IMPROVING THE PERFORMANCE OF SME BUILDING CONTRACTORS THROUGH THE IMPLEMENTATION OF TQM PHILOSOPHY

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IMPROVING THE PERFORMANCE OF SME BUILDING CONTRACTORS THROUGH THE IMPLEMENTATION OF TQM PHILOSOPHY

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ABSTRACT

The study focused on identifying ways in which the delivery of the building infrastructure projects that are executed by SME contractors can be improved. TQM, which has been widely used in other sectors with great success, has been explored as the tool that can be used to improve the delivery of building projects.

The literature review that was conducted focused on the entire spectrum of the project cycle. It first addressed the functioning of the public sector and the legislative mandate of the DPW. Then it addressed the construction industry and SME contractors that are working in the built environment. TQM together with its elements were explored in detail to determine its applicability in terms of the delivery of building projects.

The empirical study was undertaken to test the outcomes of the literature review in the context of the built environment. A quantitative research method was adopted for the study which achieved a response rate of 44%. Descriptive statistics were computed during the analysis of the data with the mode being used as the main measuring tool.

The findings revealed that there was an uneven distribution of human capital in the industry and the consulting firms were the biggest benefactors of this. The study also revealed a high turnover rate in the SME contractors while the public sector has the oldest employees. Architects and construction managers were found to be the least represented profession. There was also a high concentration of role players in the Amathole Region.

The recommendations were four fold and the Department of Public Works (DPW) as client body had to take the centre stage in implementing such recommendations. The recommendations are meant to address: the development of technical people to enhance their capacity, the reduction of the high turnover rate of technical people, the uneven distribution of resources, and specifying of the roles and responsibilities of all the people that are involved in building infrastructure projects.
DECLARATION BY CANDIDATE

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STUDENT NUMBER: 210129212

QUALIFICATION: Masters in Business Administration

TITLE OF PROJECT: Improving the Performance of SME Building Contractors through the Implementation of TQM Philosophy

DECLARATION:

In accordance with Rule G4.6.3, I hereby declare that the abovementioned treatise is my own work and that it has not previously been submitted for assessment to another University or for another qualification.

SIGNATURE: ________________________________

DATE: ________________________________
ACKNOWLEDGEMENTS

I give the honour and praise to the wonderful God Almighty who has given me strength and wisdom throughout my life and in difficult times. I can only promise Him that I will remain His humble servant and I will to serve His people through dedication and commitment in whatever I do.

I also want to thank my family for the support that they have given me throughout my journey in life and particularly in difficult times and during the term of my studies.

I reserve a special acknowledgement for my lovely daughter, Gugulikayise Ntsholo for what she had to endure during the course of my studies. However, despite whatever happened, the father-daughter bond has become even stronger.

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OUTLINE OF THE STUDY

The Treatise is presented as follows:

- Chapter One provides an outline of the study, which includes the problem to addressed, the importance of conducting the study, the managerial implications, and the method followed in conducting the study;
- Chapter Two comprises a literature review where an in-depth analysis of the independent variables is presented;
- Chapter Three details the methodology that the study followed, addressing the different types of paradigms, samples, and sampling methods, together with the measuring instruments;
- Chapter Four comprises the findings of the empirical study including the results of the tests to determine whether the independent variables have any correlation with the dependent variable, and
- Chapter Five comprises a summary, the conclusions, and recommendations that will provide a guide to management on how to realise continuous improvement.
CHAPTER ONE

1.1 INTRODUCTION

Dikmen, Birgonul, Ozorhon, and Sapci (2009: 381) indicate that business failure in the construction industry, other than financial distress, is caused by other managerial factors which include unavailability of intangible resources, inefficiency of the value chain at corporate level, and inappropriateness of organisational decisions. Nag and De (2008: 12) further expand that contractors also face challenges in assessing training, market intelligence, and important technology.

Ncwadi and Dangalaza (2005: 2) expand further by indicating that contractors realise client dissatisfaction when delivering building projects. They associate this with the slow delivery and non-achievement of quality on the construction projects.

Cagnazzo, Taticchi, and Brun (2010: 165) suggest that the current competitive environment in the construction industry requires that efficiency and rapid response should be achieved. This view is further supported by Pheng and Hong (2005: 36) who argue that quality has become the cornerstone of the competitive strategies and may be the differentiating element in the eyes of the client.

Ncwadi and Dangalaza (2005: 11) further illustrate that the lack of funding by the commercial banks affects all SMEs as these banks base the funding of contractors on the likely return on investment. Nang and De (2008: 12) further state that SMEs are constrained from achieving economies of scale while purchasing necessary resources, seeking finance, and consulting services.

Davenport (2010: 1) highlights the findings of the survey conducted by the Construction Industry and Development Board (cidb) in 2009, which indicated that only 40% of the contractors are paid on time and the rest were paid after 30 days. Davenport (2010: 1) concludes that such delays are marginalising the SMEs.
This illustrates the magnitude and complex challenges facing the contractors in terms of the delivery of building infrastructure projects. These include the technical and administrative capacity of contractors, the attitude of financial providers towards funding emerging SMEs and the inability of government to support emerging contractors by paying them on time. This, therefore, requires an informed strategy that will address the challenges in the whole value chain in the building infrastructure delivery process.

1.2 PROBLEM STATEMENT

According to Burda and Wyplosz (2009: 86) public infrastructure is one of the contributing factors to the economic growth of any country. They further state that governments take charge of infrastructure spending by using taxation to fund these expenditures.

In the DPW 2009 annual report the DPW’s mandate is quoted as follows:

“In terms of the Constitution of the Republic or South Africa, 1996 (Act No 108 of 1996), the President had allocated a functional mandate to the Department of Public Works. The Department provides land and accommodation to national government departments and institutions, manages such land and accommodation, is the custodian of national government immovable assets, provides strategic leadership to the Construction and Property industries and coordinates the implementation of the Expanded Public Works Programme.” (Malebye, 2009: 9)

This indicates the role the DPW plays in economic growth through effective delivery of building infrastructure. This is further supported by Ncwadi and Dangalazi (2005: 1) who state that the South African government is the biggest client in the construction industry.

Bolton (2006: 193) states that government procurement is often used to promote aims which are secondary to the primary objective such the promotion of social, industrial and environmental policies. He further elaborates that public sector
procurement is the instrument that is used to support development of contractors in the construction industry.

The cidb Act No. 38 of 2000 provided the mandate for the establishment of a national registry of contractors. Section 16.2 of the Act stipulates that the register of contractors must:

- Indicate the size and distribution of contractors operating within the construction industry, and
- Indicate the volume, nature and performance of contractors and target groups.

In the Eastern Cape Province the registry shows the number of contractors available as stipulated in Table 1.1 below:

**Table 1.1: cidb Contractor register**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Value Threshold (Rand)</th>
<th>General Building (GB) (No.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>200 000</td>
<td>8114</td>
</tr>
<tr>
<td>2</td>
<td>650 000</td>
<td>219</td>
</tr>
<tr>
<td>3</td>
<td>2 000 000</td>
<td>51</td>
</tr>
<tr>
<td>4</td>
<td>4 000 000</td>
<td>91</td>
</tr>
<tr>
<td>5</td>
<td>6 500 000</td>
<td>48</td>
</tr>
<tr>
<td>6</td>
<td>13 000 000</td>
<td>52</td>
</tr>
<tr>
<td>7</td>
<td>40 000 000</td>
<td>15</td>
</tr>
<tr>
<td>8</td>
<td>130 000 000</td>
<td>7</td>
</tr>
<tr>
<td>9</td>
<td>No Limit</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: cidb (2009: 1)

In 2009 the cidb produced a Status Quo Report (cidb, 2009: 8) which indicated that black ownership is high across Grades 2 to 6 with about 80% of all construction firms being black owned. It further indicates that preferential treatment of black owned construction firms becomes less of a differentiator in the lower cidb Grades to
support contractor development. This should indicate a shift towards other competitive means where contractors, who are owned by previously disadvantaged people, compete against one another.

Pycraft, Singh, Phihlela, Slack, Chambers, and Johnston (2010: 38) state that there are five performance objectives which aim at satisfying the requirements of customers. They name these performance objectives as quality, speed, dependability, flexibility, and cost. The attainment of these performance objectives in the construction industry would improve the delivery of building infrastructure projects.

The creation of an environment where performance objectives can be realised in the built environment could go a long way to address the concerns that the Auditor General identified in the province which impact on infrastructure delivery. The findings of the Auditor General (AG) in the 2007 / 2008 financial report as captured in the Consolidated General Report on the Provincial Audit Outcomes (2009) contains among others, the following findings:

- “The Eastern Cape, Free State and Gauteng accounted for more than 80% of the total amount of fruitless and wasteful expenditure incurred by the provinces, and

- Four departments (two in the Eastern Cape – Education and Health, one in Gauteng – Health, and one in the Northern Cape – Health) remained in the ‘worse audit outcomes’ category in the 2009-10 financial year.”

Section 1 of the Public Finance Management Act No. 29 of 1999 (Republic of South Africa, 1999) defines fruitless and wasteful expenditure as expenditure made in vain and that would have been avoided had reasonable care been exercised. This together with the second bullet point of the AG report could have serious implications for the construction industry in the Eastern Cape. The two departments mentioned by the AG report contribute a major extent to the construction sector as they both
have huge building infrastructural budgets which seek to address backlog on the provision of proper schools and health facilities.

This therefore indicates that the attainment of the performance objectives as mentioned earlier is desired in the whole value chain in the building infrastructure delivery including the strategic level of relevant departments, but particularly by the DPW.

Karna (2004: 69) argues that in construction the extent of client satisfaction is only known late in the project when the client has already spent most of its money. He further contends that customer satisfaction is one of the key elements in TQM, an approach that emphasises overall satisfaction through the continuous improvement of products. However, he argues that construction has lagged behind other industries in implementing TQM because of its inability to accurately determine the customer requirements and successfully transform these requirements into the completed facility (Karna, 2004: 69).

Various authors have suggested a number of elements of TQM but the most commonly referred elements will be used as a basis for this research. The elements which will be assessed relative to the SMEs in the construction industry are:

- Leadership and top management commitment;
- Customer management and satisfaction;
- Training and education;
- Teamwork;
- Management and empowerment;
- Supplier partnership, and
- Effective communication.

The problem statement for this study can be summarised as the poor performance by the contractors that are responsible for delivery of building infrastructure projects.
1.3 RESEARCH OBJECTIVES

The primary objective will first be explained and it will be followed by the explanation of the secondary objectives.

1.3.1 Primary objective

The primary objective of the study is to investigate ways in which the delivery of building infrastructure projects could be improved while using SME contractors by adopting TQM philosophy.

1.3.2 Secondary research objectives

The primary objective can be broken down into the following secondary objectives:

- To determine how the commitment of management and quality leadership would enable optimal output by SME contractors;
- To determine the impact that the maximum focus on the customer satisfaction will have on improving the performance of every stakeholder that is involved in the delivery of building infrastructure projects;
- To determine the impact that the continuous training and educating of staff members will have on the delivery of building infrastructure projects;
- To establish how the emphasis on teamwork will help to improve the delivery of quality projects in the built environment;
- To determine the impact that effective people management and empowerment will have on the delivery of building infrastructure projects;
- To establish the importance of supplier partnerships in ensuring effective output by SME contractors, and
- To determine the impact of effective communication in improving the quality of works in the building infrastructure industry.
1.3.3 Research design objective

To meet the primary and secondary objectives, research was conducted to meet the following design objectives:

- Secondary literature review was conducted with a special focus on independent variables with the aim of testing their correlation with the dependent variable;
- The questionnaire was derived from the outcome of the literature review. The purpose was to empirically test the findings of the literature review;
- The questionnaires were tested on the pilot study sample that was chosen;
- The questionnaires were collected and improvements and corrections were made and distributed to the randomly selected sample;
- The responses from the distributed questionnaires were collected in a structured format;
- After the collection of the data it was be captured in a Microsoft Excel worksheet;
- The collected data was analysed and descriptive statistics were computed;
- Upon analysis, results were recorded in Microsoft Excel for interpretation;
- Once the results were recorded the findings were interpreted and summarised, and
- The implications of the results to the managers in the built environment responsible for the implementation of the infrastructure project were detailed and recommendations for the possible solutions were made.

1.4 HYPOTHESES

The following hypotheses formed part of the study:

H1: Efficient top management yields to effective delivery of building infrastructure projects.
H2: Constant focus on client satisfaction impacts on the output in the building infrastructure delivery.
H3: Continued emphasis on education and training of personnel improves the delivery of projects.
H4: Constant focus on teamwork improves the quality of work on projects.
H5: Effective people management and empowerment will ensure improvement in the delivery of projects.
H6: A healthy relationship between contractors and material suppliers ensures timely delivery of projects.
H7: Effective communication promotes the improvement of quality on projects.

Figure 1.1 below depicts a model based on the above hypotheses.
Figure 1.1: Hypothesised model

Top management commitment
Focus on client satisfaction
Education and training
Teamwork
Effective people management and empowerment
Relationship between suppliers and contractors
Effective communication

Optimal infrastructure delivery by emerging contractors

Source: Self constructed
1.5 TERMINOLOGY

The following terminology is central to the study

- **Top to bottom approach** – This means that the strategic decision is taken at corporate level and every unit and sub-unit in the operation aligns its decisions and strategies to those taken at corporate level;

- **Bottom up approach** - This means that formulation of corporate strategy is influenced by experiences and capabilities of the various units and sub units in an organisation;

- **Market requirements** – This means understanding the market and its requirements and ensures that the corporate strategy adopted addressed such requirements, and

- **Operation resources** – This means production resources which could be both tangible and intangible. Tangible resources means equipment and plant whilst intangible resources would mean experience and techniques that the organisation might have acquired together with the relationship it might have forged with other stakeholders.

1.8 CONCLUSIONS

The DPW in the Eastern Cape implements projects on behalf of the Department of Health and Education. The sizes of the projects vary from small to mega, and that compels the DPW to use the SMEs that qualify to implement most of the projects. However, there has been a constant concern regarding the quality and slow progress on the building projects awarded to SME contractors. On the other hand, the contractors have been complaining about the delay in payments on projects that are funded by the state.

This Treatise, therefore, is an attempt to determine the impact that the implementation of a TQM philosophy would have on the delivery of building projects. The following chapter will explore the literature to test the effectiveness of TQM in
the construction industry. It first addresses the public sector in relation to contracting, and then it addresses the construction industry and the SMEs before interrogating TQM and its elements.
CHAPTER TWO

2.1 INTRODUCTION

Chapter one portrayed the concerns and failures in the delivery of building construction projects, which are executed by SME contractors. It has been indicated that the failure of the SME contractors is not only caused by financial distress, but by other intangible assets that include the skills and competencies of the staff members.

Also it has been widely reported that the Eastern Cape Province has a huge building infrastructure backlog. This therefore requires the constant focus on the ability of all those that are involved in the built environment with the intention of improving the delivery of the building projects.

The state president in the 2012 state of the nation address and the minister of finance in the budget speech, have indicated that the focus and commitment in investing in infrastructure projects was the priority for the government.

The commitment by the principals of the state cannot yield results unless the role players in the industry improve their capacity to deliver the building infrastructure projects to the requirements of the client. It is therefore important to have a balance between the commitment and the ability to deliver infrastructure projects.

In an attempt to attain such a balance, a literature review was conducted to determine what has succeeded in other industries to improve the performance of SMEs, and test whether that could be used in the construction industry. This was done by first addressing the public management and the DPW as the driver for the public infrastructure delivery.

The dynamics of the construction industry and the challenges faced by SMEs in the industry were also discussed. This will lead to the focus on TQM in the construction industry as it has been widely used in other sectors.
2.2 PUBLIC SECTOR AND MANAGEMENT

According to Nutt (2005: 291) public management is not concerned with managing for profit, but operates within the confines of the political structures and the requirement that accountability in the public sector for all the decisions and actions are not negotiable. He further argues that the private sector participates in activities only if there is a reasonable expectation that the expenditure incurred in a venture will be less than the possible revenue collected (Nutt, 2005: 291).

Teng (2011: 2) further explains that the state determines the way in which businesses are being run. He expands by saying that the right combination of good government policies for business and a spirit of entrepreneurship among the current and aspiring business owners can help develop a healthy entrepreneurial climate, which forms the basis for economic growth.

Rosenbaum (2002: 2) also expands on the subject by indicating that common practice by the governments across the globe is the contracting of the delivery of public services to the private sector. He further argues that the states are compensating for the lack of technical skills that are needed by the state institutions by utilising the private sector when executing public initiatives and the governmental service delivery.

This therefore makes it clear that the utilisation of the private sector is not peculiar to South Africa, but it is the practice that has been adopted throughout the world. This will therefore make it possible to compare the initiatives taken across the globe in ensuring better delivery of building infrastructure projects.

Teng (2011: 4) elaborates more by saying that the government business policymakers could ensure the implementation of high quality and pro-business policies that support the business community in general and the small businesses in particular. He further indicates that the business leaders could also pursue their goal of ensuring business successes with the better personnel management and leadership training by taking more business management and leadership courses and personal development (Teng, 2011: 4).
There is reportedly an uneven distribution of economic and infrastructural development in South Africa. The regions such as the Eastern Cape have both buildings and roads infrastructural backlogs in key areas that are meant to ensure economic and social order.

According to Burda and Wyploz (2009: 87), public infrastructure is one of the most important factors of the production function and economic growth. In line with this thinking, the government of the Republic has therefore committed to invest more money in addressing the infrastructural backlog as indicated both in the 2012 state of the nation address and the national budget by the Treasury Department.

However, it is often a challenge to translate commitment into actual action or successful implementation. It is therefore important to understand the functioning and the processes that each role player undertakes in the process of converting the commitments into actions. This will ensure that correct strategies are taken to ensure that optimal benefits are realised from the expenditure incurred.

2.2 DEPARTMENT OF PUBLIC WORKS AND EMERGING CONTRACTORS

The legislative mandate of the DPW has been quoted in the previous chapter as the following:

“To be the custodian and manager of all national governments’ fixed assets, for which other legislation does not make another department or institution responsible. This includes the determination of accommodation requirements, rendering expert built environment services to client departments, the acquisition, maintenance and disposal of such assets.”

Phaladi and Thwala (2009: 533) explain that since 1995 the DPW has been actively involved in conceptualising and implementing programmes to promote emerging contractors in the built environment. They further illustrate that through such programmes, the DPW has increased participation of previously disadvantaged individuals in the mainstream economy.
Watermeyer, Jacquet, and Noyana (2001: 2) illustrate that the Targeted Procurement System, which has been established by the Ministries of Finance and Public Works in South Africa, classifies the contracts on the basis of scale and nature of resources. They further indicate that such a system has been successfully used in the construction industry to provide access to work opportunities and to create a demand for the goods and services of black owned businesses in South Africa.

The focus on emerging contractors is important if the definition of SMEs by the National Small Business Act suffices. The National Small Business Act as cited by Abor and Quartey (2010) defines small enterprise as those that have an annual turnover of less than 200 million. The infrastructural developments in most under developed parts of the country, which are meant to address the backlog fall within this category of work not exceeding R200m.

The understanding of the dynamics of the construction industry is important in ensuring the legislative mandate given to DPW is carried successfully. The next paragraph will therefore look at the dynamics of the construction industry in an endeavour to ensure optimal delivery of building infrastructure is realised.

2.3 CONSTRUCTION INDUSTRY

Martin and Root (2010: 65) explain that the construction industry has seen growth in output of up to 21.3% year on year. They cite the cidb (2007) by illustrating that the prediction which is based on the expected infrastructure investments demands suggest that the growth of the industry will remain at around 10 to 15 %. The high demand on the construction services therefore translates into a high demand for the skills and capacity to deliver these goods (Martin and Root, 2010).

Pheng and Hong (2005: 35) expand more by indicating that the current trend in the construction industry is moving towards higher quality. They cite Hasegwa (2008) by stating that contractors are forced to upgrade the quality of their service to meet the needs of the clients. The orientation towards quality has been the result of the clients which are becoming more knowledgeable (Pheng and Hong, 2005).
In expanding on the same issue, Lau and Rowlinson (2010: 694) indicate that the value systems of the clients, the consultants, the subcontractors, and the suppliers are different and so are their goals. He further explains that the respective work behaviours are expressed as stimulus-response, blaming, criticising, and fault-finding. In many cases the behaviour is destructive because people are critical, ask too much and try to coerce others into doing what they do not want to do (Lau and Rowlinson, 2010).

A further exploration of that subject by Mahmood, Mohammed, Misnan, Yusof, and Bakri (2006: 2) shows that the industry comprises of a multitude of occupations, professions and organisations which are involved in different stages of the project. The client, consultants, contractor, and subcontractors of a construction project all have a role to play in delivering a quality project. Failure by any of the parties will seriously affect the quality of the final project (Mahmood et al., 2006).

Yang and Peng (2006: 459) also assert that construction projects involve stakeholders that are closely related and interact during a given project. They further illustrate that the level of stakeholder satisfaction directly influences the current project and subsequent projects. The clients are satisfied by the contractors who complete a project in accordance with the plans and specifications, within budget, and on time (Yang and Peng, 2006).

Lau and Rowlinson (2010: 695) expand more by stating that to maintain good relationship, it is necessary to create a friendly, trustworthy and supportive working environment that promotes good working relationships.

According to Arslan and Kivrak (2010: 43) success has been the ultimate goal of every business activity. They further explain that the traditional approach to success in the construction industry is to focus on the ability to plan and execute projects. They also argue that because of the changing business environment, it is crucial to focus on corporate success in order to be competitive in the built environment (Arslan and Kivrak, 2010).
Pheng and Hong (2005: 35) further illustrate that the contractors that continue to neglect the sophisticated requirements of their clients do so at their own peril. They claim that in the quality perspective, profit is a result of continuous conformance to the requirements of the client.

Mahmood et al. (2006: 2) define quality as having a three-fold meaning in the construction industry. It means getting the job done on time, ensuring that the basic characteristics of the final project fall within the required specifications, and it means getting the job done within the required budget.

There have been in the recent past, projects that have been either left incomplete or of poor quality. Most of these projects have been allocated to contractors commonly known as SMEs. The Department of Human Settlement in 2009 has ordered that a number of low cost houses in the Eastern Cape must be demolished due to poor workmanship.

The persistent complaints by the clients and end users of facilities of the projects that were constructed by the SME contractors warrants a closer look at the SMEs with the goal of ensuring the effective and efficient infrastructure delivery.

2.4 SMALL MEDIUM ENTERPRISES (SMEs)

These enterprises play an enormous role in the construction industry, and thus require further explanation.

2.4.1 SME defined

Phaladi and Thwala (2009: 534) cite Dlungwana and Rwelamila (2003) when explaining that contractors are distinguished from each other by variables such as the size of annual turnover, capacity, and capability.
However, Abor and Quartey (2010: 219) indicate that the European Commission define SMEs in terms of the number of employees as illustrated in the Table 2.1 below.

Table 2.1: SME categories

<table>
<thead>
<tr>
<th>Number of Employees</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 9</td>
<td>Micro Enterprises</td>
</tr>
<tr>
<td>10 – 99</td>
<td>Small Enterprise</td>
</tr>
<tr>
<td>100 – 499</td>
<td>Medium Enterprises</td>
</tr>
</tbody>
</table>

Source: Abor and Quartey (2010: 219)

In the South African context, Abor and Quartey (2010: 220) cite the National Small Business Act 102 of 1996 which defines the small enterprise as that which has an upper limit of 50 employees. They further explain that the small enterprises are generally more established than very small enterprises and exhibit more complex business practices.

The cidb has been given a legislative mandate, which includes creating a register of building contractors. This register categorises contractors from grade 1 to grade 9 in the field that the contractor specialises in. The register indicates the upper limit in monetary value for the contractors. All the state organs, when procuring building infrastructure projects, are compelled to use cidb guidelines. The focus point for this research will be between grade 3 which has an upper monetary limit of R3m and grade 7 with an upper limit of R30m.

2.4.2 Importance of SMEs in general and in the construction industry

Teng (2011: 2) illustrates that one of the essential sectors that are responsible for propelling the economy of the country forward is that of small business as it produce jobs whilst being innovative compared to large companies. He further indicates that being small enables the SMEs to be flexible and nimble in making changes and exploiting new opportunities compared to the larger firms.
Abor and Quartey (2010: 218) further illustrate that SMEs are often described as efficient and prolific job creators, the seeds of big businesses, and the fuel of the national economic engine. They further indicate that even in the developed industrial economies, the SME sector is the largest employer of workers.

Bowen, Morara, and Mureithi (2009: 17) indicate that the health of the economy as a whole has a strong relationship with the health and nature of the micro and small enterprise sector. When the state of the macro economy is less favourable, by contrast, the opportunities for profitable employment expansion in SMEs are limited particularly to those SMEs that have linkages to the larger enterprises and the economy at large.

Abor and Quartey (2010: 219) expand further by illustrating that in the Republic of South Africa, it is estimated that 91% of the formal business entities are Small, Medium and Micro Enterprises (SMMEs) and contribute about 52% to GDP and provide about 61% of employment.

Dlungwana and Rwelamila (2003: 2) illustrate that the majority of contractors in the construction industry fall in the small and medium-size range. They further argue that the SME sector does not compete in the global construction market which is dominated by the multinational enterprises. However, they state that the local SME sector often has the capacity to execute small and medium-sized projects. They further illustrate that the SME contractors comprise by far the largest proportion of the contractors in the industry (Dlungwana and Rwelamila, 2003).

Dlungwana and Rwelamila (2003: 3) further illustrate that the construction industries in developing countries should start by addressing the industry constraints by gearing the local contractors to deliver effectively on local projects. They also illustrate that not all SMEs will thrive and be successful, but good contractors will emerge to become more sustainable and globally competitive.

It is therefore important to understand and analyse such constraints and challenges faced by the SMEs in the construction industry in order to develop a tailor made
approach that will ensure the prosperity of the emerging contractors, which will result in optimal delivery of building infrastructure projects.

2.4.3 Challenges faced by SMEs in construction industry

Phaladi and Thwala (2009: 534) state that the challenges facing the small and medium-sized contractors can be distinguished between those that affect the small-scale contractors and those that affect the medium-sized contractors.

The most common problems indicated by the various authors include the following:

- Lack of business management;
- Clients dissatisfied by performance;
- Lack of funding;
- Poor relationship between emerging contractors and suppliers, and
- Late payment by the clients.

These constraints and their impact will be discussed in detail below.

2.4.4 Lack of business management

Martin and Root (2010: 65) illustrate that the newly formed enterprises often fail to turn into sustainable firms with many failing during their first five years of existence and the South African construction sector is no exception. They argue that such a failure rate adds to the pressure on the sector and infringes on its overall capacity, which is required to satisfy the needs of the country for built infrastructure.

Phaladi and Thwala (2009: 535) further indicate that the lack of effective management during the early stages is the major cause of business failure for the SME contractors. They also illustrate that business funds are often put to personal use, and thus used in settling domestic issues.
Martin and Root (2010: 66) further explain that the root cause of the problem for SMEs is a general lack of knowledge which includes the technical and industry based knowledge. They further indicate that emerging contractors need to gain knowledge that will foster their sustainability and competitiveness in the marketplace.

It therefore becomes imperative for the SMEs to have sound business acumen irrespective of the industry sector that they operate in. This will ensure that the company gains necessary learning experience and accumulate relevant economies of scale to ensure competitiveness in the particular sector.

2.4.5 Dissatisfied clients

Bowen et al. (2009: 16) state that potential clients perceive small businesses as lacking the ability to provide quality services and are unable to satisfy more than one critical project simultaneously as compared to larger firms. They further state that because of their small size, a simple management mistake is likely to lead to sure death of a small enterprise; hence no opportunity to learn from its past mistakes.

2.4.6 Financial challenges

Bowen et al. (2009: 17) further illustrate that the lack of planning, improper financing and poor management have been posited as the main cause of failure of small enterprises. They further argue that the lack of credit has also been identified as one of the most serious constraints facing SMEs and hindering their development.

Thwala and Mvubu (2008: 94) state that the high competition among the emerging contractors has contributed to increases in financial failures of the emerging market, making the market unsustainable.

Thwala and Mvubu (2008: 94) also argue that the complexity and risks involved in the construction industry have led to enormous failures especially with small
contractors. They further illustrate that the small emerging contractors that harbour the wrong impression that there is quick money to be made are the most affected.

Thwala and Mvubu (2008: 94) also explain that lack of access to finance both during pre-construction and during construction leads to cash-flow problems, incomplete work, and even liquidation. Thus, there are numerous financial constraints facing emerging contractors.

### 2.4.7 Relationships between emerging contractors and suppliers

Thwala and Mvubu (2008: 94) further state that emerging contractors do not have good relationships with their suppliers. They elaborate more by stating that in an emerging supplier relationship, the supplier requires cash up front and will not deliver the material until payment is made in full (Thwala and Mvubu, 2008).

The challenges highlighted are not an exhaustive list of challenges, but provide an indication of the type of approach that could be adopted to ensure the successful delivery of the building infrastructure projects.

The following section focuses on TQM as the tool that could enable construction SMEs to optimise their output, and thus ensure successful implementation of building projects.

### 2.5 TQM PHILOSOPHY AS A TOOL FOR ADDRESSING CHALLENGES IN THE BUILDING INFRASTRUCTURE BY SMEs

The TQM philosophy will be further analysed in the following section.

#### 2.5.1 Definition of TQM and its importance in the construction industry

Yang and Peng (2006: 458) refer to TQM as a complete management philosophy that emphasises the overall satisfaction through the continuous improvements to products and processes. Lam (2010: 2) concurs by referring to TQM as both a
quality management philosophy and a set of guiding principles that foster an organisational culture and participation of all members of the organisation.

Ngowi (2000: 443) expands further by stating that the management philosophy of TQM directs all strategic and operational policies in which the company engages. He further argues that TQM is therefore embedded with its own set of cultural beliefs, norms, values, and assumptions.

Psychogios and Priporas (2007: 42) also refer to TQM as the mutual co-operation of everyone in an organisation and associated business processes to produce products and services which meet and exceed the needs of the customers. They concur with Ngowi (2000) in arguing that TQM is both a philosophy and a set of management guiding principles for managing an organisation.

Pheng and Hong (2005: 36) further illustrate that quality is an entire system of thoughts and is the key to value creation and should be made an integral part of the strategy of any company. They also explain that the strategic impact of quality is big and firms which do not accept quality as the measure against which all corporate efforts are gauged, will not be well positioned in the marketplace of the future.

Pheng and Teo (2004: 8) sum it up by defining TQM as a way of thinking about goals, organisations, processes, and people to ensure that the right things are done right first time.

Mahmood et al. (2006: 1) elaborate further stating that the implementation of a TQM philosophy within an organisation requires a cultural change and that it be recognised as an important aspect of the implementation process. This is supported by Ngowi (2000: 443) when he states that the implementation of TQM requires change to the shared assumptions, frames of reference, and understanding that most organisations have developed through interaction with their environment.

Pheng and Teo (2004: 9) also support this contention, but go further by advocating for horizontal coordination based on the flow of work processes and linkages with the
suppliers and customers. They believe that without upper-management involvement, commitment, and leadership, a TQM programme cannot succeed.

Mahmood et al. (2006: 1) further indicate that TQM has the potential to improve business results, greater customer orientation and satisfaction. They also state that the construction industry is being viewed as one with poor quality emphasis compared to other sectors such as the manufacturing and service sectors.

The elements of TQM would enable the measurement of whether infrastructure delivery would be optimised following the adoption of the philosophy. This is important given the unique nature of the construction industry. These elements will thus be discussed below.

2.5.2 Elements of TQM

Mahmood et al. (2006: 3) state that although culture is unique to each organization, certain elements commonly define quality culture. Mahmood et al. are supported by other authors such as Ngowi and Pheng when arguing that various elements of TQM should be present in an organisation. The common elements indicated by these authors, which provided the basis of the research are listed below:

- Leadership and top management commitment;
- Client management and satisfaction;
- Training and education;
- Teamwork;
- Management and empowerment;
- Supplier partnership, and
- Effective communication.
2.5.3 Leadership and top management commitment

Deroc, Rahman, Ghani, Wahab, Hashim, and Khamis (2009: 16) illustrate that top management is a team of individuals at the highest level of organisational management who have the day-to-day responsibilities of managing a corporation.

Pheng and Hong (2005: 38) assert that top management must be deeply involved with the quality management to emphasise the need for commitment from the staff members. Mahmood et al. (2006: 3) elaborate further by illustrating that without clear and consistent quality leadership, quality cannot be achieved, hence quality leadership needs to be a strategic objective.

Hough, Thompson, Strickland, and Gamble (2007: 250) indicate that it is the function of top management to ensure execution of strategy and this requires diligent pursuit of operating excellence. Deroc et al. (2009: 16) further indicate that because TQM is a long-term business strategy, and senior management should start TQM implementation as the primary internal change agent for quality improvement. This provides two major roles for senior management which is to shape organisational values and establish a managerial building infrastructure to actually bring about change.

Mahmood et al. (2006: 4) further state that top management must convey the philosophy that quality will receive a higher priority over cost or schedule, and that in the long run consistent and superior quality will lead to improvement in cost and delivery performance. Sajjad and Amjad (2012: 35) indicate that top management commitment and leadership are considered as the initial inputs to the implementation process of TQM.

Deroc et al. (2009: 16) argue that management commitment and leadership represents a paradigm shift from the traditional management role and responsibilities, towards a new role which supports and enhances the total quality culture and environment. They further claim that a leader who has a deep understanding and thinking, who knows what to do and how to lead the change process, must lead TQM.
Sajjad and Amjad (2012: 35) further state that top management will be helpful in promoting organisational commitment. They explain that in a global market the success of the organisation will depend on the abilities of quality leaders or managers in terms of teamwork, knowledge, skills and problem solving.

It has already been indicated that the construction industry comprises various stakeholders, including clients. The DPW, is mandated in terms of legislation to be the custodian of the government’s immovable assets, should set a strategic direction on the adoption of TQM in the industry. As stated, this will require commitment from the leadership of the department. The AG has in the recent past questioned the logic of having the DPW, which is a ‘property’ department, being led by a person without a background in the built environment. The full implementation of TQM will therefore require DPW to do some introspection as the client to see whether current structure supports requirements needed for the implementation of TQM.

2.5.4 Client management and satisfaction

Mahmood et al. (2006: 4) state that TQM requires that all efforts in the organisation focus on client satisfaction. They further illustrate that the emphasis on client satisfaction is considered as a major success of the quality management effort. Pheng and Hong (2005: 38) illustrate that customer driven service is to satisfy the clients by doing the right thing the first time and it requires that all employees should see the customer as the focus of their activity.

Karna (2004: 69) illustrates that to measure customer satisfaction in the construction environment, the main subjects should be identified. A customer may be defined as the owner of the project and the one that needs the constructed facility. The customer is also as a body that incorporates the interests of the buyer of construction services, prospective users and other interest groups (Karna, 2004: 69).

Pheng and Teo (2004: 8) indicate that the benefits of higher customer satisfaction, better quality products and higher market share are often obtained following the adoption of TQM by construction firms. They argue that adoption of TQM requires a
complete turnaround in corporate culture and management approach, as compared to the traditional way of top management giving orders and employees merely obeying them.

Karna (2004: 69) also argues that the extent of customer satisfaction in the construction industry is only known late in the project when most of the money has already been spent. He further states that the construction sector has lagged behind other industries in implementing TQM because of its inability to accurately determine the requirements of customers and to successfully transform these requirements into the completed facility.

Yang and Pheng (2006: 458) suggest that the construction industry has many characteristics common to the manufacturing and service industries. In the construction industry, customer satisfaction demands on the contractor are in accordance with contractual duties, obligations, and responsibilities. Total customer satisfaction has never been a goal for designers, construction managers, subcontractors and material suppliers. It is hard to achieve higher satisfaction levels by any single project participant (Yang and Pheng, 2006: 458).

Karna (2004: 70) elaborates further by indicating that the relationship between the customer and the contractor in the construction sector constitutes a multi-level complex situation in which parties operate simultaneously and collaborate in groups of networks. He therefore argues that customer satisfaction should be understood as relationship-specific rather than a transaction-specific construct.

Ngowi (2000: 442) further explains that the full implementation of TQM increases competitiveness, and customer satisfaction reduces waste and improves the working lives of employees.

Karna (2004: 78) further emphasises the importance of co-operation between the customer and the contractor as the input of the customer has considerable implications for the outcome of the construction project.
In the public sector, the DPW often implements projects on behalf of client departments such as the Department of Education, Department of Health, and other departments. In return, the DPW appoints a team of consultants and contractors to execute the projects. There has been some unhappiness in the recent past from the DPW’s client departments regarding the service provided by the DPW. However, the DPW has also been complaining about the performance of service providers it engages in the implementation of its projects.

This therefore indicates the need for the DPW to, inter alia; clearly articulate the needs of its various client departments.

2.5.5 Training and education

Bowen et al. (2009: 17) explain that education is one of the factors that impact positively on the growth of firms. They further illustrate that the entrepreneurs with the larger stocks of human capital in terms of education and vocational training are better placed to adapt their enterprises to the constantly changing business environments.

Lonnqvist (2002: 284) expands further on the subject by defining intellectual capital as the economic value of the two categories of intangible assets of a firm, which are organisational capital and human capital. They explain that human capital refers to human resources within the organization, and external to the organisation. They further claim the existence of a correlation between human capital development and the performance of the organisation. The emphasis on human capital in the organisations reflects the view that the market value depends less on the tangible resources, but rather on the intangible resources which include human resources (Lonnqvist, 2002).

Mahmood et al. (2006: 4) also state that the importance of training is to ensure that the skills of the workforce do not become obsolete in an environment of change and an understanding and attitude of quality is developed and maintained. They also indicate the emergence of a shift in emphasis away from the external positioning in
the industry, but towards realisation of the importance of internal resources in ensuring sustained effectiveness.

Jamal and Saif (2011: 55) concur by explaining that the new economic order or the informational era will do for human capital than the Industrial Revolution did for physical capital. They further argue that human capital and the knowledge-based industries are emerging as the key to wealth creation.

Pheng and Hong (2005: 38) also state that the implementation of TQM cannot be undertaken without training. One of the goals for the training programme should be that of developing the skills and abilities of the employees to ultimately bring about improvements. The training can create the framework to help guide the organisation towards quality improvement (Pheng and Hong, 2005: 38).

There has been a report of a brain drain in the DPW in recent years, where experienced and qualified technical personnel were reported to be leaving the department. This shows the importance of training of staff at all levels to increase the pool of capable individuals. Also, with the changing technology and the effects of global warming on the built environment, it becomes imperative to provide continuous training on the developments in the industry. This should apply to role players in the industry which include clients, various consultants and contractors.

**2.5.6 Teamwork**

Tabassi, Ramli, and Bakar (2011: 5631) indicate that managers spend no less than 50% and possibly as much as 90% of their working time in some type of teamwork activity. They further indicate that the teams are the backbone of the organisations, and can produce more and better solutions to problems than individuals can.

Kinicki and Kreitner (2009: 232) define the team as a small number of people with complementary skills who are committed to a common purpose, performance goals, and approach in which they hold themselves mutually accountable. They further
indicate that the teamwork skills which include group problem solving and emotional intelligence need to be role modelled and taught.

Dubrin (2010: 256) define teamwork as work done with an understanding and commitment to the team goals on the part of all the team members.

Mahmood et al. (2006: 5) state that teams are a major part of any TQM effort because teamwork enables various parts of the organisation to work together to meet the customer needs in ways that cannot be done through the individual job performance. The continuing development of teams provides a much richer mix of skills in the thinking and processes among many of the firm’s management and those fulfilling supervisory roles.

Tabassi et al. (2011: 5630) indicate that a high performance workplace focuses on increasing the influence of the people on the business through, inter alia, investment in its human resources and supporting technical and innovative skills. They further illustrate that in the case of the construction industry, the project teams form the focus of working life in the industry. The changing requirements of construction activities necessitate the companies to form different teams each time a new project is undertaken. Therefore, any policies and practices that are applied by the firms in order to improve teamwork activities can have effects on the performance of their projects (Tabassi et al., 2011).

Pheng and Hong (2005: 38) further elaborate that in the construction industry teams are the organisational units that are accountable for performance. They further argue that no progress will be made in implementing TQM principles without teamwork as everyone in the organisation should share the responsibilities and benefit from team learning.

Mahmood et al. (2006: 5) further argue that the effective teams have three main attributes: high task fulfilment, high team maintenance, and low self-orientation. Teamwork is universally accepted as the vehicle for change and the organisational mechanism for involving people in quality improvement.
The construction industry, as previously stated, requires a team based approach as every function of one role player compliments the function of the other role players. It is, however, important to maintain the spirit of support in order to minimise self-orientation among the team members. Furthermore, the effectiveness of teamwork is dependent on other factors such as the education and training of team members, and their empowerment.

2.5.7 People management and empowerment

Psychogios and Priporas (2007: 45) define empowerment as an environment in which people have the ability, the confidence, and the commitment to take the responsibility and ownership to improve the process and initiate the necessary steps to satisfy the requirements of the customer within well-defined boundaries in order to achieve organisational values and goals.

Jamal and Saif (2011: 56) allege that nothing happens unless human beings make a concise decision to act. They further argue that there is no structural capital without intellectual capital, and no intellectual capital without humans.

Mahmood et al. (2006: 5) describe employee involvement as the process of transforming the culture of the organisation to utilise the creative energies of all employees for problem solving and for making improvements. They further indicate that the empowered employees are directly involved in determining what should be done and how that should be done.

Jamal and Saif (2011: 56) indicate that the sources of superiority depend on the quality of the interest alignment and the employee development in a firm compared with the industry rivals. They further indicate that the organisation must capture the benefits of any firm-specific competencies and capabilities that they develop.

Pheng and Hong (2005: 38) further explain that TQM requires that decision making should be delegated to the lowest level, while top management maintains control
over certain key decisions. They also indicate that delegation and empowering employees to make decisions is a good motivational tool.

Pheng and Teo (2004: 9) also illustrate that employees need to be trained and shown how to reallocate their time and energy to studying their processes in teams, searching for causes of problems, and correcting the causes not the symptoms. Mahmood et al. (2006: 4) cites Ahire et al. (1996) in arguing that employee empowerment is not effective unless employees have received formal and systematic training in quality management. They sum it up in explaining that employee involvement evolved out of the need for business to improve performance. The impact of human resources in the organisation depends on the kind of empowerment given to them (Mahmood et al., 2006: 4).

The construction industry comprises various role players that include clients, consultants, and contractors. It is therefore important that each role player empowers its people and delegates some decision making responsibilities to the lowest level in the organisation. This will help to increase the confidence and the ability of people to execute work effectively.

2.5.8 Supplier partnership

Mahmood et al. (2006: 5) further indicate that supplier quality management is an important aspect of TQM since materials and the purchased parts are often a major source of quality problems. They further argue that non-conforming supplier products result in extra costs for the purchaser. In order for both parties to succeed and their business to grow, a partnership is required (Mahmood et al., 2006).

Pheng and Teo (2004: 9) cite Williams (1997) in asserting that supplier relations should progress in the direction of supplier partnerships with both parties benefiting from the relationship. They further illustrate that both parties should seek to improve quality and work toward forming long-term relationships.
Mahmood *et al.* (2006: 6) also explain that firms should establish supply chain partnerships to motivate the suppliers to provide materials that are needed to meet the expectations of the customer. They further cite Kanji and Wong (1998) in indicating that the creation and enhancement of the customer-supplier partnership is a major quality practice. Also suppliers should be viewed as an integral part of the business operations of the organisation (Mahmood *et al.*, 2006).

The actual purchasers of materials in the construction industry are contractors who do the physical work. The good relationship between contractors and suppliers cannot be over emphasised. However, the maintenance of that relationship is not solely dependent on the contractors, but also to other role players in the construction industry. The consultants could assist by doing the valuation of the interim payments claim and submit it on time to the client. The client could on the other hand, ensure that payments are processed swiftly to ensure that contractors pay their suppliers on time to maintain a good working relationship.

### 2.5.9 Effective communication

Kinicki and Kreitner (2009: 288) define communication as the exchange of information between the sender and the receiver and the perception of the meaning between the individuals involved. They further illustrate that the manager who understands the process can analyse the communication patterns and design the communication programme that fits the needs of the organisation.

Elving (2005: 131) states that organisational communication commonly has two goals. The first goal of organisational communication should be to inform the employees about their tasks and about the policy and other issues of the organization. The second goal is to communicate with the intention to create a community within the organisation (Elving, 2005: 131).

Mahmood *et al.* (2006) cite Kanji *et al.* (1993) who contend that effective communication is the key to the total quality process. They further explain that
effective communication is seen as the means of maintaining momentum and morale for the quality improvement process.

Elving (2005: 132) elaborates further by stating that communication creates the conditions for commitment and should be seen as its important antecedent. He further states that communication creates a community, resulting in commitment with the organisation, trust in the organisation and its management and organisational identification will have an effect on readiness for change.

Pheng and Teo (2004: 9) further explain that the constant measurement and analysis of factors that truly impact the performance and then creating channels to communicate the lessons learned, will result in performance improvement.

Elving (2005: 132) elaborates further by stating that organisational communication can be considered as an important antecedent of the self-categorisation process, which helps to define the identity of a group and to create a community spirit, which fits into the requirements of the organisation.

Mahmood et al. (2006: 7) assert that TQM will significantly change the way many organisations operate and conduct business, and such change requires direct and clear communication from top management to all staff and employees. They further explain that the key medium for motivating the employees and gaining their commitment to TQM is face-to-face communication and visible management commitment.

Elving (2005: 129) sums it up by stating that communication is vital to the effective implementation of organisational change. He argues that poorly managed change communication results in rumours and resistance to change, exaggerating the negative aspects of the change.

The construction industry is contractual in nature and it requires reciprocal communication from all the parties. This includes the briefing by the client to the design team to ensure that the needs of the client are taken care of. Also, during the interactions among the members of the design team and the client and eventually
the contractors when they get appointed, effective communication should be a priority.

2.6 CONCLUSIONS

Public management is concerned with the accountability of state funds, and it is guided by the confines of the political structures. The private sector on the other hand engages on a task when there are reasonable grounds for making a profit.

The DPW has been legislated to oversee public infrastructure delivery in the country. The DPW has since developed policies that seek to ensure the participation of previously disadvantaged individuals in the construction industry.

The construction industry is team based, where the involvement and participation by clients, consultants, and contractors is important. This however, could translate to a blaming game where one stakeholder accuses others.

The participation of emerging contractors is both important and challenging. SMEs in general are known to be contributing to economic growth and employment creation, and the construction industry is no exception. Numerous challenges that are faced by emerging contractors include lack of construction and financial management skills, dissatisfied customers, and poor relationships with suppliers.

TQM is a philosophy which aims at the continuous improvement of the product with the aim of ensuring customer satisfaction. TQM has been widely adopted in the manufacturing sector, while the construction industry has been lagging behind. This has been attributed to the challenge of clearly defining quality before the execution of the job, as in many instances conformance to quality is assessed at the end of the project.

The commonly used elements of TQM which have been quoted by various authors include top management commitment, customer management, and satisfaction, education and training, teamwork, people management and empowerment, supplier partnership, and effective communication.
Chapter Two has focused on the secondary data in the form of the results of the survey of the literature. The next chapter focuses on the methodology that adopted for the empirical study undertaken to secure the primary data, which was used to test the hypotheses.
CHAPTER 3

3.1 INTRODUCTION

Chapter Two presented the literature review based upon secondary data gathered from various sources. The scope of the previous chapter was broad, and it addressed various aspects to determine whether specific independent variables could yield to positive outcomes of the dependent variable.

Chapter Two was preceded by Chapter One, which addressed the overall research design of the study including its objectives, and which recorded:

“The primary objective of the study is to investigate ways in which the delivery of building infrastructure projects could be optimised while using small emerging contractors.”

This chapter focuses on the methodology applied to gather and analyse the primary data gathered, which was based on the survey of the literature reported on in Chapter Two, to determine whether it is applicable and relevant in terms of being corroborated by the literature and the realisation of the primary objective of the study.

The methodology that follows includes an analysis of different research paradigms and the reasons for choosing the quantitative approach as a research paradigm for the study. It also addresses the research strategy, time horizons for the study, methods of collecting data, and the measuring techniques of the quantitative research paradigm. This is followed by the conclusion, which will also introduce the following chapter.

3.2 RESEARCH PARADIGM

Collis and Hussey (2009: 11) define a research paradigm as the philosophical framework that guides how scientific research should be conducted. Two types of
paradigms, which are the quantitative and qualitative methods, and the paradigm chosen for the study, are discussed below.

3.2.1 Quantitative method

Kiessling and Harvey (2005: 29) state that quantitative techniques focus on measuring things that can be counted by using predetermined categories that can be treated as interval or ordinal data, and subjected to statistical analysis. They further illustrate that the predetermined categories are developed through a researcher bias.

Sale et al. (2002: 44) indicate that the quantitative paradigm is based on positivism. They elaborate further by stating that science is characterised by empirical research, meaning all phenomena can be reduced to the empirical indicators, which represent the truth.

Sale et al. (2002: 44) further explain that the ontological position of the quantitative paradigm is that there is only one truth, an objective reality that exists independent of human perception. They argue further by indicating that the investigator and the investigated are independent entities and therefore, the investigator is capable of studying the phenomenon without influencing it or being influenced by it.

Kiessling and Harvey (2005: 30) elaborate by explaining that quantitative research suggests that the universalist will research through carefully designed questions that will lead to proof or disproof through measurement and rigorous evaluation by utilising the existing theory and literature. They further state that the disadvantages of this viewpoint are that it ignores other potential focuses, the research objectives are too narrow and it ignores other levels and other stakeholders.

Sale et al. (2002: 44) summarise by saying that the goal is to measure and analyse the causal relationships between the variables within a value-free framework. The techniques to ensure this include randomisation, blinding, highly structured protocols, and written or orally administered questionnaires with a limited range of predetermined responses. The sample sizes are much larger than those used in
qualitative research, so that statistical methods to ensure that samples are representative can be used.

3.2.1.1 Research approach for the quantitative method

_Deductive_

Collis and Hussey (2009: 8) illustrate that under the positivism paradigm, the research is deductive. They further define deductive research as a study in which a conceptual and theoretical structures are developed which are then tested by the empirical observation.

Thomas (2006: 238) indicates that deductive analysis refers to the data analyses that set out to test whether the data is consistent with the prior assumptions, theories, or hypotheses identified or constructed by an investigator. He further argues that in deductive analyses such as those used in experimental and hypothesis testing, research is often obscured, reframed, or left invisible because of the preconceptions in the data collection and the data analysis procedures that are imposed by the investigators.

Elo and Kyngo (2008: 111) further indicate that the deductive content analysis is often used in cases where the researcher wishes to retest the existing data in a new context such as testing categories, concepts, models or hypotheses. They further explain that if the deductive content analysis is chosen, the next step is to develop a categorisation matrix and to code the data according to the categories.

3.2.2 Qualitative method

Sale _et al._ (2002: 45) explain that the qualitative paradigm is based on interpretivism and constructivism. Kiessling and Harvey (2005: 30) state that qualitative data focuses on the naturally occurring events in the natural settings.
Kiessling and Harvey (2005: 30) further assert that the use of qualitative research is significant in relation to the different cultures whose values, goals, and morals vary significantly. They further argue that qualitative research focuses on the experiences of people and the meanings they place on events, processes and the environment of their normal social setting.

Sale et al. (2002: 45) contend that ontologically, there are multiple realities or multiple truths based on the construction of reality by a person as reality is socially constructed and is constantly changing. They further contend that on an epistemological level, there is no access to the reality that is independent of the minds and no external referent by which to compare claims of truth.

Sale et al. (2002: 45) further expand by illustrating that the investigator and the object of study are interactively linked so that the findings are mutually created within the context of the situation which shapes the inquiry. They claim that this suggests that reality has no existence prior to the activity of investigation, and reality ceases to exist when there is no more focus on it.

3.2.2.1 Research approach for qualitative study

**Inductive**

Thomas (2006: 239) also contends that the use of an inductive approach is common in several types of qualitative data analyses, especially the grounded theory. They further describe the inductive analysis as an approach that primarily uses the detailed readings of raw data to derive concepts, themes, or a model through interpretations made from the raw data by a researcher.

Collis and Hussey (2009: 8) also describe inductive research as a study in which theory is developed from the observation of empirical reality; thus the general inferences are induced from particular instances.
Elo and Kynga (2008: 109) suggest that if there is not enough former knowledge about the phenomenon or if such knowledge is fragmented, the inductive approach is recommended. They further indicate that an approach based on inductive data moves from the specific to the general, so that particular instances are observed and then combined into a general statement.

Elo and Kynga (2008: 109) further illustrate that if the inductive content analysis is used, the next step will be to organise the qualitative data. This process includes open coding, creating categories and abstraction. Open coding means that notes and headings are written in the text while reading it.

### 3.2.3 Paradigm chosen for the study

The quantitative research approach has been chosen for the study. This is because the study intends to test the outcomes of the literature review in the built environment and specifically on building projects. It has been stated above that the quantitative paradigm is based on the fact that there is only one truth which is an objective reality that exists independent of human perception.

It was stated in Chapter One that the study was on testing hypotheses. This therefore means that the deductive approach, which has been defined as the research approach for a quantitative paradigm, was used for the study.

### 3.3 RESEARCH STRATEGY

#### 3.3.1 Surveys

Collis and Hussey (2009: 76) define the survey as the methodology that is designed to collect the primary or secondary data from a sample with a view to analyse them statistically and generalising the results to a population. They further illustrate that a random sample is chosen to represent an unbiased subset of the population.
Glasow (2005: 1) elaborates further by defining the survey as a data collection tool for carrying out survey research. He cites Pinsonneault and Kraemer (1993) by further defining a survey as a means for gathering information about the characteristics, actions, or opinions of a large group of people.

Glasow (2005: 3) expands further by asserting that the surveys are capable of obtaining the information from large samples of the population and are also well suited to gathering the demographic data that describe the composition of the sample. He further indicates that the surveys are inclusive in the types and number of the variables that can be studied, require minimal investment to develop and administer, and are relatively easy for making generalisations. The surveys can also elicit information about attitudes that are otherwise difficult to measure using the observational techniques (Glasow, 2005: 3).

This study therefore used surveys to collect the data from the chosen sample of the population.

3.4 TIME HORIZON

Quantitative research needs to be conducted with a timeframe as discussed below.

3.4.1 Cross sectional

Collis and Hussey (2009: 77) contend that the cross sectional studies are designed to obtain the data in different contexts, but over the same period of time. They also claim that the cross sectional studies are used to investigate characteristics in surveys of large numbers of organisations and people.

For this study, a cross sectional horizon will be used as the data will be collected at the same time in the form of questionnaires that will be distributed at the same time.
3.5 DATA COLLECTION METHODS

3.5.1 Sample and sampling design

Collis and Hussey (2009: 62) define a sample as a subset of the population. They further define a population as a precisely defined body of people or objects under consideration for statistical purposes.

Evans (2010: 143) states that the first step in sampling is to design an effective sample plan that will yield a representative sample of the population under study. He explains a sampling plan as a description of the approach that will be used to obtain samples from a population prior to any data collection activity.

Glasow (2005: 3) in turn states that a sampling plan describes the approach that will be used to select the sample, how an adequate sample size will be determined, and the choice of media through which the survey will be administered.

Collis and Hussey (2009: 62) also state that in a positivist study a random sample is chosen to provide an unbiased subset of the population.

The population of this study comprised of technical personnel working in the building industry in the Eastern Cape. These included construction firms graded between 3GB and 7GB by the cidb, the consulting professionals and government technical managers that are involved in building projects. The details of contractors were obtained from the cidb register, which is available on the cidb website. Details of consulting professionals were obtained from the DPW data base of professional services. Government officials’ details were obtained from departmental human resource records.

The sample size was comprised of ninety respondents. Thirty respondents were randomly selected from the government technical managers, another thirty from consulting firms, and another thirty from contractors. The sample was drawn from
the population which has been explained above by means of random sampling where every member of the population has an equal chance of being selected.

3.5.2 Questionnaire development

The elements of TQM that were indicated in Chapter Two formed the basis of the formulation of the questionnaire. The questions were designed in such a way that the effectiveness of the elements of TQM in the delivery of building infrastructure projects was tested. The Likert scale has been used in the formulation of questions.

Allen and Seamen (2007: 1) define the Likert scale as a common rating format for surveys. Respondents rank quality from high to low, or best to worst using five or seven scales. They further elaborate that Likert scales were developed as the familiar five-point bipolar response. These scales range from a group of categories - least to most - asking people to indicate how much they agree or disagree, approve or disapprove, or believe to be true or false. There is really no wrong way to construct a Likert scale. The most important consideration is to include at least five response categories. Some examples of category groups appear in Table 3.1.

Table 3.1: Likert Scale

<table>
<thead>
<tr>
<th>Unsure</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: Self Constructed

3.6 MEASUREMENT CHARACTERISTICS OF QUANTITATIVE RESEARCH INSTRUMENTS

3.6.1 Reliability

Collis and Hussey (2009: 64) state that reliability is concerned with the findings of research, and therefore is a crucial aspect in terms of the credibility of the study. The
findings are said to be reliable if another person conducts the same research and comes up with the same findings.

The reliability in this study will be tested using the internal consistency method. Collis and Hussey (2009: 64) define the internal consistency method as a system where every item is correlated with every other item across the sample and the average inter – item correlation is taken as the index.

3.6.2 Validity

Collis and Hussey (2009: 65) also indicate that validity is an extent to which the findings accurately reflect the phenomena being investigated. They further argue that it will be worthless to have highly reliable findings, but that do not measure what was intended to be measured. The questions asked should therefore correspond with the explanation given to the respondents as the purpose of the study.

3.7 CONCLUSION

This chapter addressed both the quantitative and qualitative research paradigms. Deductive and inductive research approaches, which are used for the quantitative and qualitative paradigms respectively, have been analysed.

Due to the nature of the study the quantitative paradigm was chosen for the study, which will then adopt the deductive research approach. A survey has been adopted as a research strategy for the study. The time horizon for the study will be cross sectional as data will be collected over the same time.

The sample size for the study was constituted by 90 managers working in the infrastructure delivery process in the province. Questionnaires were developed using a Likert scale. The reliability will be ensured by means of the internal consistency method.
The next chapter presents and interprets the data that was collected and analysed using the method discussed in this chapter.
CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

4.1 INTRODUCTION

The previous chapter elaborated on the methodology used in conducting the empirical study for this research. The quantitative methodology has been chosen as the paradigm used in collecting and analysing data for the study. The previous chapter also articulated on the sample strata, time horizons, and the validity and reliability of the data.

This chapter deals with the analysis of collected data for which the results are presented in tabular format from Table 4.1 – 4.12. Data was collected using questionnaires as explained in Chapter Three and a copy of a blank questionnaire is attached as Appendix 1.

Descriptive statistics were computed and a measure of central tendency was used to interpret the responses.

4.2 CHARACTERISTICS OF TARGETED SAMPLE

The characteristics of the targeted sample are presented and discussed in terms of the response rate and demographic data.

4.2.1 Response rate

The response rate is presented Table 4.1 below. It indicates that the total of 90 questionnaires were evenly distributed to professional people working for the government as the major client, consulting firms, and contracting firms. These are informed as discussed in Chapter Two, by the relevant players in the value chain in the provision of building infrastructure projects.
Thirty questionnaires were distributed to professionals working for government, another thirty to consulting firms and another thirty to contractors. There was a high level of response from consulting firms in the form of a 67% response rate. There was also a good response from government officials in the form of a 50% response rate. The contracting sample trailed far behind recording a 17% response rate. Overall, 40 responses were received, which equates to a 44.4% response rate.

Table 4.1: Response rate

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Sample (No.)</th>
<th>Response (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>30</td>
<td>66.7</td>
</tr>
<tr>
<td>Consulting</td>
<td>30</td>
<td>16.7</td>
</tr>
<tr>
<td>Contracting</td>
<td>30</td>
<td>44.4</td>
</tr>
<tr>
<td>Total</td>
<td>90</td>
<td>100</td>
</tr>
</tbody>
</table>

4.2.2 Demographic data

4.2.2.1 Measurement tool

The demographic data was collected and is reflected in the three tables below (Table 4.2 – 4.9). The collected data have been measured by either using statistical methods. The mean has been used when measuring average age and the experience of respondents.

4.2.2.2 Analysis of demographic data

Table 4.2 and 4.3 presents the professional distribution of the built environment response, which shows a high number of engineers and quantity surveyors, with most of them working for consulting firms and with architects trailing behind. There was a low response from the construction management sample, which was probably due to the low response from contractors.
Table 4.4 and 4.5 reflect the gender and age of respondents. Overall, a third of professionals are female with a high percentage of females in the contractor sample. The consulting firms are trailing behind, with government being the worst performer when it comes to gender balance. The average age statistics show government with the highest average and the contractors with the lowest.

Tables 4.6 – 4.8 present the working experience of the respondents. It shows that the average numbers of years with current employer is higher in the consulting field and lower in the contracting field. However the average age is higher in government in terms of the number of years in the built environment and is lower in the contracting field. In terms of regional representation, the Amathole region predominates followed by the Cacadu region, and no responses from both the Chris Hani and Alfred Nzo regions.

**Table 4.2: Nature of discipline**

<table>
<thead>
<tr>
<th>Profession</th>
<th>Response (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architecture</td>
<td>20.0</td>
</tr>
<tr>
<td>Construction Management</td>
<td>10.0</td>
</tr>
<tr>
<td>Quantity Surveying</td>
<td>30.0</td>
</tr>
<tr>
<td>Engineering</td>
<td>35.0</td>
</tr>
<tr>
<td>Other</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Table 4.3: Registration status**

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Registered (%)</th>
<th>Not Registered (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>22.5</td>
<td>15.0</td>
</tr>
<tr>
<td>Consulting</td>
<td>45.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Contracting</td>
<td>2.5</td>
<td>10.0</td>
</tr>
<tr>
<td>Total</td>
<td>70.0</td>
<td>30.0</td>
</tr>
</tbody>
</table>
### Table 4.4: Gender

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Male (%)</th>
<th>Female (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>32.5</td>
<td>5.0</td>
</tr>
<tr>
<td>Consulting</td>
<td>35.0</td>
<td>15.0</td>
</tr>
<tr>
<td>Contracting</td>
<td>7.5</td>
<td>5.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>75.0</td>
<td>25.0</td>
</tr>
</tbody>
</table>

### Table 4.5: Age

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Mean</th>
<th>Mode</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>46.67</td>
<td>41</td>
<td>45</td>
</tr>
<tr>
<td>Consulting</td>
<td>41.5</td>
<td>44</td>
<td>41</td>
</tr>
<tr>
<td>Contracting</td>
<td>39.25</td>
<td>32</td>
<td>38</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>43.35</td>
<td>32</td>
<td>4</td>
</tr>
</tbody>
</table>

### Table 4.6 Average Years with the current employer

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Mean</th>
<th>Mode</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>8.2</td>
<td>5</td>
<td>5.5</td>
</tr>
<tr>
<td>Consulting</td>
<td>9.5</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Contracting</td>
<td>5.6</td>
<td>N/A</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>8.53</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

### Table 4.7 Average Years in the Built Environment

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Mean</th>
<th>Mode</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>20.07</td>
<td>30</td>
<td>20.5</td>
</tr>
<tr>
<td>Consulting</td>
<td>15.77</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Contracting</td>
<td>8</td>
<td>12</td>
<td>8.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>16.53</td>
<td>12</td>
<td>14.5</td>
</tr>
</tbody>
</table>
### Table 4.8 District of operation

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Cacadu (%)</th>
<th>Amathole (%)</th>
<th>OR Tambo (%)</th>
<th>Chris Hani (%)</th>
<th>Alfred Nzo (%)</th>
<th>Multiple (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>17.5</td>
<td>12.5</td>
<td>5.0</td>
<td>0.0</td>
<td>0.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Consulting</td>
<td>2.5</td>
<td>37.5</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>10.0</td>
</tr>
<tr>
<td>Contracting</td>
<td>0.0</td>
<td>7.5</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>20.0</td>
<td>57.5</td>
<td>5.0</td>
<td>0.0</td>
<td>0.0</td>
<td>17.5</td>
</tr>
</tbody>
</table>

### 4.3 DATA ANALYSIS

Data analysis as it is discussed below presented the findings of the study.

#### 4.3.1 Reliability of Data

Table 4.9 contains results of a reliability test based on internal consistency as discussed in Chapter Three by the means of the Cronbach alpha coefficient. Tavakol and Dennick (2011: 54) explain that internal consistency describes the extent to which all the items in a test measure the same concept or construct and the acceptable values of alpha range from 0.70 to 0.95.

This therefore indicates that there was high internal consistency on the collected data, which indicates that most variables that were used in the questionnaires were measuring the same concept of optimising delivery of building projects through the implementation of TQM.
Table 4.9: Reliability Statistics

<table>
<thead>
<tr>
<th>Cronbach's alpha</th>
<th>Cronbach's alpha based on standardized items</th>
<th>No. of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.957</td>
<td>0.960</td>
<td>40</td>
</tr>
</tbody>
</table>

4.3.1 Measuring instrument

Collis and Hussey (2009: 240) explain that central tendency provides a convenient way of summarising a large frequency distribution by providing it with a single statistic. Evans (2010) supports that assertion by indicating that central tendency provides estimates of the single value that represents the centre of the entire data.

Collis and Hussey (2009: 189) further elaborate that the ordinal variable is measured by using numerical codes to identify ranks which allows the authors to determine if one observation is ranked more highly than another. Evans (2010: 33) further indicates that ordinal data are ranked according to relationships to one another. He further illustrates that in measuring ordinal data, averages are meaningless because ordinal data have no fixed units of measurement. This therefore rules the usage of a mean out for this statistical exercise.

Collis and Hussey (2009: 241) also illustrate that mode can be used to measure all variables irrespective of the measurement scale and they define it as the most frequently occurring value. Evans (2010: 64) concurs with the assertion by defining mode as the measure of central tendency with the observation that occurs more frequently. Collis and Hussey (2009: 240) supported by Evans (2010: 64), indicate that the median is useful for ratio, interval, and ordinal data.

The data analysis will be based on the data that was collected through the methodology described in Chapter Three. The questionnaires were developed using
a five point Likert scale. The ratings are 1 - Unsure, 2 – Strongly Disagree, 3 - Disagree, 4 - Agree, and 5 – Strongly Agree.

The analysis is based on the measurement of central tendency and used mainly the mode, but often referring to the median. The following section deals with the analysis of the collected data using measures of central tendency.

4.3.2 Leadership and management commitment

Table 4.10 presents the findings related to leadership and management commitment in various organisations. The mode of 4 was recorded for most of the independent variables, which indicates that most respondents agree that most organisations have a positive attitude towards leadership and management commitment.

However, the mode of 5 was recorded for a sub-statement, which tested whether the top management in various organisations is suitable, qualified and involves itself in the daily operations in various organizations. This indicates that most respondents strongly agree with the assertion.

The mode of 4 was recorded for other statements that tested other variables such as: quality leadership is treated as a strategic objective in various organisations, management emphasises on the implementation of strategy and operational excellence and management puts more emphasis on quality than cost. Also, the same mode of 4 was recorded for independent variables which tested management commitment on the creation of an environment that is conducive to conformance to requirements and quality improvements and whether management promotes both organisational and managerial commitment in pursuit of a quality culture.
Table 4.10: Leadership and management commitment

<table>
<thead>
<tr>
<th>Sample</th>
<th>Response (%)</th>
<th>Mean score</th>
<th>Median</th>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>44.4</td>
<td>4.20</td>
<td>4</td>
<td>5</td>
<td>Top management in my organisation engages in the daily operations</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>4.17</td>
<td>4</td>
<td>4</td>
<td>Quality leadership is one of the strategic objectives of my organisation</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>4.20</td>
<td>4</td>
<td>4</td>
<td>Top management emphasises the implementation of strategy and operational excellence</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>3.90</td>
<td>4</td>
<td>4</td>
<td>Top management puts more emphasis on quality than cost</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>4.20</td>
<td>4</td>
<td>4</td>
<td>Management is committed to creating an environment conducive to conformance to requirements and quality improvement</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>4.15</td>
<td>4</td>
<td>4</td>
<td>Management promotes both organisational and managerial commitment in pursuit of a quality culture</td>
</tr>
</tbody>
</table>

4.3.2.1 Summary

The findings indicate that leadership and management commitment is viewed as an important aspect in many organisations. It is also interesting to note that there is a strong consensus on the competency of the top management.
4.3.3 Client management

Table 4.11 presents the findings related to the client management variable which was discussed in Chapter Two. The first two independent variables, which tested whether client satisfaction was regarded as important and the attitude of doing first things right, achieved a mode of 5. This gives an indication that most respondents strongly agreed with the two assertions.

Also a mode of 4 was recorded for the other two independent variables, which tested if there is a clear distinction in the roles of end user client and the implementing client and whether satisfaction of clients gets to be known during the execution process. This indicates that most respondents were in agreement with the two assertions. However, a mode of 3 was recorded for the other two sub-statements, which tested if the demands of the client are always in line with contractual duties as per the specification, and if there is always a healthy relationship between various service providers and representative of the client in a project. This indicates that most respondents disagreed with the two assertions.

Table 4.11: Client management

<table>
<thead>
<tr>
<th>Sample</th>
<th>Response (%</th>
<th>Mean score</th>
<th>Median</th>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>44.4</td>
<td>4.35</td>
<td>4.5</td>
<td>5</td>
<td>Satisfied of clients is regarded as paramount in my organisation</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>4.23</td>
<td>4</td>
<td>5</td>
<td>The emphasis is always on doing things right the first time</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>3.67</td>
<td>4</td>
<td>4</td>
<td>There is a clear distinction between end user client and implementing client and their roles</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>3.77</td>
<td>4</td>
<td>4</td>
<td>The satisfaction of our clients gets to be known throughout</td>
</tr>
</tbody>
</table>
The demands of clients are always in line with the contractual duties as per the specification.

There is always a healthy relationship between various service providers and the client representatives in the projects.

### 4.3.3.1 Summary

The collected data indicated that most respondents agreed with most assertions. However, a large number of respondents disagreed with two critical assertions, which were meant to test compliance with prescribed specification and the relationship between client and service providers.

### 4.3.4 Training and education

Table 4.12 contains findings in relation to training and education in various organisations that are involved in the built environment. A mode of 4 was recorded for most of the independent variables, which shows that there is consensus with respect to the impact and approach of education and training by various organisations.

A mode of 4 was recorded for independent variable which required the opinion of respondents on whether various organisations prioritise the education and training of technical personnel and whether organisations do focus on recruiting better qualified personnel while sending technical staff on industry related course. This indicates that most respondents agreed with the assertions above.
A mode of 4 was also recorded for the other independent variables that tested if organisations are using knowledge as a competitive tool, and if the training that is provided is linked to quality improvement. This also indicates that the majority of respondents agreed with the two assertions.

Table 4.12: Training and education

<table>
<thead>
<tr>
<th>Sample</th>
<th>Response (%)</th>
<th>Mean score</th>
<th>Median</th>
<th>Mode</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>44.4</td>
<td>4.10</td>
<td>4</td>
<td>4</td>
<td>My organisation prioritises education and training of technical personnel</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>4.02</td>
<td>4</td>
<td>4</td>
<td>The organisation focuses on recruiting better qualified technical people</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>3.97</td>
<td>4</td>
<td>4</td>
<td>The organisation normally sends technical staff on all levels of employment to attend relevant industry courses for refreshment</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>4.05</td>
<td>4</td>
<td>4</td>
<td>There is greater emphasis on using knowledge as competitive tool</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>3.92</td>
<td>4</td>
<td>4</td>
<td>The training provided is linked to the improvement of quality</td>
</tr>
</tbody>
</table>

4.3.4.1 Summary

The statistics indicate that most respondents agreed that most organisations prioritise education and training of technical staff, the recruitment of better qualified staff, the emphasis on using knowledge as a tool, and the provision of training that is linked to quality improvement.
4.3.5 Teamwork

Table 4.13 contains findings that were gathered for a variable, which tested the impact of and attitude to teamwork by various organisations.

A mode of 4 was recorded for the independent variables that tested if the managers spend most of their time promoting team work; the team centred tasks are performed better than the individual centred tasks, and if the various organisations encourage the influence of team members in the organisations. This indicates that most respondents are in agreement with the assertions.

Also a mode of 4 was recorded for the other independent variables, which tested if the teams are project based and change with each project, the responsibility for performance is shared by everyone and the organisations focus on high task fulfilment, there is high team maintenance and low self-orientation practised in various organisations. This also gives the indication that the majority of respondents are also in agreement with the statements above.

Table 4.13: Teamwork

<table>
<thead>
<tr>
<th>Sample</th>
<th>Response (%)</th>
<th>Mean score</th>
<th>Median</th>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>44.4</td>
<td>3.67</td>
<td>4</td>
<td>4</td>
<td>Managers spend most of their time promoting teamwork</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>3.82</td>
<td>4</td>
<td>4</td>
<td>Team centred tasks are performed better than individual centred tasks and are more productive than individual tasks in my organisation</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>3.7</td>
<td>4</td>
<td>4</td>
<td>My organisation encourages the influence of team members in the organisation</td>
</tr>
</tbody>
</table>
Teams are project based and change with each project

Responsibility for performance in the organisation is shared by everyone

My organisation focuses on high task fulfilment, high team maintenance and low self-orientation

4.3.5.1 Summary

The findings indicate that most respondents agreed with the assertions relative to teamwork, which included statements relating to whether management promotes teamwork and whether organisations focus on the maintenance of high teamwork

4.3.6 People management and empowerment

Table 4.14 presents findings pertaining to the organisations’ approach to the management of people and empowerment.

A mode of 4 was recorded for most independent, which gives an indication that most respondents agree that the management and empowerment in accordance with TQM approach is practiced by various organisations. The respondents were also tested on whether their organisations encourage confidence development in taking responsibilities of tasks and a mode of 4 was recorded. That gives an indication that most respondents agreed with the statements pertaining to empowerment.

A mode of 4 was also recorded relative to the independent variable that tested if the creative energy of all employees was enhanced by the organisations, the organisations were exploiting the competencies of their employees to enhance
productivity, the management promotes the decentralisation of decision making, the identification of necessary resources and provision of quality management training are the priorities of various organisations. This also gives an indication that most respondents agree with statements pertaining to empowerment.

Table 4.14: People management and empowerment

<table>
<thead>
<tr>
<th>Sample</th>
<th>Response (%)</th>
<th>Mean score</th>
<th>Median</th>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>44.4</td>
<td>4.05</td>
<td>4</td>
<td>4</td>
<td>My organisation encourages staff members to develop ability and confidence to take responsibility and ownership of tasks</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>3.97</td>
<td>4</td>
<td>4</td>
<td>My organisation encourages creative energies of all employees</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>3.77</td>
<td>4</td>
<td>4</td>
<td>The organisation focuses and exploits the competencies of the employees that they develop.</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>3.47</td>
<td>4</td>
<td>4</td>
<td>The organisation decentralises decision making to the lowest level in a controlled manner</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>3.77</td>
<td>4</td>
<td>4</td>
<td>Employees are trained to identify the resources necessary for their tasks</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>3.57</td>
<td>4</td>
<td>4</td>
<td>Employees are provided with quality management training</td>
</tr>
</tbody>
</table>
4.3.6.1 Summary

The statistics indicate that the majority of respondents agree that most organisations have a positive attitude when it comes to people empowerment and management. Most respondents agreed with a range of statements from whether organizations encourage staff to develop confidence and ability to decide whether employees are provided with quality management training.

4.3.7 Supplier partnership

Table 4.15 provides findings for the variable which enquired regarding the opinion of respondents relative to the supplier partnership in various organisations.

The recorded mode of 4 indicates that most respondents agree that various organisations do have a relationship with their suppliers. The response also shows that most respondents agree that the organisations do focus on the development of supplier quality management. The same response was recorded relative to whether organisations have established relationships with the suppliers of various materials.

Furthermore, the respondents were required to indicate whether the organisation has established a supply chain partnership and whether the organisation views suppliers as an integral part of the organisation. In both instances the mode 4 was recorded, which gives an indication that most respondents agreed with the two statements.

Table 4.15 Supplier partnership

<table>
<thead>
<tr>
<th>Sample</th>
<th>Response (%)</th>
<th>Mean score</th>
<th>Median</th>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>44.4</td>
<td>3.52</td>
<td>4</td>
<td>4</td>
<td>The organisation focuses on developing supplier quality management</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>3.45</td>
<td>4</td>
<td>4</td>
<td>The organisation has established relationship with the suppliers of various</td>
</tr>
</tbody>
</table>

61
| 90 | 44.4 | 3.17 | 3.5 | 4 | The organisation has established supply chain partnerships to motivate suppliers |
| 90 | 44.4 | 3.47 | 4 | 4 | The organisation views suppliers as an integral part of the organisation |

4.3.7.1 Summary

The statistics indicate that most respondents agreed with most of the assertions relating to supplier partnerships. These range from the development of supplier quality management, to the viewing of suppliers as an integral part of the organization.

4.3.8 Effective communication

Table 4.16 presents findings relative to the effectiveness of communication in various organisations.

A mode of 4 was recorded for most of the independent variables, which indicated that most respondents are of the opinion that communication is effective in most organisations. The response to whether organisations had designed a tailor made communication model resulted in a mode of 4. The respondents were also asked whether their organisation creates a community within the organization, and whether communications engendered high morale for quality improvement. For both assertions the response resulted in a mode of 4, which indicated agreement with the statements.

The respondents were also asked if their organisations use communication to identify the lessons that have been learnt, whether communication promotes
employee commitment, and whether communication is used to inform members about change within the organization. For all these assertions the recorded mode of 4 indicated that people agreed with all the statements.

Table 4.16: Effective communication

<table>
<thead>
<tr>
<th>Sample</th>
<th>Response (%)</th>
<th>Mean score</th>
<th>Median</th>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>44.4</td>
<td>3.52</td>
<td>4</td>
<td>4</td>
<td>The organisation has designed a communication programme in a tailor made manner</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>3.95</td>
<td>4</td>
<td>4</td>
<td>The organisation uses communication to create community within the organisation</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>3.92</td>
<td>4</td>
<td>4</td>
<td>Communication engenders high morale for quality improvement</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>4.25</td>
<td>4</td>
<td>4</td>
<td>Effective communication promotes employee commitment</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>4.02</td>
<td>4</td>
<td>4</td>
<td>Communication is used to identify lessons that have been learnt</td>
</tr>
<tr>
<td>90</td>
<td>44.4</td>
<td>4.22</td>
<td>4</td>
<td>4</td>
<td>Communication is used to inform members about changes within the organisation</td>
</tr>
</tbody>
</table>

4.3.8.1 Summary

The statistics indicate that most respondents agreed with the pivotal role played by effective communication in their organisations. They agreed with most assertions,
which range from whether organisations designed communication programmes in a tailor made manner, to whether communication is used to inform members regarding changes within the organization.

4.4 CONCLUSIONS

The study has revealed a magnitude of issues that need to be addressed to ensure the successful implementation of TQM in the delivery of building infrastructure projects. The most important issue emanating from the study is the high concentration of service providers in the Amathole Region, which is where the government headquarters is situated. Another aspect that has been identified is the skewed distribution of skilled personnel with a high concentration in the consulting firms.

Nevertheless, according to the majority of respondents, many aspects of TQM are being recognised by a number of organisations. The exception was with client management, in which case many respondents disagreed with some of the assertions.

The next chapter will then articulate the findings in detail and provide recommendations that will endeavour to improve the delivery of building infrastructure projects. This will be followed by comprehensive conclusions that will sum up the whole study.
CHAPTER 5

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION
This chapter will focus on the findings of the research, the conclusions and the recommendations. The summary of the whole research will first be presented which will then be followed by findings. The conclusion of the research will be presented which will be followed by the recommendations. Limitations of the study and areas for future research will also be narrated.

5.2 SUMMARY

The primary objective of the study is:

To improve delivery of building infrastructure projects while using SME contractors by applying TQM philosophy.

The secondary objectives of the study were recorded as:

- To determine if the commitment of management and quality leadership would enable optimum output by SME contractors;
- To determine the impact that the maximum focus on customer satisfaction will have on improving the performance of every stakeholder that is involved in the delivery of building infrastructure projects;
- To determine the impact that the continuous training and educating of staff members will have in the delivery of building infrastructure projects;
- To establish how the emphasis on teamwork will help to improve the delivery of quality projects in the built environment;
- To determine the impact that effective people management and empowerment will have on the delivery of building infrastructure projects;
- To establish the importance of supplier partnerships in ensuring effective output by SME contractors, and
• To determine the impact of effective communication in improving the quality of work in the building infrastructure industry.

5.3 FINDINGS

The findings which are based on the data analysis which was discussed in the previous chapter are presented below.

5.3.1 Demographic findings

The findings revealed that the building infrastructure projects are dominated by two professions in the Eastern Cape region, namely Quantity Surveying and Engineering. Furthermore, there are few architects across all sectors in the industry. The construction managers were the least represented and they were mostly found to be working for construction firms. It was also discovered that there was a skewed distribution of registered professionals, most working for consulting firms.

Furthermore, it was determined that there is a high concentration of professionals in the Amathole Region, where the provincial government headquarters is situated. This raises a concern regarding the effective monitoring of projects when people are required to travel long distances.

These findings have huge implications when taking into account the various responsibilities that each profession has in the construction cycle of a building project. The construction cycle comprises the pre-construction stage, construction stage, and post construction stage. The role of architects during the first stage is designing, and during construction they are responsible for assessing the quality of the building works. Construction managers are responsible for programming and operations management and more frequently work as project managers. Quantity surveyors throughout the construction cycle are responsible for cost control, while engineers are responsible for the stability of the building.
The low number of architects indicates that there is likely to be limited quality control during construction. Furthermore, programming and construction management are likely to be compromised as construction management is also under represented. The high concentration of professionals in the Amathole region raises concerns with respect to their ability to monitor the projects frequently.

5.3.2 Leadership and management commitment

The findings concluded that leadership and management commitment is regarded as an aspect of TQM that is visible in most organisations. Furthermore, it has been observed that most management members are viewed as fairly qualified and have relevant industry expertise.

5.3.3 Customer management

The findings indicated that some aspects of customer management as described in Chapter Two under TQM were visible in most organisations. These can be summarised as customer satisfaction, doing things right the first time, clarifying roles of clients and implementing agents and identifying client satisfaction through the execution of the project. However, some other aspects of the same component of TQM were found to be lacking in most organisations. These include healthy relationship between service providers and clients and demands of clients which are not always in line with contractual specifications.

These findings portray a critical area of TQM which requires swift intervention to ensure improvement of delivery of building infrastructure projects.

5.3.4 Training and education

The findings concluded that the aspects of training and education, as they were discussed in Chapter Two, are undertaken to a degree by many organizations. One
of the aspects training and education, which was observed to be visible in many organisations, is that the training and education is linked to quality improvement.

The findings indicate that the foundation has been set with regard to training and education by most organisations, but such initiatives should be expanded further to all the organisations.

5.3.5 Teamwork

The findings concluded that most organizations adhere to the aspects of teamwork as discussed in Chapter Two. An important aspect, which was observed to be practised in many organisations is that management is at the forefront of promoting teamwork.

The findings also indicate that the positive attitude towards teamwork is increasing, but such attitude should be expanded to all sectors of the industry.

5.3.6 People management and empowerment

The findings concluded that most organisations practice the aspects of people management and empowerment as these were discussed in Chapter Two. One critical aspect that organisations seem to be doing as per the findings is to encourage staff members to develop the ability and confidence to take responsibility and ownership of the task at hand.

The findings also showed that most organisations have moved towards an appreciation of individual development of employees for the good of the organisation.
5.3.7 Supplier partnership

The findings indicated that most organisations appreciate and value the development of partnership with the suppliers. One important factor that organisations seem to be doing well with is to view suppliers as an integral part of the organisation.

The findings also show that most organisations are no longer complacent in terms of supplier relationships, which is an important aspect of TQM.

5.3.8 Effective communication

The findings indicated that most organisations regard communication as an effective tool which ensures smooth running of organisations. The most important finding relative to this component of TQM is that organisations in the construction industry use communication to create unity within an organisation.

The findings indicate that effective communication, which is the key component of TQM, is starting to be appreciated by most organizations.

5.4 RECOMMENDATIONS

The recommendations to improve the delivery of building infrastructure projects are narrated based on the findings of the empirical study and discussion of the literature review presented in Chapter Two. The successful delivery of building projects is dependent on all the role players in the value chain of the construction cycle. It was indicated in the literature review that the value chain in the construction industry comprises a multitude of players that are interdependent of each other. It therefore makes it necessary that the recommendations should address all sectors that are involved in the construction cycle in the delivery of building projects.

The recommendations for the study are four fold, and focus on capacity development, reduction of high turnover, even distribution of resources, and specifying roles and responsibilities of all role players. This is to ensure that the
positive findings of the study are applied to and optimised throughout the value chain of the construction cycle.

5.4.1 Capacity development

The DPW in the Eastern Cape province should establish a relationship with the Nelson Mandela Metropolitan University (NMMU) and the Walter Sisulu University (WSU) with the intention of recruiting students for construction related professions, and particularly architectural and construction management, which are seemingly lacking. The emphasis should be in the remote areas of the province where potential students could be offered bursaries, but who would have to return to their areas to serve a number of years equivalent to the years that they were sponsored while attending a tertiary institution.

5.4.2 Reduction of high turnover

The emphasis would be on the government side and the contractor’s side. Findings indicated that most government officials are middle aged, while on the contractor side, most officials are still young. The cidb, which is mandated in terms of legislation to categorise contractors in terms of capacity, should modify its formula by tying capacity to the experience and expertise of the core staff component. This is aimed at ensuring that construction firms that have the intention to grow, endeavour to recruit skilled and capable individuals and provide them with secure contracts. This is intended to reduce the poaching of employees, while developing them.

Government, on the other hand, should target the recruitment of young professionals that are still energetic and able to travel the length and breadth of the province to ensure compliance with the prescribed standards. Doing so will also ensure that the older generation imparts customised government experience to these professionals to ensure continuity and sustainability of delivery of building projects.
5.4.3 Even distribution of resources

The DPW should play a leading role in ensuring the even distribution of human capital resources in the implementation of projects. Firstly, the DPW should intensify its requirement for contractors to specify the technical personnel who would be responsible for the running of the project. In addition the DPW should enforce that the bidding company has a strategy of dealing with staff turnover. The intention of this is to obviate the situation where the running of projects is dependent on an individual who could leave the organisation at any time.

The DPW should also specify in the appointment letters of consultants that they will be required to establish a satellite office in the town where projects are being implemented. This should apply in the instances where the appointed consultant is operating from a town or a city that is very far away from the project. The key consultants would be determined by the nature and complexity of the project, while the duration of the project would be taken into account. The details and dynamics of this approach would require a special task team that would develop guidelines on how to implement the project.

5.4.4 Specifying roles and responsibilities

The role players in the implementation of a project can be said to be three fold particularly for the benefit of the study. Firstly, there is the DPW representing the client, then the bundle of consultants that provide various technical and professional expertises, and then there is a contractor who is responsible for the actual execution of the works. It is important that the role of each of the important stakeholders should be clarified to prevent a situation where unnecessary demands are put on role player.

Also the line and method of communication that would be applied in a project should be established as a standard guideline that should be applied throughout the construction industry. This will ensure continuity, whilst ensuring effectiveness of the accrued learning experience.


5.4.5 Summary of recommendations

Once these recommendations have been adhered to the next phase would have to be to ensure that the elements of TQM, which have been widely discussed in the previous chapters, are systematically implemented. The findings indicated that most respondents agreed with most of the assertions relative to each component of TQM. However, the challenge that was identified was the uneven distribution of human capital in the industry as well as the high concentration in the Amathole region where the government headquarters is based. It therefore becomes paramount that the first phase should deal with the structural arrangement in the built environment. The implementation of TQM should then be introduced gradually as a standard in the built environment where non-compliance could result in penalties for such an uncooperative firm or individual.

5.5 LIMITATIONS OF THE STUDY

The findings of the study had certain limitations that will need to be considered when dealing with the outcomes of the study.

Firstly, the study focused on the technical people that are involved in the construction cycle without addressing supplementary issues such as supply chain management, human resources, and the finance section of all the sectors that have been discussed in the study. These supplementary issues are critical as they enable the successful implementation of projects.

The study was also confined to the Eastern Cape Province, but the public tendering system enables both contractors and consultants from anywhere in the country to tender for any project. This is evident by the number of both contractors and consultants that are from outside the province, but are running projects in the province. This could perhaps explain the small response from the contractors as articulated in the previous chapter.

The study also focused on projects that are implemented by the DPW, but there are projects that are implemented by other entities such as the municipalities, Transnet,
and some other government departments such as the Department of Human Settlements.

To cater for these limitations a broader study will have to be conducted over a longer period of time and may also require additional resources to enable travelling to various parts of the country.

5.6 OPPORTUNITIES FOR FURTHER RESEARCH

The findings of the study presented opportunities for further research and these will be narrated below.

Research could be conducted to determine the reasons and recommendations on the high turnover rate in the construction firms, while the consulting firms seemingly have low turnover rates.

Further research could be conducted to determine the implications for the DPW of ageing staff, on the successful implementation of projects. This should be done while being cognisant of the legislative mandate of the DPW and the geographic stretch of the province where people are required to travel long distances.

Research could be conducted to determine the reasons for many firms which are either contracting or consulting mostly from East London, while the majority of the projects are in other parts of the province, mostly in the former Transkei. Well thought recommendations will have to be provided for this research to ensure that people are closer to the projects that they are supposed to monitor.

5.7 CONCLUSIONS

The intention of the study was to find ways of improving delivery of building infrastructure projects. This was done in the light of the challenges that the construction industry is facing, and the complex nature of service delivery in a public sector.
TQM philosophy, which has been widely used in other sectors, has been identified as the tool that could be used to improve the performance of building contractors and all the players in the value chain of the construction cycle.

An in-depth literature review was conducted on the entire spectrum of public building projects. The review first addressed the functioning of the public sector in general, and then focused on the DPW and its legislative mandate. The construction industry was discussed in general including the whole value chain. The SMEs and the challenges that they face, particularly when working for public sector, were discussed. The TQM philosophy and its elements were also discussed in great detail to determine if the implementation of such elements in the construction industry could have the same positive effect.

The empirical study investigated the extent to which the elements of TQM are used in the delivery of building infrastructure projects.

The latter part of the study provided recommendations with respect to optimising the delivery of building projects in the Eastern Cape. The limitations of the study were narrated, while opportunities for future research were identified based on the findings of the study.

Finally, the findings indicate that there is need for improvement in the delivery of building infrastructure projects, and a focus on TQM could contribute thereto.
REFERENCES


Qualitative Report, 12, pp. 42-45.


I am currently conducting research at the Nelson Mandela Metropolitan University (NMMU). The data collected will be used in partial fulfilment towards a Masters Degree in Business Administration. My research topic is: *Improving the performance of SME Building Contractors that are working for the Department of Public Works in Eastern Cape through the implementation of a Total Quality Management philosophy.*

Please assist in supplying me with the information required on the attached questionnaire. Please note that the information gathered from you will be used solely for academic purposes and will be treated as confidential.

Thank you for your cooperation.

Kind Regards
Vukani Ntsholo
072 907 9388
## Section 1

<table>
<thead>
<tr>
<th>Personal Qualifications (Tick one box only)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.1 Nature of Profession</strong></td>
</tr>
<tr>
<td>1. Architecture</td>
</tr>
<tr>
<td>2. Construction Management</td>
</tr>
<tr>
<td>3. Quantity Surveying</td>
</tr>
<tr>
<td>4. Engineering</td>
</tr>
<tr>
<td>5. Other (Please State)</td>
</tr>
<tr>
<td><strong>1.2 Nature of Service</strong></td>
</tr>
<tr>
<td>1. Government</td>
</tr>
<tr>
<td>2. Consulting</td>
</tr>
<tr>
<td>3. Contracting</td>
</tr>
<tr>
<td><strong>1.3 If (1) not chosen above please state the number of employees in your organization</strong></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td><strong>1.4 Number of years with the current employer</strong></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td><strong>1.5 Number of years in the built environment industry</strong></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td><strong>1.6 Registration with the relevant council (Please record)</strong></td>
</tr>
<tr>
<td>1. Yes</td>
</tr>
<tr>
<td>2. No</td>
</tr>
<tr>
<td><strong>1.7 Gender</strong></td>
</tr>
<tr>
<td>1. Male</td>
</tr>
<tr>
<td>2. Female</td>
</tr>
<tr>
<td><strong>1.8 Age (Please record)</strong></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td><strong>1.9 District of operation</strong></td>
</tr>
<tr>
<td>1. Cacadu</td>
</tr>
<tr>
<td>2. Amathole</td>
</tr>
<tr>
<td>3. OR Tambo</td>
</tr>
<tr>
<td>Chris Hani</td>
</tr>
<tr>
<td>Alfred Nzo</td>
</tr>
</tbody>
</table>
Section 2

Please indicate the extent to which you agree, disagree or unsure with each statement

<table>
<thead>
<tr>
<th>Leadership and Top Management Commitment</th>
<th>Unsure</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Top management in my organization is qualified and involved in the daily operations</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2.2 Quality leadership is one of the strategic objectives of my organization</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2.3 Top management emphasizes the implementation of strategy and operational excellence</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2.4 Top management put more emphasis on quality than cost</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2.5 Management is committed to creating the environment conducive to conformance to requirements and quality improvements</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2.6 Management promotes both organizational and managerial commitment in pursuit of a quality culture</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Client Management
### Satisfaction of clients is regarded as paramount in my organization

| 2.7 | The emphasis is always on doing things right the first time | 1 | 2 | 3 | 4 | 5 |
| 2.8 | There is clear distinction between end user client and implementing client and their roles | 1 | 2 | 3 | 4 | 5 |
| 2.9 | The satisfaction of our clients gets to be known throughout the execution process | 1 | 2 | 3 | 4 | 5 |
| 2.10 | Client's demands are always in line with the contractual duties as per the specification | 1 | 2 | 3 | 4 | 5 |
| 2.11 | There is always a healthy relationship between various service providers and the client representatives in the projects | 1 | 3 | 4 | 5 |

### Training and Education

| 2.12 | My organization prioritizes education and training of technical personnel's | 1 | 2 | 3 | 4 | 5 |
| 2.13 | The organization focuses on recruiting better qualified technical people | 1 | 2 | 3 | 4 | 5 |
| 2.14 | The organization normally sends technical staff on all levels of employment to attend relevant industry courses for refreshment | 1 | 2 | 3 | 4 | 5 |
| 2.15 | There is greater emphasis on using knowledge as competitive tool | 1 | 2 | 3 | 4 | 5 |
| 2.16 | The training provided is linked to the improvement of quality | 1 | 2 | 3 | 4 | 5 |

### Teamwork

| 2.17 | Managers spend most of their time promoting teamwork | 1 | 2 | 3 | 4 | 5 |
| 2.18 | Team centred tasks are performed | 1 | 2 | 3 | 4 | 5 |
better than individual centred tasks and are more productive than individual tasks in my organization

| 2.20 | My organization encourages the influence of team members in the organization | 1 | 2 | 3 | 4 | 5 |
| 2.21 | Teams are project based and change with each project | 1 | 2 | 3 | 4 | 5 |
| 2.22 | Responsibility for performance in the organization is shared by everyone. | 1 | 2 | 3 | 4 | 5 |
| 2.23 | My organization focuses on high task fulfilment, high team maintenance and low self-orientation | 1 | 2 | 3 | 4 | 5 |

**People Management and Empowerment**

| 2.24 | My organization encourages staff members to develop ability and confidence to take responsibility and ownership of tasks | 1 | 2 | 3 | 4 | 5 |
| 2.25 | My organization encourages creative energies of all employees | 1 | 2 | 3 | 4 | 5 |
| 2.26 | The organization focuses and exploits the competencies of the employees that they develop. | 1 | 2 | 3 | 4 | 5 |
| 2.27 | The organization decentralizes decision making to the lowest level in a controlled manner | 1 | 2 | 3 | 4 | 5 |
| 2.28 | Employees are trained to identify the resources necessary for their tasks | 1 | 2 | 3 | 4 | 5 |
| 2.29 | Employees are provided with quality management training | 1 | 2 | 3 | 4 | 5 |

**Supplier Partnership**

| 2.30 | The organization focuses on developing supplier quality | 1 | 2 | 3 | 4 | 5 |
| 2.31 | The organization has established relationship with the suppliers of various materials | 1 | 2 | 3 | 4 | 5 |
| 2.32 | The organization has established supply chain partnerships to motivate suppliers | 1 | 2 | 3 | 4 | 5 |
| 2.33 | The organization views suppliers as an integral part of the organization | 1 | 2 | 3 | 4 | 5 |

**Effective Communication**

| 2.34 | The organization has designed a communication program in a tailor made manner | 1 | 2 | 3 | 4 | 5 |
| 2.35 | The organization uses communication to create community within the organization | 1 | 2 | 3 | 4 | 5 |
| 2.36 | Communication engender high morale for quality improvement | 1 | 2 | 3 | 4 | 5 |
| 2.37 | Effective communication promotes employee commitment | 1 | 2 | 3 | 4 | 5 |
| 2.38 | Communication is used to identify lessons that have been learnt | 1 | 2 | 3 | 4 | 5 |
| 2.39 | Communication is used to inform members about changes within the organization | 1 | 2 | 3 | 4 | 5 |