medium sized contractors and not meeting or sticking to the planned programme completion date.

An outstanding 88% responded with an affirmative no, to the question 'if small-medium sized contractors plan adequately?' with 8% respondents indicating that contractors do a superficial planning only and that it wasn't planning that was a problem but implementation of the plan.

In terms of the obstacles these contractors face the following were identified by the first category of respondents (that is those who indicated registered as PrCPM) poor planning and programming of resources, cash flow management and poor access to credit, the experience and expertise of the contractor, client and professional team influence on the project, administrative discipline of the contractor, poor communication, retaining skills on site, a lack of experience supervision or staff and management problems. Again, planning and programming of resources was top of the list followed by cash flow management and so on.

The observations of the second category of respondents (that is those who didn't indicate registered as PrCPM) align with the observations of the first group. They attributed the biggest obstacles with regards to the small-medium sized contractor meeting or sticking to the planned programme completion dates to poor resource planning.

The second group (that is those who didn't indicate registered as PrCPM) also attributed the obstacles to poor performance of municipal and government clients in processing claims and making payments, acts as an obstacle for the contractor to achieve planned completion date. In the South African context, over regulation and client-caused delays in appointments have significant cost implications that are often not taken into account by these contractors.

PM5 (not registered with the SACPCMP) concurred with the first and second group stating that small-medium sized contractors misunderstand the resources needed for the project and technical mistakes are made due to lack of expertise and lack of the right equipment for the job.

PM5 (not registered with the SACPCMP) also gave a different perspective stating that most delays in the construction industry point back at the professional team or the client. Smaller contractors have difficulty putting pressure on these people. It is worthwhile to note the chasms in opinions concerning this subject matter of the professional team.

Finally, the area in which these contractors fall short in planning adequately in, PM5 was of the opinion that is it an issue of the secondary and refined planning. This is the area these contractors fall short in. Most contractors do adequate bar charts but the process of planning falls down in refined planning such as critical path, resourcing, and cash flows and so on.

5.5 How can small-medium sized contractors adequately plan their projects

Poor planning was identified in the literature review as being a challenge for small-medium sized contractor. The first category of respondents (that is those who indicated registered as PrCPM) suggested how small-medium sized contracts can plan adequately for their projects suggesting that after submitting the tender, study the drawings to re-plan, to recheck and get ready for the possibility of being awarded that project, take the timeline and plan the tasks properly including float,

These contractors need informal training on how to do basic planning and cost estimating, good contracts managers have tertiary education, most foreman don't have tertiary education so take the time to sit down with them and inform them that you are doing a program but request for their gantt chart. Most instances, most of the small contractors are not experienced. They should get technical

assistance from competent people on all levels as well as admin and financial management advice from competent persons

Project managers begin to play a role contractually in facilitating or mentoring the contracts on behalf of the Municipal Clients in RSA .The municipalities have a lack of competent people to monitor their very own projects". Clients should set aside some funds for say contractor incubation and provide them with technical & planning support (starting from before tender stage)", employers must assist by paying within contractual time limits".

The second group of respondents (that is those who didn't indicate registered as PrCPM) suggested that these contractors should invest in quality site people including a junior quantity surveyor. Project managers can help by ensuring these contractors understand and can successfully apply the basics of applied project management in their business, get mentors to assist with the initial planning.

Contractors should be open minded, collaborative, have multi-dimensional approach and not just about making money, clients need to compensate for the contractors inefficiencies by shadowing scheduling, buying capital items direct, loaning and providing establishment items

The final response is that of PM5 (not registered with the SACPCMP) who concurred by saying smaller contractors need to be taught critical path.

5.6 Collaborative planning between the Project Manager and the Small-medium sized contractor

An objective of the study which was to explore the need for a collaborative planning framework that addresses the technical and managerial gaps of small-medium sized construction firms in South Africa and this study revealed that 84% of respondents agreed that it would be beneficial and it would contribute to the adequate planning of the works, if the project manager assisted the contractor during the planning of the execution of the works before actual construction begins.

Munns and Bjeirmi (1996) identified that project planning by the project manager is needed to overcome under-costing, overspending and late delivery of projects. Menches and Hanna (2006) were in support stating that intuitively most contractors believe better planning can lead to more successful project performance but the evidence has been mostly anecdotal. Therefore the response of the respondents pertaining to the beneficial contribution of a collaborative planning framework between the project manager and contractor is apt. Both project managers and contractors are of the same opinion concerning the importance of planning.

The reasons stipulated for this collocation, according to the first group of respondents (that is those who indicated registered as PrCPM), is that it is very important to go through the detailed programs of the small-medium sized contractor with them in terms of understanding time allocations for various activities. However, the contractor should still develop their own program. The Project Manager would be in a position to understand the thinking of the contractor and assist if there are apparent flaws or information overlooked. The project manager could mentor the contractor on how to do the planning schedule, how to claim for payments and so on. The project manager can better evaluate the skill level of the relevant contractor personnel and identify specific areas of assistance. The relationship between the client and the client representative/consulting engineer and the appointed contractor would improve therefore creative a conducive working environment".

The second group of respondents (that is those who didn't indicate registered as PrCPM) were of the opinion that the contractor still has the levy to program the works according to their discretion however the contractor will listen and adjust his plan anyway. The Project Manager is equally responsible for the successful completion of the Project, Everyone can gain if more upfront planning is done, the challenge is the liability and responsibility shifts to the Project Manager and unless the client is on board to promote this it could get very messy.

PM5 (not registered with the SACPCMP) "I think it would BUT one has to be mindful of the contractual disturbance one brings about because of that. I am also often appalled by the lack of planning knowledge some PM's have. They have the theory of CPM but really don't understand how long work takes etc. I am not sure it would easily work as a national directive. I don't think PM do nearly enough at programme approval stage. In fact many PM's have no idea what to look at when approving a programme. "

Rwelamila and Purushottam (2012) have noted that appointing project managers mainly based on their technical expertise and project managers running projects based on intuition and experience alone, has led to some serious deficiencies and failures; although no other study has empirically provided a causal link between the project failures and lack of project management competence. They have acknowledged the importance of technical expertise but absent of project management competence, have led to project deficiencies and failures, although there isn't any empirical evidence creating the link between both factors. PM5 accused project managers in South Africa of some level of incompetence in project management knowledge.

5.7 Five most important competencies of project managers for handling small-medium sized contractors in South Africa

The SACPCMP delineates the roles of the construction project manager between acting as principal consultant and acting as principal agent. The focus of this research is on the role of the construction project manager as the principal consultant only.

The minimum competencies required by the SACPCMP for the effective execution of the Identified Work for the Construction Project Manager are as follows: technical competencies which includes knowledge of construction science, knowledge of construction processes, knowledge of the design processes and knowledge of financial and cost factors.

According to the findings of this study, technical knowledge, relationship management including conflict management, planning of the works, support and guidance to contractor, communication, quality conscious, experience and skill and contract administration, were discovered to be the most recurrent five important competencies of the project manager.

The first group of respondents (that is those who indicated registered as PrCPM) reported that the project manager needs to understand the building process, technical know in terms of how to assist the contractor, technical knowledge of what's being built, intimate knowledge of the work process and critical path, with the ability to break down a task into various activities, know and enforce technical standards, master relationship management and conflict management, possess peoples skills, competent in programming, resource management of plant, labour and materials handling, competent in assisting the contractor to plan to break down his program, have patience, willingness to assist, skills and time to assist, communication abilities, competent in construction administration, have the experience and education, be competent in monitoring and control.

The second group of respondents (that is, those who didn't indicate registered as PrCPM) reported that the project manager needs to have knowledge of construction regulations, knowledge of contracts, construction knowledge, good understanding of the work details to highlight programme constraints and mitigate them, create a relationship with the contractor else they become opponents, access to a planning program, need patience and mentoring, project managers need to be authoritative and a coach and mentoring daily planning, budgeting and managing cash flow, communicate well with all parties.

PM5 (not registered with the SACPCMP)gave the perspective on the influence of the project manager on the small medium sized contractor by saying small-medium sized contractors rely on the project manager to do the right thing whereas on big projects the contractors will force the project manager to

do the right thing. The project manager carries the moral compass for the project and must do much of the upward management to the client, who often wants to do unethical things. The project manager has to input management and sometimes technical skills to make a success of the project. Unfortunately many project managers are top of the heap without having skills, morals or expertise.

The opinion of PM5 concerning the project managers being top of the heap without having skills, morals or expertise, resonates with the argument of Rwelamila and Purushottam (2012). They say that traditional project management in Africa is often conducted through intuitions and experience. In a majority of cases, individuals are appointed as project managers because they have qualifications in the same field as the project's core business but no real experience in the management of a project.

5.8 Preferred style of leadership

Group 1 (that is those who indicated registered as PrCPM): Assist rather than insist, being a mentor, mentoring but then I can do it more quickly myself, open door / mentorship, consultative and collaborative, participative management, communicate effectively, Apply strict ground rules and communicate these clearly and regularly, lead from the front and from the back and lead by example.

Group 2 (that is those who didn't indicate registered as PrCPM): Mentoring, coaching and patience, collaborative, engagement, consultation, co-operation, Making them part of the team, participative leadership, a servant Project Manager, understand spiritual aspects of human beings, leadership style characterized by empathy and decisiveness, leadership style needs to be adaptive, delegation for contractor who knows what to do, then participation, then motivation and lastly instructing or The merits of the various styles of leadership and their definitions are recognised to have some influence in this topic area but it is beyond the scope of this research. In one of the few works on construction leadership in a developing country, transformational leadership was found to be the major style for construction projects in a developing country. It was found that transformational leadership generated better leadership outcomes than either the transactional or *laissez-faire* styles. Transformational leadership produces higher work quality and volume, as well as creative problem-solving by subordinates (Ofori and Toor, 2012). This argument is somewhat supported by Muller and Turner (2010), they suggested that transactional leadership and concern for process is more important on relatively simple projects, but transformational leadership and concern for people, is necessary on more-demanding projects.

This suggestion correlates with the argument of Edum-Fotwe and McCafer (2000). They suggest that to attain professional competency in project management, it is done with the combination of

knowledge acquired during training, and skills developed through experience and the application of the acquired knowledge.

One of the points highlighted by the second group of respondents was to understand the spiritual aspects of human beings. This construct of spirituality was briefly touched on by Thomas and Mengel (2008) who stated that project managers need to develop the emotional and spiritual skills and capabilities to create buy-in and provide orientation even in complex, unknown and uncertain environments. The importance of vision, values, and beliefs are required from project managers in complex environments. Ofori and Toor (2012) also alluded to the idea of a leadership style with a deeper sense of meaning called authentic leadership. Authentic leaders are thought to possess the highest level of integrity, a deep sense of purpose, courage, genuine passion and leadership.

PM5 (not registered with the SACPCMP) noted that compassion plays a bigger role, project managers must be more of a 'project leader' than a project manager.

5.9 Competences of project management training institutes

One of the assumptions of this research was that a practising project manager has received pre-requisite knowledge in the management of projects. This assumption is justified in the findings of this study. This is because in South Africa to practise as a construction project manager one has to be registered with the SACPCMP as a professional construction project manager.

It is worth noting that according to the SACPCMP, it was established as a juristic person to be known as the South African Council for the Project and Construction Management Professions on the 1st of December 2000 in Cape Town and its aim is to provide for the provision of the registration of professionals, candidates and specified categories in the project and construction management professions; to provide for the regulation of the relationship between the South African Council for the Project and Construction Management Professions and the Council for the Built Environment; and to provide for matters connected therewith (www.SACPCMP.org.za).

A total of 11 out of 25 (44%) positively affirmed that the competences, as listed by their project management training institutes, do take into consideration the South African project environment. The South African project environment which is faced with challenges such as frequent strikes of the various industries, the working moral or ethics of the general labourer or employee, the entry method of individuals into the construction industry such as the South-African coined term 'tenderpreneurs'. Irrespective of the various project management training and institute embarked on by the project managers, the SACPCMP has its own set of criteria to be registered as a professional construction

project manager; as well as the competence the project manager must possess to qualify as a professional construction project manager.

The first group of respondents (that is those who indicated registered as PrCPM) acknowledged that their various training institutes perhaps did not sufficiently take into consideration the South African project environment. They also identified these challenges as being more evident in recent years. Some respondents noted that every project has different a situation which is a risk that the project manager needs to manage. Managing labourers is a good thing because challenges with labourers are quite frequent in South Africa. It is good for the project manager to understand how to deal with these labourers but there is a contract which dictates how the project manager deals with them.

These respondents (that is those that indicated registered as PrCPM) highlighted that project managers should not get involved with the labour relations of a contractor and that project managers should manage it according to what the contract says. The requirements take into consideration the needs but do not address the methodology of getting the required experience. This argument is the same criticism given by Thomas and Mengel (2008). They criticised the "Project Manager Competency Development Framework" as being a shopping list. It identifies a comprehensive list of knowledge and performance indicators including personal competencies crucial for project management success in addition to the application of project management knowledge; but does not address the learning or development issues around they are to be acquired.

The second group of respondents (that is those that didn't indicate registered as PrCPM) noted that managing in South Africa, the consideration of the South African project environment, was taken. Some also noted that moral and ethics in tender awards to well placed, but incompetent contractors was a challenge and nothing can prepare one for it. Others also noted good understanding of the people on the project and work relationship for the task or tasks ahead are competencies that must be adapted to each situation using leadership skills, more localisation of specific knowledge and experience related to the construction industry would be useful. This argument supports the argument of Muller and Turner (2010). They suggested that project performance can be impaired on some types of project if project managers don't adapt their leadership style to the type of project. They also suggested the examination of the personal characteristic of the project manager and their associated leadership style, suitable for various project types.

PM5 (not registered with the SACPCMP) had a completely different opinion on the subject matter, saying "Strangely enough I have mentored a few young project managers refused entry by SACPCMP that have entered via PMI and others. This procedure [project management procedures] is generally administrative and if one has the fundamentals of project management then processing, auditing and procedure is what is added by the competencies of each".

5.10 Competency of the Project Manager

76% of respondents believed that critical analysis and judgement is the most important competence within the category of intellectual competence, while the opinions of the respondents were split for the managerial competence of the project manager. 32% of respondents believe that resource management and engaging communication are the most important for the managerial competence. Finally, 28% of respondents believe that motivation is the most important for emotional competence.

Table 5.1: Project manager's competencies classified according to years of experience

Category	Competence	0 - 5 years	6 - 10 years	11 - 15 years	16 - 20 years	21 - 25 years	26 - 30 years	31 - 35 years	36 - 40 years	41 - 45 years	> 45 years
Intellectual Competence	Critical analysis and Judgement	-	-	100%	80%	67%	100%	60%	100%	75%	-
	Vision and imagination	-	-	-	20%	-	-	40%	-	25%	-
	Strategic Perspective	-	100%	-	-	33%	-	-	-	-	-
Managerial Competence	Resource Management	-	-	-	20%	67%	50%	20%	33%	50%	-
	Engaging Communication	-	100%	50%	40%	33%	-	20%	33%	25%	-
	Empowering	-	-	-	20%	-	-	20%	33%	-	-
	Developing	-	-	-	20%	-	50%	40%	-	25%	-
	Achieving	-	-	50%	-	-	-	-	-	-	-
Emotional Competence	Self-awareness	-	-	-	-	-	-	-	-	-	-
	Emotional Resilience	-	-	-	-	-	-	-	-	-	-
	Intuitiveness	-	-	-	-	33%	-	20%	33%	-	-
	Interpersonal Sensitivity	-	-	-	20%	33%	50%	-	33%	25%	-
	Influence	-	-	-	20%	-	-	20%	-	25%	-
	Motivation	-	-	100%	20%	-	-	60%	-	25%	-
	Conscientiousness	-	100%	-	40%	33%	50%	-	33%	25%	-

Table 5.1discusses the results of the perceived competencies of the project managers according to the demographics of their years of experience. There was only one respondent with 6 to 10 years of experience in the construction industry. This respondent expressed that strategic perspective within the intellectual competence dimension, engaging communication within the managerial competence dimension and conscientiousness within the emotional competence dimension, were critical competencies a project manager should possess in handling small-medium sized contractors in South Africa.

While on the other hand, the highest years of experience among the respondents within the construction industry was 40 to 45 years. These respondents, in this category of experience in the construction industry, indicated that critical analysis and judgement was the most critical within the intellectual competence dimension, resource management is the most critical within the managerial competence dimension and an equal split between interpersonal sensitivity, influence, motivation and conscientiousness within the emotional competence dimension. In the study conducted by Muller and

Turner (2010), they concluded that there were high expressions of critical thinking (a sub dimension of the IQ dimension), influence, motivation and conscientiousness (sub dimension of the EQ dimension) found in successful projects managers in all types of projects. They had the closest match, in comparison to the other respondents, to the observations of Muller and Turner (2009). There is also a correlation in the responses of respondents in this study with the most years of experience and the observations of competencies possessed by successful project managers on all project types reported by Muller and Turner (2010).

Table 5.2 shows the perceived required competencies of the project manager, according to the respondents irrespective of their years of experience and the category of respondents. The table also shows that critical analysis and judgement was the most critical skill within the intellectual competence dimension. 76% of the respondents affirmed that the important skill within the subset of intellectual competence of the project manager was critical analysis and judgement. Within the subset of the managerial competence of the project manager was an equal split between resource management and engaging communication. Motivation was considered to be the most critical skill within the subset of the emotional competence of the project manager. It is interesting to note that self-awareness and emotional resilience were not considered by any of the respondents to be a required competency of the project manager.

Table 5.2: The project manager's required competencies

No.	Category of Competency	The Project Manager's Competency	% of Respondents
1	Intellectual Competence	Critical analysis and Judgement	76%
2		Vision and imagination	16%
3		Strategic Perspective	8%
4	Managerial Competence	Resource Management	32%
5		Engaging Communication	32%
6		Empowering	12%
7		Developing	20%
8		Achieving	4%
9	Emotional Competence	Self-awareness	0%
10		Emotional Resilience	0%
11		Intuitiveness	12%
12		Interpersonal Sensitivity	24%
13		Influence	12%
14		Motivation	28%
15		Conscientiousness	24%

CHAPTER 6 – CONCLUSION AND RECOMMENDATIONS

The aim of this study was to explore how to improve construction project success of small-medium sized contractors within the South African construction industry. It focused on the role of the construction project manager on construction projects in bridging the existing technical and managerial gaps of small-medium sized contractors on the continent; and the need for a collaborative planning framework between the contractor and the project manager. This study successfully achieved its aim through the investigations of the objectives of the study.

One of the objectives of the study was to investigate the challenges of the construction industry in South Africa. Challenges listed by Thwala and Phaladi (2009) as facing emerging contractors in the North-West of South Africa was discovered to be the same challenges facing small-medium sized contractors in Johannesburg, despite the fact that the study was conducted a few years ago. These challenges are inadequate finance and inability to get credit from suppliers, inability to employ competent workers, poor pricing, tendering, and contract documentation skills, poor mentoring; fronting for established contractors, lack of entrepreneurial skills, lack of proper training, lack of resources for either large or complex construction work, lack of technical, financial, contractual and managerial skills, and late payment for the work done. It is interesting to note that at the same time, these challenges were identified to be the same issues facing small-medium sized contractors in other parts of Africa in a recent study such as Nigeria and Ghana in the Literature review. Some of the most critical challenges experienced by small-medium sized contractors in Lagos, Nigeria are financial related. These challenges include high interest rates associated with bank loans, lack of capital equipment, lack of access to funding from commercial banks and failure to give incentives by the government (Mafinidiwo and Iyagba; 2015).

Another objective of this study was to recommend the need for a framework that addresses the specific competency needs of small-medium sized contracting firms in South Africa. Study shows that it would be beneficial and would contribute to the adequate planning of the works by small-medium sized contractors in South Africa, if the project manager assisted the contractor in the planning of the execution of the works before actual construction begins. Planning is an important component in achieving project success (in terms of cost and time).

The benefit of such collaboration entails that the project manager would be in a position to understand the thinking of the contractor and assist in areas where there are apparent flaws or information overlooked during the planning process by the contractor. The project manager could also mentor these contractors on how to do the planning schedules and so on. The project manager would be in a situation where they could evaluate the skills of the relevant contractor personnel and identify specific

areas of assistance. However, this may pose a risk to the project manager, as the question of who takes responsibility of the program is raised. The conclusion is that there is a need for a collaborative planning framework between small-medium sized contractors and the project managers in South Africa to address the challenge of poor planning by these contractors.

Another objective was to investigate the challenges of implementing a foreign competency framework among project managers in South Africa and this study discovered that the competency of the project manager is imperative to the success of the project (in terms of cost and time). Project management training institutes in South Africa do take into consideration the South African project environment which is faced with challenges such as frequent strikes of the various industries, the working moral or ethics of the general labourer or employee, the entry method of individuals into the construction industry such as the South-African coined term 'tenderpreneurs'. However, it was discovered that irrespective of the various project management training institute in South Africa, the SACPCMP has its own set of criteria in which prospective candidates are registered as a professional construction project manager. These include the required minimum competence of the project manager.

The study delineated the perceived specific competency needs of small-medium sized construction contracting firms working with project managers in South Africa. The study shows that these contractors, above all, need to plan adequately to achieve project success (in terms of cost and time). It was discovered in this study that the critical skills of a project manager handling small-medium sized contractors in South Africa, within the subset of the intellectual competence, is critical analysis and judgement; within the subset of the managerial competence, is an equal split between resource management and engaging communication; and within the subset of the emotional competence, is motivation.

Further analysis of the responses revealed that the respondent with the least amount of experience indicated that strategic perspective within the intellectual competence dimension, engaging communication within the managerial competence dimension and conscientiousness within the emotional competence dimension, are critical competencies the project manager should possess in handling small-medium sized contractors in South Africa.

While respondents with the highest years of experience in the construction industry indicated that critical analysis and judgement was the most critical within the intellectual competence dimension, resource management is the most critical within the managerial competence dimension and an equal split between interpersonal sensitivity, influence, motivation and conscientiousness within the emotional competence dimension.

In conclusion it is evident that issues reported in earlier reports by authors such as Ofori (1991) and Dlungwana et al (2002) in the literature review concerning the challenges experienced by contractors in developing countries such as those on the African continent are still present and are also present in the South African construction industry.

The extent and degree in which these recurrent problems are prevalent in this day and age have not quantified in this study. Data depicting the accurate estimation and quantification of the magnitude of the challenges faced by small-medium sized contractors in South Africa, that is data depicting the increase or declination of these challenges over the years is not reported in this study. This is an area of recommendation for further research.

In the opinions of the project managers, the execution of projects by small-medium sized contractors in South Africa is perceived to be executed poorly and these contractors require mentorship. Would these observations remain valid if it were the opinions of the small-medium sized contractor? This is an area of recommendation for future research.

In terms of the specific competency required by project managers for handling small-medium sized contractors in South Africa, it is worth highlighting the correlation between the responses of the respondents with the highest years of experience and the observations of Muller and Turner (2010). Muller and Turner (2010) found that critical thinking, which is a subset of the intelligence competence; influence, motivation and conscientiousness, which is a subset of the emotional competence, were critical competencies possessed by successful project managers on all project types. As a result of this correlation, it could be concluded that the more experienced a project manager, the higher the chances of these project managers being successful managers on all project types. It could also be argued that this correlation is coincidental and the results may vary with a larger sample size. Either ways, this is an area that can be explored with more research.

It was also interesting to note that self-awareness and emotional resilience, which are subsets of emotional competence, were not considered by any of the respondents as being a critical competence of the project manager. Would the outcome of these responses vary depending on gender and ethnicity? This is another area recommended for future research.

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Annexure 1 – Informed consent (see attached)

Annexure 2–Approved Ethics Clearance Form (see attached)

Annexure 3 – Questionnaires (see attached)