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The Role of Quantity Surveyors in Public-Private Partnerships Projects in South Africa

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Abstract

Title of treatise: The role of quantity surveyors in public-private partnerships projects in South Africa

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Purpose: Many countries in the world are using Public-Private Partnerships (PPPs) as an alternative procurement method for the delivery of public services. The research investigates the use of PPPs in South Africa, as a means of public infrastructure procurement, and the role that quantity surveyors could play in PPPs.

Design/Methodology: A survey questionnaire was conducted among South African quantity surveyors, in order to determine their level of involvement in PPPs. The survey questions were divided into five categories: background information; level of knowledge and participation in PPPs; traditional and non-traditional roles of quantity surveyors; respondents' perceptions regarding the education and competency of a quantity surveyor; and lastly, further education.

A case study of a completed PPP in South Africa was also conducted for triangulation purposes.

Findings: Firstly, the research shows that PPPs are an alternative procurement method for public infrastructure procurement in South Africa. Secondly, the study shows that, although quantity surveyors possess the relevant skills and competencies required in a PPP project, their current involvement in PPPs in South Africa is limited.

Originality/Value: The findings have highlighted the many opportunities that exist for quantity surveyors in PPP projects in South Africa. Given that PPPs are still in their infancy in South Africa, and the government's commitment to PPPs, further research is required in this field.

Keywords: Public-Private Partnerships (PPPs), Quantity Surveyors, Quantity Surveying Profession, South Africa, Infrastructure

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LIST OF ACRONYMS

AAArb	Associate of the Association of Arbitrators
AIQS	Australian Institute of Quantity Surveyors
ASAQS	Association of South African Quantity Surveyors
B & F	Build-Finance
BAFO	Best and Final Offer
BBBEE	Broad-Based Black Economic Empowerment
BEE	Black Economic Empowerment
BLT	Build -Lease and Transfer
BOO	Build –Own- Operate
BOOT	Concession / Build-Own- Operate- Transfer
BOT	Build Operate Transfer
CECE	Commission of European Construction Economics
D&C	Design and Construct
DB	Design and Build
DBE	Department of Basic Education
DBFM	Design- Build- Finance- Maintain
DBFO	Concession/ Design- Build -Finance- Operate
DBFOM	Design- Build- Finance -Operate and Maintain
DBFOT	Design- Build- Finance- Operate-Transfer
DBO	Design- Build- Operate
DBOT	Design- Build- Own- Transfer
DCM	Design- Construct and Maintain
DFBOT	Design-Finance-Build-Operate-Transfer
DFO	Design-Finance-Operate
DIRCO	Department of International Relations and Cooperation
DPW	Department of Public Works
DWAF	Department of Water and Forestry
ECC	Evaluation Co-ordination Committee
EIA	Environmental Impact Assessment
FCIOB	Fellow of the Chartered Institute of Building
FM	Facilities Management
FRICS	Fellow of the Royal Institution of Chartered Surveyors
GDP	Gross Domestic Product
GVA	Gross Value Added
IMF	International Monetary Fund
IT	Information Technology
ITS	International Transport System
JV	Joint Venture
KZN	KwaZulu-Natal
LDO	Lease-Develop-Operate

LLP	Limited Liability Partnership
MAQS	Member of Association of South African Quantity Surveyors
MBA	Master of Business Administration
MPL	Mpumalanga
MSA	Municipal Systems Act
NDP	National Development Plan
NRB	National Road Board
NRF	National Road Fund
NTC	National Transport Commission
NZIQS	New Zealand Institute of Quantity Surveyors
O&M	Operate and Maintenance Contract
OUTA	Opposition to Urban Tolling Alliance
PDF	Project Development Facility
PEC	Project Evaluation Committee
PFI	Private Finance Initiative
PFMA	Public Finance Management Act
PIAC	Public Interest Advocacy Centre
PICC	The Presidential Infrastructure Coordinating Commission
PM	Project Management
PPP	Public Private Partnership
PSC	Public Sector Comparator
RFP	Request for Proposal
RFQ	Request for Qualification
RICS	Royal Institution of Chartered Surveyors
SA	South Africa
SACQSP	South African Council for the Quantity Surveying Profession
SANRAL	South African National Road Agency
SARB	South African Roads Board
SIP	Strategic Integrated Projects
SKA	Square Kilometre Array
SPV	Special Purpose Vehicle
StatsSA	Statistics South Africa
TA:I	Treasury Approval: I
TA:IIA	Treasury Approval: IIA
TA:III	Treasury Approval: III
TET	Technical Evaluation Teams
UK	United Kingdom
UN	United Nations
USA	United States of America
USP	Unique Selling Point

WTO World Trade Organization

Chapter 1
Introduction

1.1 Introduction

The main aim of this chapter is to explain the rationale for the study. The chapter contains the following headings:

- The background of the study;
- The statement of the problem;
- The purpose of the study;
- The research hypotheses;
- The research question;
- The significance of the study;
- Limitations and assumptions;
- Organization of the study;
- Summary.

1.2 The Background of the Study

The main aim of the research is to investigate the role of Public-Private Partnerships (PPPs) in infrastructural development, the current role, as well as the future role of quantity surveyors in PPPs.

Most governments are turning to PPPs as an alternative procurement method for the provision of public sector services. They recognize that government funding alone is insufficient to meet the infrastructural needs of their citizens. Public entities are increasingly using private funding and expertise for the provision of public sector services, such as roads, water, electricity, housing, hospitals, recreational facilities, etc.

In order to address its infrastructural backlog challenges, the South African government is also using PPPs as an alternative method for procuring public

services. The monetary value of the infrastructure backlog has been estimated to be R3,5 trillion (Abedian, 2012).

The South African government also recognizes that one of the keys to growing the economy is through public infrastructure investment. During the next three years, (2014-2017), it will spend R847 billion on infrastructural projects (Gordhan, 2014).

PPPs in South Africa are still in their infancy stage, or stage one (see Figure 1.1) The first stage of a PPP market is where there are a few PPP projects in the market, (United Nations, 2008). There is, therefore, room for further growth in the PPP markets in South Africa.

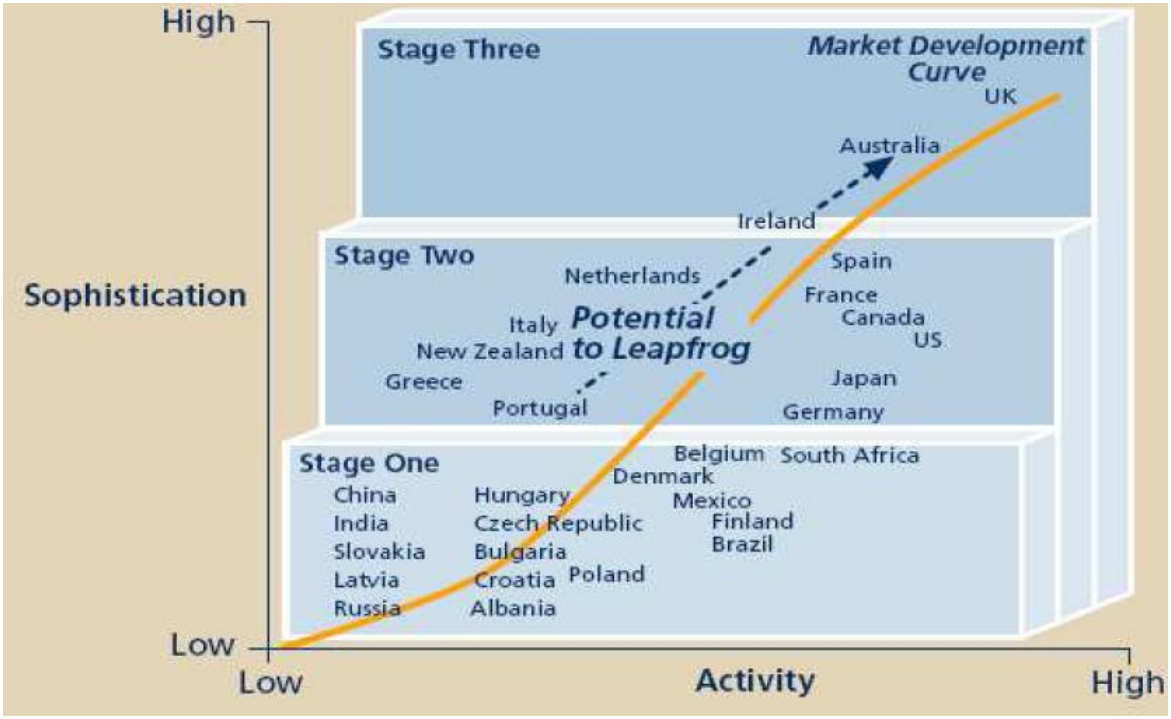

Figure 1.1: PPP Market Maturity Curve (Delloitte & Touche USA LLP in UN, 2008)

As stakeholders in the provision of infrastructure, quantity surveyors' role in the provision of infrastructural projects cannot be overlooked. Quantity surveyors are regarded as cost-and-contract experts in the built environment. It is, therefore,

important to investigate their current role in PPPs, as well as their possible future role.

The aim of the study is therefore to:

1. Add to the body of knowledge in PPPs and the quantity surveying profession;
2. Investigate the current role of quantity surveying in PPPs;
3. Highlight the possible future role of quantity surveyors in PPPs.

The study will highlight the distinctive skills and expertise that quantity surveyors possess. Decision-makers in PPPs will, thus, employ their skills more widely in PPP projects. Lastly, the study will attempt to influence quantity surveyors to apply their skills, knowledge and expertise to other markets, which are not generally regarded as being their traditional markets.

1.3 The Statement of the Problem

Investment in public infrastructure is the key to the socio-economic development of South Africa. Public sector inefficiencies in the delivery of public sector services have played a major role in leading the South African government to seek partnerships with the private sector, in order to provide public services to its citizens.

Unless all the stakeholders in the provision of infrastructure, including quantity surveyors, become acquainted with PPPs, and adapt to the new alternative procurement method, the objectives of PPPs will not be fully realised.

The research seeks to answer the question: “What is the current and future possible role of quantity surveyors in PPPs in South Africa?”

1.4 The Purpose of the Study

The first purpose of the study is to investigate what PPPs are – and their role in infrastructural delivery in South Africa. Secondly, the study will also investigate the

current role that quantity surveyors in South Africa play in PPPs; and thirdly, it will attempt to highlight their possible future role.

1.5 The Research Hypotheses

A hypothesis is defined as, "…*something taken to be true, for the purpose of argument or investigation*." (American Heritage Dictionary of the English Language, 2011). In simple terms, a hypothesis is an assumption.

1.5.1 Hypothesis One

Quantity surveyors, with many years of quantity surveying experience, from large quantity surveying private firms in more economically developed provinces, are more likely to participate in the provision of PPPs.

1.5.2 Hypothesis Two

The majority of quantity surveyors are not familiar with PPPs; and as a result, they do not participate in PPP projects.

1.5.3 Hypothesis Three

The education and training of quantity surveyors enables them to be able to transfer their skills and competencies to become involved in new non-traditional roles.

1.5.4 Hypothesis Four

Quantity surveyors prefer their traditional role to non-traditional roles.

1.5.5 Hypothesis Five

Education and training in non-traditional roles can contribute to quantity surveyors' participation in PPPs.

1.5.6 Hypothesis Six

Other stakeholders in the provision of infrastructure are not aware of the wide range of services that quantity surveyors can offer.

The above-mentioned hypotheses will assist in guiding the study and in the gathering of the evidence.

1.6 The Research Questions

There are three research questions, namely:

- What is a PPP, and what is its role in the delivery of infrastructural projects?
- What is the current role of QSs in PPPs?
- What is the future role of QSs in PPPs?

Phrased in another way, the questions could read: “Is there enough evidence to suggest that PPPs are going to be used more frequently, as an alternative method for procuring public services? Are quantity surveyors currently adding value in PPPs? Is there room for quantity surveyors to add more value to PPPs than they are currently adding, that is, could quantity surveyors’ skills and expertise enable PPPs to work more efficiently?”

1.7 Significance of the study

The National Development Plan (NDP) was adopted by the South African government in 2010, as government’s 20-year economic growth plan. The plan’s major objective is to improve the quality of life for all South Africans through the eradication of poverty and reduction of inequality (KPMG, 2014).

Included in the NDP is the Infrastructure Plan. The Infrastructure Plan’s objectives are: Economic development; the acceleration of basic service delivery; job creation; and integration with other African economies. The South African government adopted the Infrastructure Plan in 2012. The Presidential Infrastructure Co-ordinating Commission (PICC) is a body established by the Cabinet for the implementation of the Infrastructure Plan (PICC, 2012).

The South African government intends to create five million jobs by the year 2020. Investment in infrastructure development has been identified as the leading job-

creation driver; it is also critical in boosting economic development and addressing socio-economic needs (PICC, 2012).

The PICC completed an audit of the country's infrastructural needs. It did so, by identifying infrastructure gaps across the country, population movement, and economic performance. It then placed these in a spatial framework; and eighteen Strategic Integrated Projects (SIPs) were identified as key infrastructural projects for unlocking economic opportunities for the people of South Africa and Africa (PICC, 2012).

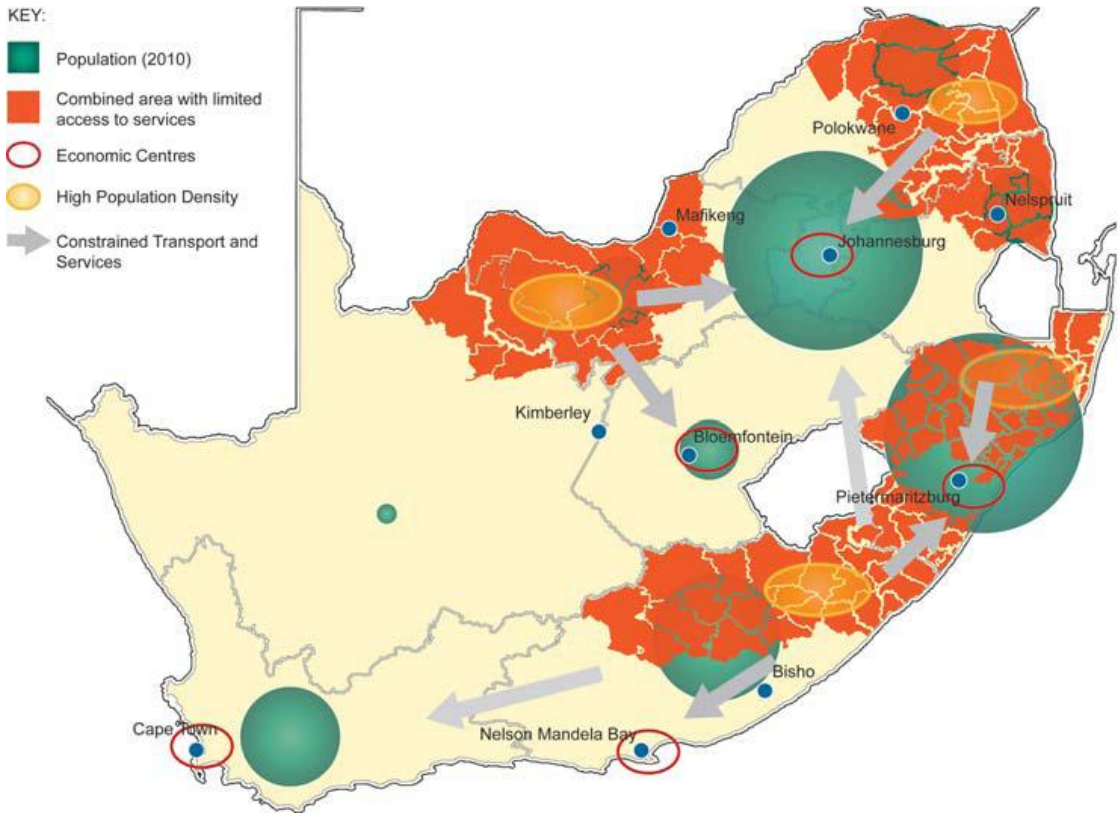

Figure1.2: Distribution of basic services relative to population density and economic centres (PICC, 2012)

Figure1. 2 shows the population density in South Africa relative to access to basic services. The term 'basic services' refers to water, electricity, telecommunication and sanitation. Unless socio-economic interventions are implemented, people from regions with inadequate basic services and fewer economic opportunities will

continue to migrate to the more developed economic hubs, thereby resulting in the overloading of services in those centres.

Figure 1.3 shows how the current and future infrastructure investment should enable further economic growth.

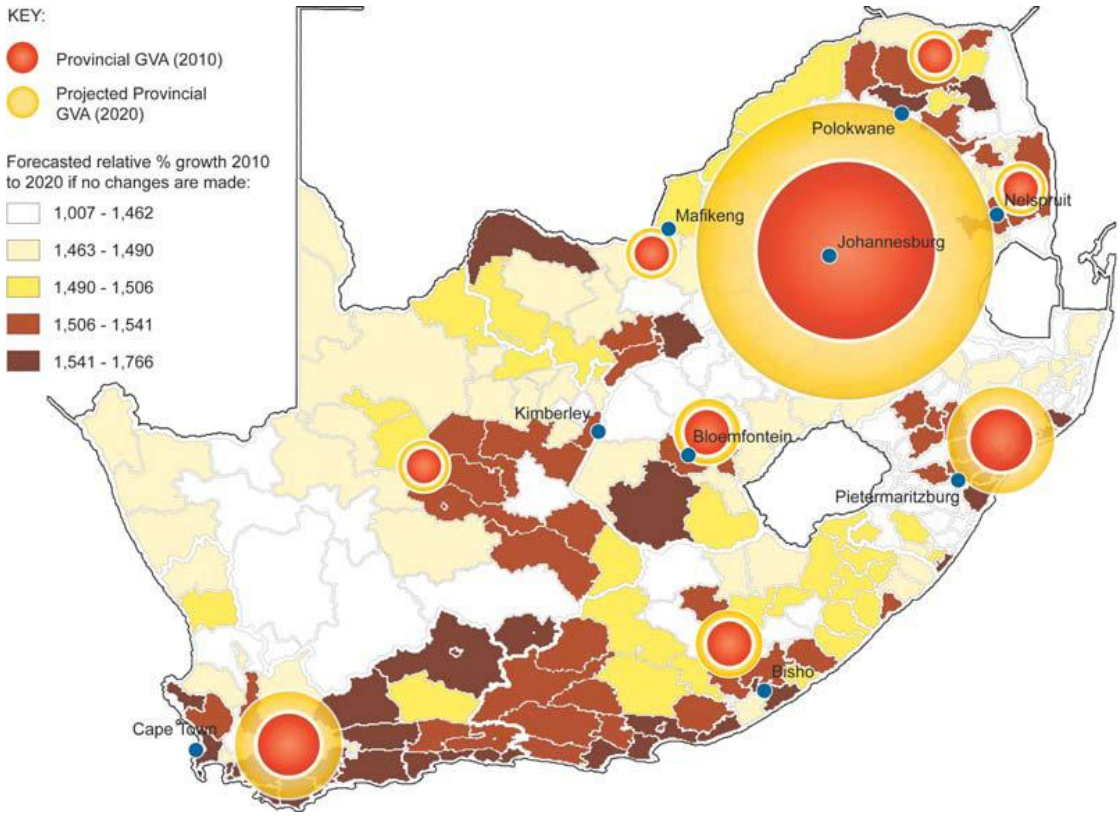

Figure 1.3: Needs analysis based on current and projected economic growth (PICC, 2012)

***GVA stands for gross value added across the country (PICC, 2012)**

The eighteen SIPS identified are divided into seven categories, namely: geographic, energy, spatial, social infrastructure, knowledge, regional and water, and sanitation SIPs. The following are the names of the projects:

1.7.1 Geographic Strategic Integrated Projects

- SIP 1: Unlocking the northern mineral belt, with Waterberg as the catalyst.
- SIP 2: Durban-Free State-Gauteng logistics and industrial corridor.
- SIP 3: South-Eastern mode and corridor development.
- SIP 4: Unlocking the economic opportunities in North West Province.

- SIP 5: Saldanha-Northern Cape corridor development strengthening marine support capacity for oil and gas and through the expansion of iron ore mining production.

1.7.2 Energy Strategic Integrated Projects

- SIP 8: Green energy in support of the South African economy.
- SIP 9: Electricity generation to support socio-economic development and to address the historical imbalances.
- SIP 10: Electricity transmission and distribution for all.

1.7.3 Spatial Strategic Integrated Projects

- SIP 6: Integrated municipal infrastructure projects.
- SIP 7: Integrated urban space and public transport programme: this is to co-ordinate the planning and implementation of public transport, human settlements, the economic and social infrastructure.
- SIP 11: Agri-logistics and rural infrastructure SIP would improve investment in the agricultural and rural infrastructure.

1.7.4 Social Infrastructure Strategic Integrated Projects

- SIP 12: Revitalization of public hospitals and other health facilities.
- SIP 13: National school building programme.
- SIP 14: Higher education infrastructure.

1.7.5 Knowledge Strategic Integrated Projects

- SIP 15: Expanding access to communication technology.
- SIP 16: Square Kilometre Array (SKA) and Meerkat Projects.

1.7.6 Regional Strategic Integrated Projects

- SIP 17: Regional Integration for African cooperation and development.

1.7.7 Water and Sanitation Strategic Integrated Projects

- SIP 18: Water and Sanitation infrastructure.

According to KPMG SA's (2013) report entitled, "Planned infrastructure expenditure and NDP: Mind the Gap," the planned budget for the infrastructure is:

- R827 billion is the planned budget for the next three years on infrastructure (Budget speech 2013/2014).
- R1.1 trillion infrastructure spending is required over the next three years, in order to reach the NDP target of 10% of GDP.
- R4 trillion is the amount planned to be spent over the next 15 years on the infrastructure.
- R11.8 trillion is the required budget amount to reach NDP's target by 2030.

The amount of funding allocated to the implementation of the NDP indicates that the South African government is committed to infrastructural development. However, in spite of the billions of funds allocated to infrastructural development since the dawn of democracy in 1994, most of the funds allocated remain unspent. For example, in the financial year of 2012/2013, most government departments only spent 68%-70% of their allocated budget (KPMG, SA, 2013).

One of the reasons for the unspent funds is: the poor implementation capacity, or shortage of skills in public entities. Other factors that impede the proper implementation of infrastructural projects include: poor planning; delayed implementation of projects; poor quality of services or products; lack of proper project control mechanisms; unplanned expenditure on re-doing the designs and construction and delays in the delivery of the services or products; and the delayed or non-payment of contractors (PICC, 2012).

The PICC recognizes the value that the private sector can add in realising the objectives of the Infrastructure Plan, and in providing the skills and expertise required for the implementation of infrastructural projects. PPPs are going to play a key role in the implementation of the NDP.

Given the future role of PPPs in the implementation of the NDP, and the fact that in South Africa PPPs are in their infancy, the need for the study cannot be over-emphasized.

The PICC 2012 report mentions the quantity surveying skills as some of the skills required for the implementation of the Infrastructure Plan. It is, therefore, imperative

for the quantity surveying profession to understand its role in the socio- economic development of South Africa.

Research and development in the profession is a key in ensuring that quantity surveyors add value in the implementation of the Infrastructure Plan.

1.8 Limitations and assumptions

The first limitation of the study is that the study is limited to South African PPPs and South African quantity surveyors. The other limitation of the study is the consequence of the instruments used to conduct the study.

A web-based questionnaire and a case study will be used to conduct the study. One of the disadvantages of using a survey is that they usually have a low return rate; and the challenges encountered by respondents cannot be corrected; because the researcher does not have direct interaction with the respondents (Mitchell & Jolley, 2013). The reliability of the data received from the respondents could be questionable; as the researcher assumes that the respondents would provide truthful information – especially with regard to the respondents' demographic information (Flick, 2011).

The author made the assumption that the respondents' interpretation of the questions posed corresponded with those of the author (Flick, 2011).

Due to time and cost constraints, only one case study will be used; there could be other variables that the data could have provided (Yin, 2014). Two or three case studies would have provided better comparisons. Multiple sources of evidence for the case study, besides interviews only, could have added to the quality of the study.

1.9 Organization of the study

The next part of the study is divided into five chapters: Chapter 2 covers a literature review for PPPs; and Chapter 3 is a literature review on the quantity surveying profession. Chapter 4 deals with the research design and methodology. Chapter 5

and 6 represent the results; and Chapter 7 deals with the conclusion and recommendations suggested.

1.10 Summary

The South African government is planning to invest trillions of rands in the provision of infrastructure by 2030. Unless all the stakeholders in the provision of this infrastructure invest in improving their knowledge, education and skills, poor service delivery will continue to hamper the socio-economic development of our country.

The next two chapters, Chapters 2 and 3, cover the literature review undertaken. It is important to find out what has been written by others on PPPs and quantity surveyors, respectively.

Chapter 2

The Literature Review: Public-Private Partnerships (PPPs)

2.1 Introduction

This chapter focuses on the review of the literature on PPPs. The literature reviewed was obtained from numerous sources in the construction field, and outside the construction field. The sources used to obtain this literature include:

- Textbooks;
- Conference papers;
- Journals;
- Websites;
- Theses and dissertations; and
- Magazines.

The aim of this chapter is to determine the information available on PPPs in infrastructural development.

2.2 Definition of a PPP

There is currently no universal definition of what a PPP is. Most scholars, academics, practitioners and countries have their own definition and understanding of what a PPP is.

There are certain aspects that various authors highlight in their attempt to define PPPs. In their 2012 journal paper, Mouraviev and Kakabadse provide different meanings and forms of PPPs, as they are described by various scholars. For instance, Sedjari (in Mouraviev & Kakabadse, 2012) places the emphasis on solidarity as a key component in a PPP. Brinkerhoff and Brinkerhoff (in Mouraviev & Kakabadse, 2012) regard "…*mutuality*" as an important feature in the partnership. Bovaird (in Mouraviev & Kakabadse, 2012) describes a PPP as a "…*commitment above and beyond contracts*".

Haque (in Mouraviev & Kakabadse, 2012) places the emphasis on "…*mutuality and organizational identity*". Klijn and Teisman (2002), state that a PPP is "…*an institutional arrangement between public and private actors, in which they share the responsibility for a product, risk, costs and benefits.*" All the above-mentioned features are unique to a PPP contract. In a traditional procurement contract, such as outsourcing, the features above would not form the basis for a contract.

A more comprehensive definition of a PPP is given by Grimsley and Lewis (in Mouraviev & Kakabadse, 2012). They define a PPP as, "…*an agreement where the public sector enters into a long-term contractual agreement with private sector entities for the construction or management of public sector infrastructure facilities by the private sector entity, or the provision of services (using infrastructure facilities) by the private sector entity to the community – on behalf of a public sector entity*" (Grimsley and Lewis in Mouraviev & Kakabadse, 2012).

The definition of Grimsley and Lewis (in Mouraviev & Kakabadse, 2012) highlights the following important aspects of a PPP:

- The agreement between the public and the private party must be a legally binding contract;
- It must be a long-term contract;
- PPPs are usually required for the provision of infrastructure or some other public-sector service;
- The public sector provides services to the public through PPPs;
- In a typical PPP agreement, a physical asset is usually built or renovated;
- A public asset can, in some instances, be transferred to the private party. The private party would then assume the responsibility for its maintenance.
- Through PPPs, the public party is able to provide services to the public via an asset constructed by, or transferred to, the private party.

Although the definition of Grimsley and Lewis (in Mouraviev & Kakabadse, 2012) is relatively more comprehensive and complete, Mouraviev and Kakabadse (2012) argue, however, that the definition does not address the implementation process, or the relationship between the parties.

Others, such as Hall (2008) and Morallos and Amekudzi (in Mouraviev & Kakabadse, 2012) emphasize the payment of services in their description of a PPP. Their description of a PPP includes the following statement: “The provision of services may be compensated through payments by the government; or they may be funded through user charges and fees.”

Andersen (in Mouraviev & Kakabadse, 2012) describes a PPP as a “continuous process of interaction and negotiation.” Klijn and Teisman (2002) claim that mutually added value for both parties is important in a PPP; while Pierre and Peters (in Mouraviev & Kakabadse, 2012) regard output management as an important feature of a PPP. Output management, according to Bult-Spiering and Dewulf (in Mouraviev & Kakabadse, 2012) focuses on governance and on process.

Other important features of a PPP include the shared product, risk, cost, benefits and a long-term agreement (Hall, 2008; Klijn & Teisman, 2002).

The long-term aspect of a PPP project is one of its most important features. It distinguishes it from other public-procurement methods. Most short-term projects are not as risky as a PPP, and are not so difficult to finance (Mouraviev & Kakabadse, 2012).

2.2.1 Theories on PPPs

The theories that underpin PPPs fall broadly into three main categories (Mouraviev & Kakabadse, 2012):

1. A partnership as a policy tool;
2. A PPP as an organisational and financial arrangement;
3. PPP performance, risk-allocation and critical success factors.

Table 2.1, developed by Mouraviev and Kakabadse (2012), summarizes the theories on PPPs, including the assumptions on which they are based.

Table 2.1 Principal PPP fields of study and underpinning theories (Mouraviev & Kakabadse, 2012)

PPP Studies	Underpinning Theories	Core Assumptions	Influential Authors
PPP as a policy tool	1. Theory of market efficiency. 2. Value for money.	1. Private markets are superior to the public sector in efficient resource allocation. 2. PPP brings along more benefits than drawbacks.	Osborne (2000), Wetenhall (2003). Grimsey & Lewis (2004), Hodge & Greve (2005)
PPP as an organisational and financial arrangement	1. Value for money. 2.Transaction cost economics. 3. Governance theory.	1. PPP should ensure lower costs and greater benefits compared to government in-house service provision. 2. Effective governance is key to success.	Klinj & Teisman (2000), Asenova & Beck (2003), Vining & Boardman (2008).
PPP performance, risk allocation, critical success factors	1. Effective risk allocation theory. 2. Governance theory	1. Risk should be transferred to the party best able to manage it with the lowest cost. 2. Effective governance is the key to success	Hall (2008, a,b), Sadka (2007), Morallos & Amekudzi (2008)

Countries, such as the UK, Canada, Australia and South Africa, where PPPs are regulated, have some elements of the features of a PPP, as broadly described above. For example, the UK distinguishes between a PPP and a Private Finance Initiative (PFI). A PFI and a PPP are distinguished thus; *"… PFI projects are a type of PPP used to fund major capital investments; while PPPs refer to a wide range of different types of collaboration between public and private bodies*." (House of Commons, 2008).

In Canada, the Canadian Council for PPPs describes a PPP as, "… *a co-operative venture between the public and the private sectors, built on the expertise of each partner that best meets clearly defined public needs through the appropriate*

allocation of resources, risks and rewards" (Canadian Council for PPPs, 2014).

The Australian government defines a PPP thus: "… *a PPP is a long-term contract between the public and private sectors, where government pays the private sector to deliver infrastructure, and pays [the] related service responsibilities*"
(Infrastructure Australia, 2008).

The South African Treasury Regulation 16 of the Public Finance Management Act, 1999, defines a PPP as: *"…a contract between a public sector and a private party, in which the private party assumes substantial financial, technical and operational risk in [the] design, financing, building and operation of a project*."

2.2.2 PPP vs Privatisation

PPPs are often confused with privatisation. In a PPP contract, the government would continue to provide core services; while the private sector would provide the infrastructure and other non-core services. The core services include services, such as health, education, welfare and suchlike. Non-core services include: maintenance, cleaning, security and other support services that are associated with the infrastructure.

In addition, the responsibility for the infrastructure is often transferred to the private sector for a limited and specified period (Infrastructure Australia, 2008).

It is important to note that in the USA, PPPs and privatisation refer to the same thing (Canadian Council for PPPs, 2014).

2.2.3 PPP vs the Traditional Procurement Method

Table 2.2, from Infrastructure Australia (2008), demonstrates the difference between a PPP and a traditional procurement method.

Table 2.2 PPPs vs Traditional Procurement (Infrastructure Australia, 2008)

PPPs	Traditional Procurement
Government purchases infrastructure services.	Government purchases an infrastructure asset.
One long-term contract integrating design, build, finance and maintenance.	Short-term design and construction contracts (two to four years).
Output-based specifications.	Input-based specifications.
Private sector retains whole-of-life asset risk.	Government retains whole-of-life asset risk.
Payments begin once the asset is commissioned. The payment profile is relatively even, reflecting the level of service provision over the longer term of the contract.	Payment profile has a spike at the start to pay for capital costs, with low ongoing costs.
Private contractor is responsible for construction time and cost overruns.	Government is usually liable for construction time and cost overruns.
Government may or may not operate the facility	Government operates the facility
Government manages one contract over the life of the facility.	Government manages multiple contracts over the life of the facility.
Performance standards are in place. Payments may be abated if services are not delivered to contractual requirement	Often no ongoing performance standards
End-of-term handover quality defined.	Handover quality less defined.

In the traditional method of procurement, the private sector knowledge and expertise are limited to the construction period; whereas in a PPP, the private party's knowledge and expertise can extend to twenty years or more. Private party suggestions – in terms of design and innovation – are very limited in a traditional procurement method. Furthermore, the private party's risks are limited to defects during a liability period and a specific area of involvement; whereas in a PPP, the private party's risks are wide-ranging and long-term.

In traditional procurement methods, the public party is accountable to itself only; whereas in a PPP, the private party is accountable to the public party (Infrastructure Australia, 2008).

2.2.4 PPP vs Outsourcing

The Australian government distinguishes between four types of procurement methods: the traditional method; PPP; outsourcing, and privatisation. Figure 2.1 illustrates these levels of private-party participation in the provision of public services (Infrastructure Australia, 2008).

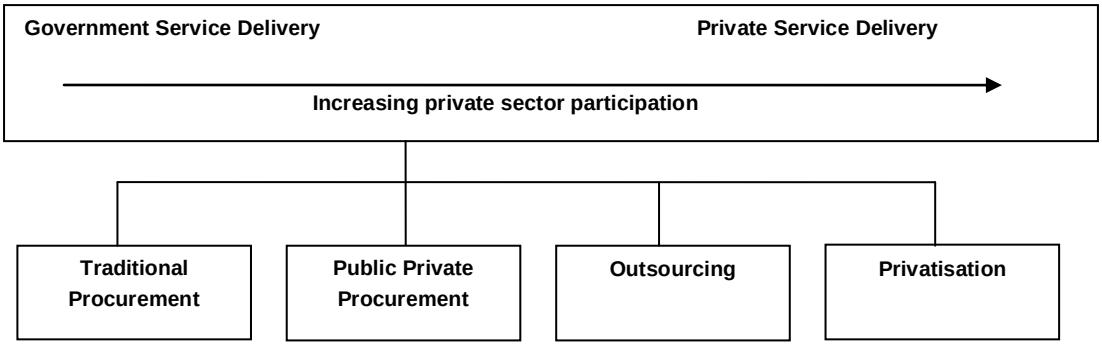

Figure 2.1 Public and Private Sector Delivery. (**Infrastructure Australia, 2008)**

In South Africa, what the Australians refer to as the traditional method, is regarded as outsourcing. Figure 2.2 shows the degree of private-party participation in public provision in South Africa.

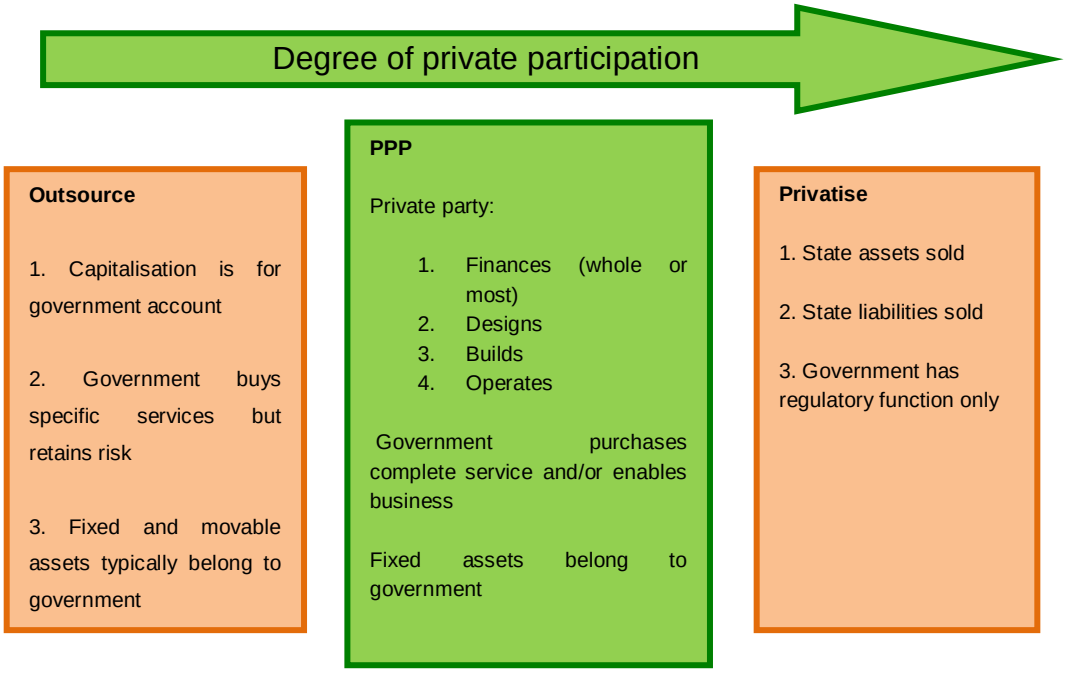

Figure 2.2 Degree of private-party participation in public-service delivery (South African National Treasury PPP Unit, 2005)

In outsourcing, the capital cost of the infrastructure is for public entity's account. The government buys the required services from the service providers; but it bears most of the risk; but all the assets, both fixed and unfixed, belong to the government.

2.3 Forms or Methods of PPPs

There are different forms or methods of PPPs. The Canadian PPP Council claims that there are six different forms of PPPs, (Canadian Council for PPPs, 2014):

- Finance Only;
- An Operation and Maintenance Contract (O & M);
- Build – Finance;
- Design – Build – Finance – Maintain (DBFM)
- Build-Own-Operate (BOO);
- Concession or Design – Build – Finance – Operate (DBFO).

2.3.1 Finance Only

In this form of PPP, a private party funds the infrastructural project. The design, construction, operation and the maintenance of the project is carried out by the public party (Canadian Council for PPPs, 2014).

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2.3.2 Operation and Maintenance Contract (O & M)

Under this form of PPP contract, the private party operates a publicly owned asset for a specified period of time. At the expiration of the contract term, the operation and maintenance of the asset reverts to the public party (Canadian Council for PPPs, 2014).

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2.3.3 Build – Finance (B & F)

The build-finance PPP form is where the private party builds and finances the infrastructure during the construction period (Canadian Council for PPPs, 2014).

2.3.4 Design-Build-Finance-Maintain (DBFM)

In a DBFM PPP method, the private party designs, builds, finances, and maintains the asset for a specified period of time. An example of this type of contract is in the provision of public infrastructure for healthcare, education and government offices or facilities. The government provides core services to the public; while the private party provides non-core services, such as cleaning, security, routine maintenance and other support services that may be necessary (Canadian Council for PPPs, 2014).

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2.3.5 Build-Own-Operate (BOO)

The private party in a BOO PPP finances, builds, operates the facility, or provides the service in terms of the contract (Canadian Council for PPPs 2014).

2.3.6 Concession or Build-Own-Operate-Transfer (BOOT)

In a concession PPP, the private party or the concessionaire, finances the infrastructure through investments, and operates the infrastructure for a fixed and agreed term. After the term expires, the ownership of the asset reverts to the public party. A concessionary type of a PPP is usually used in roads (Canadian Council for PPPs, 2014).

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In a road concession type of a PPP, the private party constructs a road – using private funds or investments. He takes responsibility for the road, including upgrading and maintenance for a specified period of time, usually twenty to thirty years.

The private party then charges user fees or tolls to recover its investment and operational costs (Mouraviev & Kakabadse, 2012).

2.3.7 Other Forms of PPPs

The Infrastructure Australia (2008) classifies the Design and Construct (D & C) and the Design, Construct and Maintain (DCM) as forms of the traditional procurement method. Included in its forms of PPPs is the Design, Build, Finance and Operate (DBFO) form.

Other forms include Design and Build (DB) and Design, Build, and Operate (DBO) (Poisson, 2009). Mouraviev and Kakabadse (2012) include Build, Operate, Transfer (BOT) and Design, Build, Finance, Operate, and Transfer (DBFOT) as forms of PPPs. Hall *et al.* (2003) include Build, Lease, and Transfer (BLT), Design, Build, Own, Transfer (DBOT), Joint Ventures (JVs) and Facilities Managements as other forms of PPP. Lease, Develop, and Operate (LDO) is also another form of a PPP (Hall, de la Motte & Davies, 2003).

As stated before, in the United Kingdom, PPPs are referred to as a Private Finance Initiative (PFI). However, a PFI is also regarded as another form of PPP. Contrary to the typical PPP, in a PFI, service provision remains the responsibility of the private party. The private party provides the service directly to the public, and not the special-purpose vehicle (SPV) or the consortium.

An SPV is a company that has been formed for the purpose of implementing the project. The private party can either solely or jointly form the company together with the public party. The difference between a PFI and a PPP is not easy to discern. Hence, PFIs are often regarded as PPPs (Mouraviev & Kakabadse, 2012).

An asset life-cycle contract is another form of a PPP. It can also be regarded as a concessionary form of a PPP. The difference between the two forms is that in an asset life-cycle contract, it is the public party and not the end-users that pay for the construction cost of the asset and the service provision (Bovaird, Sadran, Sedjari, in Mouraviev & Kakabadse, 2012). The duration of the contract term is determined by the asset's usable life, which tends to be difficult to determine –

especially given technological advancement (Westerman, McFarlan & Iansiti, in Mouraviev & Kakabadse 2012).

From the foregoing, it is clear that there are many forms of PPPs. Which form of PPP would be used for a particular project is often determined by what risk the public sector wants to transfer to the private sector (Williams, Sadka ; Morallos & Amekudzi, in Mouraviev & Kakabadse, 2012) and the degree of private finance participation (Farquharson, Torres de Mastle, Yescombe & Encinas, 2011).

2.4 The History of PPPs as a Form of Public Procurement

The rising public debt led most Western governments to encourage private investments in public infrastructure in the 1970s and 1980s. In 1992, Prime Minister John Major introduced PFIs in the United Kingdom (UK). By 2011, over seven hundred PFIs worth over £60 billion (at 2010 prices), had been contracted (House of Commons, 2011).

History, however, shows that concessionary PPPs existed long before the twentieth century. In 1438, Louis de Bernam, a French nobleman, was awarded a concessionary contract to charge fees for goods transported on the Rhine River (Sports Infrastructure Management Board of Krakow, 2014).

In 1792, France offered the Perrier brothers a concessionary PPP contract for the distribution of water in Paris. It was soon after that period that the French legally formed a public works concession or "*concession de travaux publics"* (Sports Infrastructure Management Board of Krakow, 2014).

In the 19th and 20th century, in response to providing better roads for its citizens, most European and North American countries started charging toll fees for road improvements, maintenance – and to construct other transport networks, such as bridges and tunnels (Nyagwachi, 2008).

One of the most well-known examples of a concessionary PPP is the Suez Canal. Construction of the Suez Canal began in April 1859, and terminated in November 1869. The canal was constructed in response to a global need to transport goods expeditiously. The Universal Suez Ship Canal Company was formed, and given the right to build and operate the Canal for ninety-nine years. After that time, the Egyptian government was to take over the operation. The Universal Suez Ship Canal Company was jointly formed by both the French and the Egyptians (About Geography, 2014).

After paying the final payment to the Universal Suez Ship Canal Company, Egypt took control of the Canal in 1962 (About Geography, 2014).

In 1924, Italy started charging tolls on a motorway near Milan. In the 1950s and 1960s, other European countries, such as France and Spain entered into concessionary contracts with various private parties to build roads. This resulted in increased development of infrastructure, without any increased State debt (Nyagwachi, 2008).

From history, factors that seem to have influenced the decision to use PPPs as a procurement method have included the following:

1. Reduction of public debt;
2. Increase in public service-delivery efficiency;
3. The need to build, finance, maintain and upgrade infrastructure without burdening the public sector;
4. The promotion of national and regional economic development.

These reasons seem to have stood the test of time. The above factors, to some extent, still influence the decision to select PPPs as alternative forms of public procurement.

2.5 PPP as a Form of Procurement

As can be deduced from section 2.4 above, different countries have different reasons for selecting PPPs as a means of procurement. For instance, in the UK, when PFIs were introduced in 1992, they were aimed at improving the public infrastructure procurement by utilising private finance (Hodge, Greve & Boardman 2010).

In developing economies, like South Africa, the government alone cannot meet the infrastructural demands of the country; hence, it seeks partnerships with the private sector for the provision of infrastructure (Gordham, 2014).

2.6 The Advantages and Disadvantages of PPPs

There are advantages and disadvantages to selecting PPPs. Table 2.3 shows some of the advantages and disadvantages of a PPP (Corner, 2006).

Table 2.3 The Advantages and the Disadvantages of a PPP. Source: Public Accounts Committee (2003) in Corner (2006)

Advantages	Disadvantages
Greater price certainty. The public sector body and contractor agree on the annual unitary payment for the services to be provided. This should usually only change as a result of agreed circumstances.	The public sector body is tied into a long- term contract (often around 30 years). Business needs change over time so there is the risk that the contract may become unsuitable for these changing needs during the contract life.
Responsibility for assets is transferred to the contractor. The public sector body is not involved in providing services which may not be part of its core business.	Variations may be needed as the public sector body's business needs change. Management of these may require renegotiation of contract terms and prices.
Private Finance Initiative brings the scope for innovation in service delivery. The contractor has incentives to introduce innovative ways to meet the public sector body's needs.	There could be disadvantages, for example, if innovative methods of service delivery lead to a decrease in the level or quality of service.
Often, the unitary payment will not start until, for example, the building is operational, and so the contractor has incentives to encourage timely delivery of quality service.	The unitary payment will include charges for the contractor's acceptance of risks, such as construction and service delivery risks, which may not materialise.
The contract provides greater incentives to manage risks over the life of the contract than under traditional procurement. A reduced level or quality of service would lead to compensation paid to the public sector body.	There is the possibility that the contractor may not manage transferred risks well. Or public sector bodies may believe they have transferred core business risks, which ultimately remain with them.
A long-term Private Finance Initiative contract encourages the contractor and the public sector body to consider costs over the whole life of the contract, rather than considering the construction and operational periods separately. This can lead to efficiencies through synergies between design and construction and its later operation and maintenance. The contractor takes the risk of getting the design and construction wrong.	The whole life costs will be paid through the unitary payment, which will be based on the contractor arranging financing at commercial rates which tend to be higher than government borrowing rates.

The benefit of delivering public services to the public in a faster and more cost-effective manner through a PPP does not always materialise. If unforeseen

circumstances arise, there might be time and cost overruns; and the perceived benefits may thereby be eroded (Mouraviev & Kakabadse, 2012).

The use of private funds in PPPs for the construction, maintenance and operation of the public infrastructure is only beneficial in the short term. Government's deficit would be low in the short term. Monetary payments to the private party over the contract period would be much higher than if the government had used its own funding to finance the project. Private parties borrow money at a much higher rate than can public parties (Hall, 2008 ; Sadka, in Mouraviev & Kakabadse, 2012).

If the private party in a PPP is incompetent or inexperienced, the perceived benefits of a private party's expertise and knowledge may not be realised (Mouraviev & Kakabadse, 2012). Furthermore, just because the public sector faces bureaucratic challenges, inefficiencies in service delivery, and budgetary constraints, it does not necessarily mean that the private sector would produce better services (Hemson, 1998).

The public sometimes regards PPPs as the government's means of abdicating from its responsibilities; and without public acceptance, PPPs might fail (Mouraviev & Kakabadse, 2012).

2.7 Some of the "Inherent" Features of a PPP

Even though a PPP is a viable alternative procurement method, it also has its own challenges. Some of the challenges associated with PPPs include the following (Akintoye, Akintola, Beck, Mathias, Hardcastle, Cliff, Chinyio, Ezekiel & Asenova, in Alshawi, 2009):

- Bidding costs and transaction costs are high;
- The procurement period is long and complex;
- Contractors may deliver assets that are not of the best quality in terms of design and construction, in order to avoid time and cost overruns;

- Consortium members, or SPV members, often have differing objectives; and as a result, it may be difficult to access their information;
- How the private sector deals with operations, decision-making and accountability often differs from how the public sector deals with the same issues;
- The success of any PPP depends on the political will of the public party;
- The cost of private finance is much higher than government borrowing.

2.7.1 High Bidding and Transaction Costs

PPPs' bidding costs are generally higher than those of traditional procurement methods. In the UK, the bidding costs are 2%-3% of the capital value; in Australia they are 0.5%-1.2%; while in Canada, they are only 0.35%-1% (KPMG Australia, 2010). This may discourage many bidders from bidding, thereby limiting competition; and the government may not get full value for its money.

2.7.2 The Procurement Period

The procurement period varies according to the country. In Australia, the average period is 17 months; in Canada, it is 16 months; while in the UK it is 34 months (KPMG Australia, 2010). South Africa's procurement period is not less than 39 weeks. Hence, most projects that are implemented through PPP are high-value long-term projects.

2.7.3 Misgivings about the Quality of Assets

One of the criticisms levelled against PPPs is that; in their attempt to meet deadlines, and to maximize their profits, the private party may compromise on the quality of the asset. This argument does not hold too much merit, especially as government's monthly monetary payments would be based on the quality of the asset or service provided. If the private party provides a poor quality asset or service, it would hurt the party in the pocket in the long run.

2.7.4 Misinformation regarding Consortium Members or SPV

Consortium or SPV members may include a wide range of companies and funders. Public finance may come in many forms, including equity, bonds, loans, etc. The full extent of each member's interest and objective in the company is often not easy to determine. Given that PPPs are long-term projects, it is important for the government to know "with whom it gets into bed".

2.7.5 Public Sector vs Private Sector

There will always be differences regarding how the public sector and the private sector deal with issues, such as operations, decision-making and accountability. The private sector is usually motivated by minimizing costs and maximizing profits. The public sector, on the other hand, has a political and constitutional mandate that dictates its conduct in everything it undertakes. The public party's motivation in undertaking any project is to solve societal problems, and to create public value, that is, the creation of jobs, and improving the standard of living for its citizens (Kassel in Kamunyu, 2012). These differences can frequently result in conflicts and delays.

2.7.6 Political Will

Most researchers agree that political will can either ease or complicate the success of a PPP. Lack of political will can impede the success of a PPP (KPMG Australia, 2010).

2.7.7 Private Finance vs Public Borrowing

Private financing is more expensive than public borrowing. This is the major factor that makes PPPs to be more "expensive" than the traditional method of procurement. In the short term, the cost to the public is low; but in the long term, the public pays more for the asset.

2.8 Keys to Successful PPPs

Factors that contribute to the success of a PPP vary from country to country. However, there are some success factors that are common to all countries (Cheung, Chan & Kajewski 2012).

A 2004 research project by Pinder conducted through a questionnaire to 701 respondents in the UK discovered that there are four factors that are critical in delivering a successful PPP project. They include: a properly drafted output-based specification; the commitment of senior management; a strong business case; and extensive consultation with the end-users (Pinder, in Cheung *et al*., 2012).

In another study conducted by Li *et al*. in 2005 (quoted by Cheung *et al*., 2012), it was found that a proper procurement procedure, government guarantee, favourable economic conditions, and a conducive financial market are the contributing factors to a successful PPP.

Research by Kwak *et al*. (in Cheung *et al*., 2012) found government competence, appropriate risk allocation to the best party able to manage it, selection of an appropriate private party, and a sound financial deal, as critical PPP success factors (Cheung *et al.*, 2012).

In new PPP markets, like South Africa, political and social stability are essential in delivering a successful PPP project (Wong in Cheung *et al*., 2012). Other success factors include a transparent and efficient procurement process. These can be achieved by providing a clear brief before the bidding period, and by providing bidders with a solid output specification (Corbett & Smith; Gentry & Fernandez; Jefferies *et al*. ; Jefferies; Li *et al*.; Qiao *et al* ; Zhang in Cheung *et al*., 2012).

Another success factor in a developing market is project financing for the private sector. An efficient and mature financial market, low financing costs, and a diverse range of financial products are great incentives for the private sector (Akintoye *et al*.;

Corbett & Smith; Jefferies *et al.*; Jefferies; Li *et al*; Qiao *et al.*; Zhang, in Cheung *et al*., 2012).

A well-developed legal framework was found to be a key factor in the success of a PPP market (Cheung *et al*., 2012).

Cheung *et al.* (2012) conducted a survey in three countries: the UK, Australia, and Hong Kong – through a questionnaire. The respondents were requested to rank the success factors of a PPP. They found the following to be the main success factors in these countries – in varying degrees.

- A stable macro-economic condition;
- A favourable legal framework;
- A sound economic policy;
- An available financial market;
- Multi-benefit objectives;
- Appropriate risk-allocation and risk-sharing;
- Commitment and responsibility of public and private sectors;
- A strong and good private consortium;
- Good governance;
- Project technical feasibility;
- Shared authority between public and private sectors;
- Political support;
- Social support;
- A well-organized and committed public agency;
- A competitive procurement process (enough potential bidders in the process);
- Transparency in the procurement process (process is made openly and publicly);
- Government involvement by providing a guarantee; and finally
- A thorough and realistic assessment of the cost and benefits.

KPMG Australia (2010) research found the following to be the factors that would contribute to the success or failure of PPPs:

- Legal and procurement frameworks;
- Institutional arrangements;
- The level of political commitment and public acceptance;
- The experience and competence levels of the parties involved; and
- The procurement approaches adopted.

A 2012 UK PFI report also found amongst other factors, that a long procurement process and the appropriate or inappropriate risk transfer can make or break a PPP deal (Her Majesty's Treasury, 2012).

2.9 PPPs in the South African Context

2.9.1 Public Infrastructure Projects in South Africa

The Department of Public Works (DPW) is the custodian of the public infrastructure in South Africa. It has to ensure that all government departments are provided with the entire physical infrastructure that they need to perform their core functions. Its responsibilities include the construction of new buildings, and the maintenance of the existing buildings.

There are usually three procurement options that the DPW has to consider when discharging its mandate. These options are namely: outsourcing, privatization, or a PPP (South African National Treasury PPP Unit, 2005).

2.9.1.1 Outsourcing

Whether the DPW selects outsourcing to deliver on its mandate, would depend on:

- The capital cost of the infrastructure is for its account;
- The government buys the required services from the service providers and consultants; but it bears most of the risk; and

- All assets, both fixed and unfixed, belong to the government (South African National Treasury PPP Unit, 2005).

Outsourcing is sometimes referred to as the traditional method of procurement.

2.9.1.2 Privatization

Where privatization is selected as a means of service delivery:

- The government asset is sold to the private party;
- All of the government's liability is sold and transferred to the private party; and
- The role of the government is reduced to that of regulating only (South African National Treasury PPP Unit, 2005).

2.9.1.3 PPP

Where a PPP is selected as a means of service delivery:

- The private party is responsible for the financing of the infrastructure. In addition, the private party is also responsible for the designing, the construction and the operating of the infrastructure;
- The role of the government is to purchase the required services and skills from the service providers, and/or to facilitate business;
- Only the fixed assets become the property of the government (South African National Treasury PPP Unit, 2005).

2.9.2 PPP as a Procurement Option

The South African constitution (1996) states that, "…*when an organ of state…contracts for goods and services, it must do so in accordance with a system, which is fair, equitable, transparent, competitive and cost-effective*"
(Constitution of the Republic of South African 1996, Act No.108 of 1996).

Whichever procurement option the DPW chooses, it must ensure that this satisfies the procurement requirements, as set out in the South African constitution.

PPP as a form of procurement is a fairly new concept in South Africa. The South African cabinet first approved the legislative framework for PPP only in December 1999. Prior to the dawn of democracy in 1994, the government used to mainly use outsourcing as means of discharging its constitutional mandate.

When the new democratic South African government came into power in 1994, it inherited a severe backlog in physical infrastructural development from the previous government. In 1997, it was estimated that in order for South Africa to meet its economic development target, the construction industry had to contribute at least fifty per cent (50%) to fixed capital investments (Department of Public Works,1997).

The minister of finance, Pravin Gordhan, announced the National Infrastructure Plan (NIP), which aimed, "…*to change the political landscape of the economy, create new jobs, and to strengthen the delivery of basic services*," in his 2013 budget speech. The government infrastructure budget for the year 2013/2014 was R827 billion. The budget was for the construction of new infrastructure, and the upgrading of the existing infrastructure (Gordhan, 2013).

In spite of the foregoing, the South African government recognizes that its resources alone will not be able to meet the infrastructure demand of the country. It is for this reason that it seeks to partner with private parties to meet the demand, and to also meet its constitutional mandate. PPPs in infrastructure development are vehicles through which the government is able to provide basic services, eradicate poverty, create jobs and stimulate economic growth.

The decision for the government to choose PPPs over the other procurement options is also influenced by the perceived technical efficiency and expert efficiency that the private party brings to a PPP agreement. In economics, technical efficiency refers to "…*the effectiveness with which a given set of inputs is used to produce an output*," (Economics Help, 2014).

An organization is efficient if it is able to produce maximum output from minimum input. X-efficiency (or expert efficiency) refers to the prevention of the wasteful use of inputs (Fourie & Burger in Burger, 2006); or "…*where competitive pressure causes firms to combine the optimum combination of factors of production*" (Economics Help, 2014).

The former finance minister, Trevor Manuel, in August 2004 said that; "…*the diverse interests of different sectors can, in fact, be harnessed for the collective good. This is what PPPs are about. The public gets better, more cost-effective services; while the private sector gets new business opportunities. Both are in the interests of the nation*" (South African National Treasury PPP Unit, 2005).

Generally, after outsourcing the services of the private party to design and build its infrastructure, DPW would then take over the responsibility of operating and maintaining the infrastructure. The DPW's maintenance record is generally poor. This has often led to the deterioration, destruction and eventual replacement of the infrastructure.

De Sitter's Law (1984) states that,"… *for every dollar of routine maintenance that is deferred, this will end up costing $5 in repairs, or ultimately $25 in rehabilitation or replacement, as assets decline over time*" (De Sitter, 2013). Figure 2.3 illustrates the current DPW's maintenance problem.

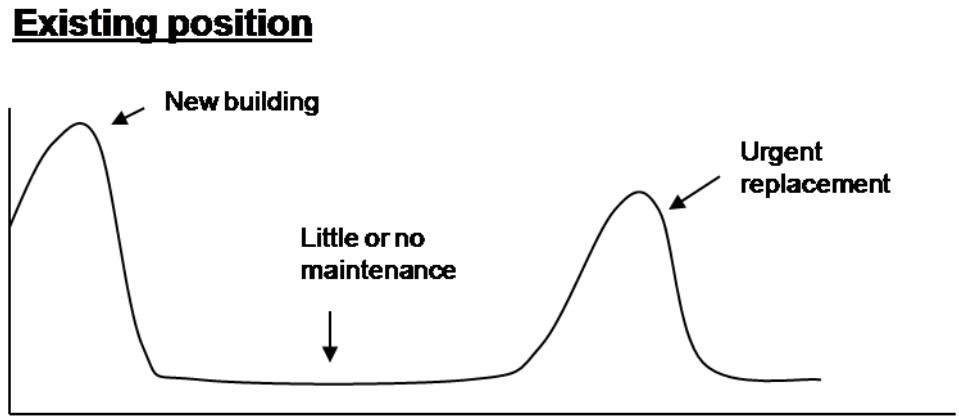

Figure 2.3: Existing Government Position on Maintenance (South African National Treasury PPP Unit, 2005)

In a PPP, the private party builds, operates and maintains the infrastructure, thereby increasing the lifespan of the infrastructure, and saving on the capital cost to develop new infrastructure. Figure 2.4 illustrates the efficiency that the private party brings to a PPP agreement.

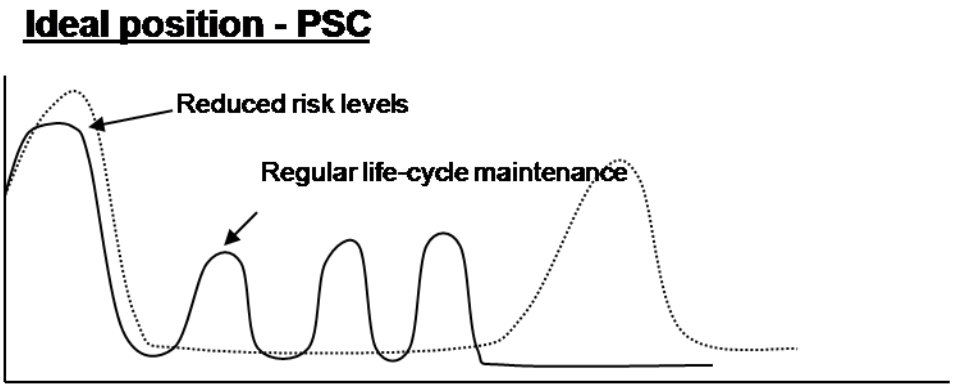

Figure 2.4: Ideal Government Position on Maintenance (South African National Treasury PPP Unit, 2005)

2.9.3 PPP's Definition and Legislation

The South African Treasury Regulation 16 of the Public Finance Management Act, 1999, defines a PPP as, "*…a contract between a public sector and a private party, in which the private party assumes substantial financial, technical and operational risk in design, financing, building and operation of a project*."

Figure 2.5 illustrates a typical PPP contract.

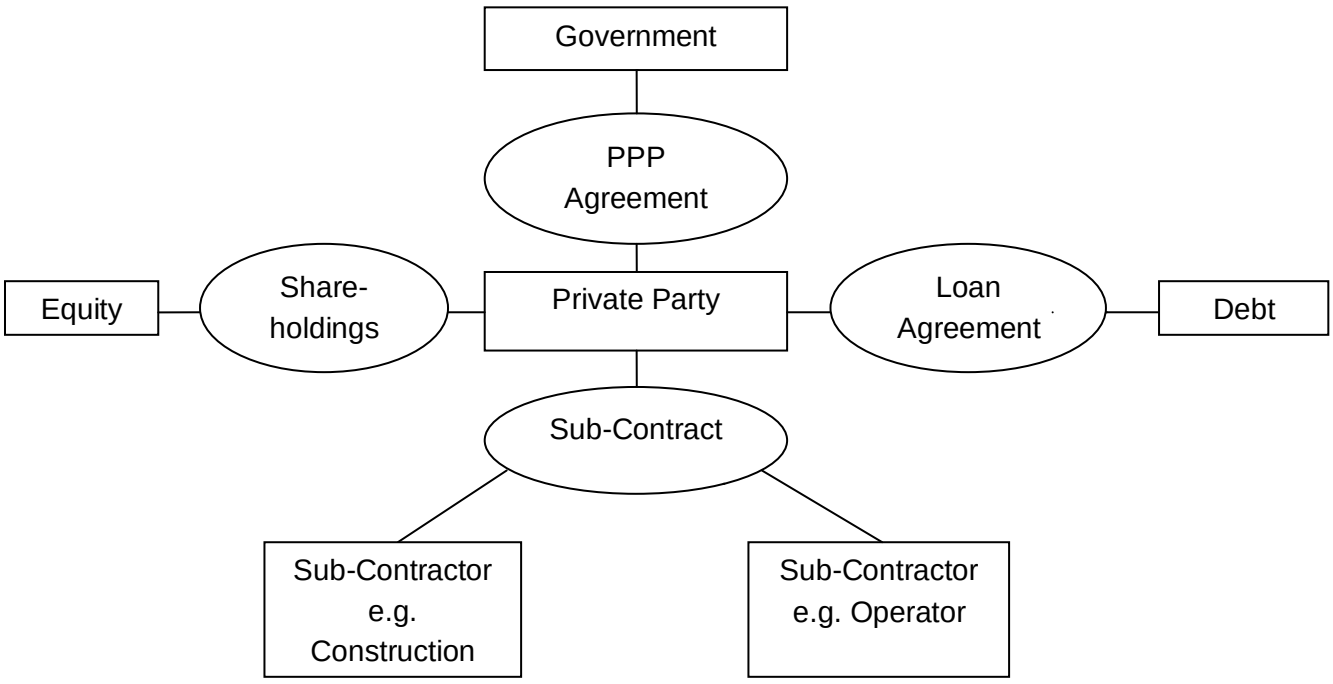

Figure 2.5 A typical PPP contract (South African National Treasury: PPP Unit, 2005)

In a PPP contract,

- The parties to the contract are the government institution and the private party.
- The duty of the private party is to provide an institutional service and/or to use a state property, according to the agreement between the two parties.
- The major risk of the project is transferred to the private party. The risk that is transferred to the private party comprises the financial, technical and operational risk.
- The obligation of the institution is to pay the private party for the services rendered, according to the agreement between the two parties.

The procurement of services and goods for public institutions in South Africa is governed by the Public Finance Management Act (PFMA), 1999 (Act No.1 of 1999), as amended by Act No. 29 of 1999.

A PPP as a procurement method is governed by Regulation 16 of the PFMA.

The PFMA describes the five pillars of procurement as:

1. Value for Money;
2. Open and effective competition;
3. Ethics and Fair Dealing;
4. Accountability and Reporting; and
5. Equity.

2.9.3.1 Value for Money

Value for money is described as, “the best available outcome when all relevant costs and benefits over the procurement cycle are considered.” The lowest price offered is, therefore, not necessarily the best value for money (National Treasury, 2001).

2.9.3.2 Open and Effective Competition

Open and effective competition means transparency and openness in laws, policies, practices and procedures. It also means fair competition and compliance with the provisions of the Preferential Procurement Policy Framework Act 2000 (Act No.5 of 2000) (National Treasury, 2001).

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2.9.3.3 Ethics and Fair Dealing

The parties to any government contract must trust and respect each other. They must also act with integrity, be fair and reasonable in the way they exercise their duties in meeting the requirements of the contract (National Treasury, 2001).

2.9.3.4 Accountability and Reporting

Accountability and reporting implies that there must be a public reporting system that ensures that individuals and organisations are held responsible for their plans, actions and outcomes (National Treasury, 2001).

2.9.3.5 Equity

“Equity” in the PFMA refers to the adherence to government policies, which are aimed at promoting the advancement of previously disadvantaged persons due to unfair discrimination (National Treasury, 2001).

It is important to note that without this fifth pillar, no public procurement system can be operated.

2.9.3.6 The PPP Unit and Regulation 16 of the PFMA

In 2000, National Treasury established the PPP Unit in its ministry. According to the National Treasury PPP Practice Note Number 01 of 2005, the aim of the PPP Unit was:

- To provide technical assistance to institutions embarking on PPPs, throughout the PPP project cycle; to help them achieve a quality PPP project; and to comply with Treasury Regulation 16;
- To recommend to National Treasury whether treasury approvals for the various phases in a PPP project cycle should be granted or declined;
- To develop and disseminate PPP policy, manuals, standardisation and sectoral toolkits;
- To disseminate accurate and up-to-date information on PPP projects;
- To build PPP capacity; and
- To build confidence and integrity in South Africa’s PPP market.

The National Treasury Regulation 16 of the PFMA, which regulates the administration and the implementation of PPPs in South Africa, came into effect in 2004.

The following are the clauses contained in Regulation 16:

- Clause 16.1 - Definitions
- Clause 16.2 - Exclusive competency of accounting officers and accounting authorities.
- Clause 16.3 - Project Inception
- Clause 16.4 - Feasibility Study - Treasury Approval I
- Clause 16.5 – Procurement - Treasury Approvals: IIA & IIB
- Clause 16.6 – Contracting PPP agreements – Treasury Approval: III
- Clause 16.7 – Management of PPP agreements
- Clause 16.8 – Amendments and Variation of PPP agreements
- Clause 16:9 – Agreements binding on the State
- Clause 16:10 - Exemptions

The first issue of the National Treasury Standardised PPP Provisions was issued on the 11th March 2004. The objective of the provision was to, “describe the key issues that are likely to arise in public-private partnership (“PPP”) projects regulated by the provisions of Regulation 16 of the Treasury Regulations (“Treasury Regulation 16”). It prescribes how these key issues must be dealt with in a PPP agreement (as defined in Treasury Regulation 16) (“PPP Agreement”) in a manner that achieves the requirements of “substantial risk transfer”, “value for money” and “affordability”, as these terms are defined, or otherwise dealt with in Treasury Regulation 16” (National Treasury, 2004).

2.10 A Typical PPP Project Cycle

Figure 2.6 PPP Project Cycle (SA National Treasury PPP Unit, 2004)

In a typical PPP procurement, the public sector procures the design, the construction, the operation and the maintenance of the asset. All these services are paid for on the basis of the long-term PPP agreement with the private sector. Monetary payments made by the public sector are dependent on successful delivery of the complete services by the private sector. Figure 2.6 shows the six phases of a typical PPP project.

2.10.1 Phase I: The Inception

A government institution would, at this stage, usually conceive and register a PPP project with the relevant treasury (provincial or national). It is also at this stage that a project officer and a transaction advisor of the project are appointed (South African National Treasury PPP Unit, 2004).

A project officer may be or may not be a government official. The reason for the appointment of a project officer is that he/she may act on behalf of the government in terms of the PPP project. A transaction advisor is a group of external consultants with legal, technical and financial expertise appointed by the government, to act on their behalf in terms of all legal, technical and financial matters relating to a PPP project.

The appointment of a transaction advisor is regulated by Clause 16.3 of the Regulation 16 (South African National Treasury PPP Unit, 2004).

2.10.2 Phase II – The Feasibility Study

The feasibility study is usually undertaken by the transaction advisor, in order to determine whether the project is affordable, to transfer the risk to the party best suited to manage it, and to provide value for the money. In order for any PPP project to proceed to the next phase, it must satisfy these three tests. If a project fails to pass these three tests, a PPP procurement process will not proceed any further. The institution must consider other procurement options, such as privatisation and

outsourcing. Furthermore, throughout the entire project cycle, all these tests must be satisfied (South African National Treasury PPP Unit, 2004).

2.10.3 Phase III – Procurement

The procurement phase of a PPP project varies greatly with the traditional method of public infrastructure procurement method. In a traditional method of procurement, there is only one step in the procurement process. An offer is usually made to the institution by another party, either a public or a private party; and if the institution accepts the offer, then the services of that other party is procured.

There are five complex and laborious procurement steps in a typical PPP project. These steps are outlined in the National Treasury PPP Practice Note, Number 06, of 2004 (South African National Treasury PPP Unit, 2004). The five steps are, namely:

1. Pre-qualification;
2. Request for Proposals (RFPs);
3. Best and final offer, where appropriate;
4. Negotiations; and
5. Financial closure.

Figures 2.7 to 2.9 show a typical PPP procurement process (National Treasury PPP Practice Note, Number 06, of 2004 in SA National Treasury PPP Unit, 2004).

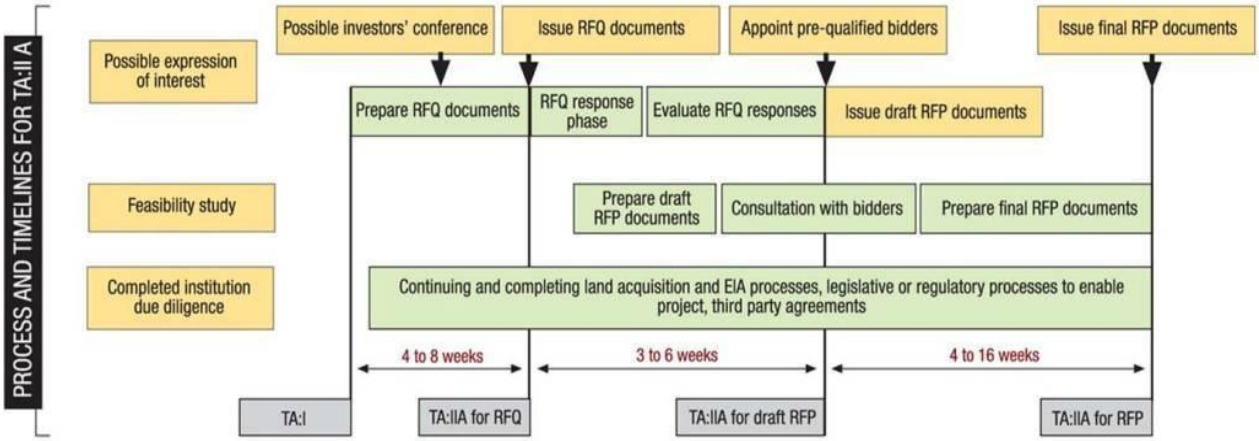

Figure 2.7 Stages of PPP procurement with indicative timelines: Part 1
(National Treasury PPP Practice Note, Number 06, of 2004)

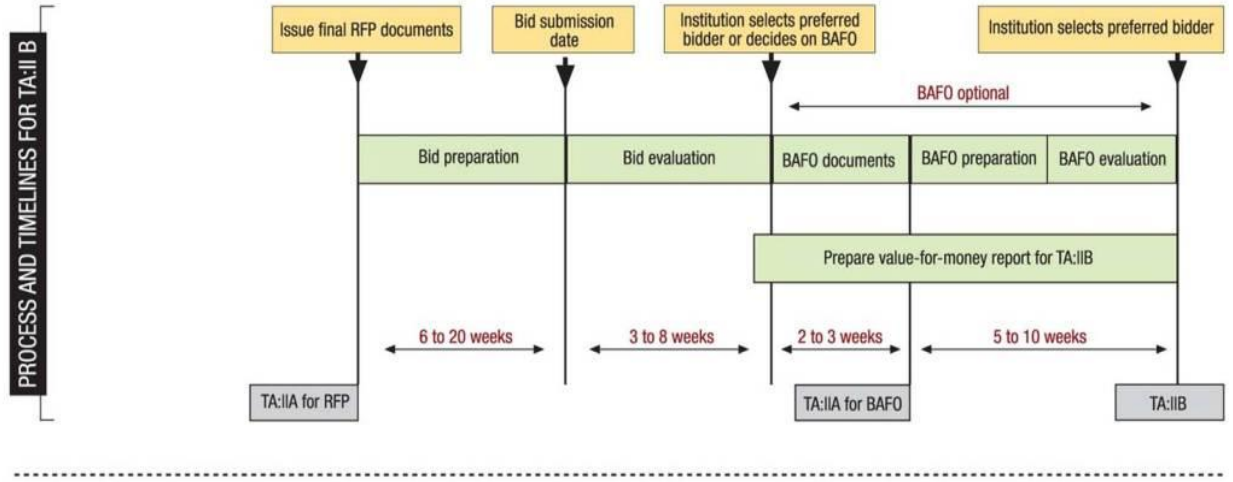

Figure 2.8 Stages of PPP procurement with indicative timelines: Part 2
(National Treasury PPP Practice Note, Number 06, of 2004)

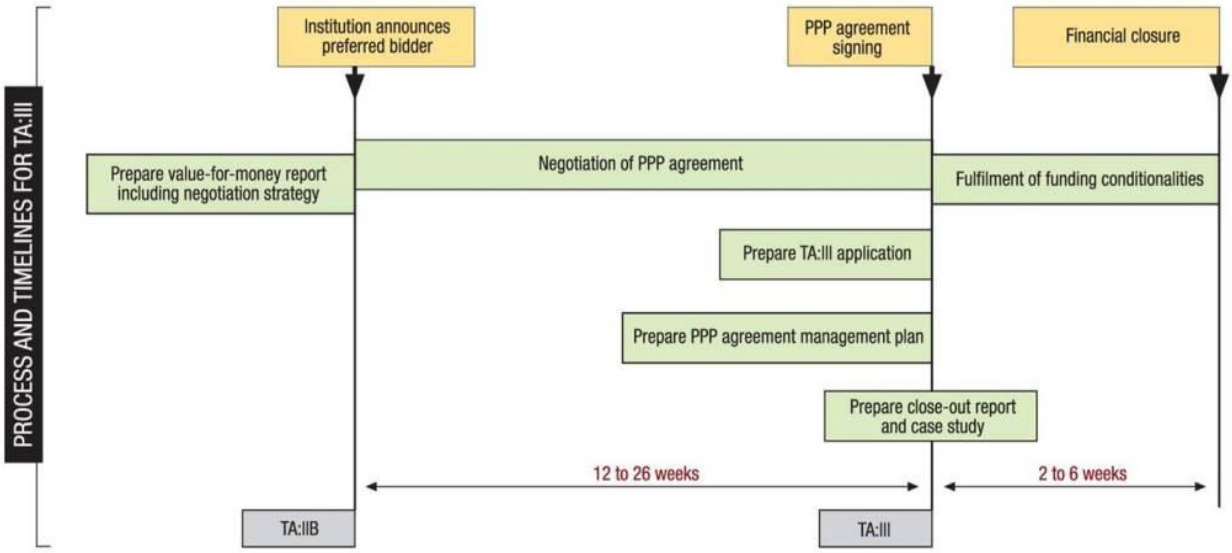

Figure 2.9 Stages of PPP procurement with indicative timelines: Part 3 (National Treasury PPP Practice Note, Number 06, of 2004)

As part of its best practice, National Treasury requires private parties to be pre-qualified before entering into the bidding process. In order to select bidders eligible to bid, the institution would be required to prepare the request for qualification (RFQ) document. Once pre-qualified bidders are selected, they are issued with request-for-proposal (RFP) documents. On receipt and evaluation of the RFP documents, the institution would either select a preferred bidder, or it would go through a best and final offer (BAFO) process. A BAFO process is entered into where the bids are similar, or where there are no bidders that meet the institution's requirements.

The institution would then issue revised RFP documents to all those parties from which a preferred bidder will be selected (South African National Treasury PPP Unit, 2004).

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Once a preferred bidder is selected, the institution would enter into a process of negotiation with the preferred bidder. At the negotiation phase, the bid is discussed; and clarity is sought on those items that might seem ambiguous. Aspects that may be negotiated at this phase include risk allocation and conflict of interest. If the negotiations are successful, the institution would enter into an agreement with the preferred bidder (South African National Treasury PPP Unit, 2004).

The procurement process is finally concluded once the payment mechanism has been agreed upon by both parties.

Figure 2.10 shows an example of the payment mechanism.

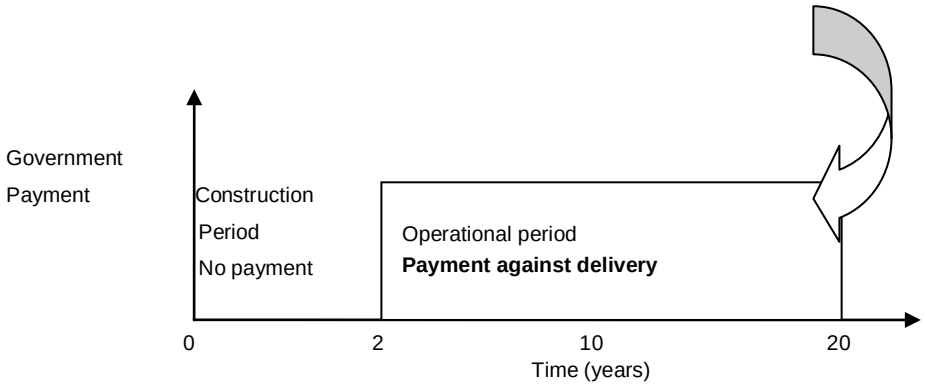

Figure 2.10 Example of PPP's payment mechanism (South African National Treasury: PPP Unit, 2005)

2.10.4 Phase IV- The development phase

The development phase begins once the PPP agreement is signed; and it ends once the delivery phase begins. The development phase may include the design and the construction of a building (South African National Treasury PPP Unit, 2004).

2.10.5 Phase V- The delivery phase

The delivery phase is where the services are rendered to the institution in accordance with the PPP agreement for the entire lifespan of the project (South African National Treasury PPP Unit, 2004).

2.10.6 Phase VI – The exit phase

The exit phase is usually where the project term ends, or when the agreement is terminated. At this stage, the project's activities are concluded; and new arrangements are made for the continuation of the services (South African National Treasury PPP Unit, 2004).

2.11 Current PPP Projects in South Africa

As of November 2011, there were twenty-one PPP projects signed off in terms of Treasury Regulation 16.

Table 2.4 shows the number of PPP projects that have been signed off as of November 2011.

Table 2.4 PPP Projects signed in terms of Treasury Regulation 16, as of November 2011, (PPP Unit, 2014)

PPP type indicated by combination of private party risk for: **D:** design; **F:**finance; **B**:build; **O:**operate; **T:**transfer of assets back to government; **BEE:** Black economic empowerment; **vfm:** value for money; **PFMA:** Public Finance Management Act 1999

Project and government institution	PPP type; Duration; Date of financial Close	BEE as % of equity and sub-contacting	Financing & Arrangers	Value to government (NPV of unitary charge)	NPV benefit to government
Inkosi Albert Luthuli Hospital KwaZulu-Natal Dept Health	DFBOT 15 years December 2001	Equity: 40% Sub-c: 40%	Debt: 70% Equity: 20% Gvt contribution: 10%	R4,5 billion	N/A
Eco-tourism Manyeleti 3 sites. Limpopo Dept Finance, Economic Affairs, Tourism	DFBOT 30 years December 2001	Equity: 30% 30%, 40% Sub-c: 30%, 30%, 40%	Equity: 100%	N/A	R25 million cash
Universitas and Pelonomi Hospitals co-location Free State Dept Health	DFBOT 21 years November 2002	Equity: 40% Sub-c: 40%	Equity: 100%	N/A	R43 million cash plus R38 million in form of upgrade.
Information Systems Department of Labour	DFBOT 10 years December 2002	Equity: 30% Sub-c: 25%	Equity: 100%	R1.5 billion	N/A
Chapman's Peak Drive toll road Western Cape	DF(part)BOT 30 years	SPV : 30% Design & construct	Debt: 44% Equity: 10%	N/A	R450 million

Dept Transport		construct sub-c: 10% Ops & maintain sub-c: 50%			
State Vaccine Institute Dept Health	Equity partnership 4 years January 2004 Extension to December 2009	Equity: 15% Sub-c: n/a	Equity: 100%	N/A	R15 million systems investment; & NPV vfm of R60m over current
Humansdorp District Hospital Eastern Cape Dept Health	DFBOT 20 years June 2003	Equity: 25% increasing to 40% Construct sub-c: 50% Ops & maintain sub-c: 40%	Equity: 90% Govt Contribution 10%	R18.9 million	R15 million upgrade plus R34 million cash
Fleet Management Eastern Cape Dept Transport	DFO 5 Years August 2003	Equity: 25% Sub-c: 25%	Debt: 100%	R553 million	N/A
Head Office Accommodation Dept of Trade & Industry	DFB0T 25 Years August 2003	Equity: 55% Design & Contruct sub-c: 43% Facilities Manage sub-c: 50%	Debt: 80% Equity: 8% Govt. Contribution: 12%	R870 million	N/A
Cradle of Humankind Interpretation Centre Complex Gauteng Dept Agriculture, Conservation, Environment and Land Affairs	DBOT 10 years October 2003	Operating equity: 53% Construction sub-c: 40% Ops sub-c: 25%	Govt: 100% capex Equity: 100% opex	N/A	R39 million cash
Gautrain Rapid Rail Link Gauteng Dept Public Transport, Roads & Works	DBFOT 20 years September 2006	Equity: 25% Sub-c: 10 %	Capital Contribution: 87% Debt: 11% Equity: 2%	N/A	Capital Value: R23,09 billion
National Fleet Management Department of Transport	DFO 5 years September 2006	Equity: 50% Sub-c: 50%	Equity: 100%	R213 million	R919 million
Western Cape Rehabilitation Centre & Lentegeur Hospital	Facilities Management November 2006	Equity: 45% Sub=c: 40%	Equity: 100%	R38,685 million	R 334 million
Polokwane Hospital Renal Dialysis	DBOT 10 years 1 December 2006	Equity: 40% Sub-c: 50%	Equity: 100%	R88,35 million	N/A
Dept. of Education Serviced Head Office Accommodation	DBFOT 27 years 23/04/2007	BEE: 25%	Debt 90% Equity 10% SCMB	R706 989m	Capital Value R512 264m
Eastern Cape Dept of Health . Port Alfred & Settlers Hospital	DBFOT 17 years 7 May 2007	Equity:40% Sub-c:60%	Debt:78% Equity:22% Pure Equity:10% S/Holders Loan:90%	R275million	Capital Value: R168.6 million
Western Cape Nature Conservation Board	DBFOT 30 years	BEE: 21%	Equity: 100%	N/A	Capital Value R40 million
Northern Cape Dept of Transport, Roads & Public Works	DFO 5 Years	BEE 100%	Debt: 100%	N/A	R342 million
Dept. of	DBFOT 25	TBC	TBC	TBC	TBC

International Relations & Cooperation	Years				
Phalaborwa Hospital	DBFOT 15 Years	BEE 85%	Debt: 92% Equity: 8	N/A	Capital Value R90 million

According to the PPP Unit, there were sixty-nine projects in preparation and registered, according to Regulation 16 of the National Treasury in South Africa as of June, 2014. Table 2.5 shows the projects' progress.

Table 2.5 PPP Project Progress (PPP Unit, 2014)

PPP Project Progress	No.
Exemption Granted	13
Inception	18
Feasibility Study	23
Feasibility Study Completed	2
Procurement	8
Procurement & Negotiations	1
Negotiations	2
RFQ Completed, Awaiting Approval	2

The Gautrain, the rapid rail and bus transport system for Gauteng Province, is the most well-known PPP project in South Africa and is the largest PPP project in Africa. The project was valued at R25.4 billion in 2011 (Dachs, 2011). It is a concessionary form of a PPP project. The parties to the contract are the South African Government (Department of Transport and Gauteng Provincial Government) and the Bombela Concession Consortium Co.

Critics of the Gautrain claim that the money spent on the project could have been used to provide other much-needed services to the poor (Dachs, 2011).

Another PPP project that has been thrust into the media spotlight recently is the Mangaung Prison. This PPP is a partnership between the Department of Correctional Services and G4S Africa. G4S Africa was instructed to design, build, finance, operate and maintain (DBFOM) the prison on behalf of the Correctional

Services – with the aim of rehabilitating offenders. The contract was signed in 2000; and the term of the contract was 25 years.

When the contract was signed in 2000, there was no regulatory framework on PPPs in South Africa. In 2013, the prison experienced rioting and stabbings. Claims of torture also surfaced. Government has requested G4S Africa to investigate the incidents; and it is also considering variations to the PPP contract.

2.12 Advantages of a PPP procurement method

South Africa is a developing country. For the country to grow economically, it needs to invest in infrastructure development. Government on its own cannot afford to invest in infrastructure – in both the short and the medium term; hence the need for the private sector.

The following are some of the advantages of a PPP in South Africa (Kelman, 2007):

2.12.1 High Quality Public Service Delivery

Most of the projects managed through PPP contracts are considered to be of a better quality than those managed by the government. Prisons, hospitals and office accommodation are often cited as the best examples of successful PPP projects in South Africa. The reason for their success is that through penalties on monthly monetary payments, the government is able to exert pressure on the private party to provide high quality services at all times (Kelman, 2007).

2.12.2 Faster Construction

The private party is able to deliver within the stipulated construction period; as it is responsible for managing the risk associated with programme overruns (Kelman, 2007).

2.12.3 Better Maintenance of Public Assets

As stated before in section 2.2, the South African's government's track record on maintenance is generally poor. The private party's duty in a PPP contract is to maintain the asset as well. If it fails to maintain the assets, then there would be contractual consequences and remedies. Because the maintenance of the asset is built into the contract, the private party has good reasons to use high quality material in the construction of the asset; and it can claim for both maintenance and operational costs in the monthly claims. These are some of the reasons why the private party's maintenance record is far better than that of the government (Kelman, 2007).

2.12.4 Improvement in the traditional procurement method

PPP procurement has a positive impact on the traditional method of procurement. This is because public organs that are not performing in terms of service delivery would risk their projects being procured through PPP. The risk usually encourages better performance from public officials (Kelman, 2007).

2.12.5 Discourages corruption

Inherent in every PPP contract is the termination of the contract, should corruption be discovered. The private sector would also lose its equity interest in the project (Kelman, 2007).

2.12.6 Risk is transferred to the party best suited to manage it

In a traditional procurement method, the risks that could be better managed by the private sector are borne by the government. Construction costs, construction programme and the maintenance of the asset can better be managed by the private party. However, in traditional procurement methods, the government bears the complete risk (Kelman, 2007).

2.13 Disadvantages of the PPP procurement method

PPPs, like other procurement methods, have their own advantages and disadvantages. The following are some of the disadvantages of a PPP:

2.13.1 PPPs are expensive when compared with the traditional procurement method

The cost benefits of PPPs are generally experienced during the first years of the project. This is as a result of cost savings without any cost overruns during the construction phase. The government's monetary payments to the private party continue for longer periods – ranging from 3 years to 30 years. What determines whether the PPPs provide value for money for the government is the discount rate applied on future payments. Currently, South Africa does not have a prescribed discount rate (Kelman, 2007).

The two PPP prisons, Mangaung Facility and Kutama-Sinthumule facility, in South Africa are considered to be overpriced. These contracts were signed before the PPP regulation framework fell into place. Jolingana (2014) recently told Parliament that, "The Mangaung Prison deal was a bad decision, a bad decision with great intentions" (Jolingana, 2014).

2.13.2 The PPP Success Depends on the Political Will

The Gautrain PPP project's success is attributed to the strong political will of the former premier of Gauteng, Mbazima Shilowa. The project was even referred to as the "Shilowa Express". Since PPPs are long-term projects, they usually go through many political changes. The Gautrain has survived three elections and five premiers (Dachs, 2011). If the political will is lacking, PPPs could be abandoned. Feasibility studies on four new prisons in South Africa began in the 2007 financial year; however, in 2011, the minister of Correctional Services cancelled the PPP policies for prisons (Ramagaga, 2011).

2.13.3 Questions on the Constitutionality of a Private Party Delivering Public Services

The provision of basic services, such as water, electricity, roads, etc. is regarded as a State function. When a private party steps in to provide a service that the State should be providing, the question of constitutionality arises. Before the PPPs for prisons were cancelled, there were questions raised regarding the constitutionality of private citizens incarcerating other citizens (Ramagaga, 2011).

The former Correctional Services minister, Ngconde Balfour, in 2006 proposed a shift away from PPPs in prisons – on the basis of the international debate on the "constitutionality of private companies being responsible for the incarceration of citizens" (Ramagaga, 2011).

Opposition to Urban Tolling Alliance (OUTA), an organization formed to oppose the tolling of urban roads in Gauteng, South Africa, argues that government wants the public to pay for an existing road, which users were able to use in the past for "free." It argues that the upgrading of the road in Gauteng was as a result of poor planning and neglect of the road on the part of the government over the years (Opposition to Urban Tolling Alliance, Not Dated).

Figure 2.11 illustrates the attitude that South Africans have towards what they consider to be the privatisation of public services.

Figure 2.11: Attitude of South Africans towards "privatization "of public services. (© 2012, Zapiro: All Rights Reserved) Used with permission from www.zapiro.com

Toll roads have a long history in South Africa. They were first introduced in South Africa in 1891. The funds collected from tolling were to be used for the construction and maintenance of roads and bridges. The administration and maintenance of the infrastructure provided jobs (News24, 2013).

Toll roads were unpopular in the 1890s, as they are today. There were many complaints as a result of the tolling. Many believed that the toll gates were misplaced. In August 1892, tolling was suspended. After reviewing the toll system, the "Tweede Volksraad" resumed tolling again on the 1st January 1894; and a Revised Toll Act came into effect on the 1st October 1894. However, on the 31st December 1896, tolling was suspended indefinitely (News24, 2013).

In 1935, the first National Roads Act (Act 42 of 1935) was passed by Parliament. Through this law the National Road Board (NRB) and the National Road Fund (NRF) were established. The responsibilities of the Board included, amongst other issues, the construction and the maintenance of the national roads (Pienaar, 2011).

Over time, the laws were amended and the Board evolved. The National Road Fund (NRF) funds started to decline in 1974. In 1980, the funds and reserves were completely depleted. The National Transport Commission (NTC), which had now taken over from the National Road Board (NRB), proposed tolling as an alternative to government funding and tax on petrol customs. Parliament approved the proposal (Pienaar, 2011).

The National Transport Commission (NTC) was replaced by the South African Roads Board (SARB) in 1988; and in 1998, the South African National Roads Agency Limited (SANRAL) replaced the South African Roads Board (SARB) (Nieuwoudt in Pienaar, 2011). The National Road Fund (NRF) has thus been replaced by the South African National Roads Agency Limited (SANRAL) Fund (Pienaar, 2011).

One of SANRAL's visions and mission was to,"… *promote the user-pays principle*" (SANRAL in Pienaar, 2011). SANRAL's principle of the 'user-pays' was reinforced by the Department of Transport (1991, Chapter 12:1). This alludes to the proposition that, "…*the future financing of national roads in South Africa will have to depend on toll road policies*" (Pienaar, 2011).

2.13.4 Too Risky

Since PPPs are long-term projects, they are not immune to political, socio-economic and technological changes that occur over time. No-one knows the future. The rule for the allocation of risk in a PPP contract is that the risk should be borne by the party best suited to manage it. In order to mitigate their risk efficiently, the private party would require a premium. This premium is usually built into their charges (Kelman, 2007).

2.13.5 Accountability of Private Party Less Stringent

The problems at Mangaung Prison have been blamed on the lack of stringent accountability measures on the part of the private party. The Mangaung Prison PPP was signed in 2000. The current regulatory framework was not in place at the time of

signing. It is argued that if the State had managed the prison, the problems encountered in 2013 could have been avoided (Ramagaga, 2011).

2.13.6 Lack of Public Participation can Hamper the Success of a Concessionary form of a PPP

Public participation in PPPs is essential in delivering a successful PPP project (KPMG Australia, 2010). Should public acceptance be lacking, the success of the project could be negatively affected.

According to the research conducted by the University of Pretoria on international experience in International Transport Systems (ITS), there are eight success factors for an ITS: "… *strong advocates and public support; weak opposition; a single agency overseeing the project; a good public transportation system in place; simple and affordable pricing systems using proven technology; environmental monitoring and protection; and comfort factors that create confidence amongst [the] users*" (Beer, 2014).

Many Gauteng residents are opposed to the implementation of the tolling system in Gauteng. One of their main arguments is that there was not enough public participation in the implementation of the system (Formby, 2012).

SANRAL placed one advertisement in six regional newspapers in October 2007. It gave the public a minimum of 30 days to comment. The period given for comments was from 14 November to 14 December 2007. From 3.5 million motorists in Gauteng, only twenty-eight responses were received. Again, from April to June 2008, SANRAL gave the public an opportunity to comment on the R21 section of the road. Only two responses were received (Beer, 2014). Critics of the tolling system claim that this was grossly inadequate public notice.

International studies indicate that for an e-tolling system to be successful, defaulters of the system must not be more than 15%. According to OUTA's research, there are currently (February 2014) as many as 70% of defaulters in Gauteng (Beer, 2014).

2.14 Challenges of PPP projects

Even where it has been proven that the PPP procurement method is the best method for government to deliver services, there are still challenges that a PPP project may face. The following are some of the challenges that are commonly found in PPP projects:

A 2007 study done by Catalia Ltd and Ukhamba Advisory Services for the Presidency of the Republic of South Africa and the Business Trust found that both the private sector and the government had agreed that the following are challenges facing PPPs in South Africa (Castalia Ltd & Ukhamba Advisory Services, 2007).

2.14.1 Policy Direction at Highest Level Lacking

The legal framework provided by the National Treasury PPP Unit gives direction as to how to implement the PPP project. However, both the private and the public party agreed that it does not give direction as to why a PPP should be undertaken; and it also does not state under what conditions or circumstances a PPP should achieve the policy goals.

2.14.2 Inconsistent Political Commitment

Not all the departments within the government support the PPP method, as a form of procurement. The transport department is one of the few departments that support the implementation of projects – especially the construction of roads through PPPs.

2.14.3 Misgivings about the Private Party's Role in Infrastructure

Most managers in the public sector have misgivings about the private sector's role in infrastructure. Firstly, they believe that the private sector's intention is to make profits; and therefore it would compromise on the quality of the service provided to

the user, in order to maximise its own profits. Secondly, some managers have the view that PPPs cede their rights to control the asset. Lastly, the high level of planning that PPPs require, and the scrutiny of PPPs by the PPP Unit make PPPs unpopular.

2.14.4 Incapacity

Most managers in the public sector lack the capacity to initiate and implement PPP projects. They lack the time, the resources, the knowledge, and the ability to initiate and to manage a PPP project. Lack of confidence or authority to make decisions on PPPs was also cited as qualities that public managers lack.

2.14.5 Insufficient Resources Dedicated to the Successful Implementation of PPPs

While the PPP Unit did a great job in regulating PPPs, it has inadequate resources for the implementation and the building of capacity in other government ministries, particularly in provincial and local governments.

2.14.6 South African Procurement Policy Favours the Traditional Procurement Method

The traditional procurement method of outsourcing is the preferred choice of procurement in most of the government departments in South Africa. For departments to implement a PPP, they must ensure that they pass the PPP test; that the project will provide value for money; is affordable; and that it transfers the risk to the party best suited to manage it. As a result of these stringent tests that the PPP project has to pass, the traditional procurement method becomes the preferred method of choice for most departments.

2.14.7 No Fiscal Imperative for the Implementation of PPPs

Most government departments, including both the provincial and local governments' budgets do not cater for the cost of developing and implementing PPP projects.

2.15 Implementation of PPPs in Municipalities is more of a challenge than it is in National or Provincial Departments

The challenges described above are much worse in the municipalities. This is often because of the overlapping of responsibilities between the PPP Unit, the Department of Local Government, and other national departments, such as the Department of Water Affairs and Forestry (DWAF).

Misgivings about the role of the private party in the PPP project in municipalities have made the implementation of PPP project in municipalities almost impossible.

Most municipalities have a more dire need for technical skills than in national and provincial governments. The lack of supply-chain management and procurement-management skills in municipalities have been the major causes of the delays in infrastructure backlogs.

The Municipal Systems Act (MSA) encourages municipal projects to be initiated and implemented internally. Section 78 (1)(iii) of the Act states that; " …*the extent to which the re-organisation of its administration and the development of the human resource capacity within that administration as provided for in sections 51 and 68, respectively, could be utilized to provide the service through an internal mechanism mentioned in section 76(a)."* (Act No.32 of 2000).

Municipalities, unlike national and provincial departments, have a greater fiscal imperative to use PPPs; however, they lack the capacity to do so. The planning required for a multi-year project is a challenge for all three government levels. Treasury equitable shares or conditional grants to the municipalities cannot be guaranteed for long-term periods of 20-30 years. This means that for the remainder of the PPP project, the municipalities would have to fund the projects from fees

charged for basic services to its residents. Given that South African municipalities have a poor track-record for the collection of fees for basic services, they are unlikely to opt for a PPP as a procurement method.

2.16 Disagreements on Challenges Facing PPPs in South Africa

Table 2.6 summarizes the findings of Castalia Ltd and Ukhamba Advisory Services on the differing views that parties believe constitute the challenges facing PPPs in South Africa.

Table 2.6 Disagreements on Challenges Facing PPPs in South Africa (Castalia Ltd & Ukhamba Advisory Services, 2007)

Topic	Private Sector	Implementing Agencies*	Government Agencies Responsible for PPP Policy
Deal Flow	• Lack of deal flow	• N/A	• Enough deal flow
Implementation Time	• Implementation of PPPs is longer than the traditional procurement.	• Implementation of PPPs is longer than the traditional procurement.	• PPPs take too long to implement because they are complex.
Legal Environment	• Procurement rules for PPPs good but suitable for higher value transactions and for more developed PPP markets. • PPP Unit closely monitors transactions. • Thresholds for BEE/SMME are not consistent with sector charters. • PPPs rules are not applicable in municipalities.	• Procurement rules for PPPs are too onerous or confusing.	• Procurement rules for PPPs are good but need to be customized for smaller projects. • The PPP Unit has already developed customized processes for low value projects. More customized processes will be developed for different sectors.
Role of the PPP Unit	• PPP Unit does more regulation than promoting and facilitating PPPs.	• PPP Unit does more regulation than promoting and facilitating PPPs.	• PPP Unit promote and facilitates PPPs.

Role of the private sector vis-à-vis Government	• Government is overly eager to transfer risk. • Public sector can borrow at cheaper interest than the private sector.	• Private sector will compromise on quality in their efforts to make profit.	• There is little competition in private sector investment banks.
Evidence of positions	• PPPs bidders seem to be decreasing.	• N/A	• There are a number of deals that have been closed or about to close.

* Implementing agencies refers to national line departments, provincial government agencies, and municipalities.

2.17 Conclusion

From the foregoing discussion, it may be seen that PPPs have a long history. Although they have their own merits and demerits, they do provide an alternative procurement method for the delivery of public services. Many authors and practitioners believe that they are here to stay.

PPPs in Africa are viewed by some practitioners as the only way that an impoverished government can provide public services to its citizens (Lesley, 2011). Economic growth, job creation and poverty alleviation are challenges, which governments alone cannot overcome (Lombaard, 2012).

According to the PPP Manual, PPPs are increasingly being used, both in the national and provincial governments, to meet the demands of government infrastructure, and to provide service delivery to the citizens (South African National Treasury PPP Unit, 2004).

Figure 2.12 shows regions in the world where PPPs are currently being implemented.

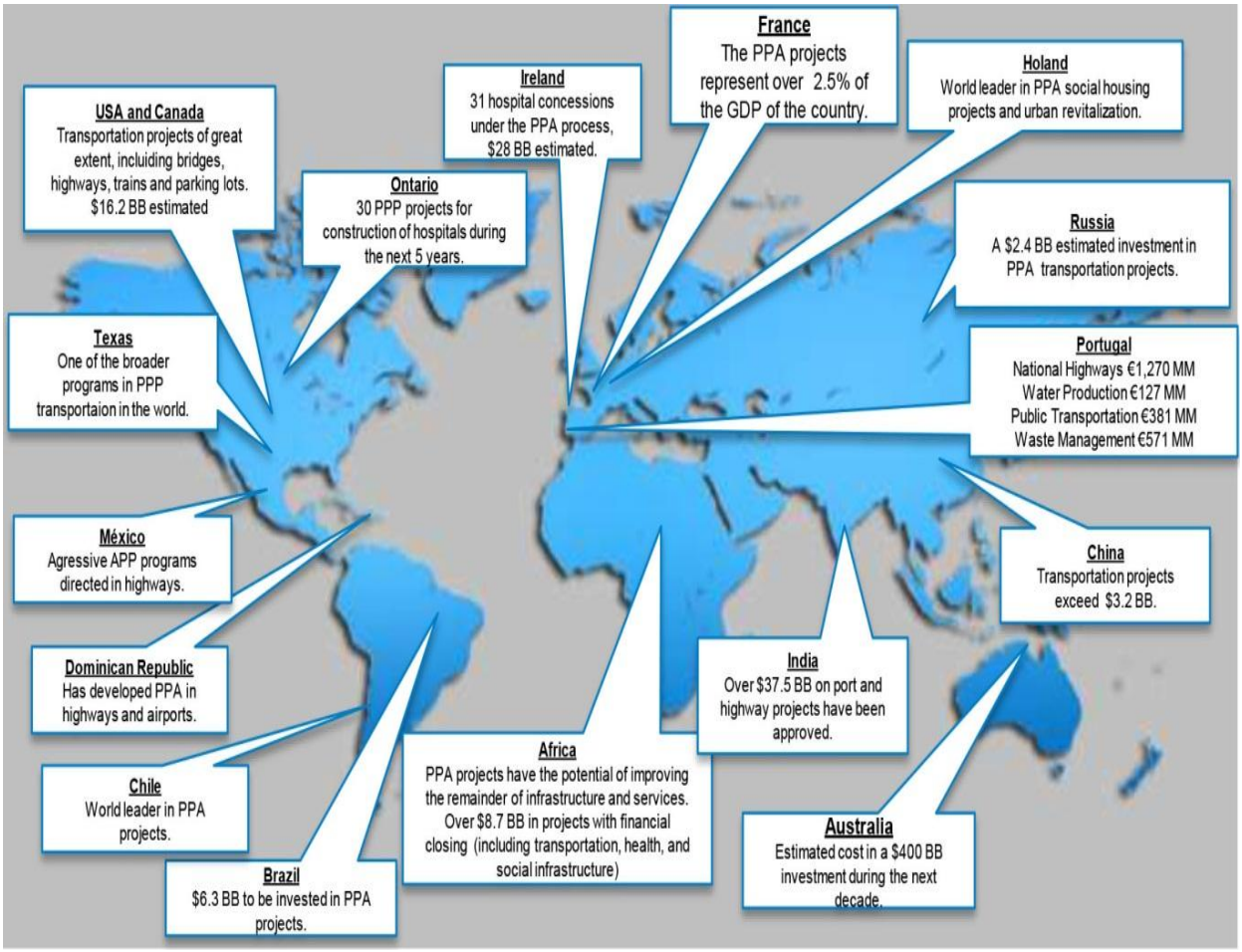

Figure 2.12: Regions where PPPs are implemented

(Modified from Australia National Public Private Partnership Forum, HM Treasury, e-privatizacion.com, Projects Today, Public-Private Infrastructure Advisory Facility, EuroMoney, Infrastructure Journal, Deloitte Research in Puerto Rico PPP Authority, Volume No.2: June 2011)

The World Trade Organization (WTO), the International Monetary Fund (IMF), and the World Bank are some of the major drivers for the use of PPPs through their deregulation and privatisation initiatives (Ashworth, Hogg & Higgs, 2013).

The European Commission described the spread of PPPs in Europe as a “phenomenon” (European Commission, 2004). It is, therefore, important for all the stakeholders involved in the provision of infrastructure, including quantity surveyors, to embrace this “phenomenon”.

Chapter 3 provides a literature review of the quantity surveying profession.

Chapter 3

Literature Review: PPPs and the Quantity Surveying Profession

3.1 Introduction

This chapter focuses on a review of the literature on PPPs and the quantity surveying profession. The literature reviewed was obtained from numerous sources within the construction field and outside the construction field. The sources used to obtain this review include:

- Textbooks;
- Conference papers;
- Journals;
- Websites;
- Theses and dissertations; and
- Magazines.

The aim of this chapter is to determine the information available on the role of quantity surveyors in PPPs.

3.2 The Role of the Quantity Surveyor in the Provision of Infrastructure

3.2.1 The Definition of a Quantity Surveyor

The Royal Institution of Chartered Surveyors (RICS in Willis *&* Willis, 1980) describes a quantity surveyor as, "…*a construction-cost adviser who, by virtue of his special training and experience, has developed knowledge of construction economics, which enables him to:*

- *Advise on what a project would cost,*
- *Advise on what size and standard of structure can be erected for any given expenditure,*
- *Advise on the economics of a project and the preparation of a budget,*

- *Co-operate with the designers to ensure that a building can be erected within an approved expenditure;*
- *Advise on tendering procedures and contractual arrangements. Prepare documents for obtaining tenders and arranging contracts;*
- *Exercise control during the construction, so that the cost is not exceeded without authority;*
- *Act with the architect or engineer to ensure that the financial provisions of the contract are properly interpreted and applied, so that the client's financial interests are safeguarded; and the builder is paid a proper price for the work*."

The Australian Institute of Quantity Surveyors (AIQS, 2014) describes the quantity surveyor as an "…*adviser who estimates and monitors construction costs, from [the] feasibility stage of a project, through to the completion of the construction period. After construction, he may be involved with tax-depreciation schedules, replacement-cost estimation for insurance purposes, and if necessary, mediation and arbitration*."

The Association of South African Quantity Surveyor (ASAQS, 2014a) describes a quantity surveyor as "…*a financial consultant of the construction industry, whose training and experience qualifies him to advise on cost and contractual arrangements, and to prepare contract documents*".

The above-mentioned definitions of a quantity surveyor clearly demonstrate that the quantity surveyor is not a brick counter, as is commonly referred to (see Figure 3.1). Quantity surveyors are highly skilled individuals in construction costs and contractual issues (see Figure 3.2).

Figure 3.1 Brick Counter
Source: PMBA, Not Dated

Figure 3.2 Quantity Surveyor
Source: NZIQS, Not Dated

The quantity surveying profession can be referred to as an unknown profession. Even though the profession has been in existence for many centuries, most people do not know what a quantity surveyor is. It is, therefore, important to look at the history of the quantity surveying profession, and at its historical role in the construction industry.

3.2.2 The History of the Quantity Surveying Profession

Quantity surveying is a profession that has been in existence from time immemorial. The profession is even mentioned by Jesus Christ in the Bible. In Luke 14:28, Jesus asks, "*Suppose one of you wants to build a tower. Will he not first sit down and estimate the cost, to see if he has money to complete it?*" (Bible, 2009).

Shakespeare (in NZIQS, 2014) also mentions the profession in Henry IV Part II; 'Bardolph' says:

"When we mean to build,
We first survey the plot, then draw the model
And when we see the figure of the house,
Then we must rate the cost of the erection;
Which if we find outweighs ability,
What we do then but draw anew the model
In fewer offices, or at least desist

To build at all! Much more in this great work,
.....should we survey
The plot of situation and the model,
Question surveyors, know our own estate,
*How able such a work to undergo" (*New Zealand Institute of Quantity Surveyors, 2014*).*

Some researchers claim that the quantity surveying profession evolved in the 17th century after the great fire in London in 1666. Prior to 1666, tradesmen were paid by day. However, due to the great magnitude of the work, it was decided that instead of paying tradesmen a wage, tradesmen were paid for the amount of trade they did. For instance, the carpenter was paid for all the carpentry carried out in the project (Kenya Institute of Quantity Surveyors, 2014).

Tradesmen had to study drawings and measure the quantity of work that was required to repair the building, and to provide an estimate for the total cost. Thus, the quantity surveying profession developed (Kenya Institute of Quantity Surveyors, 2014).

The term “quantity surveyor” was first recorded in 1859. Before then, quantity surveyors were referred to as "measurers", "custom surveyors" or surveyors". The first quantity surveying firm, Henry Cooper and Sons of Reading, was established in 1785 in the United Kingdom (ASAQS, 2014d).

The independent quantity surveyor emerged from working for master tradesman and builders to what he is today. In the early days of the profession, each tradesman or builder used to employ his own quantity surveyor, who would measure quantities and estimate the cost of works from the drawings prepared by the architect (Graham, 2010).

In order to reduce the cost of tendering, it was decided that instead of each builder having his own quantity surveyor, it would be better to employ one quantity surveyor, who would measure the works and estimate the cost of the works. Each builder would then contribute towards the cost of the quantity surveyor. The other benefit

was that all builders tendered on the same basis. The quantities were compiled in a document called the bill of quantities, which is the document that is still used by quantity surveyors today (ASAQS, 2014d).

The title, "quantity surveying" is common in the United Kingdom and in commonwealth countries. This often leads to the perception that quantity surveyors are only found in these countries. In many European countries, quantity surveyors are referred to as construction economists, or value engineers (in Finland); while in the USA, quantity surveyors are called cost engineers (Drake, 1995). In other countries, they have different titles.

3.2.3 What's in a name?

"…*What's in a name? That which we call a rose by any other name would smell as sweet*" (Shakespeare, in Romeo and Juliet). While that statement might be true for a rose, it is a different case for the title of quantity surveying. The title invokes different pictures in people's minds (Ashworth *et al*., 2013). Many people are ignorant of the profession; and many confuse the quantity surveying profession with land surveying (Ajalekoko, 2004).

There have been suggestions that the title quantity surveyor should be abandoned for a title that would accurately describe what quantity surveyors do today.

Many brand experts claim that a good name that describes a business plays an important role in the success of the business. The Business Dictionary (Not Dated) describes branding as, "…*the process involved in creating a unique name and image for a product in the customer's mind…. Branding aims to establish a significant and differentiated presence in the market that attracts and retains loyal customers*."

It is, therefore, not good for business if it has to explain what the business does. The question is: Does branding apply to professional titles, such as accountants, lawyers, doctors and quantity surveyors? (Hall, 2013).

Currently, there are many quantity surveying firms that refer to themselves by different titles, such as "*construction-cost consultants*", or "*building economists*", or "*construction accountant*," "*contractual and procurement specialist*," "*construction consultant*", "*construction management consultant*" and "*chartered surveyor*" (Ashworth *et al.,* 2013).

Those who argue against the name change argue that like many other professionals, such as accountants and lawyers, the services of quantity surveyors have evolved with time. Today, accountants and lawyers offer a wider range of services to their clients than their dictionary definition; yet their titles have remained (Ashworth *et al.,* 2013).

The anti-name change group argues that the survival of the profession lies not in the name change, but in the profession's ability to find its unique selling point (USP) (Ajalekoko, 2004). The Small Business Encyclopaedia (2014) defines USP as, "… *the factor or consideration presented by a seller, as the reason that one product or service is different from and better than that of the competition".* Simply stated, what makes a business stand apart from the rest?

In spite of the foregoing, the title quantity surveyor is still widely used by many firms and professional bodies. Whether this will be the case in the future is still unknown.

Accountants and engineers are seen as threats to the quantity surveying profession. Some quantity surveyors are employed by accounting and management-consultancy firms. If this trend continues, accountancy firms may in future not engage the services of quantity surveying firms, but instead carry out quantity surveying functions in-house (Ashworth *et al.,* 2013).

Many quantity surveyors see engineers, particularly in South African municipalities' projects, as threats as municipalities often employ engineers for functions usually carried out by quantity surveyors.

3.3 Quantity Surveying in South Africa

3.3.1 The History of Quantity Surveying

South Africa's political climate and economic development have had a great bearing on the development of the quantity surveying profession in South Africa. The discovery of gold in the Witwatersrand in 1886 played a major role in changing the economy of South Africa (ASAQS, 2009).

As a result of the increasing mining activities, and the associated economic developments, British architects started arriving in the country. With their quantity surveying knowledge, they would prepare their own quantities. These architects were also hired by other architects to assist them in measuring and costing. Fully qualified quantity surveyors, mainly from Britain, started arriving in 1896 (ASAQS, 2009).

The 1899-1902 Anglo Boer war had a negative effect on the construction industry. However, after the establishment of the Union of South Africa in 1910, the industry started to stabilize. A Public Works Department was soon established. Included within the department, were both the architectural and quantity surveying departments (ASAQS, 2009).

The government embarked on a programme of reconstruction following the war. It was during this period that the Union Buildings, regarded as an architectural masterpiece, were built. Construction of the Union Buildings in Pretoria began in November 1910; and it was completed in 1913. The total building cost was £1 310 640. The land cost was £350 000. The architect for the job was Sir Herbert Baker (World Digital Library, Not Dated; South Africa History Online, Not Dated). The Union Buildings have been the seat of the South African government since they were commissioned to date. Figures 3.3-3.5 show images of the Union Buildings.

Figure 3.3 The Union Buildings in the 1920s (Paul van Zeyl Collection)

Figure 3.4 The Union Buildings in 1925 (Circa 1925).

Figure 3.5 The Union Buildings in 2013 (http://af.wikipedia.org as at 11 December 2013)

With permission from the government, the quantity surveyors adopted the London system of measurement and issued quantities. The quantities became part of the building contracts. In 1906, the Transvaal Society of Quantity Surveyors, a voluntary association aimed at the development of the quantity surveying profession, issued

the Standard System of Measurement of Builder's Work and Billing of Quantities (ASAQS, 2009).

The Standard System of Measurement of Builder's Work is today known as the Standard System of Measuring Building Works. It is a standard method of measurement for the preparation of bills of quantities for building work (Maritz & Sigle, 2012).

Some of the factors that have contributed to the development of the quantity surveying profession include the technology used in construction, as well as the introduction of steel and concrete in construction (ASAQS, 2009).

Currently, the quantity surveying profession is regulated by the Quantity Surveying Profession Act, 2000 (Act 49 of 2000). The South African Council for the Quantity Surveying Profession (SACQSP) is a juristic person mandated by the Act to be responsible for the regulation and development of the quantity surveying profession in South Africa. One of its many duties is to facilitate the registration of professional and candidate quantity surveyors (SACQSP, 2014).

The title 'quantity surveyor' was reserved under the Quantity Surveying Act of 1970. Only persons qualified and registered in terms of the Act could undertake the work reserved for quantity surveyors.

3.3.2 The Traditional Role of the Quantity Surveyor

The ASAQS, a voluntary organisation registered with the SACQSP in terms of the Quantity Surveying Profession Act, 2000 (Act 49 of 2000), states the following to be the traditional role of quantity surveyors (ASAQS, 2014b):

- Preparing feasibility studies and budgets for proposed projects;
- Preparing Bills of Quantities and other tender documentation to acquire fair and equitable tenders for projects;
- Negotiating building contracts;
- Drafting contract documents;

- Monitoring costs and reporting to clients during the design and construction of projects; and
- Determining the final costs of projects.

On the other hand, its British counterparts identified the following as the traditional role or function of a quantity surveyor (RICS in Ashworth *et al.,* 2013):

- Single rate approximate estimates;
- Cost planning;
- Procurement advice;
- Measurement and quantification;
- Document preparation, especially bills of quantities;
- Cost control during construction;
- Interim valuations and payments;
- Financial statements;
- Final account preparation and agreement; and the
- Settlement of contractual claims.

The traditional role of the quantity surveyor in the UK and in South Africa is more or less identical. Most of the small private quantity surveying firms in South Africa still focuses on the traditional functions of the quantity surveyor.

3.3.3 The Current Role of the Quantity Surveyor

The ASAQS states the following to be the current role of quantity surveyors (ASAQS, 2014a):

- Estimating and cost advice;
- Cost planning;
- Property development advice;
- Advice on tendering procedures and contractual arrangements;
- Negotiated, lump-sum, managed and cost-plus contracts, package deals, turnkey offers, etc.;
- Financial control over contracts;

- Valuation of work in progress;
- Cash-flow budgets;
- Final account in respect of the contract;
- Act in disputes, etc.;
- Material list and values;
- Quantity surveying services in respect of civil, mechanical, and electrical work;
- Property economics;
- Project management*; and
- Fast-track construction.

*project management is not regarded as a quantity surveying role in South Africa. It is regulated by the South African Council for the Project Management Profession (SACPMP)

Quantity surveyors are experts in construction costs and construction economics. Their advice throughout all the stages of the project is essential for the successful delivery of the project (ASAQS, 2014a).

Through cost-planning, the designers and clients are able to compare the costs for different design alternatives; so that the client can get value for money and for his investment (ASAQS, 2014a).

Property development advice is usually given through pre-design feasibility studies. A pre-feasibility study guides the investor on whether to proceed, or not to proceed with the project (AQAQS, 2014a).

Quantity surveyors are able to advise their clients on which form of contract the client should select. Client needs, circumstances, the type of project and suchlike are some of the factors that would determine which type of contract should be selected. Firms' bills of quantities usually form part of the contract. Besides bills of quantities, other alternatives include: schedules of rates, negotiated lump-sum payments, managed and cost-plus contracts, package deals, turnkey offers, etc. (ASAQS, 2014a).

Throughout all the stages of the project, quantity surveyors use techniques and methods, such as valuations, cash flows, cost reports, and more to provide financial control over the project. A final account of the project is usually prepared at the end of the construction period (ASAQS, 2014a).

Quantity surveyor's knowledge of costs and contracts enables them to give advice on insurance claims, to prepare valuations for fire insurance, and to act as expert witnesses in arbitration and litigation (ASAQS, 2014a).

When required, quantity surveyors are able to provide material cost lists and material values to their clients (ASAQS, 2014a).

Quantity surveyors, who provide quantity surveying services in the engineering sector, are usually referred to as cost engineers (ASAQS, 2014a).

The training of quantity surveyors in property economics or property study courses enables quantity surveyors to advise their clients on real estate investments.

In South Africa, for quantity surveyors to provide project-management services, they must be registered with the South African Council for the Project Management Profession (SACPMP).

Quantity surveyors are able to play a role in fast-track construction. Fast-track construction is when the design phase and the construction phases of a project run parallel. Uncertainty and risk are high in this type of contract; as the final cost of the project is unknown. Cost control is usually done by agreeing on a maximum price during the design development stage, or at an early stage of construction (Knecht, Not Dated).

While there are similarities in both the traditional role (see 3.3.3.2) and the current role of quantity surveyors in South Africa and in the United Kingdom, there are also stark differences. The RICS regard the following as the current role of the Quantity Surveyor (RICS, in Ashworth *et al.,* 2013);

- Investment appraisal;
- Advice on cost limits;
- Whole life costing;
- Value management;
- Risk analysis;
- Insolvency services;
- Cost-engineering services;
- Subcontract administration;
- Environmental service measurement and costing;
- Technical auditing;
- Planning and supervision;
- Valuation for insurance purposes;
- Project management;
- Facilities management;
- Administering maintenance programmes;
- Advice on contractual disputes;
- Planning supervisor;
- Employers' agent;
- Programme management;
- Cost modelling; and
- Sustainability Advisor.

Although the South African quantity surveyor has evolved in many respects, he is still steeped in tradition, as compared with its British counterpart. Services, such as whole-life cycle costing, value management, risk analysis, and facilities management, are still in their infancy stage in South Africa. These roles are usually undertaken by big firms with international offices in other developed countries. The smaller firms usually stick to their traditional roles.

3.3.4 Current Industries where Quantity Surveying skills are employed

The education, training and skills of the quantity surveyor allow quantity surveyors to be employed in a wide range of sectors in the economy. Some of the fields, in which a quantity surveyor can be employed include the following (ASAQS, 2014c):

- Private quantity surveying firms – performing traditional and current roles.
- Construction companies – managing the construction process on-site.
- Property development companies – initiating and managing new building projects.
- Industrial development companies – mining, petro-chemical installations, airports, shipbuilding, motor industry, power stations.
- Financial institutions (banks and building societies) initiating the development of new projects, and liaising with professional consultants during the construction process.
- The public sector (government departments, local authorities, municipalities) – providing quantity surveying services for government projects, the maintenance of government buildings, and liaison with professional consultants.
- Community service projects – providing consultancy services for the provision of houses, the development of the infrastructure, initiating “design-and-supply” projects, the preparation of material lists, and the ordering of building materials for emerging contractors and owner-builders, advising on contract types, and tendering procedures.
- Other specialist opportunities – research, education and training, legal advice, consultancy services (settlement of disputes related to building work), valuations of buildings (for insurance, fire damage or expropriation purposes), investment (advice on investment in property, shares and unit trusts).
- Computer programming and advice – (development of computer programmes for consultants in the construction industry and advising on suitable software, hardware, networks and systems’ maintenance).

In the UK, the quantity surveyor is usually employed in:

- Private firms;
- Building and civil engineering construction companies;
- Government;
- Large engineering consultants;
- Heavy and industrial engineering;
- Housing Associations;
- Specialist Housing Construction Companies;
- Large international mechanical contractors and petroleum engineering companies; and
- Universities (Ashworth *et al.*, 2013; Prospects, Not Dated).

In terms of employment opportunities, quantity surveyors in the UK and South Africa are exposed to almost similar employment opportunities.

3.3.5 The Competencies of a Quantity Surveyor

In his paper entitled, the "Competencies of Professional Quantity Surveyors in a Developing Economy", Nkado (2000) provides the definition many authors and researchers attach to the word "competency".

Stewart and Hamlin (in Nkado 2000) define competency as, "…*something, which a person who works in a given occupational area should be able to do*." Holmes and Joyce (in Nkado 2000) describe competency as, "…*a description of action, behaviour or outcome, which a person should be able to demonstrate; or the ability to transfer skills and knowledge to new situations within the occupational area*."

RICS categorizes the competencies of a quantity surveyor into three categories, mandatory or basic competencies, core competencies, and optional competencies (Refer to Table 3.1).

Table 3.1 Competencies of a Quantity Surveyor (RICS in Rahmani, 2011)

Mandatory Competencies	Core Competencies	Optional Competencies
• Personal and Interpersonal Skills • Business Skills • Data Information & Technology • Professional Practice • Law • Measurement • Mapping (Nkado)	• Commercial management of construction or design economics and cost planning • Contract practice • Construction technology and environmental services. • Procurement tendering. • Project financial control and reporting • Qualification and costing of construction works (RICS, 2008)	• Arbitration and other dispute resolution procedures • Development Appraisal • Facilities Management • Insolvency • Insurance • Project Management • Property Investment Funding • Research Methodologies & Techniques • Taxation , Allowances & Grants • Valuation

A competent quantity surveyor is described as one whose variety of skills, knowledge and understanding can be applied in many contexts and organizations (Hassal *et al*. in Nkado, 2000).

As stated before, quantity surveyors, their skills and competencies, in developing countries, such as South Africa may differ from their developed country counterparts (Nkado, 2000). For instance, in South Africa, to redress the economic imbalances created by the apartheid era, the government has implemented policies such as the Broad-Based Black Economic Empowerment (BBBEE) with which quantity surveyors must be familiar when carrying out their duties.

In most commonwealth developing countries, quantity surveying skills and competencies can also include competencies and skills that are country-specific.

3.3.6 The knowledge, education and training of Quantity Surveyors

In its 1992 report entitled: "The Core Skills and Knowledge Base of the Quantity Surveyor", RICS identified the following to be the knowledge base of the quantity surveyor (William in Ashworth *et al*., 2013):

- Construction technology;
- Measurement rules and conventions;
- Construction economics;
- Financial management;
- Business administration; and
- Construction law.

The quantity surveyor's skills base includes:

- Management;
- Documentation;
- Analysis;
- Appraisal;
- Quantification;
- Synthesis; and
- Communication.

Skills are continuously developed as a result of the changes in the industry and economy. Besides basic skills, a quantity surveyor is required to have the following personal skills (William in Ashworth *et al*., 2013):

- Independence;
- Adaptability;
- Initiative taking;
- Willingness to learn;
- The ability to reflect on what has, and what has not been achieved.

The core skills required for the quantity surveyor include the following (William in Ashworth *et al.*, 2013):

- The ability to present clear information when in a group;
- Self-management;
- Critical analysis; and
- The ability to listen to others.

The process skills include the following (William in Ashworth *et al.*, 2013):

- Computer literacy;
- Commercial awareness;
- Prioritising;
- Acting morally and ethically;
- Coping with ambiguity; and
- Negotiating.

At the CEEC conference in 1993, Ramirez proposed that the training for quantity surveyors should include:

- Basic training;
- Technology;
- Law;
- Mathematics;
- Accounting; and
- Construction economics.

Basic education provides the quantity surveying student with general knowledge that is of great value when the period of specific quantity surveying training begins. The following proposed subjects were recommended by Ramirez (1993):

- General mathematics;
- Physics and Chemistry;
- Mechanics;

- Technical Drawings;
- Topography;
- Graphic Representation Methods;
- Common Law;
- Economic Theory and Enterprise Economy; and
- Communications.

In-depth knowledge of technology is required, in order for the quantity surveyor to understand construction costs. The proposed subjects included:

- Materials;
- Working Methods;
- Construction Methods;
- Installations;
- Organization and Planning Tasks;and
- Execution Control.

The quantity surveyor performs his duties in a legal environment; and as a result, it is important to understand this legal environment. Proposed subjects include the following:

- Mercantile law;
- Labour law;
- Fiscal Law;
- Planning Law; and
- European Community Directives.

The proposed subjects for mathematical training included:

- Financial mathematics;
- Statistics and operational research;and
- Computers.

Proposed accounting training included the following subjects:

- General accounting;
- Societies accounting;

- Cost accounting;and
- Accounting analysis.

Proposed training in construction economics included:

- Financial management;
- Commercial management;
- Cost management; and
- Surveying and budgeting techniques.

In South Africa, many universities offer some of the courses proposed by Ramirez. The University of Cape Town (2014) offers the following courses to quantity surveyors in their Bachelor degree studies:

First-Year Courses

Evidence-based Management;
Building Science I;
Construction Technology I;
Practical Training;
Construction-Information Systems;
Micro-economics;
Macro-economics;
Engineering Drawing; and
Statistics 1001.

Second-Year Courses

Financial Accounting 1A;
Elementary Surveying;
Business Law I;
Labour Law I;
Professional-Communication Studies;
Construction Technology II;
Practical Training;
Construction Management I; and

Measurement & Design Appraisal I.

Third-Year Courses

Construction Technology III;
Practical Training;
Construction Costing;
Measurement & Design Appraisal II;
Applied Contract Law I;
Property Studies I;
Construction Management II;and
Cost Engineering under Uncertainty.

For the Honours year, the following courses are offered:

Management Accounting I;
Property Studies II;
Measurement & Design Appraisal III;
Applied Contract Law II;
Professional Practice;
Practical Training;
Treatise;
Civil Engineering Measurement;
Statistics 1000;
Globalisation & the Built Environment;
Advanced Construction Management;
Integrated Management Project;
Housing Development & Management 1T;
Construction Innovation; and
Approved Elective*

*Approved elective means; any other course chosen by the student and approved by the University.

Other universities in South Africa offer similar or identical training as the University of Cape Town. Although many universities have advanced in terms of the variety of

courses they offer to quantity surveying students, the training of quantity surveyors is thus more or less as it was proposed by Ramirez in 1993.

The above-mentioned courses enable the quantity surveyor to be an efficient cost manager. Cost management involves forecasting, analysing, planning, controlling and accounting (Ashworth *et al*., 2013).

3.3.7 Factors that Influenced Change in the Quantity Surveying Profession

The quantity surveying profession has evolved from the humble beginnings of the profession in the seventeenth (17^{th}) century (refer to section 3.2.2 of this chapter) to becoming one of the most respected professions today.

It is, therefore, important to study the factors that have influenced the evolution of the profession in the past, in order to determine how the profession will evolve in the future.

In the United Kingdom, the factors that influenced change in the quantity surveying profession include the following (Cartlidge, 2006):

- 1990 Recession;
- Client dissatisfaction;
- Fee competition;
- Globalisation;
- Added-Value Procurement;
- Information Technology; and
- Public-Private Partnerships.

From the history of the quantity surveying profession in South Africa (see section 3.2 of this chapter), one can deduce that the major contributors to change have been:

- Clients' needs;
- Technological advancement;
- Politics; and

- The particular needs of South Africa's developing economy;

The old adage that states that change is inevitable is also true for the quantity surveying profession. For quantity surveyors to continue to add value to the economy, they will have to continuously adapt their approach and methods.

3.3.8 The Role of Quantity Surveyors in PPPs

The introduction of PPPs as a form of procurement in the early 1990s in the United Kingdom had a major impact on the development of the quantity surveying profession in that country. Quantity surveyors have had to consider their approach from just delivering projects in the short term; and to start looking at projects with a long-term view, that is, to provide whole-life costing to the project.

Quantity surveyors in the UK have been able to apply the following knowledge in PPPs: risk management, procurement advice, and whole-life cost advice. Many quantity surveyors are involved in different roles in PPPs/PFI in the UK. Table 3.2 illustrates the many roles that the quantity surveyors play in PPPs/ PFIs.

Table 3.2 The roles of quantity surveyors in PPPs/ PFIs in the UK (Adapted from Cartlidge, 2006)

The Role of the Quantity Surveyor	Services Offered
For the private party (SPV)	• Advice on procurement • General cost advice • Reviewing bids prior to submission • Advice on whole life costing • Specialist advice
For funders	• Due diligence
For the public party	• Procurement advice • The outline business case • Advice on facilities management
As joint public/private monitor certifier	• Monitoring facilities management operations
For consortium building contractors	• Preliminary cost advice • Preparation and pricing of bills of quantities

	• Supply chain management

PPPs in South Africa are regulated by Treasury Regulation 16 of the PFMA. In all the six stages of a PPP project, there are certain skills and competencies required in order to successfully deliver a PPP project.

PPPs are usually initiated by the public sector in South Africa. Once a public institution has decided to follow a PPP route, it would usually need the following role players (SA National Treasury PPP Unit, 2004):

- A PPP project advisor;
- A PPP project officer;
- A Project team;
- A Project secretariat;
- Transaction advisors;
- A Bid-evaluation panel;
- Bid managers;
- A Bid secretariat;
- Technical evaluation teams (TETs);
- An evaluation co-ordination committee (ECC);
- A project-evaluation committee (PEC); and
- A project-management team.

The project advisor

The project advisor is usually a member of the PPP Unit assigned to give technical assistance to the public institution in the implementation of the PPP project from the registration of the project till the delivery stages.

In the initial stage of the project, the project advisor assists the institution to:

- Establish a project team;
- Draft the terms of reference for the transaction advisor;
- Calculate a suitable budget for the costs of the transaction advisor;
- Make an application to the PDF, if applicable; and

- Procure the services of the transaction advisor. (SA National Treasury PPP Unit, 2004)

The PPP project officer

Treasury Regulation 16 defines a project officer as a, "… *person identified by the accounting officer or accounting authority of an institution, who is capable and appropriately qualified to manage a PPP to which that institution is party from its inception to its expiration or termination."*

The role and responsibilities of the project officer are from the inception phase till the exit phase of the project.

Some of the functions of the project officer include:

- Managing the planning, the procurement and the implementation of the PPP project for the public institution.
- Carrying out all the functions of the inception phase, including the appointment of the transaction advisor.
- Directing and managing the work of the transaction advisor, and approving payments in terms of the contract at every phase of the project preparation.
- Managing the PPP agreement for the project term on behalf of the public institution. (SA National Treasury PPP Unit, 2004)

There are diverse skills and competencies required to fulfil this role (see Table 3.3).

Table 3.3 Competency model for a PPP project officer
(Adapted from the UK Office of Government Commerce in Corner, 2006, A Competence Framework for Creating Effective PFI Projects, 2000)

Competency Cluster	Competencies	Indicators
Self	Applies professional expertise and experience.	PPP Knowledge and experience, from the public or the private sector. Comparable project experience Relevant knowledge and skill in law, finance, public administration and document management.
	Develops self and others	PPP Knowledge Personal Development Team Development Career development of self and others.
	Is resilient and motivates	Determination Self motivation Motivation of others
Task	Implements strategy	Strategy development Strategy implementation Strategy communication
	Solves problems	Problem solving Creative thinking Decision making
	Achieves results	Project management Resource management Quality management Risk management Managing ongoing change Variation management Knowledge management Monitoring
People	Builds relationships, communicates and negotiates. Leads and manages team.	Partnership and relationship management Communication PPP negotiation Leadership and management Delegation

Above all, the project officer must be honest and have a passion to achieve best value in the interests of the public and the public institution (SA National Treasury PPP Unit, 2004).

The project team

The project officer must set up a team that will assist him to plan and implement the project. The team provides the project officer with strategic and technical support. The project officer is the leader of the team.

The functions of the project team are outlined below:

- To provide strategic direction and ensure management and political buy-in in all the project-cycle phases;
- To oversee the project-development budgets and expenditure;
- To ensure that the progress of the project is effectively communicated within the institution, and to the public when required;
- To approve the deliverables of the transaction advisor; and
- To review and endorse the documentation to be submitted to the accounting officer/authority for the applications for the treasury approvals (SA National Treasury PPP Unit, 2004).

The project team is usually made up of the following:

- The project officer;
- The project secretariat and other members appointed by the public institution;
- A representative of the transaction advisor; and
- Other members, as appointed by the transaction advisor (SA National Treasury PPP Unit, 2004).

The project officer acts on behalf of the public institution; and the transaction advisor representative has delegated authority to bind the transaction advisor. The composition of the members of the team evolves throughout the project cycle,

depending on the needs and expertise required for that particular phase of the project cycle (SA National Treasury PPP Unit, 2004).

The project secretariat

The project secretariat provides administrative support to the project officer and the project team. He manages documents and administration of meetings. Together with the project officer, the project secretariat is required to set up PPP consultation systems with the internal audit of the relevant public institution to ensure compliance with the institution's risk management, internal controls and governance standards (SA National Treasury PPP Unit, 2004).

The transaction advisor

Treasury Regulation 16 defines a transaction advisor as: "…*a person, or persons, appointed in writing by an accounting authority of an institution, who has, or have, appropriate skills and experience to assist and advise the institution in connection with a PPP, including the preparation and conclusion of a PPP agreement*."

As stated before, in Chapter 2 (section 2.7), the transaction advisor is made up of one or a few consulting firms acting as a consortium. All the financial, technical, BEE and legal work required for a PPP agreement for the public institution is prepared by the transaction advisor.

The transaction advisor does the feasibility study for the institution in phase two. The feasibility study must be of such a standard that it would enable the public institution to meet Treasury Regulation I (TA:I), if necessary. In South Africa, before the PPP project progresses to the next phase, the Treasury Department must provide the necessary approval; unless the public institution has received an exemption from Treasury.

In the procurement phase, or phase three of the project cycle, the transaction advisor is required to facilitate the entire procurement process, and to prepare the documents for treasury approval (TA:II, TA:IIB &TA:III). The transaction advisor is

also expected to prepare a close-out report, case study, and financial closure for the public institution.

The services of the transaction advisor usually end after phase two; but in some cases, the transaction advisor may be employed during the early stages of the development and delivery phases. In these stages, he provides PPP agreement and management support.

Treasury requires that the transaction advisor must have the following skills and experience:

- Financial analysis, with the relevant project finance experience;
- PPP procurement and structuring;
- Contract and administrative law, including the relevant South African experience in the drafting and negotiating of PPP agreements;
- Planning management;
- Facilities management;
- Relevant expertise (in setting out elements of the project);
- BEE expertise with relevant PPP experience;
- Negotiations;
- Insurance;
- Contract Management; and
- Project Management (SA National Treasury PPP Unit, 2004).

The bid-evaluation panel

The bid evaluation panel is usually composed of the same people as the project team. The function of the bid-evaluation panel is to ensure that the PPP is delivered successfully (SA National Treasury PPP Unit, 2004).

The bid secretariat

The bid secretariat is usually drawn from the public institution's tendering department. The major function of the bid secretariat is to ensure that the bidding rules are complied with. He ensures this by:

- Preparing the relevant documents for the bid-evaluation panel;
- Receiving, recording and administering bids;
- Preparing the scoring sheets for each bid and the spreadsheets for compiling the scores, consistent with the bid package;
- Organising the venue and all logistical matters for the bid evaluation, and ensuring that all bid documents are delivered securely to and from the venue collating the scores;
- Setting up the interviews with short-listed bidders, and recording the proceedings (SA National Treasury PPP Unit, 2004).

Bid managers

Relevant bid managers from both the public party and private party are required to manage the bidding process. Within the public sector, this role is fulfilled by the public officer. In future, and on large projects, the public institutions will make this a permanent position (SA National Treasury PPP Unit, 2004).

Technical-evaluation teams (TETs)

The role of the TET is to evaluate the bids on the following criteria: technical, BEE and price. The technical evaluation includes the following: technical, legal and financial solutions. The TET needs to be made up of suitably qualified professionals from both the public institution and the transaction advisor (SA National Treasury PPP Unit, 2004).

Evaluation co-ordination committee (ECC)

The function of the ECC is to:

- Co-ordinate the TETs during their analysis through regular meetings with team leaders;
- Approve all correspondence and direct communication with bidders on clarification matters;
- Receive and pass through to the project evaluation committee the TET reports on completeness and compliance, including a recommendation on which bidders to take to further analysis as compliant bids;
- Receive the analysis reports from the TETs, and interrogate these until the committee is satisfied that each report is fully substantiated;
- Prepare its recommendations on further processes, such as BAFO;
- Evaluate the overall integrated solution for the project, taking into account all TET reports;
- Score the overall integrated solution, and provide notes to be resolved before entering into a PPP agreement; and
- Compile the total project evaluation notes and reports into a single recommendation on process and outcome (preferred and reserve bidders) to pass through to the PEC (SA National Treasury PPP Unit, 2004).

Project-evaluation committee (PEC)

According to National Treasury PPP Practice Note Number 06 of 2004, the PEC is made up of the accounting officer or authority and the committee members that he/she appointed (SA National Treasury PPP Unit, 2004).

The function of the PEC is to:

- Accept bids as complete and compliant;
- Receive and evaluate the report and recommendations from the ECC
- Score the bids;
- Decide on a BAFO process; and
- Select a preferred and reserve bidder (SA National Treasury PPP Unit, 2004).

The project-management team

The project team evolves from the inception phase up to the exit phase of the project. Throughout the project cycle, it acquires different skills and expertise in order to meet the challenges of the project. Depending on the size and the complexity of the project, the functions of the PPP agreement management may be performed by a team or by a single individual (SA National Treasury PPP Unit, 2004).

The project officer may appoint specialist and technical advisors with the relevant skills to become part of the management team. Some of this expertise includes the following:

- Knowledge of the subject matter;
- Design and construction;
- Business and product assurance;
- Facilities and services management;
- IT;
- Statutory safety and regulatory responsibilities;
- Law;
- Finance; and
- Black Economic Empowerment (BEE) monitoring (SA National Treasury PPP Unit, 2004).

Table 3.4 summarizes the roles played by different members of the public institution in all the phases of a PPP project cycle.

Table 3.4 Role players for the public party in a PPP project

Phase	Role Players
Phase 1 Inception Phase	• Project advisor • Project officer • Project team • Project Secretariat • Transaction advisor
Phase 2 Feasibility Study	• Project advisor • Project officer • Project team • Project Secretariat • Transaction advisor
Phase 3 Procurement	• Project advisor • Project officer • Project team • Project Secretariat • Transaction advisor • Bid evaluation panel • Bid managers • Bid secretariat • Technical evaluation teams (TETs) • Evaluation co-ordination committee (ECC) • Project evaluation committee(PEC)
Phase 4 Development	• Project advisor • Project officer • Transaction advisor* • The project management team+
Phase 5 Delivery	• Project advisor • Project officer • The project management team
Phase 6 Exit	• Project advisor • Project officer • The project management team

*The transaction advisor's involvement at this stage is usually optional

+The role of the project team and the project secretariat evolves to that of the project management team. Depending on the size and the complexity of the project, this role may be performed by one person

The role players for the private party in a PPP

The private party, sometimes referred to as the special purpose vehicle, also has key role players within its structure that facilitate the successful implementation of a PPP project. The role players include the following:

- Equity partners;
- Shareholders;
- Lenders;
- Funders;
- Turnkey construction sub-contractors; and
- Operator sub-contractors.

Lenders and funders

The private party would usually establish a special purpose vehicle (SPV) whose aim is to raise funding for the project. The SPV usually brings together equity partners, shareholders, lenders, funders or financial institutions, and in some instances, the public sector. The strength of the SPV is usually determined by the legal and financial environment of the country. In South Africa, the private parties claim that there is not enough deal flow that makes access to funding easy (SA National Treasury PPP Unit, 2004).

Figure 3.6 shows the relationships and role-players of the private party in a typical PPP.

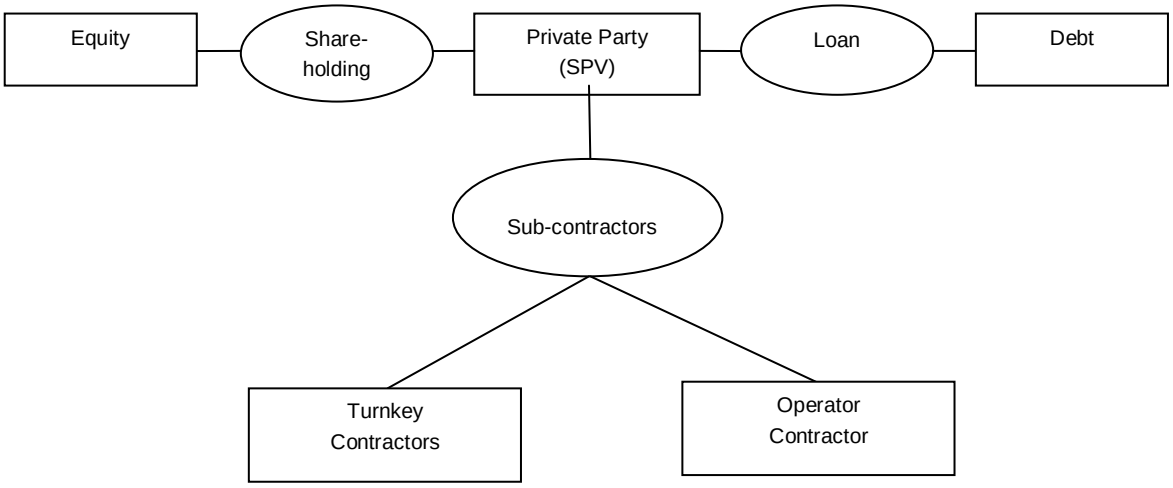

Figure 3.6 The relationships of role-players of the private party in a PPP (Adapted from the South African National Treasury: PPP Unit, 2005)

The turnkey contractor is responsible for the design and construction of the infrastructure facility. The team that makes up the turnkey contractor is usually made up of professional consultants and the main contractor, including relevant sub-contractors. The professional consultants are usually made up of the architect, the engineers, the quantity surveyors and other relevant professionals (SA National Treasury PPP Unit, 2004).

The operator contractor is responsible for the operations and maintenance of the infrastructure facility throughout the project term. The skills required for this role include: planning management, facilities management, project management and contract management (SA National Treasury PPP Unit, 2004).

3.4 Conclusion

Quantity surveyors in the UK have found their place in the implementation of PPPs/PFIs. Their skills and expertise are employed at various levels of the PPPs for both the private and public sector.

There is currently limited research on the extent of the role that quantity surveyors play in PPPs in South Africa; hence the need for this research. It will be of great

importance to both academics and practitioners to determine the current role that quantity surveyors need to play in PPPs, and their possible future role in PPPs.

Chapter 4
Design and Methods of the Research

4.1 Introduction

The main aim of this chapter is to explain the rationale for the design and methodology employed for the research. The design and methodology implemented for the research will be explained under the following headings:

- Aim of the study;
- Rationale for the design and methodology;
- Instruments of measurement;
- Selection of sample design and sampling methods;
- Data-collection procedures;
- Data-capturing and data-editing;
- Data analysis; and
- Shortcomings and sources of error.

4.2 The Aim of the Study

The main aim of the research is to investigate the current role of quantity surveyors in PPPs, how they could add more value, and also to determine their possible future role.

The research objective is to answer the following questions:

1. What is a PPP, and what is its role in the delivery of infrastructure projects?
2. What is the current role of quantity surveyors in PPPs?
3. What is the future role of quantity surveyors in PPPs?

In order to determine the extent of quantity surveyors' knowledge and involvement in PPPs, a web-based survey was conducted via a questionnaire. The survey questionnaire also encapsulated the perceptions of quantity surveyors on their education, training and competency in their traditional and non-traditional roles.

In addition to an online web-based survey, a case study was also undertaken for triangulation purposes. Triangulation is observing a research problem from at least two vantage points. The purpose of triangulation is to improve the quality of the research by providing additional knowledge (Flick, 2011).

Three case studies were considered for the study. However, due to time and cost constraints, only one case study was conducted. In addition, most of the potential interviewees in PPP projects were reluctant to participate in the case studies. Most of them cited busyness as a factor. Only a few people responded to the interview questions sent to them by email. Only those comments that were deemed relevant to the study are included in the study. Their comments are general, and are not based specifically on any one project.

In section 4.3, an explanation of the rationale for the research method and strategy is provided.

4.3 Rationale for the design and methodology

4.3.1 What is research?

Research is defined as: "…*a systematic investigative process employed to increase or revise current knowledge by discovering new facts*." (Business Dictionary, Not Dated). Saunders, Lewis and Thornhill (2009) define "… *research as something that people undertake, in order to find out things in a systematic way, thereby increasing their knowledge*."

There are two types of research, namely, applied research and basic or pure research. Applied research is usually undertaken to provide solutions to specific questions. It must provide answers that produce "corrective" action, improved performance, or policy changes. Basic or pure research is usually undertaken to provide solutions to theoretical questions that might not have any direct application on action, performance or policy. In other words, basic or pure research is usually undertaken to add to scientific knowledge (Blumberg *et al.*, 2008).

A summary of the difference between applied research and basic or pure research is shown in Table 4.1.

Table 4.1: The difference between applied research and basic or pure research (Saunders *et al.*, 2009)

Applied Research	**Basic or Pure Research**
Purpose	**Purpose**
Improve understanding of particular organizational problem	Expand knowledge of processes of a phenomenon
Results in solution of the problem	Results in universal principles relating to the process and their relationship to the outcomes
New knowledge limited to problem	Findings of significance and value to society in general
Findings of practical relevance and value to manager(s) in organisation(s)	
Context	**Context**
Undertaken by people based in a variety of Settings, including organisations and universities.	Undertaken by people based in universities
Objectives negotiated with originator	Choice of topic and objectives determined by the researcher
Tight time limits	Flexible time limits

4.3.1.2 The reasons for the type of research undertaken

This particular study falls under basic or pure research. The study was undertaken – in order to contribute to the general knowledge of PPPs and the development of the quantity-surveying profession in South Africa. The research is for academic purposes. Both the research topic and the objectives were determined by the researcher.

4.3.2 The research process

There are research philosophies that guide the research process. Research philosophy is what determines the research approach, strategy, method, time horizons, techniques and procedures. Saunders *et al.* (2009) depict this process in what they have termed the “research onion” (see Figure 4.1).

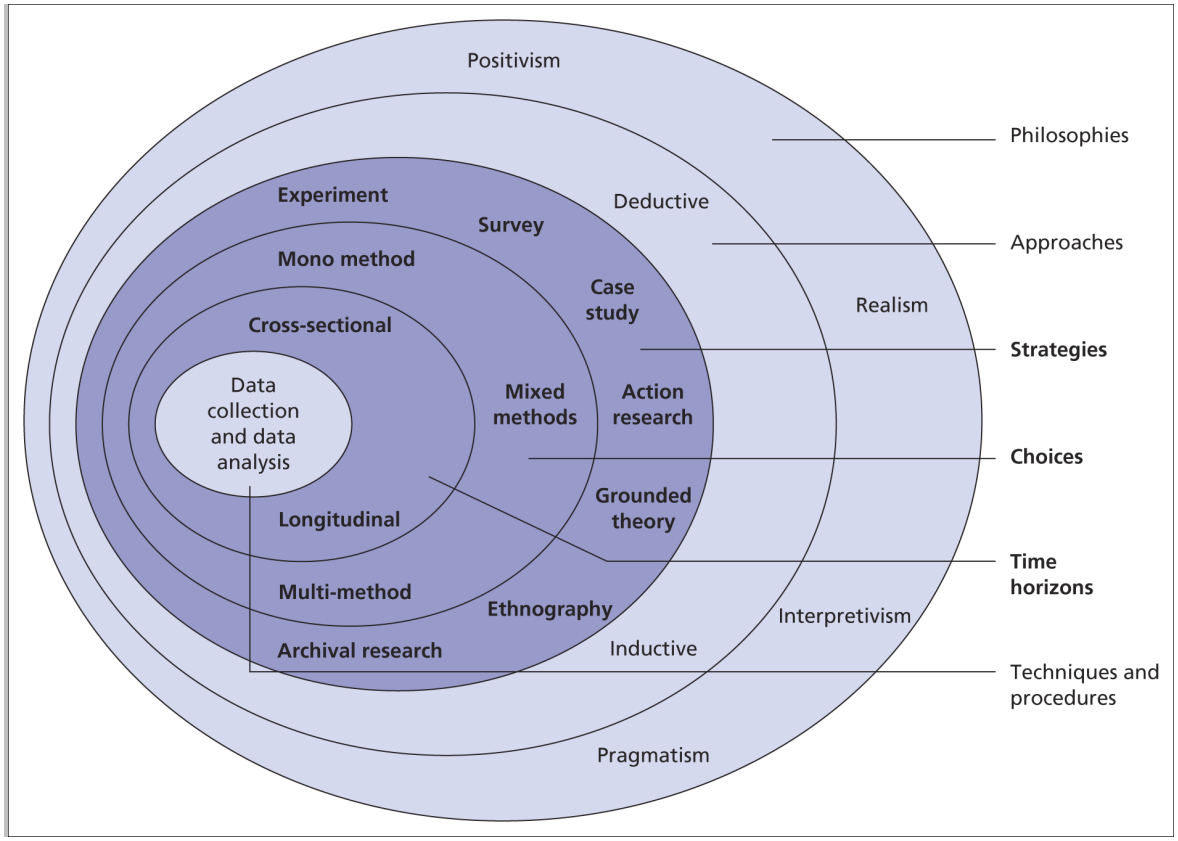

Figure 4.1 The research "onion" (Saunders *et al.*, 2009)

According to Saunders *et al.* (2009), before determining which research techniques and procedures to be employed in any research, all the other layers of the onion must be peeled away**.** Using the onion analogy of Saunders *et al.* (2009), the next sections of this chapter will describe how the layers of the "onion" were peeled away to arrive at the techniques and procedure employed to answer the research questions. The first layer of the research "onion" is the research philosophy.

4.3.2.1 The research philosophy

According to Saunders *et al.* (2009), research philosophy is "…*an overarching term that relates to the development of knowledge and the nature of that knowledge."* There are three broad categories of research philosophy, namely: epistemology, ontology and axiology. All researchers have their own world-views, which are based on their own philosophical assumptions. It is the philosophical assumptions of the researcher that justify and determine the research strategy and methods employed

in the research (Saunders *et al.*, 2009; Blumberg *et al.*, 2008).

Epistemology refers to what constitutes valid knowledge in a field of study; while ontology refers to the nature of reality (Saunders *et al.,* 2009). Axiology is concerned with value judgement, ethics and aesthetics (Saunders *et al.,* 2009, Rudestam & Newton, 2007).

4.3.2.1.1 Epistemology

There are three epistemological positions: positivism, interpretivism and realism (Saunders *et al.,* 2009). According to Blumberg *et al*. (2008), positivism is guided by three principles. Firstly, positivists believe that phenomena in the social world can be verified by objective observation. Secondly, positivists believe that research is value-free. That is, the phenomenon cannot be influenced by the researcher conducting the research. Lastly, they believe that the researcher is an objective analyst, or a "disinterested scientist" (Blumberg *et al.*, 2008; O'Dwyer & Bernauer, 2014).

The two assumptions of the positivists are: (1) that, the social world can be observed through the collection of objective data; and (2) that the social world can be reduced to simple elements (Blumberg *et al.*, 2008).

Positivists believe that for the data to be acceptable, they must be generated from observable phenomenon. The existing data are used to develop the hypotheses. The hypotheses are tested using highly structured methods. The results of the tests are quantified; and then, statistical analysis is employed to analyse the results. From the results, generalisations regarding the phenomenon are made.

These generalisations often lead to the development of theory. Positivistic philosophy is developed from the natural sciences (Saunders *et al.,* 2009; Blumberg *et al.*, 2008).

Interpretivists believe that human beings are social actors who interpret life through their own social lenses. Interpretivism is divided into two traditions: phenomenology and symbolic interactionism. Phenomenology is concerned with how humans interpret the world around them. Symbolic interactionism deals with the continuous process of humans' interpretation of the social world around them. Symbolic interactionalists believe that the way humans view the world is continuously evolving. The evolution is affected by humans' interactions with other humans. Interpretivists put themselves in the shoes of the subject they are studying. In fields, such as organisational behaviour, marketing and human resource management, the interpretivist's perspective is invaluable (Saunders *et al.,* 2009).

Realists believe that reality is not a function of the human mind. Stated in another way, there is a reality that transcends the human mind. Like positivists, realists approach the development of knowledge in a scientific manner. Data collection and analysis are justified via the scientific approach. There are two types of realism: direct realism and critical realism. Direct realists argue that our experiences, or our sensations through our five senses, are a true reflection of the real world. Critical realism, on the other hand, argues that what humans see are not the real objects, but rather representations of the real objects (Saunders *et al.,* 2009).

Dobson (2002) argues that knowledge of reality is based on our social conditioning. The perspective of the critical realist is generally ideal for business and management research (Saunders *et al.,* 2009).

4.3.2.1.2 Ontology

Ontology deals with the nature of reality. Objectivism and subjectivism are the two aspects of ontology. The objectivist's position is that objects are independent of the social actors concerned with them; while the subjectivist's position is that social actors' perceptions; and their actions as a result of those perceptions create phenomenon. In resolving a managerial problem, the objectivists are likely to focus on the principles, policy and procedures of management; while the subjectivists are

likely to focus on the subjective connotations of the actions motivating those actions (Saunders *et al.,* 2009).

4.3.2.1.3 Pragmatism

Pragmatists argue that what determines the research philosophy adopted in a particular study is the research problem. It is possible to employ both an epistemological and an ontological philosophy in one study. That is, both qualitative and quantitative methods can be beneficial for one study (Saunders *et al.,* 2009).

4.3.2.1.4 Axiology

Axiology is concerned with value judgements, ethics and aesthetics (Saunders *et al.,* 2009; Rudestam *et al*., 2014). Heron (1996) argues that our values guide our actions. In choosing a particular topic to study, researchers demonstrate what they consider to be important. The values of the researcher guide the researcher's choice of research philosophy and the subsequent data collection (Saunders *et al.,* 2009).

4.3.2.1.5 The reasons and the justification of the research philosophy adopted for the study

Understanding research philosophy is important; because it is the philosophy of the researcher that determines the research questions, the way the research questions are framed, and the way the research will be undertaken, in order to answer the research questions. No research philosophy is better than the other. Each of the research philosophies has its own strengths and weaknesses. The research question is what should determine which research philosophy to adopt in any study (Saunders *et al.,* 2009).

The research philosophy adopted for the study was based on the research problem: What is the current and future possible role of quantity surveyors in PPPs in South Africa? (Refer to section 1.3). As stated in section 4.2, the research strategies

engaged were the survey and the case study. Surveys are classified under the positivist philosophy; and they are generally regarded as being authoritative in society (Saunders *et al*., 2009).

According to Orlikowski and Baroudi (1991), 96.8% of research in the US IS journal is based on positivism. It was for its popularity that the positivist approach was adopted for this study.

Depending on how they are designed, case studies may fall under positivism or interpretivism. If the case study data collection and data analysis techniques are highly structured; they may be classified as positivists; and if they are unstructured, they may be classified as interpretivists. In the study, a semi-structured approach was adopted for the reasons advanced in section 4.6.2. Thus, for this study an epistemological position was adopted; and the ontological position was only adopted to enhance the quality of the study.

4.3.2.2 The research approaches

The second layer of the research onion is the research approach. Theory in research is either developed, hypothesised and tested (deduction); or it is developed via the data collection (induction) (Saunders *et al.,* 2009).

4.3.2.2.1 Deduction – Theory testing

Deduction is the scientific approach to research. It assumes the positivistic philosophical position. There are three main characteristics of the deduction approach. Firstly, it must justify the cause-and-effect relationship between variables. Secondly, it must be operationalised in such a way that concepts or variables can be measured in the quantitative and empirical manner. Lastly, it allows for generalisation (Saunders *et al.,* 2009).

According to Robson (2002), deduction has five successive steps, to which it should adhere, in order to be regarded as valid:

1. Deduction of a hypothesis;
2. Stating the hypothesis in operational terms;
3. Testing the operational hypothesis by using valid and reliable research methods and techniques;
4. Analysing the specific outcomes of the study, i.e. either confirming or providing an indication for the modification of the theory; and
5. Where necessary, modifying the theory in the light of the findings.

4.3.2.2.2 Induction – Theory building

The inductive research approach assumes an interpretivist philosophical position. The data are the precursors to the theory (Saunders *et al.,* 2009). Different methods are employed in the collection of the qualitative data – unlike in the deduction approach; in which a stringent methodology is adhered to (Easterby-Smith, Thorpe, Jackson & Lowe, 2008). The inductive approach allows for alternative and different views to a phenomenon, which the deductive approach may inhibit – because of the operationalization of the concepts (Saunders *et al.,* 2009). Table 4.2 illustrates the differences between the deductive and the inductive research approaches.

Table 4.2 Difference between deduction and induction (Saunders *et al.,*2009)

Deductive Approach	Inductive Approach
Scientific principles	Gaining an understanding of humans attached to events
Theory to data	
Need to explain a cause-effect relationship	A close understanding of research context
Quantitative data collection	Qualitative data collection
Operationalization of concepts to ensure clarity of definition	No operationalization of concept
A highly structured approach	A more flexible structure to allow for changes of research emphasis, as the research progresses.
A researcher is independent of what is being researched.	A realisation that the researcher is part of the research process
The necessity to select samples of sufficient size, in order to generalise the conclusions.	Less concern for the need to generalise

4.3.2.2.3 Guiding principles for the selection of either deduction or induction

According to Creswell (1994), there are five principles that a researcher must consider in the selection of a research approach. These are:

1. The nature of the research topic

The deductive approach is suitable where there is a wealth of literature; as it allows for the development of theory and hypotheses. Where there is not enough literature on the topic, the inductive approach is more suitable.

2. Time

Compared to inductive research, deductive research is less time-consuming; as the data-collection procedure is based on "*one take.*" Inductive research is more time-consuming; as the data collection and the data analysis unfold slowly.

3. Risk

Deductive research is less risky than inductive research. Except for the non-response option to the questionnaire; there is not much risk involved in the deductive approach. The risk involved in inductive research is that the data collected may not be useful; and, consequently, there may be no theory developed.

4. Audience

The audience at which the research is aimed may also influence the choice of the research approach. For example, in business research, a company might influence the researchers to conduct a market survey – in order to determine a solution to a particular problem.

5. The researcher's preferred style

The researcher's research preference also plays a part in the decision on whether a deductive or an inductive approach should be pursued.

4.3.2.2.4 The reasons for, and the justification of, the research approach for the study

The research approach for this study is mainly deductive. As stated in section 4.3.2.1.5, the deduction or scientific approach is generally regarded as authoritarian by society in general; hence it was adopted. The inductive approach's strength lies in its ability to discover useful insights regarding phenomenon; hence it was used for triangulation purposes.

4.3.2.3 The research strategy

The research strategy is the third layer of the research onion. The manner in which the research question is framed determines the purpose of the study: that is, whether it is an exploratory, descriptive or an explanatory study. The purpose of the study informs the research strategy employed (Saunders *et al.,*2009).

Exploratory studies are usually undertaken to clarify the understanding, and to gain new insights into a problem (Saunders *et al.*, 2009). They are similar to a traveller exploring the world (Adams & Schvaeveldt, 1991). Sometimes exploratory studies may reveal that there is no need to continue with the research study. Saunders *et al.* (2009) suggest the following, as guiding principles, for exploratory studies:

- A literature study;
- Interviews with experts in the field; and
- Focus-groups interviews.

The purpose of descriptive studies is to provide a precise description of the phenomenon (Robson 2002). A descriptive study is generally regarded as a precursor to the other two types of research. Explanatory studies are studies that show the cause and effect, or the causal relationships between variables. In an explanatory study, the variables in a phenomenon are studied, in order to determine if there is a relationship between them (Saunders *et al.*, 2009).

4.3.2.3.1 The reasons and the justification for the type of study undertaken

The type of study undertaken in this study is what Saunders *et al.* (2009) refer to as a *descripto*-explanatory study. It is a combination of both a descriptive and an explanatory study. The first question of the research is concerned with what PPPs are (refer to, section 4.2 above); while via the literature study (refer to Chapters 2 and 3), a detailed description of what a PPP is, is provided. It is via the case study and interviews with experts in the field, that the first question of the research was addressed.

The second and third questions of the research deal with what the current role of quantity surveyors is; and what their future possible role might be. Through the literature study in Chapter 3, and through the survey study and the case study, both questions were addressed. (Refer to chapters 5, 6 & 7 for further discussion on how the questions were addressed.)

There are six common research strategies: experiment, survey, case study, action research, grounded theory, ethnography and archival research. Any of the strategies may be applied in an exploratory, descriptive and explanatory research approach; and a combination of any of these strategies may be used in one study (Saunders *et al.,* 2009).

There is no research strategy that is superior to the other The research problem or question, the research objectives, the extent of knowledge available, the amount of time allocated to the study, and other resources available, as well as the philosophical beliefs of the researcher determine what research strategy would be applied in any research study (Saunders *et al.,* 2009).

4.3.2.3.2 Experiment

The experimental strategy is regarded as the yardstick against which the other strategies are measured (Saunders *et al.,* 2009). The main purpose of the experiment is to determine whether there is a causal relationship between an independent variable and a dependent variable (Hakim, 2000). Experiments are

most common in the natural sciences; and they are usually applied in exploratory and explanatory research – to explain the "how" and the "why" research questions (Saunders *et al.,* 2009).

The strength of the experimental strategy is that the researcher has more control over the research process and the circumstances in which the experiment is undertaken. The main disadvantage of the experimental strategy in research is that rigid laboratory settings make them unlikely to be relevant to the real world; since some of the variables that affect the real world are not taken into account in a controlled experimental environment (Saunders *et al.,* 2009, Davison, 1998).

4.3.2.3.3 Surveys

The survey strategy is the most commonly used research strategy. Most people regard surveys as dependable. Surveys are easy to explain and to understand. They are normally classified as deductive; and they can be applied to explain the "who", "what", "where", "how much" and "how many" research questions (Saunders *et al.,* 2009).

Surveys are often used in exploratory and descriptive research; and they are regarded as being cost-effective; as a large number of data are usually collected via a questionnaire administered to a large population at one point in time. The data collected through surveys are quantitative; and they can be analysed by applying descriptive and inferential statistics (Saunders *et al.,* 2009).

One of the benefits of the survey strategy is that the data collected can be used to explain causal relationships, and to provide prototypes of these relationships (Saunders *et al.,* 2009). One of the weaknesses of the survey strategy is that insights of the full extent of the causes or processes of the subject studied may not be fully explained, as a result of the operationalization (Davison, 1998). There may also be bias caused by the manner in which the questions in the questionnaire are posed (Saunders *et al.,* 2009).

The self-selecting nature of the respondents is also another weakness of a survey. Self-selection refers to where some potential respondents may choose not to participate in the survey, thereby resulting in only a certain "class" responding. (Saunders *et al.,* 2009). Other factors that may influence the results of the survey are: the time the survey is undertaken; and the manner in which the survey is designed (Davison, 1998). Other benefits and weaknesses of the survey strategy in general; and how they were addressed in the study, are explained in section 4.4.1.

4.3.2.3.4 Case Study Strategy

Robson (2002) describes a case study as "…*a strategy for doing research, which involves an empirical investigation of a particular phenomenon within its real-life context, using multiple sources of evidence."* A case-study strategy is often employed in an explanatory and exploratory research; and it provides answers to the "why", the "what", and the "how" research questions. The data in a case study are collected by using multiple sources, such as interviews, questionnaires, observation and archival documents (Saunders *et al.;* 2009, Yin, 2014).

The strength of the case study strategy is that phenomenon can be studied within its real-life context. More variables and how they affect the phenomenon can be explained – unlike in the survey and experimental strategy. Case studies are also useful in testing theory, and in producing new theory sources. One weakness of the case study is that it is often regarded as being a non-scientific method (Saunders *et al.,* 2009). The advantages and disadvantages of a case-study strategy; and how they were taken into account, are discussed in section 4.4.2.

4.3.2.3.5 Action Research

Action research is described as, "…*a form of applied research, where the researcher attempts to develop results, or a solution that is of practical value to the people with whom the researcher is working; while, at the same time, developing theoretical knowledge"* (Davison, 1998). It is sometimes regarded as a fact-finding type of research – with the aim of implementing change – by using the knowledge gained.

Action research answers the “how” questions (Saunders *et al.*, 2009).

The strength of action research is that it provides practical change while also strengthening existing theory in the field being studied. Its weakness is that, because it is usually based on a specific case, its findings cannot be generalised. Interpretations of the case studied may also differ from one researcher to the next (Davison, 1998).

4.3.2.3.6 Grounded Theory

Grounded-theory strategy is regarded as theory-building strategy through a combination of the inductive and deductive approaches. It is usually applied to explain and predict behaviour (Goulding, 2002). The data are usually collected without having any theory. The theory is then developed from the data collected (Saunders *et al.,* 2009).

The main strength of the grounded-theory approach is that behaviour can be explained and predicted (Goulding, 2002). The main weakness of grounded theory is that researcher-induced bias is difficult to detect and to prevent. Furthermore, the reliability and validity of approaches and information are difficult to assess, given the subjective nature of the data. The qualitative nature of the results can make their presentation to practitioners “non-user friendly” (Davison, 1998).

4.3.2.3.7 Ethnography

Ethnographic strategy has its roots in anthropology. In ethnography, a phenomenon is studied within the context in which it exists. Hence, it is regarded as being a naturalistic strategy. The data-collection techniques are not oversimplified. Ethnography follows an inductive approach. The data are collected by observing the participants over a prolonged period of time (Saunders *et al.,* 2009).

The benefit of ethnography is that it is useful for comprehending a particular context. A phenomenon can be understood and interpreted through the lens of the subjects involved. Its weakness is that it a lengthy process; and it takes place over a prolonged period. The researcher must be 'buried' in the social world being studied; and this involves gaining access to the social world under study (Saunders *et al.*, 2009*).*

4.3.2.3.8 Archival research

In archival research strategy, the data collection is undertaken through administrative records (Saunders *et al.,*2009). The documents used in an archival research strategy may be recent or historical (Bryman, 1989).

The main benefit of archival research is that it provides explanations on the past, and on any changes that have occurred over time. Archival strategy may be applied in exploratory, descriptive and explanatory researches. The disadvantages of the archival research include the failure to answer research questions; these are limited by the nature of the records and the documents obtained. The archival records and documents obtained may not have the correct information required to explain the research question – as result of improper recording or missing information. There may also be restrictions to access of the information – due to confidentiality (Saunders *et al.*, 2009).

4.3.2.3.9 The reasons and the justification for the research strategies employed in the study

The major deciding factor in the use of both the survey and the case-study strategies were the research questions. As stated in section 4.3.2.3.3, surveys are ideal in answering the "what", "how much" and "how many" questions. Part of the objective of the research study was to answer the questions: What is the current role of quantity surveyors in PPPs? And what is the future role of quantity surveyors in PPPs? To determine the answers to these two questions, a survey, using a self-administered questionnaire, was used to determine the number of quantity surveyors involved in

PPPs, and the extent of their involvement in the PPPs.

Through the questions posed in the questionnaire, a number of quantity surveyors currently involved in PPPs was determined. By posing questions on these quantity surveyors' perceptions of their tertiary education, and their involvement in other non-traditional quantity surveying roles, an indication of their future possible role in PPPs could be established.

As mentioned before in section 4.2, the case study was mainly chosen for triangulation purposes. Together with the literature review in Chapters 2 and 3, the case study provides the answers to the research question: What is a PPP? The case study also provided important insights into what PPPs are in the real-life context in South Africa.

There were also philosophical and practical grounds for choosing the survey strategy and the case study. As mentioned in section 4.3.2.3.3, surveys follow a scientific approach; and they are consequently popular and widely accepted as authoritative by society in general (Saunders *et al.*, 2009). On practical grounds, surveys are easy to administer; and they can reach a wide population much faster. Refer to section 4.4.1 for further explanation on why surveys were employed in the study and how their limitations were counteracted, in order to improve the validity and reliability of the results.

The philosophical ground for choosing a case study as a strategy was to improve the quality of the study. The interpretivist's approach is often useful for gaining more in-depth knowledge of a phenomenon. Due the process of operationalization applied in positivism, some important aspects of the study might be overlooked; hence the case study was also used. Only one case study was used – for the reasons advanced in section 4.2.

4.3.2.4 The research choices or methods

The fourth layer of the research onion is the research choices or methods. The two most common research methods used in research study are the quantitative method and the qualitative method. The terms, quantitative and qualitative, refer to the data collection techniques and the data-analysis procedures employed in each method. In the quantitative research method, the data collected are usually collected in a numeric form; and the procedure used to analyse the data is also numeric (Saunders *et al.,* 2009).

In qualitative research, the data are collected in words (e.g. through an interview); and the data-analysis procedures followed are in the form of words, pictures or videos (Saunders *et al.*, 2009).

Both the quantitative and the qualitative data collection and analytical methods have their own strengths and weaknesses. Table 4.3 shows the differences between the quantitative and qualitative research methods. What is important to consider in the selection of the research method is the research question, as well as the objectives of the study. The results obtained in a research study are affected by the data-collection technique employed to obtain the data. Because the effect of the technique on the results cannot be ascertained, it is often recommended that different methods be used in one study, in order to counteract the method effect (Saunders *et al.*, 2009).

Table 4.3: The difference between quantitative and qualitative methods (Rudestan & Newton, 2007)

Quantitative Method	Qualitative Method
Data expressed in numbers	Data expressed in words
Hypothetico-deductive	Inductive
Controlled research situations	Naturally occurring and contextual
Isolation of operationally defined variables	Holistic view of phenomenon
Seeks objectivity	Interested in subjectivity
Emphasis on prediction and explanation	Emphasis on description, exploration, search for meaning
Researcher directs, manipulates, controls.	Researcher participates and collaborates.
Statistical analysis	Text analysis.

4.3.2.4.1 The reasons and the justification for the research method employed in the study

The main reason for adopting the quantitative method adopted in the study is because of the research questions and the objectives of the study (see section 4.2). Quantitative methods allow the "what" and the "how many" questions to be answered. The qualitative method was incorporated to improve the quality of the study (refer to section 4.2). The use of two methods in one study also enables the counteraction of the method-effect of each design.

4.3.2.5 The time horizon

The fifth layer of the research onion is the time horizon of the research. The time horizon refers to whether the study will be a cross-sectional study, or a longitudinal study. A cross-sectional study is concerned with the study of a phenomenon at a particular time; while the longitudinal studies refer to a study of a phenomenon over a period of time. Time horizons do not depend on the research strategy, or on the research method; and they may, therefore, be applied to any research strategy or method (Saunders *et al.*, 2009).

Cross-sectional studies are often undertaken where there are tight time constraints associated with the studies, such as may be found in an academic research study. As a result, the answers to the research questions may be obtained by using a survey (Easterby-Smith *et al*., 2008; Robson, 2002). Case studies and qualitative methods may also be used to obtain the data (Saunders *et al.*, 2009). The advantage of a longitudinal study is that a change and development of a phenomenon can be observed over a period of time (Saunders *et al.*, 2009).

4.3.2.5.1 The reasons and the justification for the research time horizon employed in the study

The research questions and the objectives were the main determinants of the time horizon for the study. The first and second questions of the research (refer to

section 4.2), seek answers for the current time. The answer to the third question (refer to section 4.2) is predicated upon the answers to questions one and two of the research question. Thus, the study falls under the cross-sectional time horizon. The other reason why a cross-sectional time horizon was chosen for the study is that the study was undertaken for academic purposes.

4.3.2.6 Data collection and data analysis

The six and seventh layers of the research onion are the data-collection and the data-analysis techniques of the research. In the following sections, the data-collection techniques and the data-analysis techniques are explained, including the strengths and weaknesses of each technique.

4.3.2.6.1 Quantitative Data-Collection Techniques

The most common techniques for the collection of the data for quantitative research are: observation; interviews; questionnaires; scales and physiological measurements (Offredy & Vickers, 2010). The data collected using the quantitative data-collection techniques must be able to be analysed numerically or statistically. Saunders *et al*. (2009) argue that any data-collection technique may be used in a quantitative and a qualitative study. Each of the quantitative data collection techniques is explained in the following paragraphs – except for the physiological measurement; since this is usually used in the health sciences (Offredy *et al.*, 2010).

4.3.2.6.1.1 Observation

Saunders *et al.* (2009) state that observation is "*...the systematic observation, recording, description, analysis and interpretation of people's behaviour*." For the data collected through observation to qualify as a scientific method, the observation must be structured in such a manner that it addresses the research problem, is methodically planned and conducted, uses valid controls, and its findings are reliable and valid. Observation involves the collection of data visually or through listening, reading, smelling and touching (Blumberg *et al*., 2008).

There are two types of observations, namely: participant observation and structured observation. Participant observation is qualitative; in that it seeks to discover the reasons for people's behaviour. Structured observation is quantitative; in that it seeks to determine the prevalence of those behaviours (Saunders et al., 2009). Table 4.4 provides the advantages and disadvantages of observation as a data-collection technique.

Table 4.4 The advantages and disadvantages of the observation technique of data collection (Saunders *et al.*, 2009)

Advantages	Disadvantages
It is good at explaining 'what is going on' in particular social situations.	It can be very time consuming.
It heightens the researcher's awareness of significant social processes.	It can pose difficult ethical dilemmas for the researcher.
It is particularly useful for researchers working within their own organisations	There can be high levels of role conflict for the researcher (e.g. 'colleague' versus researcher).
Some participant observation affords the opportunity for the researcher to the experience 'for real' the emotions of those who are being researched	The closeness of the researcher to the situation being observed can lead to significant observer bias
Virtually all data collected are useful	The participant observer role is a very demanding one, to which not all researchers will be suited
	Access to organisations may be difficult
	Data recording is often very difficult for the Researcher

4.3.2.6.1.2 Interview

Kahn and Cannell (1957) define an interview as a purposeful discussion between two or more people. Each interview is based on the premise that the participant is knowledgeable about the subject matter, that their world-view on the subject is important; and that it would make a meaningful contribution to the success of the study (National Science Foundation, 2002).

Interviews may be conducted face-to-face, or through a telephone, or through a survey. One of the strengths of a face-to-face interview and a telephone interview is that clarification and follow-up questions can be asked (National Science Foundation, 2002).

Interviews may be structured, or semi-structured, or unstructured. A structured interview makes use of a list of predetermined and "standardised" set of questions to conduct the interview (Kumar, 2011, Saunders *et al.*, 2009). One of the benefits of a structured interview is that the data collected are uniform; and they can be easily quantified (Kumar, 2011). Due to their structured nature, structured interviews do not make room for the topic to be explored further beyond the list of predetermined questions set by the researcher (Blumberg *et al.,* 2008).

Semi-structured interviews, as in a structured interview, would have a list of questions and topics that must covered in the interview; but the questions may not be the same for each interview (Saunders *et al.*, 2009). Unstructured interviews are flexible in terms of structure, contents and questions. The researcher is free to ask any question that may arise during the interview (Kumar, 2011). Both semi-structured and unstructured interviews are beneficial in gaining more insight in relation to the topic under study. However, questions of data reliability, bias, validity and generalisabilty often arise (Saunders *et al.*, 2009).

The general question on reliability is whether another interviewee would have obtained the same information (Easterby-Smith *et al.,* 2008*;* Silverman, 2007*)*. Two types of bias may emerge in a semi-structured, and in an unstructured interview: interviewer bias and interviewee bias. Interviewer bias arises when the manner in which the interviewer poses the questions to the participant influences the response of the participant (Saunders *et al.*, 2009). The way the interviewer interprets and captures the data may also introduce bias. The data may be interpreted and captured through the researcher's own subjective understanding and interpretation (Easterby-Smith *et al.* 2008).

Interviewee bias often occurs when the participant does not want to reveal certain information – for various reasons – such as confidentiality or personal reasons. This often creates an incomplete picture on the topic explored (Saunders *et al.*, 2009).

Interviews are time-consuming; and not many people are willing to participate in an interview leading to sample bias. Sample bias occurs when only a few people are willing to participate in the interview (Saunders *et al.*, 2009). Yin (2003) states that

sample bias does not allow for statistical generalization or extrapolation to be made on entire populations.

The data gathered in a structured interview are usually gathered for quantitative research; whereas the data gathered in a semi-structured interview or a structured interview may be used for both quantitative and qualitative research methods (Kumar, 2011).

Saunders *et al.* (2009) recommend a semi-structured and unstructured interview for an exploratory study for gaining an in-depth insight of the phenomena. Structured interviews are more suitable for descriptive studies; as general patterns can be identified. Semi-structured interviews are suitable for understanding the relationships between variable; and thus, they are suitable for explanatory studies (Saunders *et al*., 2009).

Table 4.5 shows the advantages and disadvantages of interviews as a data-collection technique.

Table 4.5 The advantages and disadvantages of interviews (Kumar, 2011)

Advantages	Disadvantages
More suitable for complex situations	Expensive and time-consuming
Beneficial in gathering in-depth information	The quality of data depends on the quality of the interaction
Information gathered can be supplemented	The quality of data depends on the quality of the interview
Questions can be explained and clarified	The quality of data may vary when multiple interviewers are used.
Interviewing can be used in almost any type of population.	Researcher bias may be introduced

4.3.2.6.1.3 Questionnaires

Kumar (2011) defines a questionnaire as, "…*a written list of questions, the answers to which are recorded by the respondents*." Unlike in an interview, where the researcher asks and records the responses to the questions, in a questionnaire, the responses to the questions are recorded by the participants (Kumar, 2011). Questionnaires are common in survey-strategy research (Saunders *et al.*, 2009).

There are various types of questionnaires, including self-administered questionnaires, interviewer-administered questionnaires, telephone-administered questionnaires and structured-interview questionnaires (Saunders *et al*., 2009).

Self-administered questionnaires are usually administered electronically through the internet, postal mail, or delivered by hand. Interviewer questionnaires are when the researcher records the responses of each interviewee, based on their response to the questionnaire. Telephone interviews are administered via the telephone (Saunders *et al*., 2009). Structured interviewed are explained in section 4.3.2.6.1.2.

Each type of questionnaire has its own advantages and disadvantages. Table 4.6 shows the advantages and disadvantages of questionnaires.

Table 4.6 The advantages and disadvantages of a questionnaire (Kumar, 2011; Assessment Capacities Project, 2012)

Advantages	Disadvantages
Less expensive	Applicable to literate populations
Provides greater anonymity	Response rate low
Large amount of amounts of data can be gathered from a large population in a short time.	Self selecting bias
Can be administered by researcher or a number of other people without affecting its validity and reliability	No opportunity to clarify questions
Results can be easily and quickly quantified by the researcher or by the use of computer-aided software.	Spontaneous responses not permitted
Results can be analysed more scientifically and objectively Than other forms of research.	The response to a question may be influenced by responses to other questions.
After data has been analysed, it can be used to compare and contrast other research and used to measure change.	Possibility of consulting other respondents is high.
	Responses cannot be supplemented with other information.

4.3.2.6.1.4 Scales

Blumberg *et al.* (2008) define scaling as, "… *a procedure for the assignment of numbers (or other symbols) to a property of objects, in order to impart some of the characteristics of numbers to the properties in question*." Certain characteristics of the participants, such as their perceptions and attitudes, can be measured through the use of scales. Participants in the study act as judges of the characteristics being measured (Blumberg *et al.*, 2008).

There are three types of measurement scales: rating, ranking and categorization. In rating scales, the participants score an object without comparing it with another. In ranking scales, the participants are constrained to compare an object with another

object. Categorization is where participants are asked to place themselves or a property in groups or categories, such as gender or in age groups (Blumberg *et al.,* 2008).

The main advantage of using scales is that abstract objects or concepts can be "measured". The most popular rating is the Likert scale. The Likert scale is used to measure the opinions of the participants by indicating how strongly they agree or disagree with a statement or series of statements on a four-, five-, six- or seven-point rating scale (Saunders *et al.*, 2009).

Scales may produce errors in the data. The most common errors associated with rating scales are leniency, central tendency, and the halo effect. Leniency error occurs when the participants are more inclined to score people they know more highly, and to score acquaintances lower. Central tendency errors occur where the participants avoid giving extreme scores. The halo effect is introduced when participants' generalised impressions of the subject are carried from one rating over to another (Blumberg *et al.,* 2008).

4.3.2.6.2 Qualitative Data-Collection Techniques

Saunders *et al.* (2009) caution against the classifying of data-collection techniques in either the qualitative or quantitative research method. Data-collection techniques that involve direct engagement with the individuals on a one- to-one basis, or engagement with the individuals in a group setting, are usually regarded as qualitative in nature (University of Leicester, 2009). What determines how a technique is applied is the research question and the research objective.

If the technique is applied in a structured manner, it may be regarded as quantitative; and if it is applied in a semi-structured or unstructured manner, it might be regarded as qualitative.

The main benefit of a qualitative method is that the data collected provide a richer and more in-depth insight into the phenomenon being studied than in a quantitative study. Because the collection of the data in a qualitative study is time- consuming;

they are usually collected from a small sample. The disadvantage of a qualitative study is, therefore, time-consuming and expensive (University of Leicester, 2009).

According to the University of Leicester (2009), the four main methods for qualitative data collection are:

1. Individual interviews;
2. Focus-group interviews;
3. Observations; and
4. Action research.

Action research, interviews and observations were discussed in sections 4.3.2.3.5, 3.3.2.6.1.2 and sections 4.3.2.6.1.1, respectively. In the following section, only the focus-group data-collection instrument will be explained (University of Leicester, 2009).

4.3.2.6.2.1 Focus Groups

A focus group is a group interview; where 4 to 12 participants, who share some characteristics relevant to the study, are interviewed in a group setting (National Science Foundation, 2002, Saunders *et al.*, 2009). In a focus group, both observation and interviews are combined. The focus group is very popular in market research; although it may also be used in other fields (National Science Foundation, 2002).

The main advantage of the focus group technique "… *is the explicit use of the group interaction to generate data and insights that would be unlikely to emerge otherwise"* (National Science Foundation, 2002). The main disadvantage of the focus-group method is that the responses of the participants might influence each other; and the views of the majority would then become predominant (Blumberg *et al.*, 2008).

4.3.2.6.2.2 The reasons and the justification for the data collection chosen for the study

The data-collection techniques chosen for the study were informed by research questions and objectives. As PPPs are still in their infancy stage in South Africa, there is no database that captures the number of quantity surveyors who have participated in PPPs. The South African Council for the Quantity Surveying Profession's (SACQSP) database only captures the number of quantity surveyors in South Africa. It does not provide any information on whether quantity surveyors have participated in certain type of projects, or not. Given the lack of such a database, the best way to determine the number of quantity surveyors involved in PPPs was to ask them via a questionnaire.

According to Kumar (2011), one of the best ways of administering a questionnaire is through a captive audience, for example, to students in a lecture hall, or to people attending a seminar. This type of questionnaire administration is then called collective administration. Not only is the response rate; high but the questions in the questionnaire can then be explained to the audience (Kumar, 2011). The limited time-frame and geographical location of the researcher precluded the researcher from administering the questionnaire to a captive audience. The self-administered questionnaire was preferred, rather than the interviewer-administered questionnaire, telephone questionnaires and the structured interviews, because of its cost-effectiveness and speed. Section 4.4.1.1 expounds further on why the self-administered questionnaire was selected in preference to the other types, and how its weaknesses were mitigated in the study.

Personal interviews, telephone interviews and self-administered interviews were conducted for the case study – mainly to gain more insight into what PPPs are in South Africa; and how they are implemented. Further explanation on how the three types of interviews were conducted is provided in section 4.6.2.

Observation, focus-groups, action research were deemed unsuitable for the study, due to their irrelevance in answering the research question and meeting the

objectives of the study. The Likert scale was incorporated in the questionnaire, for the reasons given in section 5.5.

4.3.2.6.2.3 Quantitative data analysis

The data that are collected in a raw form must be processed and analysed, in order for them to have relevance to people (Saunders *et al.*, 2009). Quantitative data analysis includes the use of deductive methods, descriptive statistics and inferential statistics (The Assessment Capacities Project, 2012). The use of graphs, charts and statistics in quantitative data analysis makes it possible for the data to be presented and described, in such a manner, that the relationships and any trends can be examined (Saunders *et al.,* 2009).

The advancement of technology has rendered quantitative-data analysis simpler and less time-consuming. SurveyMonkey and Microsoft Excel were used in the analysis of the data in this study. Further discussion on the incorporation of SurveyMonkey in the data analysis of the study is provided in section 4.7.1

4.3.2.6.2.4 Qualitative data analysis

Qualitative data are usually analysed through conceptualization and the use of narratives to explain the relationships. Before the data can be analysed, they are usually summarized, categorized and structured (Saunders *et al.*, 2009). Generalisations are made from general ideas, themes or concepts (Neuman, 2014).

Qualitative data-analysis techniques include typology, taxonomy, constant comparisons (grounded theory), analytical induction, logical analysis or matrix analysis, quasi-statistics, event analysis or micro-analysis, metaphorical analysis, domain analysis, hermeneutical analysis, discourse analysis, semiotics, content analysis, phenomenology/heuristic analysis and narrative analysis (Ratcliff, 2004). Qualitative data techniques are time-consuming and laborious, usually requiring extensive reading and contemplation (Schutt, 2011). One of the strengths of

qualitative data analysis is that the influence of context over phenomenon is made apparent (Patton, 2002).

4.3.2.6.2.5 The reasons and the justification for the data analysis chosen for the study

Quantitative data gathered through the survey were analyzed by using SurveyMonkey; and Excel was used to analyse the survey results statistically. The reason for using computer software for the data analysis was because analysing data by hand is error-prone and time-consuming (Saunders *et al.*, 2009).

Narrative-conceptualization data analysis was used to analyse the qualitative data collected via the interviews. Narrative data analysis is the study of an individual's speech; and it uses observations and interviews to follow the participants' trails (Ratcliff, 2004). The data for the case study were collected mainly through interviews. Compared to the other forms of data analysis, it was the most appropriate data analysis technique to use for the study. The other types of qualitative data-analysis methods were deemed to be unsuitable for the study.

The next sections of this chapter focus on how the data were collected and analysed in this study.

4.4 The Instruments of measurement

4.4.1 Web-based Survey

To investigate the involvement of quantity surveyors in PPPs in South Africa, a web-based survey was undertaken. It is important to have a good questionnaire; since poorly formulated questions lead to poor results; and this could pose challenges in the data analysis (Flick, 2011). The research questionnaire was developed by the author; and the promoter evaluated it before it was approved for distribution by the ethics committee of the Faculty of Engineering, Built Environment and Information Technology of the University of Pretoria.

Three types of fixed-alternate questions were used in the questionnaire, namely: dichotomous questions, multiple-choice questions, and the Likert scale (Mitchell *&* Jolley, 2013). There were some questions that the researcher believed required a "yes" or "no" type of response; hence the use of dichotomous questions. Dichotomous questions can provide authentic and valid data (Mitchell *et al*., 2013). Other questions provided more than two alternative responses; while others gauged the perceptions of the participants – thus, the use of multiple-choice questions and the Likert scale.

The questionnaire was distributed to quantity surveyors in South Africa via the ASAQS's website, and via emails sent to quantity surveyors by the researcher (i.e. purposive sampling). The questionnaire sought to highlight the following information:

- Background information;
- The level of knowledge and participation in PPPs
- The traditional and non-traditional roles of quantity surveyors;
- Perceptions regarding the education and competency of quantity surveyors; and
- Further education.

4.4.1.1 The advantages of Online Surveys

Online surveys provide savings in cost and time. There are no printing and postage costs involved. There is time saving; since they can be easily accessed and distributed by the click of a button. Secondly, they are user-friendly. Participants can easily move from one section to the other, and make corrections easily. Thirdly, they eliminate spatial and logistical problems. Potential participants can be reached over longer distances without the concern of: "How the data are going to be distributed and collected." Lastly, the responses tend to be of high quality; as the data are produced in an electronic format, instead of in handwriting (Flick, 2011).

Because of the advantages mentioned above, the researcher was persuaded to use an online survey.

4.4.1.2 The disadvantages of Online Surveys

The rate of response of online surveys can be low. One of the reasons for the low response rate can be attributed to the fact the survey can only reach the population that is already online. Secondly, if the potential participants have misgivings regarding the anonymity of the survey, they may decide not to respond. Thirdly, there may be multiple responses from one respondent (Flick, 2011).

To overcome the problem of the low response rate, and in posting the survey on the website of ASAQS, the researcher sent emails to the potential participants. Regarding the issue of anonymity, the covering letter clearly addressed the issue of anonymity. In addition, the software programme used to administer the questionnaire, SurveyMonkey, allows for participants to respond anonymously. The issue of multiple responses was dealt with during the data analysis. Each individual response was scrutinized. However, it is possible that an error of multiple responses could have been missed.

4.4.2 Case-Study Design

Yin (2014) provides three circumstances where a case study would be the favoured research instrument of measurement. They are:

1. When the “how” or “why” are the main research questions;
2. Where the behaviour of the events is beyond the control of the researcher; and
3. When a current issue is being studied (Yin, 2014).

One part definition of a case study is; “…*a case study investigates a contemporary phenomenon (the case), in its real-world context, especially when the boundaries between [the] phenomenon and [the] context may not be clearly evident*” (Yin, 2014).

The second part of the definition is concerned with case-study design and the data-collection process.

"*A case-study inquiry:*

- *copes with the technically distinctive situation in which there would be many more variables of interest than data points; and where one result*
- *relies on multiple sources of evidence, with the data needing to converge in a triangulation fashion; and as another result*
- *benefits from the prior development of theoretical propositions to guide the data collection and analysis*" (Yin, 2014).

According to Yin's (2014) twofold definition of a case study, and given that PPPs are relatively new in South Africa, undertaking a case study to investigate how they are implemented in a real-life context in South Africa, was ideal for the research study.

4.4.2.1 Advantages of Case Studies

Unlike the other research strategies, the case study strategy's main advantage is that it depends on several sources of evidence to substantiate its findings (Blumberg *et al*., 2008). Documentation, archival records, interviews, direct observation, participation observation, and physical artefacts are the six sources of evidence recommended for case-study research (Yin, 2014).

For the purposes of this research, interviews were used. Direct observation, participation observation, and physical artefacts are not applicable to this research project. They are usually applicable in sociological studies (Nyagwachi, 2008). As PPPs in South Africa are still in their infant stage; there were no archival records available for this particular case.

4.4.2.2 The disadvantages of Case Studies

One of the limitations of a case study research is that it only provides valuable information when it is properly conducted. The conclusions drawn from a case study can only be generalized to theoretical propositions – but not to populations. Case study research requires more effort; as the data are gathered from many sources (Blumberg *et al*., 2008).

The measures employed to improve the quality of the case study are mentioned in section 4.6 of this chapter.

4.5 The selection of sample design and sampling methods

4.5.1 Sample size for the survey

A sample is defined as; "… *a selected small collection of cases or units that closely reproduces features of interest in a larger collection of cases, called [the] population*" (Neuman, 2012). The task of choosing a sample from a larger group to use as a base for predicting unknown information or results concerning the larger group is called sampling (Kumar, 2011).

There are advantages and disadvantages to sampling. The advantages include savings on money, human resources and time. The disadvantages are that one can only predict, but not determine, exactly the behaviour or characteristics of the population (Kumar, 2011).

The sample size and the extent of variation in the sampling size can affect the conclusions drawn from the sample. The general rule-of-thumb in determining the correct sample size is: The bigger the size, the more accurate the estimate (Kumar, 2011).

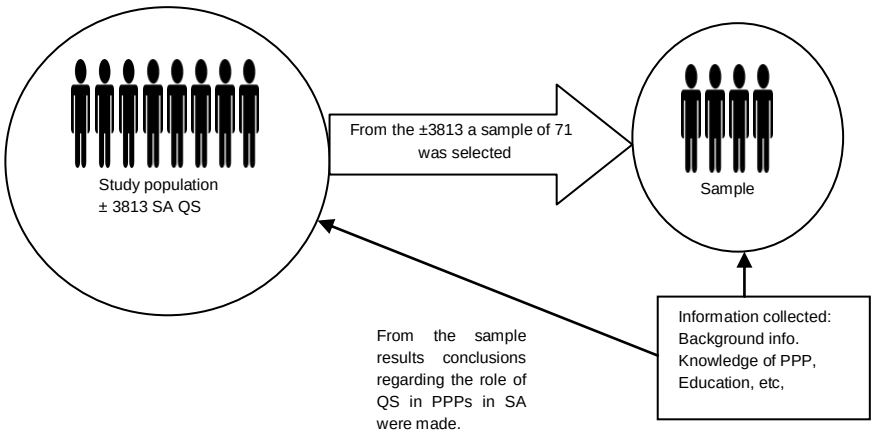

Figure 4.2: Sampling of South African Quantity Surveyors (Adapted from Kumar, 2011)

The study population of the research is limited to the South African quantity surveyors, both the non-registered and registered quantity surveyors in terms of the South African Quantity Surveying Act of 2000. There were 3813 quantity surveyors registered on the SACQSP database as at 31st December 2014 (SACQSP, 2015).

Flick (2011) argues that not every study needs a sample that is as closely representative of the population at large as possible. The sample would be regarded as adequate – only if it avoids gross generalization in its inferences (Flick, 2011). According to statisticians, a sample size of 30 or more usually yields a mean distribution that is very close to a normal distribution (Saunders *et al.,* 2009). Based on the foregoing, a sample of at least 70 quantity surveyors was deemed sufficient for the purpose of the research (refer to Figure 4.2). From the 71 survey respondents, 21 or 30% of the respondents indicated that they had previously participated in PPPs.

Small sample sizes are those between 5-30 participants. FMRI, laboratory animals and usability studies use small sample sizes (Sauro, 2013). Sauro (2013) states that, "…*statistical analysis with small samples is like making astronomical observations with binoculars.*" Although small sample sizes can be used in a research study, they limit the researcher to seeing big differences or big effects only

(Sauro, 2013). In analysing the research findings in Chapter 5, the effects of the small sample size were borne in mind.

4.5.2 The selection of the Case Study

Yin (2014) recommends that researchers should decide, before any data are collected, whether they are going to use a single case or a multiple-case study for the study. It was the intention of the researcher to undertake three case studies; since multiple-case studies' evidence is considered more convincing (Herriot & Firestone, in Yin, 2014). However, for the reasons provided in section 4.2 of this chapter, and section 1.8 of Chapter 1, a single case study was selected instead.

The use of a single case study is justifiable under certain circumstances. Yin (2014) distinguishes between five types of a single-case study, namely: the critical; the unusual; the common; the revelatory; and the longitudinal case.

A critical single study case is appropriate where, "… *the selected case can represent the critical test of a significant hypothesis*". An extreme single study case "…*is where the case represents an extreme or unusual case that deviates from the theoretical norms – or even [from] everyday occurrences*". A common single case study, "…*can represent the usual everyday occurrences with the objective of yielding valuable lessons for the theoretical interest*".

A revelatory single case study is, *"… where the researcher has access to a situation, which was previously inaccessible to empirical evidence*". The longitudinal single case study is where the same single case is studied, but at two or more different points over a period of time (Yin, 2014).

The case study selected for the study falls into the common case-study category. The objective for selecting the DBE PPP for accommodation in this study is that the project is regarded as one of the most successful PPPs accommodation projects in South Africa. Secondly, quantity surveyors are more likely to be involved in PPP for accommodation – than in any other type of PPP; since accommodation represents a large part of their work.

4.6 Data-Collection Procedures

4.6.1 Data-Collection Procedures for the Online Survey

The data were collected through SurveyMonkey, an online survey software programme that allows one to undertake online surveys.

After the request to distribute the questionnaire through the SACQSP website was declined, on the grounds that the SACQSP distributes surveys for doctoral studies only, the ASAQS was approached with a similar request. The request was granted. The researcher also distributed the questionnaire via email. The potential participants' email addresses were solicited from the ASAQS' centenary book, personal database, and from the internet. The email referred them to the website, where they could participate in the survey (see Annexure 1 for a copy of the email sent).

The online survey was accompanied by a covering page explaining the objective of the study. The potential participants were informed that the survey was approved for distribution by the University of Pretoria's Ethics Committee, and that the survey was anonymous and voluntary (refer to Annexure 2 for a copy).

The survey was posted on ASAQS' website from the 23rd October 2014. ASAQS has 10 900 subscribers. The researcher sent 127 emails to potential participants on the 23rd October 2014. Another email with 760 new potential participants was sent. 154 emails bounced. Reminders were sent on the 4th and 11th November 2014. Initially, the survey was planned to be open for participation for two weeks from 18th October 2014 until 1st November 2014; however due to poor initial response, the survey was extended by another week.

There were two more respondents who participated, in the survey in spite of missing the deadline. Their responses were included with the results; as their responses were deemed to be valuable.

4.6.2 Data-Collection Procedures for the Common Single Case

Yin (2014) recommends four principles for data collection in case study research design; these are: "*The use of multiple sources of evidence*"; "*the creation of a case study database*;" "*the maintenance of a chain of evidence*;" and "*caution when using data from electronic sources*" (Yin, 2014).

Blumberg *et al.* (2008) maintain that a case-study research from one source of evidence only cannot be regarded as a valid case study. However, Yin (2014) states that a case study design with one source of evidence is acceptable, even though this is not generally recommended (Yin, 2014).

As stated previously in section 4.4.2.1., PPPs are fairly new in South Africa; there is a limited amount of documents and archives available. Hence, the case study design for the study relied heavily on interviews. The documentation used was limited; and most of the information solicited from the documents applied generally to PPPs in South Africa – and not specifically to the case selected for the study.

The following four main participants in the selected PPP were interviewed for the study:

- The project officer for the public entity;
- The transaction advisor from the technical team;
- The representative from the private party; and
- The quantity surveyor for the transaction advisor.

All the participants were contacted via telephone and emails. The researcher attached two letters, one from the researcher, and one from the study leader, requesting permission for an interview, and also explaining what the objective of the research was (See Annexure 3 for copy of letters). The interviews were semi-structured and unstructured. Blumberg *et al.* (2008) recommend both semi-structured and unstructured questions for such a single case study.

The semi-structured questions were used to direct the interviewee in the right direction. The researcher sent the interviewees questions via email before the

interview. The purpose was to prepare the interviewees, and to allow them to prepare for the interview. During the interview process, the researcher started with the specific questions considered to be relevant for the study; and then the interviewees were allowed to give additional information if they thought this fit.

Unstructured questions allow respondents to answer the questions in a manner with which they are comfortable. It was via unstructured questions that more insight was gained on PPPs in South Africa, and the role that quantity surveyors play in South Africa (Blumberg *et al.*, 2008).

The researcher conducted personal interviews, telephone interviews; and she obtained information through self-administered email questions or questionnaires. The selection of which interview to conduct was guided by: cost, time constraints, preference and convenience.

During personal and telephone interviews, the data were collected through note taking. Audio-recording was avoided; since it might make the interviewees uncomfortable, and thereby jeopardize the quality of the interview (Blumberg *et al.,* 2008).The data collected are presented in Chapter 5.

Where the potential participants could not participate in personal or telephone interviews, they were sent a questionnaire or written questions via email (see Annexure 4 for the questions). The data were thus collected via email. The interviewees were given the liberty to respond to the specified questions, or to answer in a manner which they felt comfortable with. This was to allow the interviewee to add information of which the researcher might not be aware, and to also improve the quality of the data collected.

4.7 Data-Capturing and data-editing

4.7.1 Data-Capturing and data-editing for the Online Survey

Mouton (2011) considers the following as being some of the common errors associated with data-capturing: capturing errors; post-coding errors; too many

missing values; and the omission of data-validation procedures. To minimise all these common errors in data capturing, SurveyMonkey, was used.

As stated in section 4.6.1, SurveyMonkey is an online survey software programme that allows one to undertake online surveys. The programme automatically analyzes the data received. The data can be exported in Adobe PDF, Microsoft Excel, Microsoft PowerPoint and other analytical software programs.

The researcher exported the data in Adobe PDF format. If the data had too many missing values, they were then regarded as incomplete. From a total of 80 responses, 9 responses were considered to be incomplete. All the incomplete responses were rejected from the data-analytical process.

After the data had been exported, the researcher extrapolated the data onto Microsoft Excel. The results were sent to a statistician at the University of the Witwatersrand for verification.

4.7.2 Data-Capturing and data-editing for the Case Study

As stated in section 4.6 above, personal interviews, telephone interviews and self-administered interviews were conducted. During the personal and telephone interviews, the researcher took notes. After the data had been captured onto Microsoft Word, the notes were sent by email to all the interviewees for correction and verification. The data were analyzed only after they had been corrected by the interviewees.

Case identity is an important factor to consider when capturing and presenting data in case studies. The best option, according to Yin (2014), is to disclose the identity of the case and the participants in the case study. Anonymity may be necessary where the case study addresses a controversial issue. In this case, both the case and the participants could be kept anonymous. Where the subsequent actions of the participants may be affected by the research report, two compromises should be considered. The first compromise is to disclose the case, but keep the identities of the participants anonymous. The second compromise is to include the list of all those

individuals who participated in the case study, without attributing any view to any particular individual (Yin, 2014).

The researcher decided to choose the first compromise, that is, to disclose the name of the case, but to keep the participants anonymous. The reason for this choice was that in the second compromise it is possible for certain comments to be inferred as coming from certain participants.

4.8 The Data Analysis

According to Neuman (2014), the data analysis is the systematic arrangement, integration and examination of data in search of patterns and relationships in the distinct details. Through data analysis, the data can be related to a specific hypothesis, support generalization, and connect trends or themes, and thereby improve understanding, expand theory, and advance theory and knowledge (Neuman, 2014).

Section 4.8.1 explains how the data analysis was conducted for the survey; and Section 4.8.2 explains how the data analysis for the case study was conducted.

4.8.1 Data Analysis for the Online Survey

As stated in section 4.7.1, SurveyMonkey was used to capture and to analyze the data. Data coding was automatically done by the software. However, the researcher checked the data using Microsoft Excel. After they had been verified by a statistician, the evidence was then presented in bar charts to give theoretical meaning to the results (Neuman, 2014).

The above method was also applied to the secondary information deduced from the data received.

4.8.2 Data Analysis for the Case Study

Qualitative data analysis was used to analyze the case-study results. The data were analyzed using narrative conceptualization. Conceptualization is defined, "*… as a means of arranging and understanding data by organizing [the] data through themes, concepts, or similar features*" (Neuman, 2014).

The researcher arranged the data collected from the interviewees into themes, and then presented them in tabular form. The results are also explained in the following paragraphs based on the research hypotheses.

4.9 Shortcomings and Sources of Error

4.9.1 Shortcomings and Sources of Error for the Online Survey

As stated previously in section 4.7.1 of this chapter, SurveyMonkey was used to minimize the errors associated with data capturing. However, online surveys are also error-prone.

Face over-coverage error occurs where people who are not part of the target population respond to the questionnaire (Flick, 2011). Not all ASAQS subscribers are quantity surveyors; and there is a possibility that some respondents may not be quantity surveyors. In order to minimize this error, the researcher sent emails to quantity surveying firms, and individual quantity surveyors only.

Since online surveys are self-administered, the participants might misinterpret the question, and thereby answer a different question to that which is being asked (Mitchell *et al*., 2013). The researcher avoided ambiguous questions; and where there was a possibility that questions could be misinterpreted, definitions were given. Furthermore, the questionnaire was distributed beforehand to six people for comments (Mitchell *et al*., 2013).

4.9.2 Shortcomings and Sources of Error for the Case Study

As stated before in section 4.4.2.1, a case study is dependent on many sources of evidence. For the reasons already advanced in sections 4.4.2.1 and 4.6.2, only interviews were conducted. In addition, the case-study design was used in conjunction with the survey design, in order to ascertain various view-points.

Each type of interview has its own advantages and disadvantages. While personal interviews allow the researcher to ask follow-up questions, and to enjoy personal interaction with the interviewee, they also have disadvantages. Verbal and non-verbal gestures may influence the interviewees' response. Interviewees may give socially correct answers – in an attempt to impress the interviewer.

Personal interviews are more time-consuming, and can be expensive, depending on the geographic location of the interviewees (Mitchell *et al*., 2013). To reduce the problems of cost and time, telephonic and self-administered interviews were conducted. The interviewees were given the recorded data to verify after they were captured, in order to improve the quality of the data.

Telephone interviews are less expensive; and geographic constraints are not a big factor; as telephone or online calls are generally less expensive than travel cost. Furthermore, the problem of interviewer bias, and the problem of socially correct answers mentioned above are less of a factor. However, one of the major limitations of telephonic response is that they limit the type of questions that can be asked. With a telephone interview, only simple and short questions can be asked; as the interviewee may be distracted by his environment.

The other disadvantage is that of telephone receiver identity. The interviewee might be interviewing an impostor; since there is no way of seeing the respondent (Mitchell *et al*., 2013). The problem of respondents' identity is also present in self-administered interviews. The researcher was able to verify the interviewees' identity by checking their online LinkedIn profile information. However, some interviewees have a low online presence; and hence no identity verification could be done. The interviewer was able to verify the answers by repeating the answers back to the

interviewee; and the notes of the interview were then sent to the interviewee for further verification.

Self-administered interviews' advantages and disadvantages are similar to those of online surveys. Errors were minimized, as in section 4.9.1**.**

4.10 Summary

In this chapter, the design and methods of the research were discussed and explained. The advantages and disadvantages of the survey and case study were given. The rationale for choosing the survey and the case as research designs for the study was also articulated.

In the next two chapters, the results of the survey and the case study are presented and analyzed.

Chapter 5
Presentation and Discussions of Survey Results

5.1 Introduction

In Chapter 4, the design and methodology, including the shortcomings and errors of the data, were discussed. In Chapter 5, the results of the survey will be presented and discussed with reference to the research questions, the research hypotheses and the literature review. The case-study results will be presented in Chapter 6.

5.2 Questionnaire Results

5.2.1 Section 1: Background Information

The objective of soliciting the background information of the respondents was to determine whether the size of the firm, the geographic location, the economic sector of the firm, and the career experience of the respondents were determinants of participation in PPPs.

The objective of section 1 was to test the **hypothesis** that states that only quantity surveyors with many years of quantity-surveying experience, from big private quantity-surveying firms in more economically developed provinces would be likely to participate in PPPs.

Question 1: Size of organization: How many people are employed in your organization (local branch only, if there is more than one branch)?

The aim of question one was to determine the size of the respondents' organizations. PPPs projects are usually regarded as big and complex projects of high monetary value. Question one's purpose was to find out whether most quantity surveyors engaged in PPP were from big firms or from smaller firms. The researcher wanted to test the hypothesis that bigger firms are more likely to participate in non-

traditional quantity-surveying roles, as they have more resources with which to do so than smaller firms.

Figure 5.1 shows that most of the respondents are from smaller firms. As many as 49 per cent of the respondents are from firms that employ no more than five people. One plausible explanation for the result could be attributed to the fact that most quantity surveyors work for small quantity surveying firms.

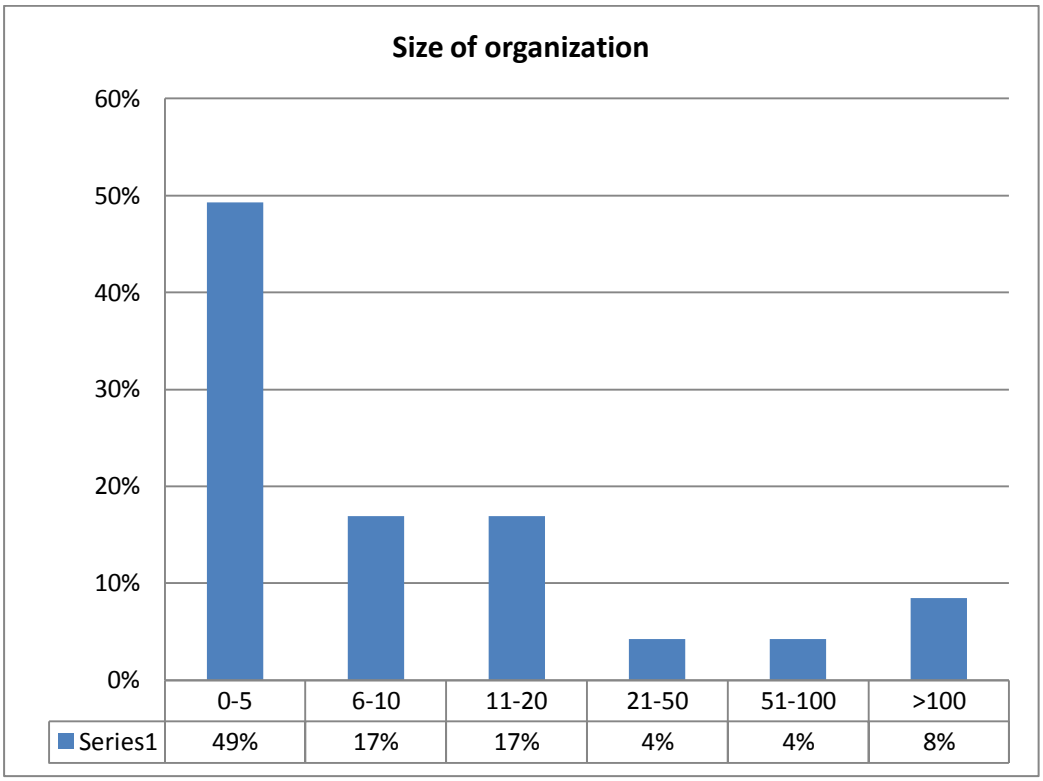

Figure 5.1: Size of organization

From Question 7 of the questionnaire, 21 of the 71 respondents had worked in PPPs before. Figure 5.2 shows that of the 21 respondents who have worked in PPPs, 33% or 7 of them were from firms that do not employ more than five people. A total of 29%, or 6 respondents, and 24% or 5 respondents, were from firms that employ11- 20 or 6-10 people, respectively.

From results of Figures 5.1 and 5.2, we may deduce that the size of the firm is not a determinant of participation in PPPs.

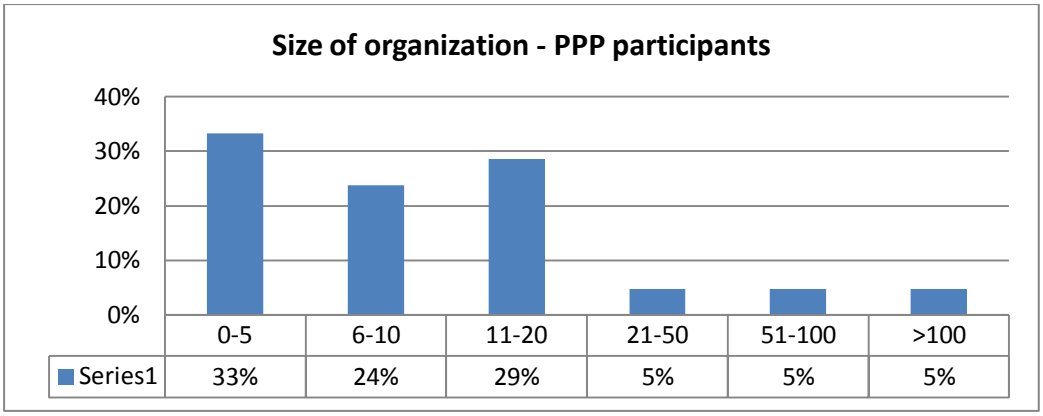

Figure 5.2: Size of organization for PPP participants.

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Question 2: Location: In which province in the RSA is your organisation located (the local branch, if there is more than one branch)?

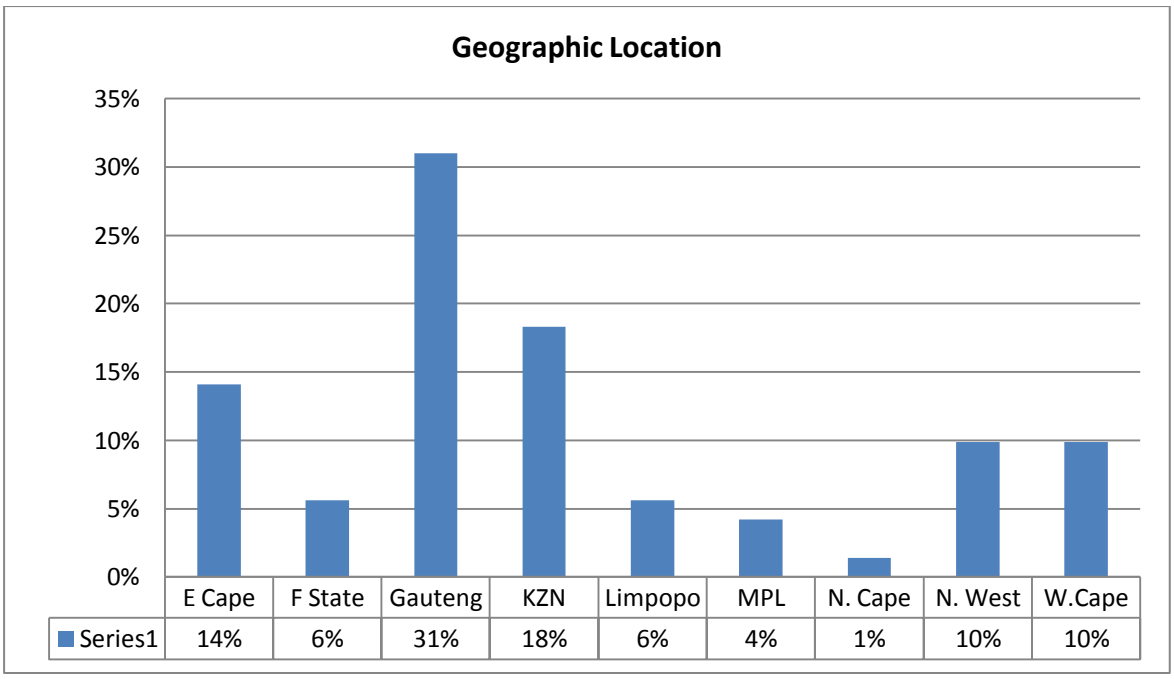


Figure 5.3: Geographic location of practices

The purpose of question 2 was to determine whether the respondents from more economically active provinces were more inclined to participate in PPPs than those from provinces that were less economically active. According to StasSA (2013); Gauteng, KZN and the Western Cape contributed 34,7%, 15,8% and 14,0%, respectively, to the country's economy in 2012. While for the same period, the Northern Cape, the Free State and North West province contributed 2,2%, 5,2% and 6,4%, respectively (StatsSA, 2013).

According to Figure 5.3, the majority of the respondents were from Gauteng (31%). These figures are to be expected; as Gauteng is the economic hub of South Africa. It would, therefore, be expected to have the most quantity surveying firms located in Gauteng. The lowest number of respondents are from the Northern Cape, which has the lowest population in South Africa, and would therefore have fewer quantity surveying firms (1%).

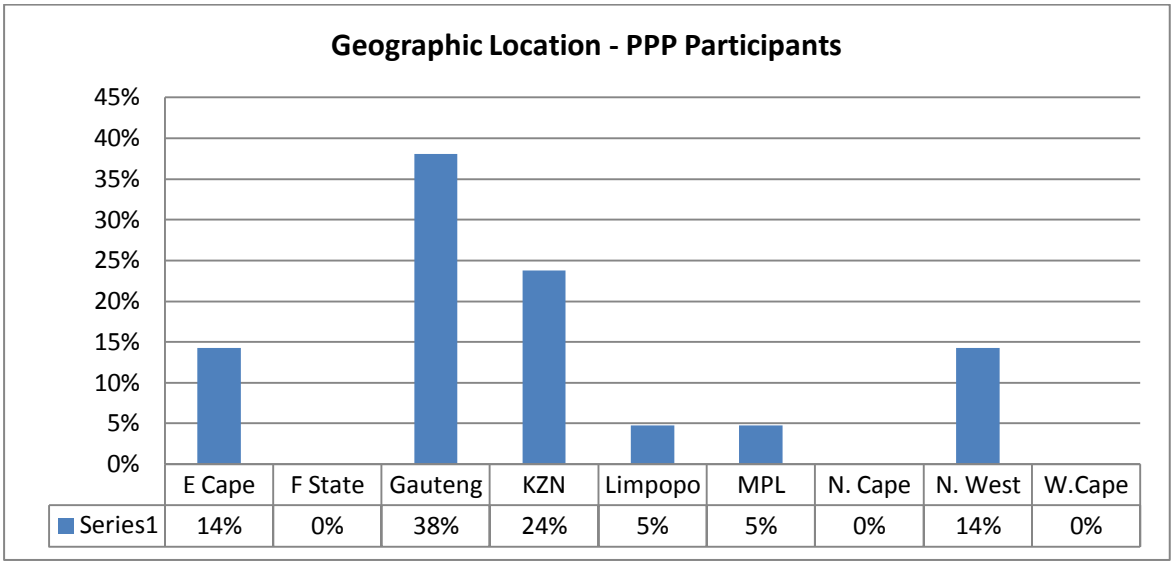


Figure 5.4: Geographic location of practices that have participated in PPPs

Figure 5.4 shows the distribution of those respondents who have participated in PPPs, according to their geographic location. Most participants in PPPs are from Gauteng (38%), KZN (24%), with the North West (14%) and the Eastern Cape (14%) sharing the third position. These figures are somewhat consistent with the hypothesis that most PPP participants are from more economically developed provinces.

Question 3: Economic sector: Indicate the economic sector in which the main activity of your company falls.

The question sought to determine whether the economic sector in which the participants were involved played any role in PPP participation. The hypothesis to be tested was: Most PPP participation would be from private quantity surveying firms; as private sector skills can easily be transferred to other sectors of the economy. For

instance, quantity surveyors in property development may be restricted to undertaking work in the property sector only.

Figure 5.5 shows that the majority of the respondents were from private quantity surveying firms (75%). This may be an indication that the majority of quantity surveyors are employed in private practice.

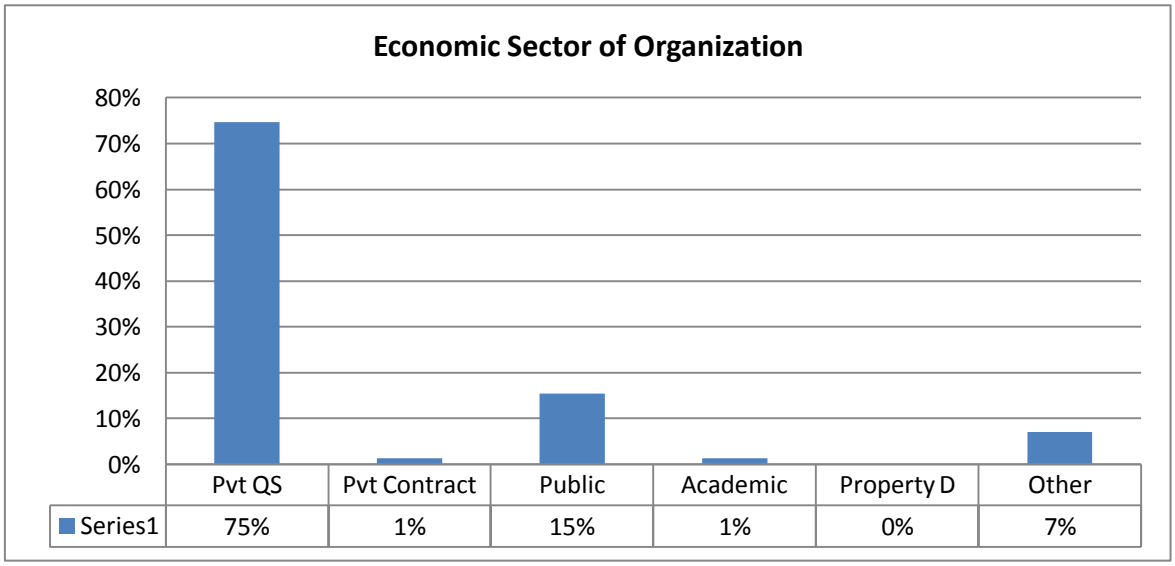


Figure 5.5: Economic sector

Figure 5.6 indicates that the majority of the participants in PPPs are from the private sector (71%), followed by the public sector (24%) and private contracting (5%). These results are consistent with the results in Figure 5.5 above**.**

It is, therefore, correct to assume that most participants in PPP would be from private quantity surveying firms. There are two reasons for this assumption. Firstly, the majority of quantity surveyors are employed in private quantity surveying firms. Secondly, quantity surveying skills in private quantity surveying firms can be easily transferred to other sectors. They are not sector-specific.

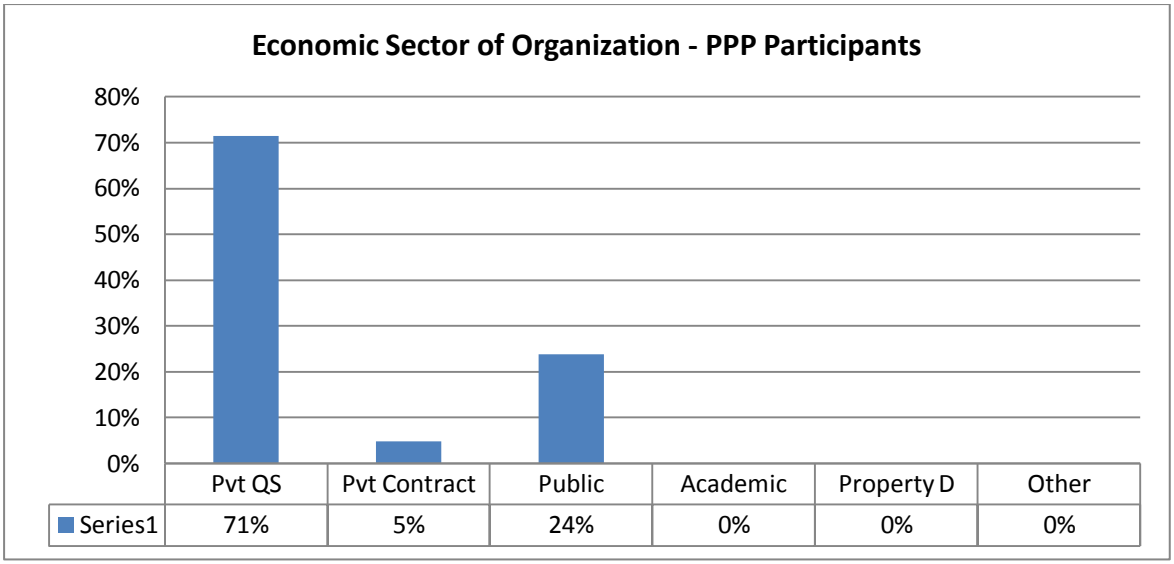


Figure 5.6: The Economic Sector – PPP Participants

Question 4: Career Experience: Indicate the number of years in the quantity surveying profession.

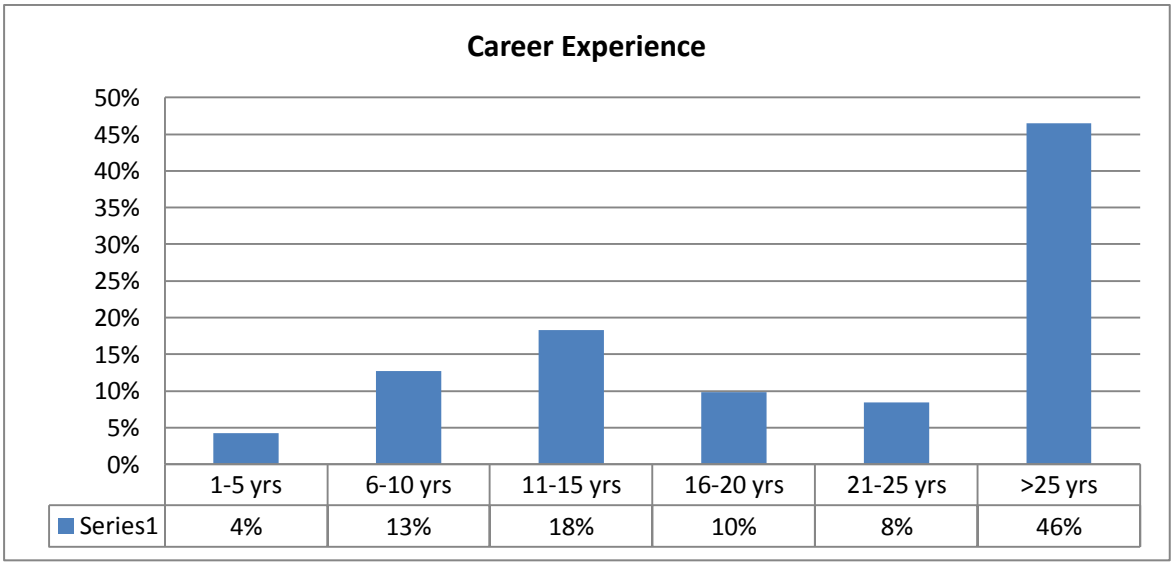


Figure 5.7: Career Experience of Respondents

The aim of question four was to test the hypothesis that: Quantity surveyors with a longer career experience are more likely to participate in PPPs than those with fewer years of career experience.

Figure 5.7 shows the length of experience in the quantity surveying field of the respondents. The majority of the respondents have had at least 25 years of

experience or more (46%), followed by those with 11-15 years, and those with 6-10 years of experience at 18% and 13% respectively. Figure 5.8 shows that from the respondents who have participated in PPPs, 29% of them have 25 years or more career experience, followed in joint second place by those with 6-10 year and 11-15 year career experience, both at 24%.

From the results of Figure 5.8, two conclusions can be drawn, given that the majority of the respondents are from the categories specified in the previous paragraph, these results are to be expected. However, another conclusion that could be drawn is that career experience is not a major factor in determining PPP participation.

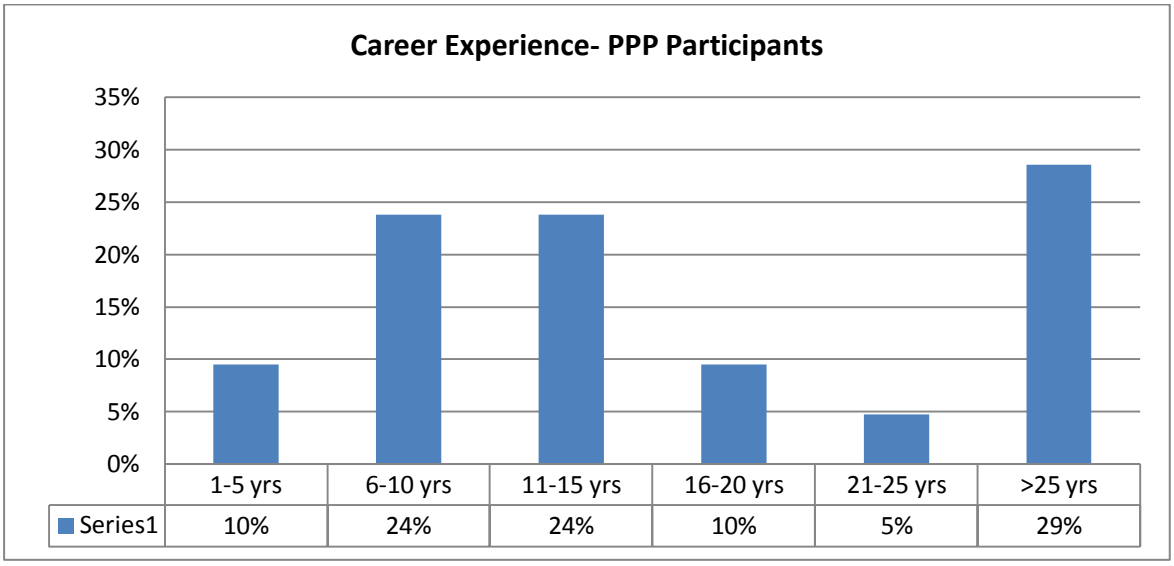


Figure 5.8: Career Experience of PPP Participants

5.2.2 Summary of Results for Section 1 of the Questionnaire

From the results of section 1 of the questionnaire, it may be concluded that the hypothesis that states that only respondents with many years of quantity surveying experience, from big private quantity surveying firms in more developed provinces, would be more likely to participate in PPPs, is not entirely correct.

Participation in PPPs is not determined by the size of the firm and career experience. However, quantity surveyors in more economically active provinces in private firms are more likely to participate in PPPs.

5.3 Section 2: Level of knowledge and participation in PPPs

The purpose of section 2 was to test the hypothesis that the majority of quantity surveyors are not familiar with PPPs, and as a result do not participate in PPP projects.

From section 2, the researcher wanted to determine the extent of quantity surveyors' knowledge. The results of section 2 would firstly assist in assessing the quantity surveyors' current role and future possible role. Secondly, the results would also assist in determining from quantity surveyors who have participated in PPPs their level of engagement in PPPs, the distinctive quantity surveying skills that they employed in PPPs, and for which client they were working. Unless the above-mentioned factors can be established, it would be difficult to assess the value that quantity surveyors could contribute to PPPs.

Question 5: Are you familiar with Public-Private Partnerships?

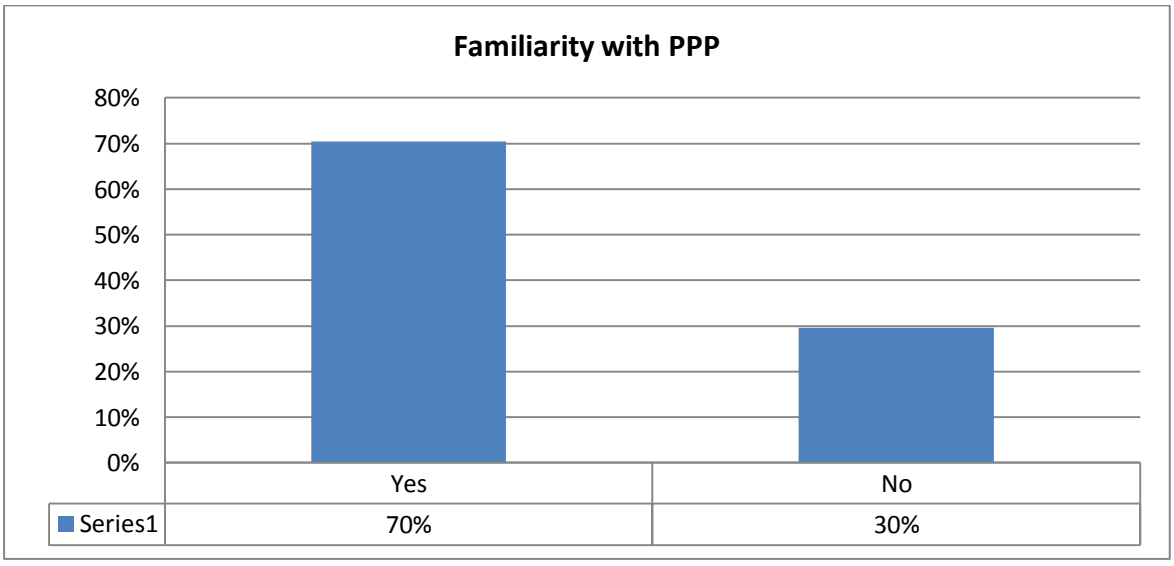


Figure 5.9: Familiarity with PPPs

According to Figure 5.9, the majority of the respondents are familiar with PPPs (70%). Question 5 was posed as a dichotomous question; as it was important to avoid grey areas on the familiarity of the respondents with PPPs. Question 6 was asked as a follow-up question, in order to determine the extent of the familiarity of the respondents with PPPs.

It may be concluded that the hypothesis that quantity surveyors are not familiar with PPPs is not necessarily correct.

Question 6: Rate your familiarity of Public Private Partnership on a scale of 1 - 5.

As stated in the previous paragraph, question 6's aim was to determine the extent of familiarity with PPPs on a scale of 1-5. The following is the rating for scale:

- 1- Very Low
- 2- Low
- 3- Average
- 4- High
- 5- Very High

Although the majority of the respondents (refer to Figure 5.9) claimed that they were familiar with PPPs, only 7% of the respondents knowledge was either high or very high (see Figure 5.10)**.** The majority of the respondents' familiarity with PPPs was average (44%). The rest of the respondents' knowledge of PPP was either low (25%) or very low (24%).

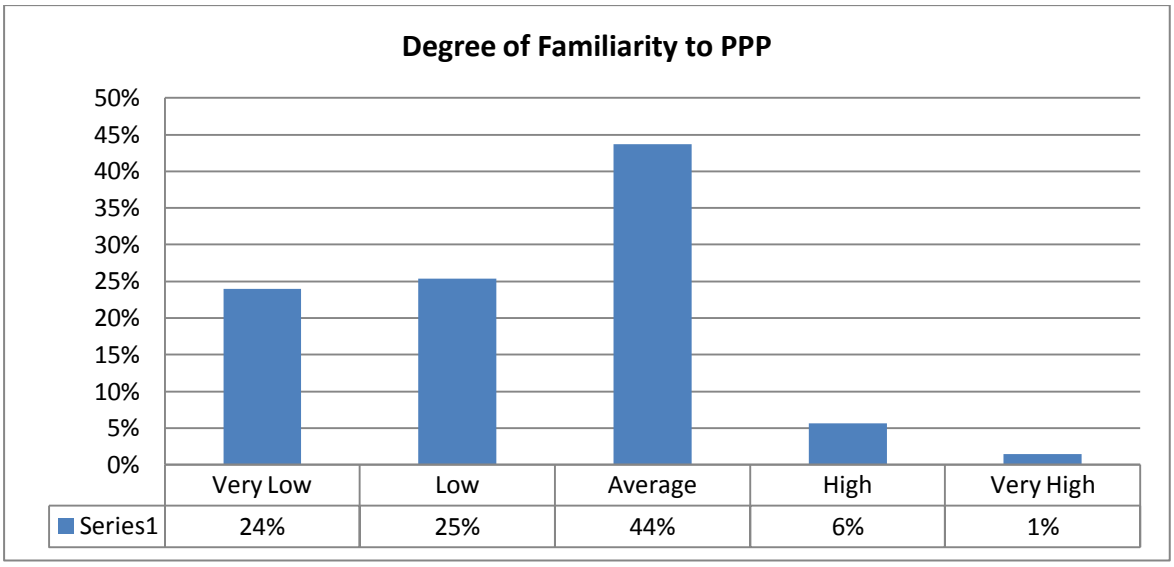


Figure 5.10: Degree of Familiarity to PPPs

The results of Figure 5.10 indicate that although most respondents are familiar with PPPs (refer to Figure 5.9), their level of knowledge is not high or very high (refer to Figure 5.10). The question that needs to be answered is: To what extent does

quantity surveyors' level of familiarity affect their participation in PPP? Figure 5.11 and Figure 5.12 show the results of quantity surveyors who have worked in PPPs, as well as their level of knowledge, respectively.

Question 7: Have you ever worked on a Public-Private Partnership project?

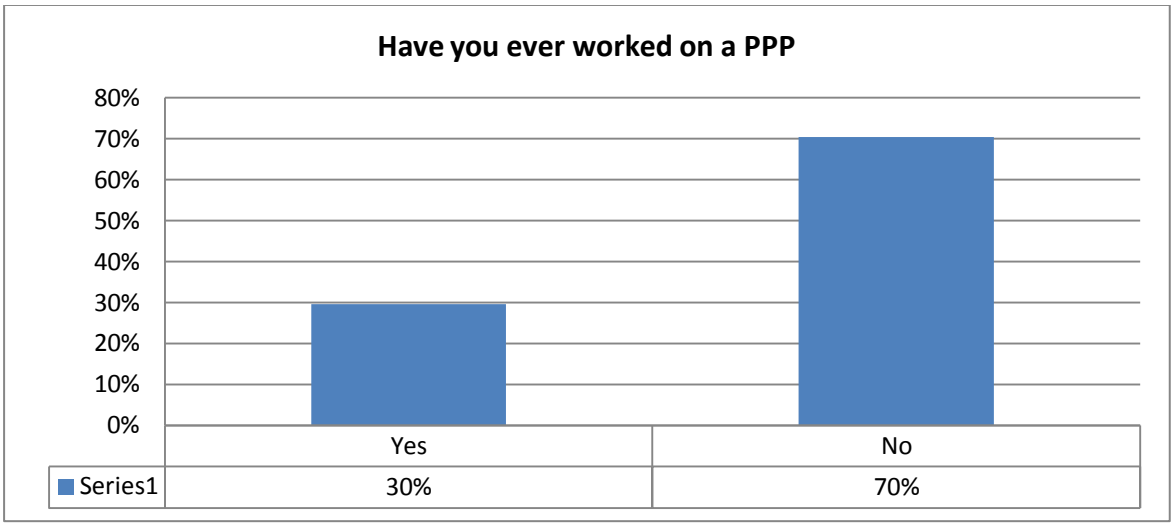


Figure 5.11: Number of Respondents who have worked on PPPs

The majority (70%) of the respondents' answers to question 7 indicated that they had never worked on a PPP project (see Figure 5.11). Figure 5.12 shows that most of the respondents' familiarity with PPPs was average (44%) (those who had worked with PPPs).

The results of Figure 5.12 are consistent with the claim that quantity surveyor's familiarity with PPPs is average (see Figure 5.10). From the results of Figure 5.11 and 5.12, we can infer that quantity surveyor's level of knowledge does not determine the level of their participation in PPPs.

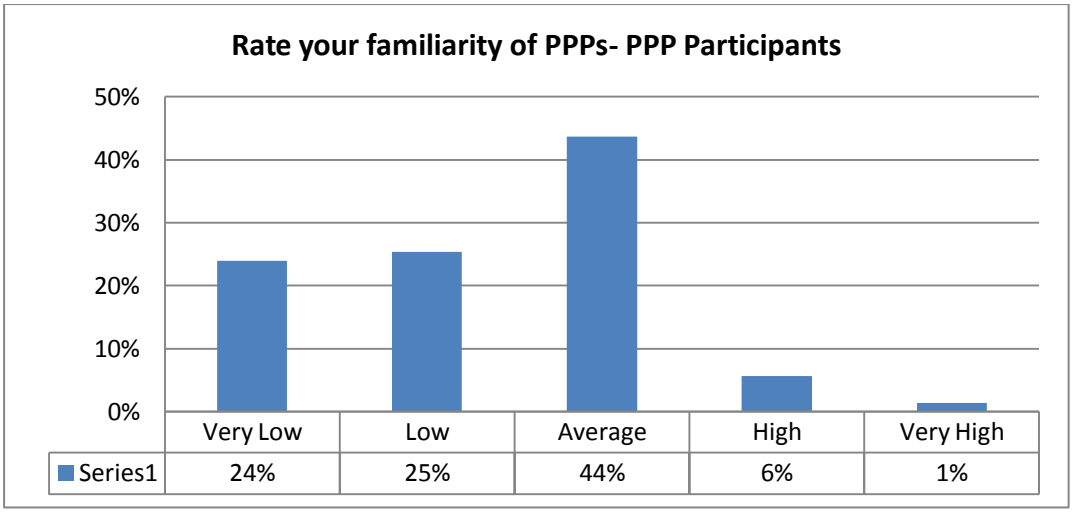


Figure 5.12: Degree of Familiarity to PPPs- PPP Participants

Figure 5.12 results pose other questions that require answers. If the level of familiarity is not the determinant of PPP participation, then what are the factors that influence quantity surveyors' participation in PPPs? Sections 3, 4 & 5 of the questionnaire sought to establish what other factors might have influenced quantity surveyors' participation in PPPs.

Questions 8-11 were only applicable to those respondents who had participated in PPPs. The questions' aim was to answer the research question: What is the role of quantity surveyors in PPPs in South Africa?

Question 8: If your answer to question 7 was "yes", for whom were you consulting?

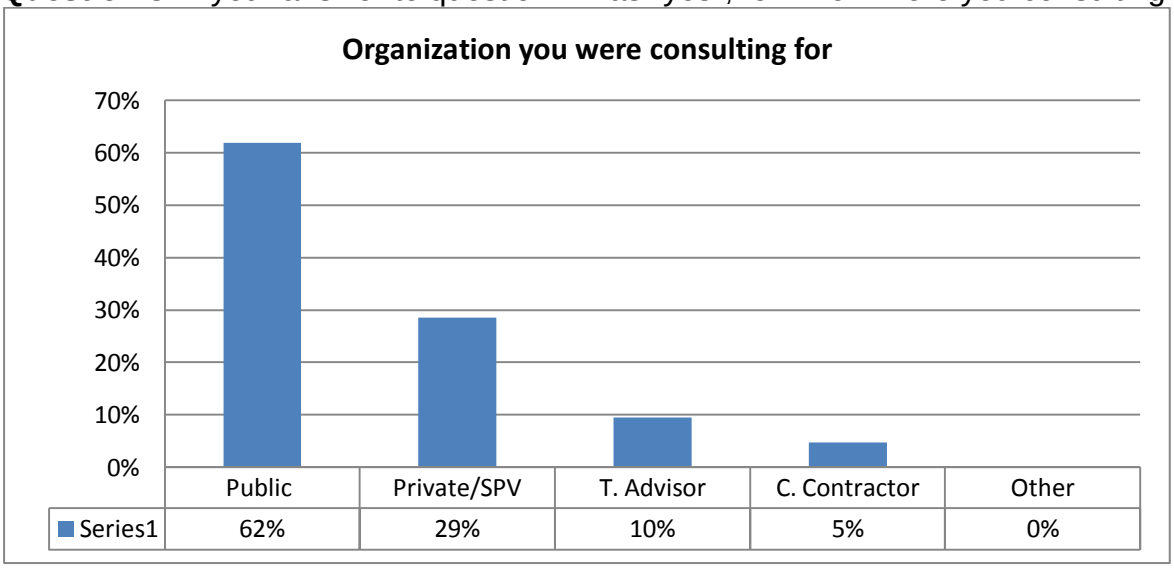


Figure 5.13: Entity for whom the respondents were consulting

According to Figure 5.13, from the 21 respondents who had worked in PPP projects, the majority were consulting for the public entity (62%). The results of Figure 5.13 can be expected; as in South Africa, a PPP project is usually initiated by the public sector. Before the public sector can proceed with any PPP project, it has to satisfy the requirements of Regulation 16: that of value for money, affordability and risk transfer. It may be assumed from the results, that the public sector would probably engage the services of quantity surveyors, in order to determine whether the requirements of Regulation 16 had been satisfied.

What the results of Figure 5.13 do not show, however, is whether the quantity surveyors were employed as in-house quantity surveyors for the public entity, or as independent quantity surveyors consulting for the public entity. It may be assumed that the majority of the 62% of the quantity surveyors who were consulting for the public entity would fall somewhere in these two categories.

Participants were required to tick all the relevant boxes in questions 9-11. The data were analysed on the basis that for each option there are 21 possible respondents. So, the number of the responses for each option was divided by 21 respondents to get a percentage. For question 10, however, one respondent skipped the question; the denominator for question 10 was thus 20 instead of 21.

Question 9: If your answer to question 7 was "yes", which quantity surveying services did you provide? Please tick all the appropriate boxes.

Figure 5.14 shows that estimating is the most offered service (76%). It is important to note that most of the other traditional quantity surveying tasks, such as, feasibility studies, advising on tendering, preparation of tender documents, financial control, valuation, cash flows, and final accounts were also offered (an average of 61%).

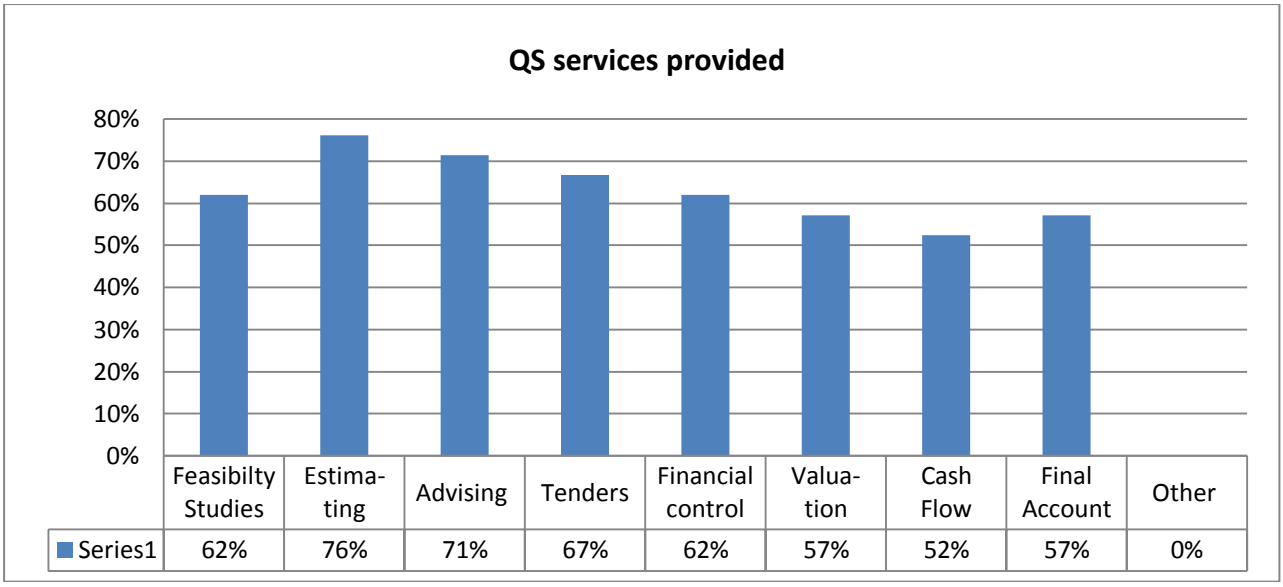


Figure 5.14: Quantity surveying services provided by respondents

The aim of question 9 was to determine whether certain quantity surveyors' services were more suitable or preferred for PPP projects than other quantity surveying services. The results of Figure 5.14, show that that although estimating is more likely to be offered in a PPP project, there is no specific quantity surveying service that is more preferred, or more suited to a PPP than any another.

Question 10: If your answer to question 7 was "yes", in which phases of a Public Private Partnership were you involved? Tick all the relevant boxes.

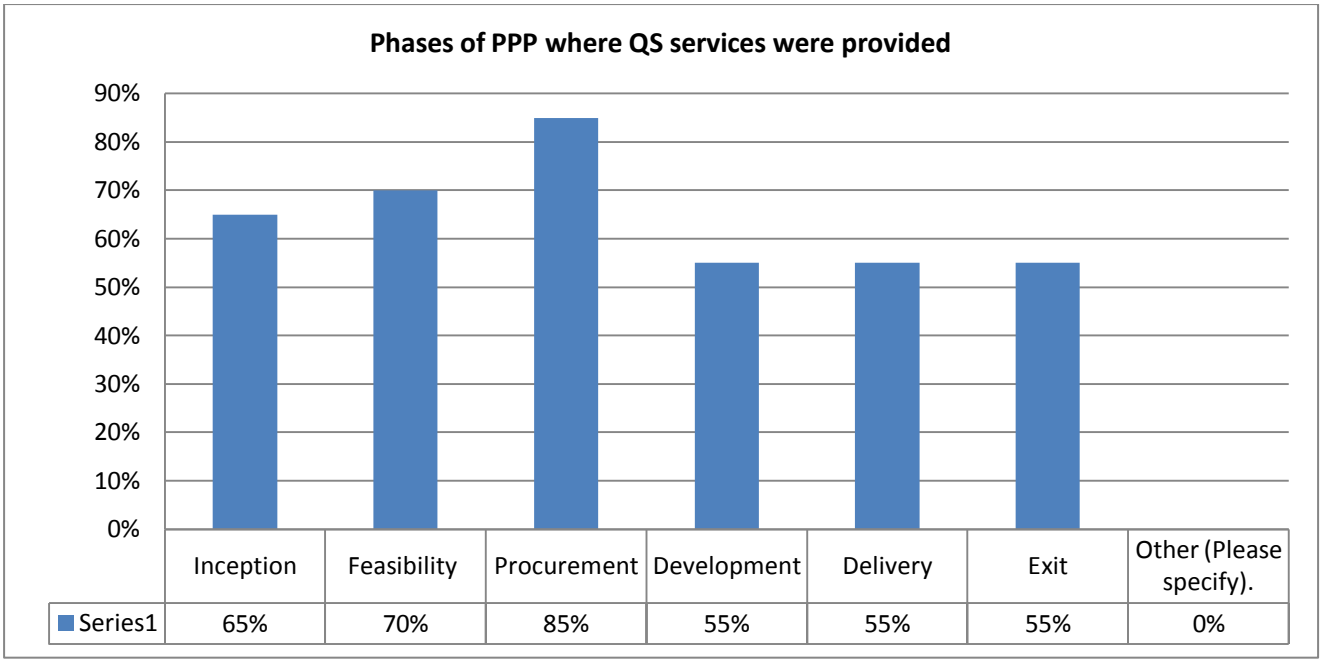


Figure 5.15: Phases of PPP respondents were involved in

Question 10's purpose was to determine in which PPP phase quantity surveyors would most probably be engaged, in a PPP project. As with the results of Figure 5.14, although procurement (85%) is more likely to be offered in a PPP project, there is no PPP phase that is more suitable for quantity surveyors than any another (refer to Figure 5.15). The procurement phase of a PPP includes, among other things, the preparation of bid documents by the public entity.

Question 11: From the services you provided in 9 and 10 above, which distinctive quantity surveying skills did you apply? Tick all the relevant boxes.

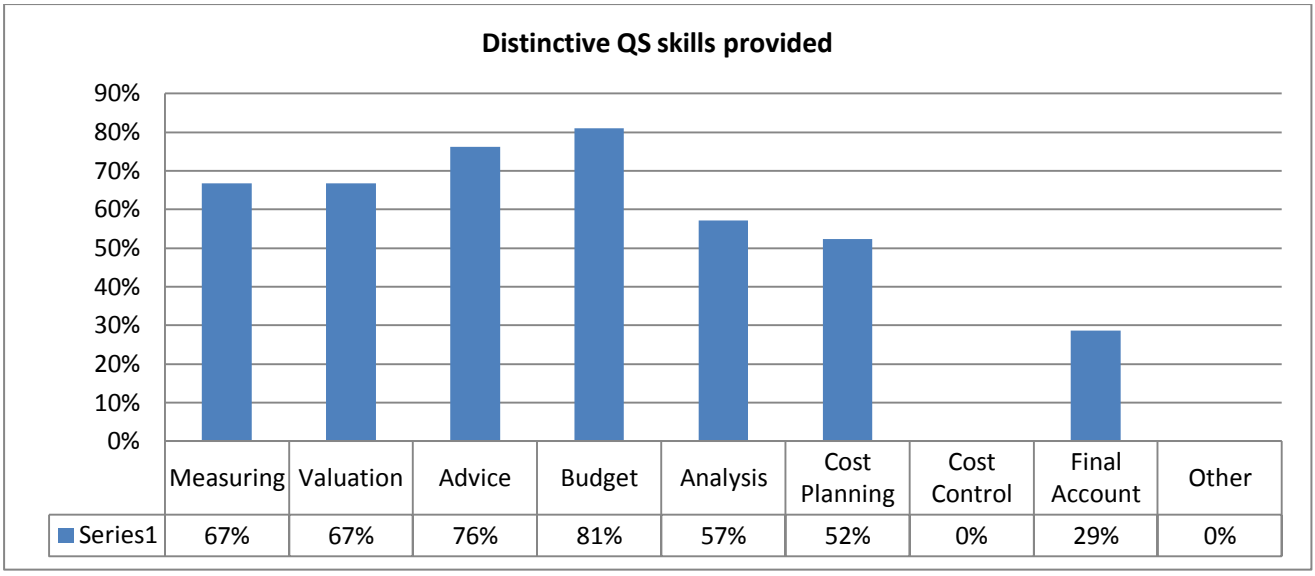


Figure 5.16: Distinctive quantity surveying skills respondents applied in PPPs

Figure 5.16 shows that the most distinctive quantity surveying skills offered by most respondents' in PPP were forecasting and budgeting (81%). The inception and feasibility stages of a PPP depend on the initial estimated capital cost, to determine whether the three PPP tests of a South African PPP have been met, in order for a project to follow a PPP route, or to follow the traditional route. The estimated capital cost is used as a benchmark against any bids received in the procurement phase. Throughout the PPP projects, the three PPP tests must still be satisfied; it is, therefore, expected that quantity surveyors are likely to be called upon to estimate the cost of variation orders, and to provide and determine the costs of other various contract items, in order to ensure adherence to the three PPP tests.

None of the respondents was likely to offer cost control in a PPP project. Most of the costs of a PPP are predetermined at the beginning of the project. There is little room for variation orders in PPPs. The private party takes the majority of the risk for design and cost variations. This might be the reason why quantity surveyors are less likely to use their cost control skills in PPPs.

5.3.1 Summary of the results in Section 2 of the questionnaire

Most quantity surveyors are familiar with PPPs. Although the level of their familiarity is average to very low, it is not the degree of their familiarity that determines their involvement in PPPs. The level of familiarity for most quantity surveyors who have been involved in PPPs is average. Therefore, the hypothesis that the majority of quantity surveyors are not familiar with PPPs; and as a result have not participated in PPP projects, has been rejected in its entirety.

The results of section two also show that the public sector is more likely to solicit the services of quantity surveyors than other parties involved in PPPs. All quantity surveying skills are likely to be engaged in all the phases of a PPP project. The results imply that there are no PPP-specific quantity surveying skills; nor is there any PPP phase that is more suited for quantity surveying skills, than the others.

5.4 Section 3: Traditional and non-traditional roles of quantity surveyors.

The objective of this section was to determine the extent of the quantity surveyors' involvement in non-traditional quantity surveying roles. Section 3 sought to test the hypothesis that quantity surveyors prefer their traditional role. PPP falls under the non-traditional role of quantity surveying.

The questions in this section hinged on the premise that if the majority of quantity surveyors are currently involved in other non-traditional roles, then, PPPs would be easily employed as part of their non-traditional role.

As stated in Chapter 3, the traditional quantity surveying role in South Africa includes, estimating, preparation of bills of quantities, evaluation of tenders, interim payment certificates, and final accounts.

The non-traditional role of quantity surveying includes: dispute resolutions, property development, facilities management, valuations for property or insurance, project management, fast-track construction, and quantity surveying in respect of civil, mechanical and electrical work.

Question 12: The following roles are often regarded as non-traditional roles or specialist roles of quantity surveyors. Indicate by ticking the appropriate boxes whether you have offered your services in any of these roles.

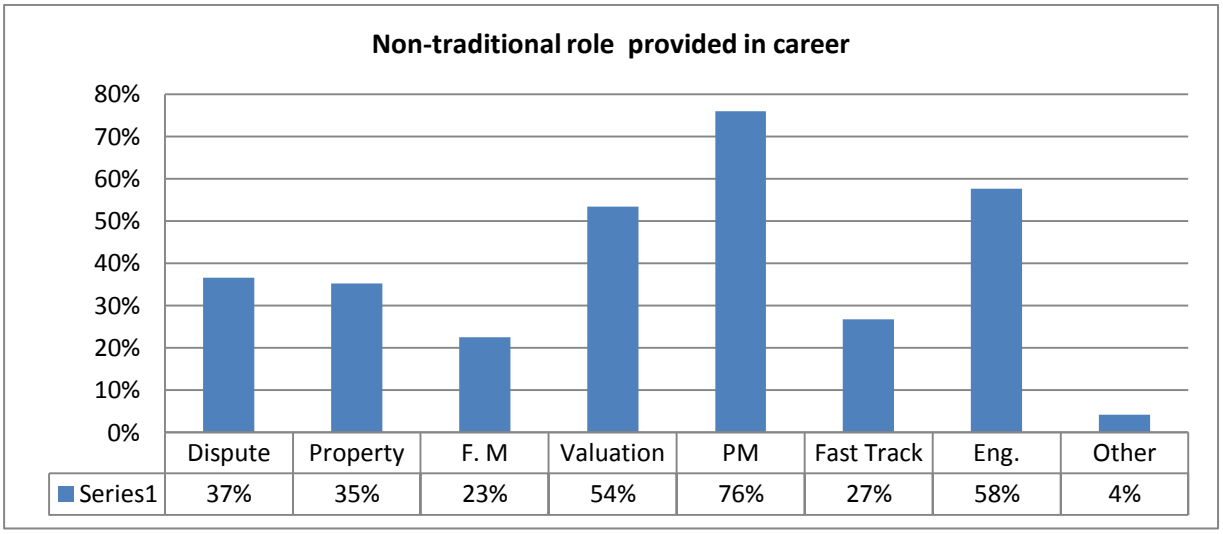


Figure 5.17 Participation in non-traditional roles

*Other includes; 1. Interior design, decorating, furniture and refurbishment, 2. Value engineering and value management and 3. Construction quantity surveying

Question 12's objective was to establish the current involvement of quantity surveyors in non-traditional roles. Knowing the current involvement of quantity surveying in non-traditional roles would assist in predicting whether quantity surveyors would be more likely to be involved in PPPs, or not.

As with questions 9-11 above, the participants were required to tick all the relevant boxes. The data were analysed on the basis that for each option there are 71 possible respondents. So, the number of the responses for each question was divided by 71 respondents – to reach a percentage.

Figure 5.17 shows that quantity surveyors are involved in other non-traditional roles of quantity surveying. The degree of involvement varies from 4% (other) to 76% (project management). Although project management is recognized as a distinct profession under the Project and Construction Management Act (Act No.48 of 2000), many other built-environment professionals, including quantity surveyors, are currently registered as project managers.

The percentage of respondents' offering services for engineering work, such as civil, mechanical and electrical work was also substantial (58%). Given that the mining industry in South Africa contributes a significant percentage of the economy, and that the bulk of the infrastructure budget is for engineering services, such as roads, dams and electricity, the results illustrated in Figure 5.17 are to be expected.

From the results in Figure 5.17, it may be concluded that quantity surveyors are flexible enough to transfer their skills to non-traditional roles, even though the degree of involvement varies immensely. Factors influencing the degree of involvement are not clear from the results, except perhaps for reasons advanced in the previous two paragraphs regarding project management and engineering work.

It may, thus, be concluded that quantity surveyors are more likely to embrace their involvement in PPPs like their other non-traditional roles, even though the extent of their involvement cannot be easily predicted.

Question 13: How often does your organisation undertake non-traditional quantity surveying work?

Figure 5.18 shows that 59% of the respondents seldom undertake work in non-traditional quantity surveying roles. As many as 41% indicated that they regularly undertake work in non-traditional quantity surveying roles. There were no respondents who indicated that they never undertake work in non-traditional quantity surveying roles.

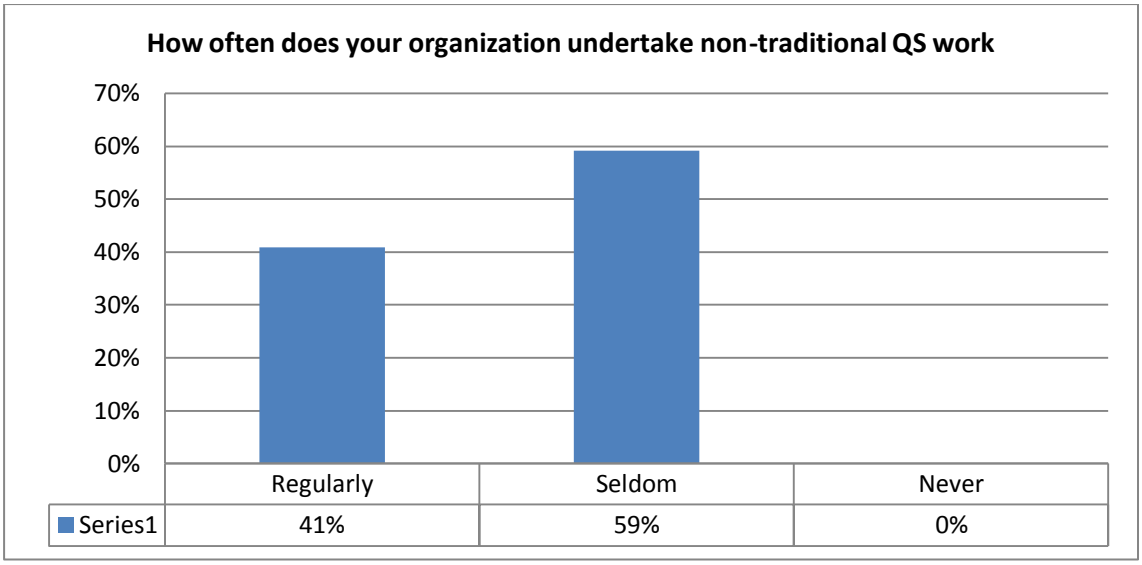


Figure 5.18: Regularity of undertaking non-traditional quantity surveying work

Without regard to the results in Figure 5.19, the results of Figure 5.18 support the hypothesis that quantity surveyors prefer their traditional roles.

Question 14: If your answer in the previous question was “seldom” or “never” please indicate the reason(s) for your answer.

Since there were no respondents who indicated that they never undertook non-traditional quantity surveying work, only those respondents who indicated that they seldom undertook quantity surveying work in non-traditional roles were analysed.

The majority (71%) of the 42 respondents who seldom undertook work in non-traditional roles (see Figure 5.18) cited lack of sufficient market as the main reason for their non-participation (refer to Figure 5.19).

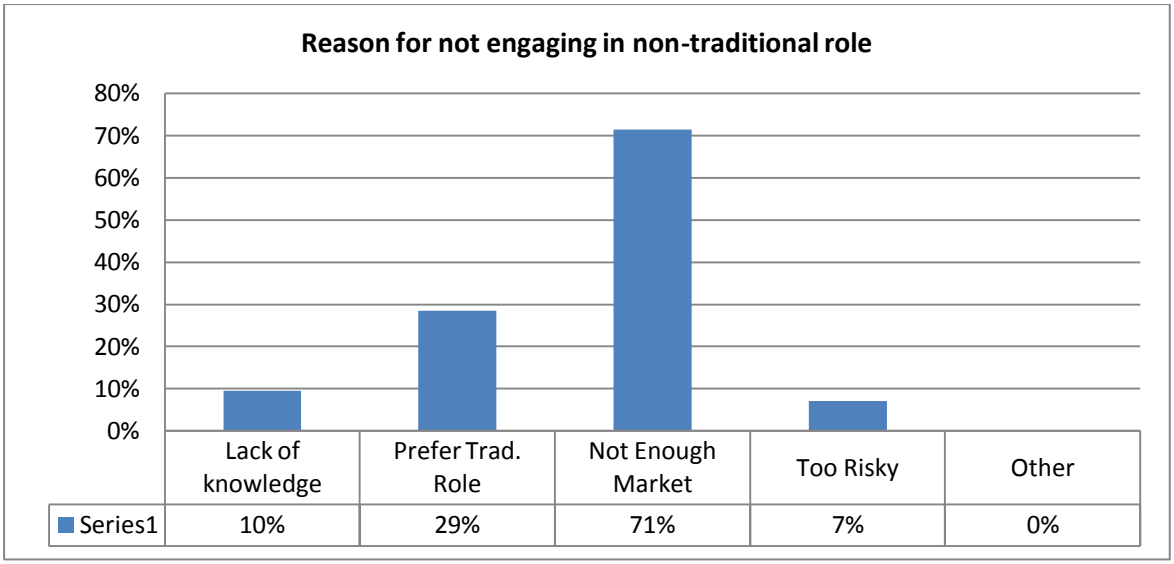


Figure 5.19: Reasons for not undertaking non-traditional roles

The majority of the respondents (71%) stated that the reason for their low participation in non-traditional role is as a result of "not enough market" (see Figure 5.19). It is interesting to note that preference for traditional roles was not the main reason; as hypothesis three of the study purports. So, the hypothesis is rejected.

5.4.1 Summary of Section 3 Results

The results in section 3 imply that the current role of quantity surveyors in other non-traditional roles (other than PPPs) is an indication that quantity surveyors are likely to embrace PPPs as part of their non-traditional roles, even though the extent of their involvement cannot be predicted.

5.5 Section 4: Your perception regarding the education and competency of a quantity surveyor (to what extent do you agree/disagree with the following statement?)

The purpose of section 4 was firstly to determine the quantity surveyors' perception regarding their education and competencies, and whether their perceptions influenced their participation in non-traditional roles, including PPPs. Secondly, section 4's objective was to test the hypothesis that quantity surveying skills and competencies can be transferred to their non-traditional roles; because their education and training has adequately prepared them to do so.

Question 15: My education and training have adequately prepared me for the traditional quantity surveying role.

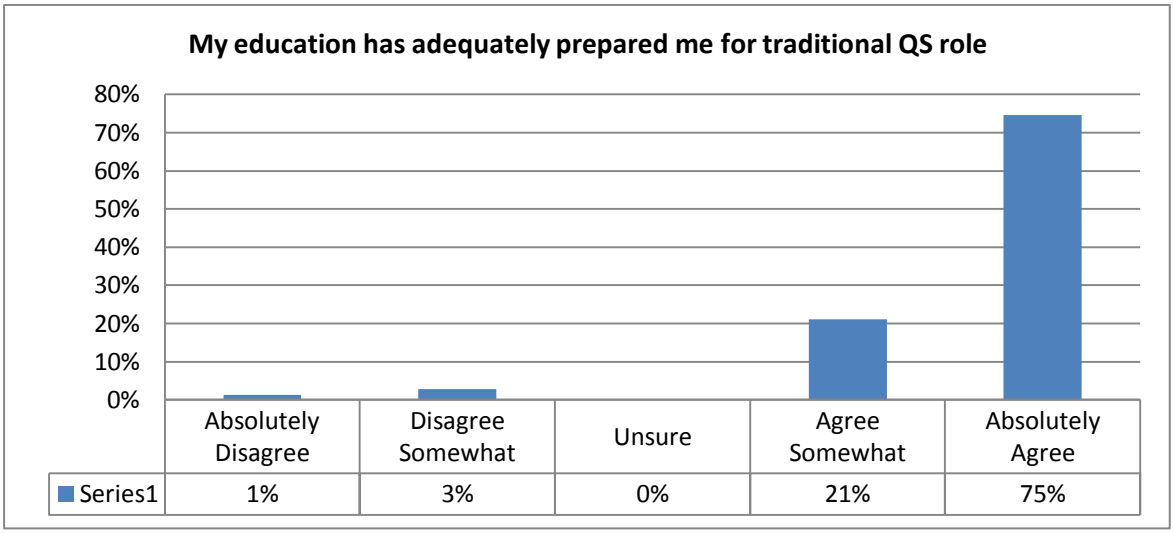


Figure 5.20: Quantity Surveyors' perceptions regarding the effect of education and training on their preparedness for the traditional role

The majority of the respondents believed that their competency in the traditional role of quantity surveying was the result of their education and training (75%), (refer to Figure 5.20). The majority of respondents who had also worked in PPP also believed that their education had adequately prepared them for their traditional role (see Figure 5.21).

The objective of question 15 was to establish the connection between education, competency and confidence. From the results of Figure 5.20 and 5.21, a conclusion may be drawn that education is vital for competency and confidence in executing function. From the results of Figure 5.21, it may be concluded that quantity surveyors who participated in PPPs felt that their education was adequate in enabling them to perform their traditional quantity surveying role. Therefore, their choice to engage in PPPs was not as a result of inadequacy in performing their traditional role.

The result of question 15 also highlighted the importance of education in boosting competency and confidence in the execution of their functions.

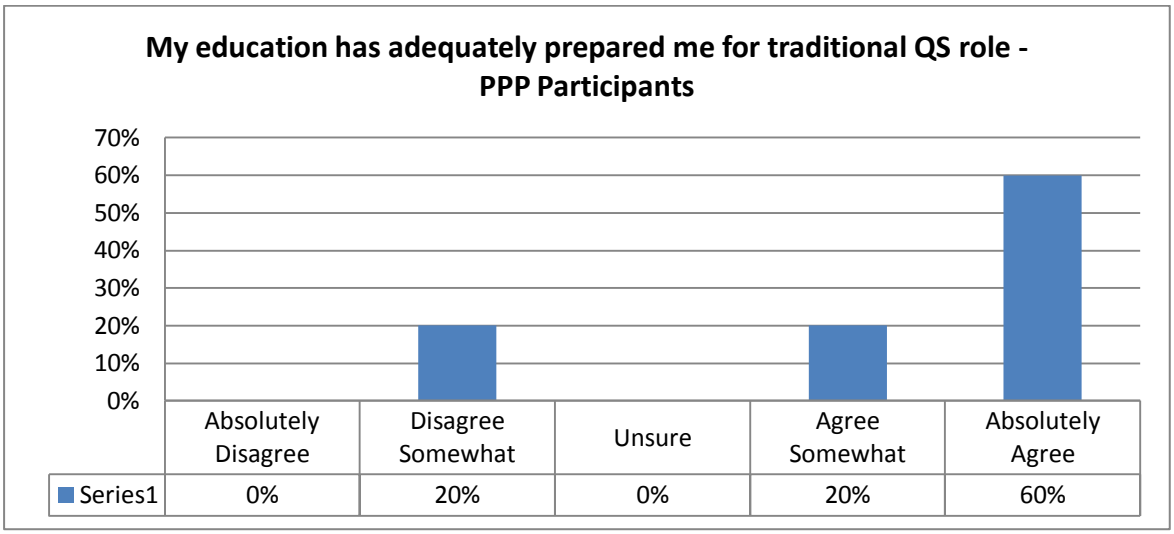


Figure 5.21: The perceptions of quantity surveyors who have participated in PPPs regarding the effect of education and training on their preparedness for the traditional role

Question 16: My education and training have adequately prepared me for the non-traditional role.

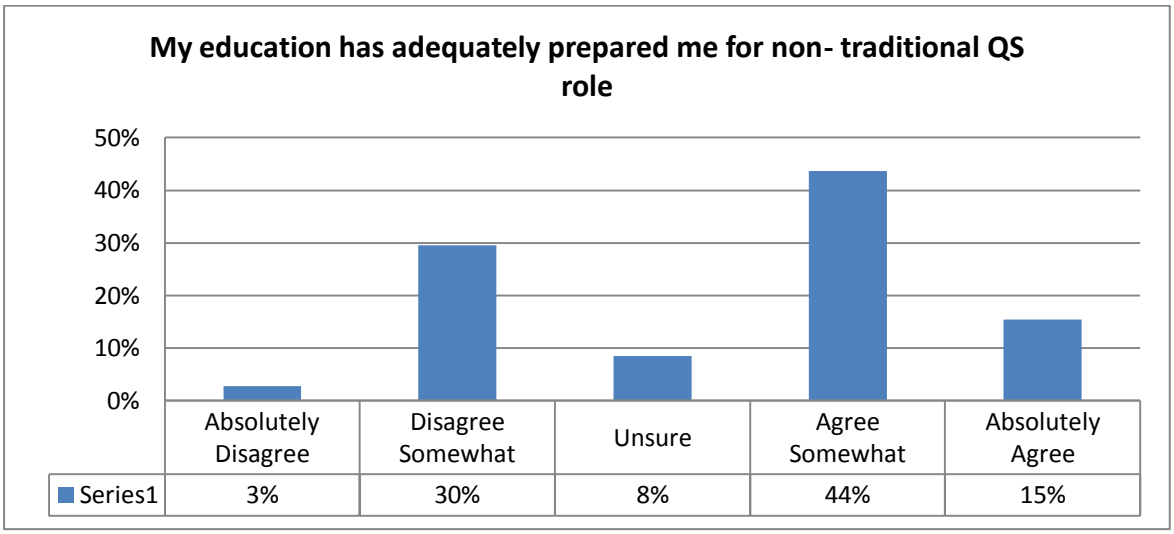


Figure 5.22: My education and training have adequately prepared me for any non-traditional role.

Question 16's aim was to determine whether the education and training of quantity surveyors influences their decision to participate in non-traditional roles, or not.

According to Figure 5.22, most of the respondents agreed to some extent that their training had adequately prepared them for any non-traditional role (44%). Only 15% absolutely agreed that their training had adequately prepared them for their non-traditional roles. As many as 41% were unsure, disagreed somewhat, or absolutely disagreed. The results of Figure 5.22 confirm that education boosts competence and confidence. Without regard to the results of Figure 5.23; education may influence the decision of quantity surveyors to participate, or not to participate in non-traditional roles.

Figure 5.23 shows the results of question 16 for those respondents who had worked in PPPs. As many as 62% of the respondents either absolutely agreed (24%) or somewhat agreed (38%) that their education had adequately prepared them for their non-traditional roles. From the results, an inference may be drawn that, although, education is important in boosting competency and confidence in service performance, it does not seem that "non-traditional specific" education is necessary for quantity surveyors to be able to function in their non-traditional roles.

From the results of question 15 and question 16, it may be concluded that, while the importance of education cannot be over-emphasized in boosting competency and confidence in work performance, it seems as if quantity surveyors' education had adequately prepared them for both their traditional and non-traditional roles. The reason why the majority of quantity surveyors seldom undertake non-traditional work can therefore be attributed to the perception that there is not enough market for the non-traditional roles (see Figure 5.19).

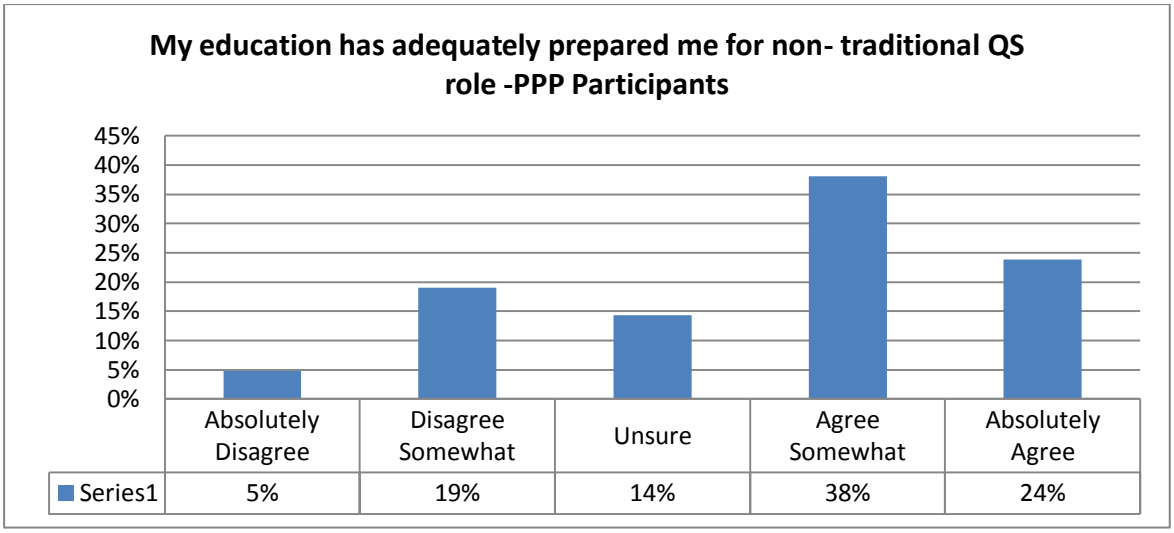


Figure 5.23: My education and training have adequately prepared me for the non-traditional role – as PPP Participants.

Question 17: Tertiary education has adequately incorporated courses on non-traditional roles in their training.

Figure 5.24 shows that 43% of the respondents absolutely or somewhat agreed that tertiary education has adequately incorporated courses on non-traditional roles in their training. As many as 35% of the respondents absolutely or somewhat disagreed with the statement. Only 23% were unsure.

As noted in Chapter 3 of the literature review, most tertiary institutions incorporate courses on non-traditional quantity surveying in their curriculum. These courses are sometimes offered as elective courses. Question 17 sought to establish the quantity surveyors' perceptions regarding the adequacy of such courses in preparing them for their non-traditional roles. Without regard to the results of Figure 5.25, the results of Figure 5.24 show that, in spite of such measures, there is no convincing number of quantity surveyors who believe that such measures are adequate in preparing them for their non-traditional quantity surveying roles.

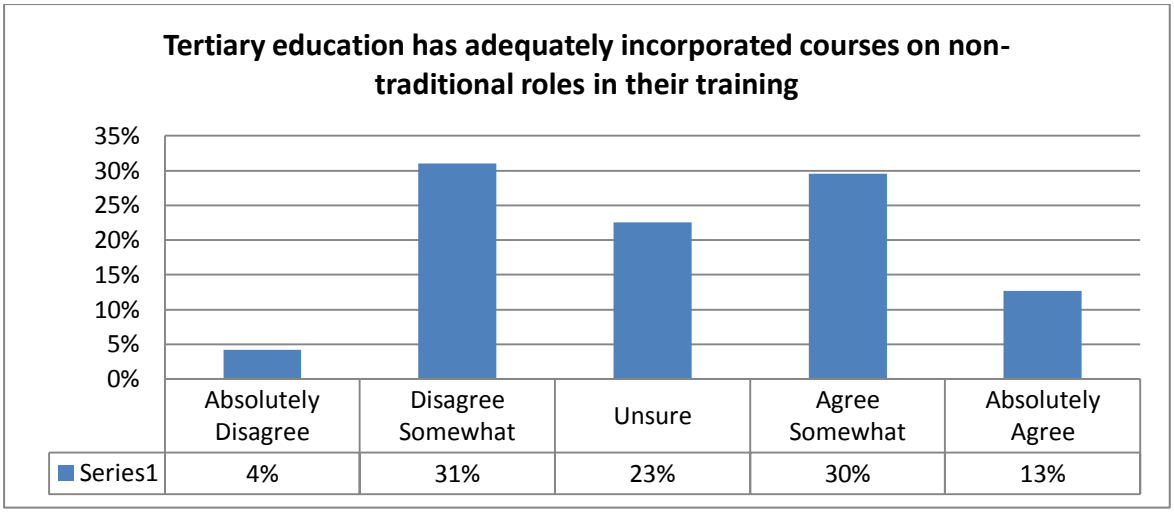


Figure 5.24: Tertiary education had adequately incorporated courses on non-traditional roles in their training.

The results of question 17a, that is, for those respondents who have worked in PPPs show that 62% of the respondents absolutely agreed (14%), or somewhat agreed (48%) that tertiary education had adequately incorporated courses on non-traditional roles in their training. The results imply that the majority of quantity surveyors who had participated in PPPs believed that tertiary education training in non-traditional roles is sufficient for preparing quantity surveyors in their non-traditional roles.

The conclusion that can be drawn from Figure 5.24 and Figure 5.25 is that the perception that quantity surveyors, who have not worked in PPPs, hold regarding tertiary education adequacy in preparing them for non-traditional roles may be as result of their belief that there is no adequate market for the non-traditional roles (see Figure 5.19).

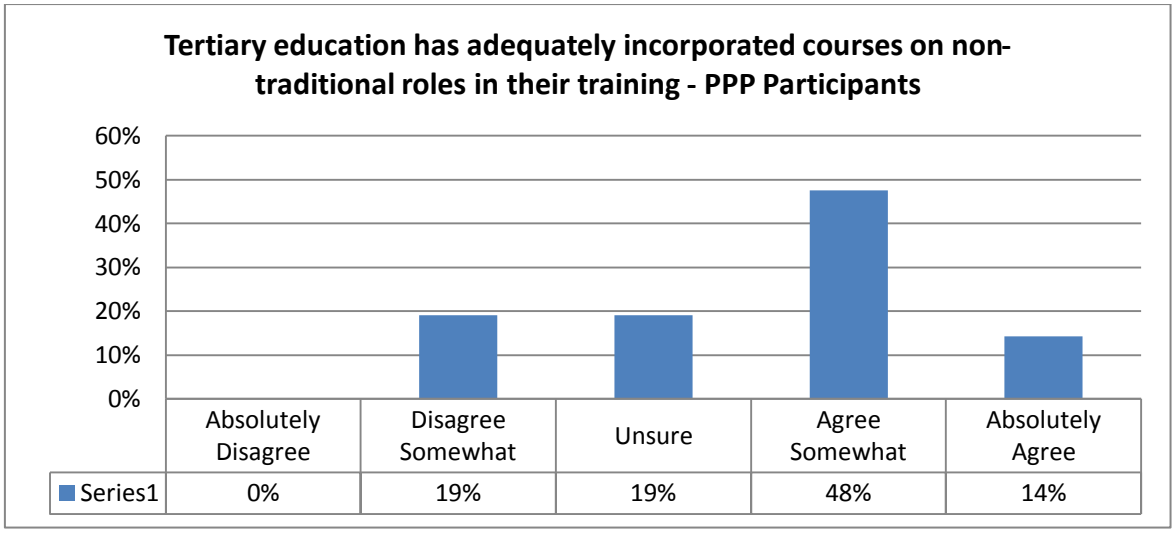


Figure 5.25: Tertiary education has adequately incorporated courses on non-traditional roles in their training – PPP Participants

Question 18: My competency in the non-traditional role is largely due to my initial education from a tertiary institution.

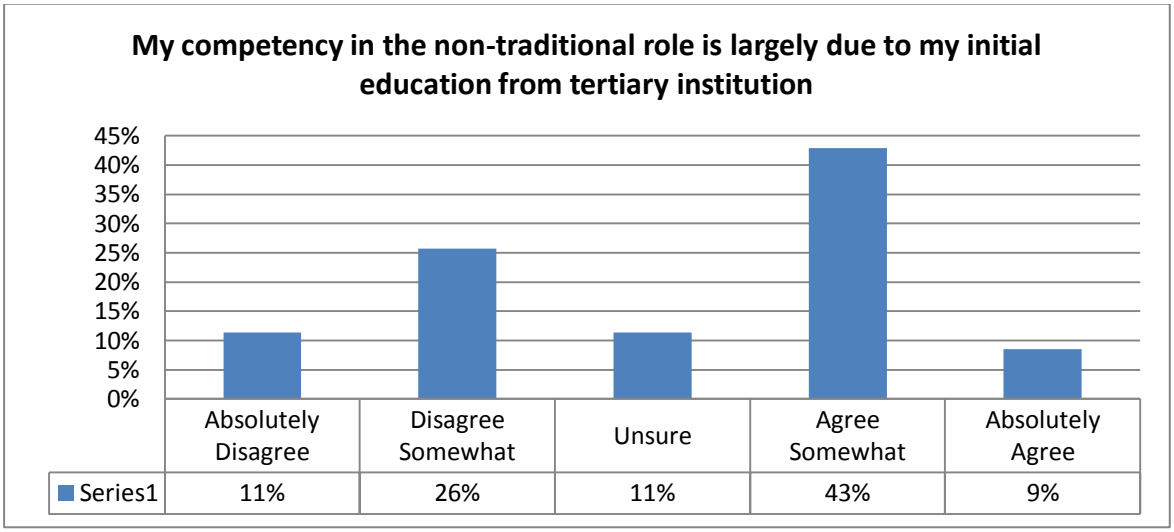


Figure 5.26: My competency in the non-traditional role is largely due to my initial education from a tertiary institution.

The results of Figure 5.17 are evidence that most quantity surveyors may at some point in their career be required to perform a non-traditional role. It was, therefore, important to determine whence their competency in such roles had largely emanated; hence question 18 was asked.

According to Figure 5.26, 52% of the respondents somewhat agreed (43%), or absolutely agreed (9%) that their competency in the non-traditional role was largely due to their initial education from a tertiary institution. If the results of Figure 5.26 are compared with the results of Figure 5.27, then for those respondents who had participated in PPPs, it is clear that that both groups of quantity surveyors shared the same perceptions regarding the adequacy of their initial education in providing the competency required to perform non-traditional roles.

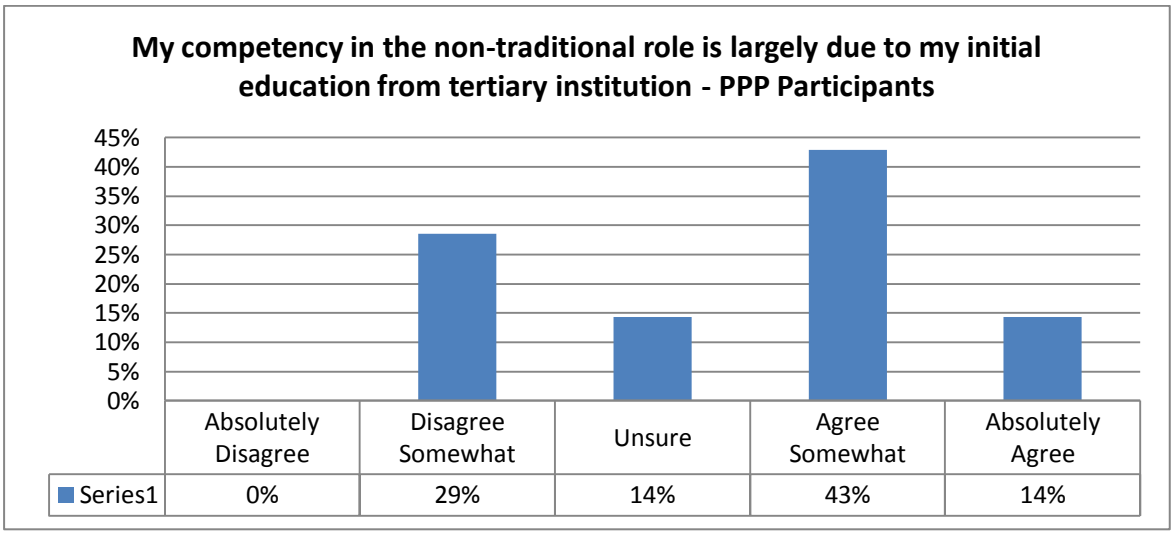


Figure 5.27: My competency in the non-traditional role is largely due to my initial education from a tertiary institution – PPP Participants.

From the results of question 18, it may, therefore, be concluded that the initial tertiary education plays an important role in preparing quantity surveyors for their non-traditional roles.

Question 19: Do you feel just as comfortable in your non-traditional role as you do in your traditional role?

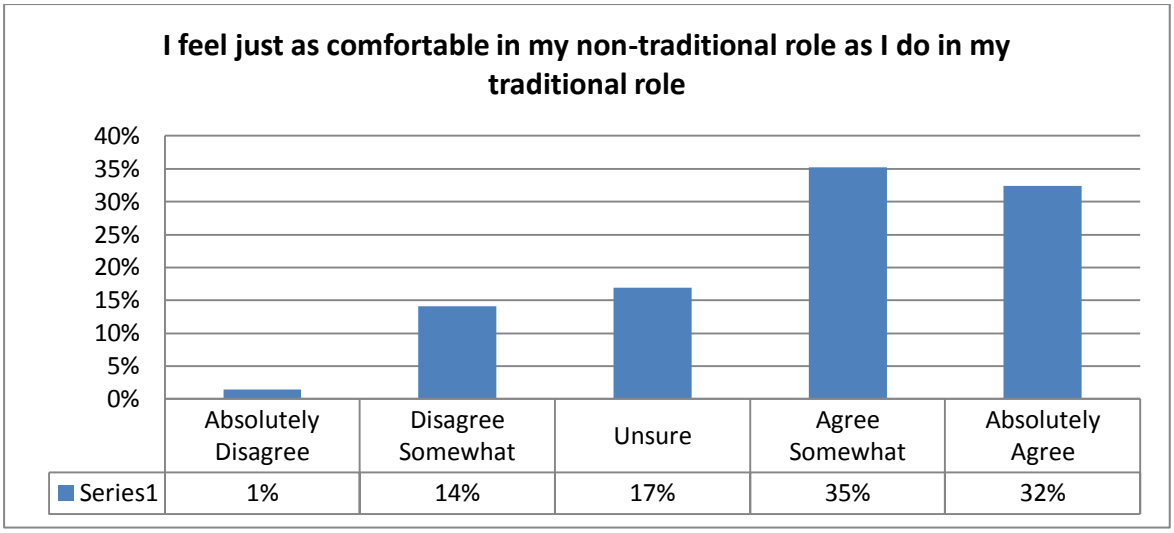


Figure 5.28: Quantity surveyors' perception regarding their degree of comfort in their non-traditional role

Question 19's assumption was that if quantity surveyors were comfortable in non-traditional roles, then they would be confident enough to undertake non-traditional quantity surveying work. Their level of comfort would, therefore, influence their decision to undertake work in non-traditional roles. In short, the greater their level of comfort, the greater their inclination to undertake work in non-traditional roles.

Figure 5.28 shows that 67% of the respondents somewhat agreed (35%) or absolutely agreed (32%) that they feel just as comfortable in their non-traditional roles, as they do in their traditional roles (see Figure 5.28). The results were similar for those respondents who had participated in PPPs (refer to Figure 5.29). As many as 70% of the respondents somewhat agreed (35%), or absolutely agreed (35%) that they feel just as comfortable in their non-traditional roles, as they do in their traditional roles.

From the results of question 19, we can therefore, draw the same conclusion as in questions 16, 17 and 18, that the reason why the majority of quantity surveyors seldom undertake work in non-traditional roles may be due to a perceived lack in the market.

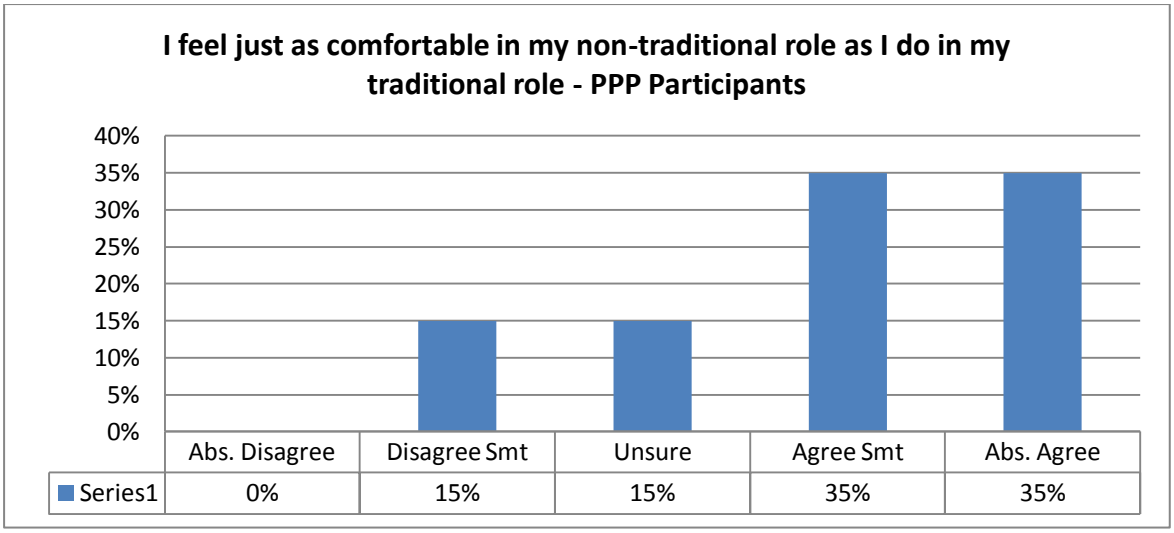


Figure 5.29: I feel just as comfortable in my non-traditional roles, as I do in my traditional roles – PPP Participants.

Question 20: My quantity surveying education and training, knowledge and skills can easily be transferred to the non-traditional roles.

The assumption of question 20 was: If quantity surveyors perceive that their education and training, knowledge and skills are transferable to non-traditional roles, then they would be more likely to undertake such work in these non-traditional roles.

A total of 54% of the respondents somewhat agreed that their education and training, knowledge and skills could be easily transferred to the non-traditional roles (refer to Figure 5.30); whereas 32% of the respondents absolutely agreed (86% overall). For those respondents who had participated in PPPs (refer to Figure 5.31), the results were similar. As many as 81% of the respondents somewhat agreed (48%) or absolutely agreed (33%) their education and training, knowledge and skills could be easily transferred to non-traditional roles.

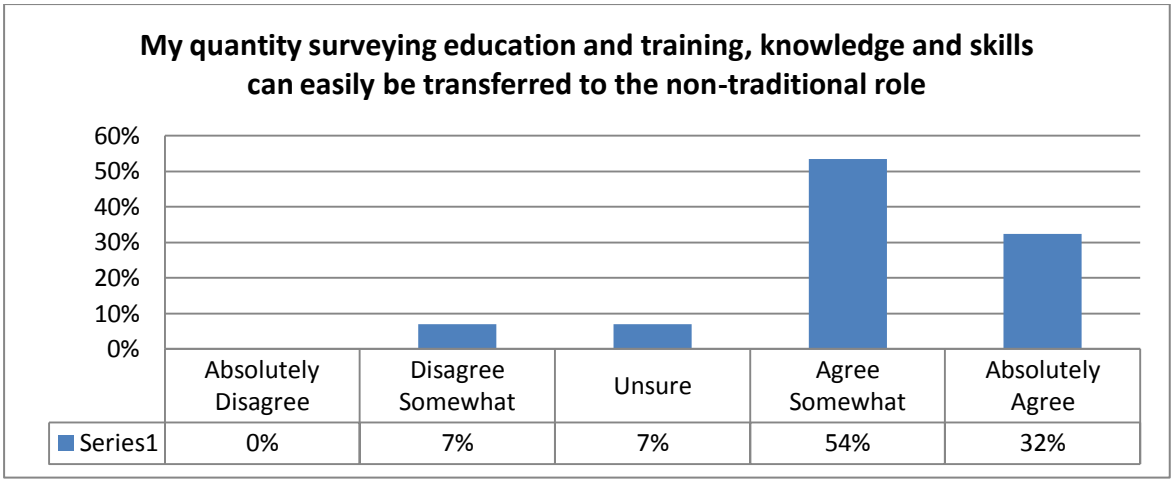


Figure 5.30: My quantity surveying education and training, knowledge and skills can easily be transferred to the non-traditional roles.

The results of question 20 further strengthen the conclusion drawn in questions 16, 17, 18 and 19 that the reason why the majority of quantity surveyors seldom undertake work in non-traditional roles may be due to the perceived lack in the market for these services.

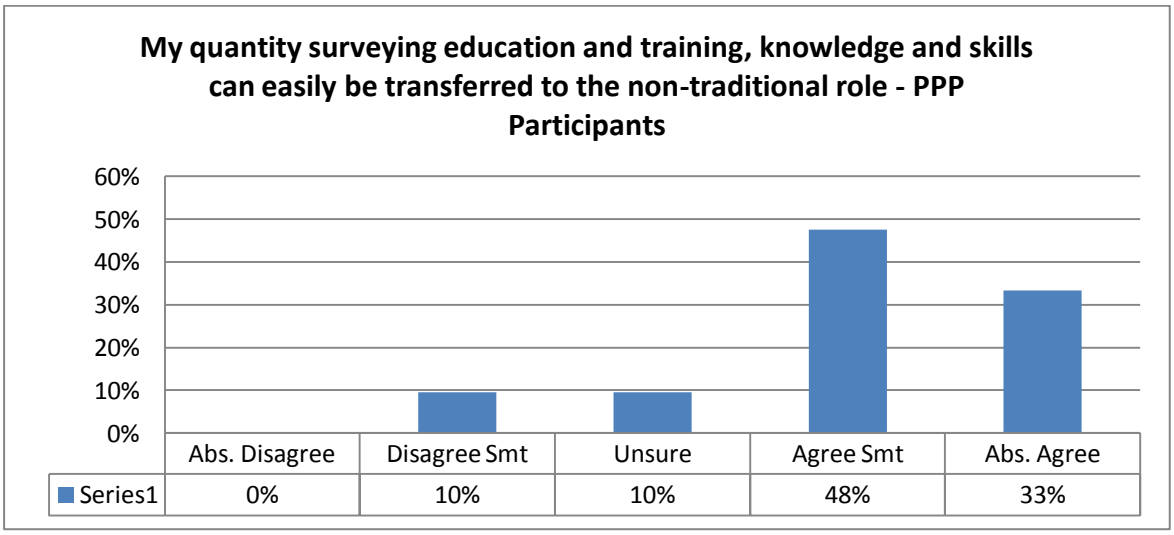


Figure 5.31: My quantity surveying education and training, knowledge and skills can easily be transferred to the non-traditional roles – PPP Participant

Question 21: I need additional training for me to competently provide services in non-traditional roles.

Question 21 sought to gauge quantity surveyors' perceived need for additional training. The assumption made was similar to that of question 15: the more educated quantity surveyors were in a particular role, the more competent they would be to undertake work in that particular role. If education prepared quantity surveyors to be adequately prepared for their traditional role, then education in non-traditional roles would have similar outcomes.

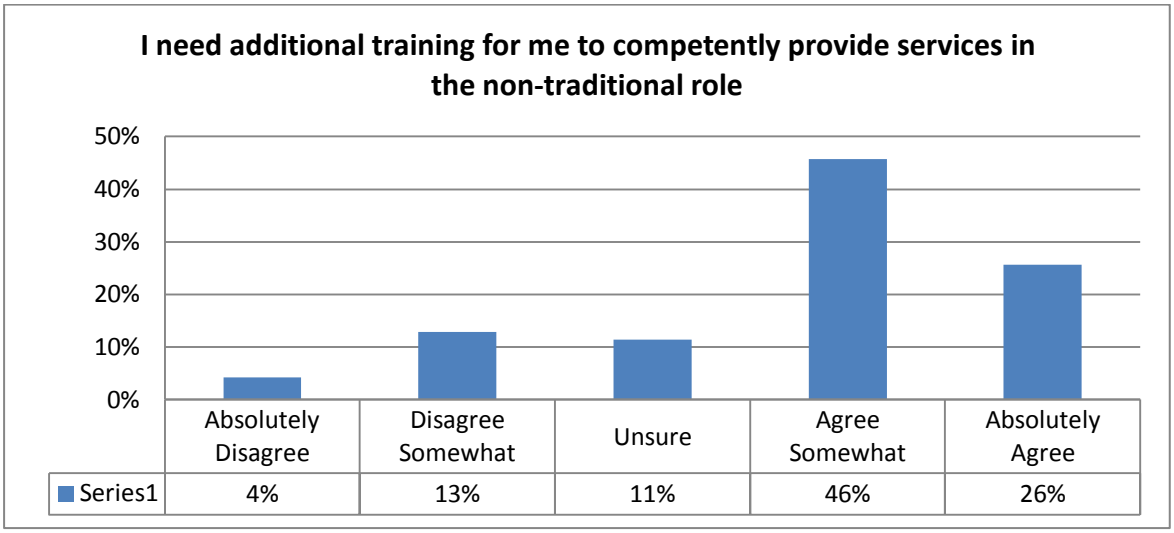


Figure 5.32: I need additional training for me to competently provide services in the non-traditional roles.

As many as 72% of the respondents either somewhat agreed (46%), or absolutely agreed (26%) that they needed additional training to competently participate in non-traditional roles (see Figure 5.32). For those respondents who have participated in PPPs (Figure 5.33), the results were similar. As many as 50% agreed somewhat; while 25% absolutely agreed with the statement (75% overall).

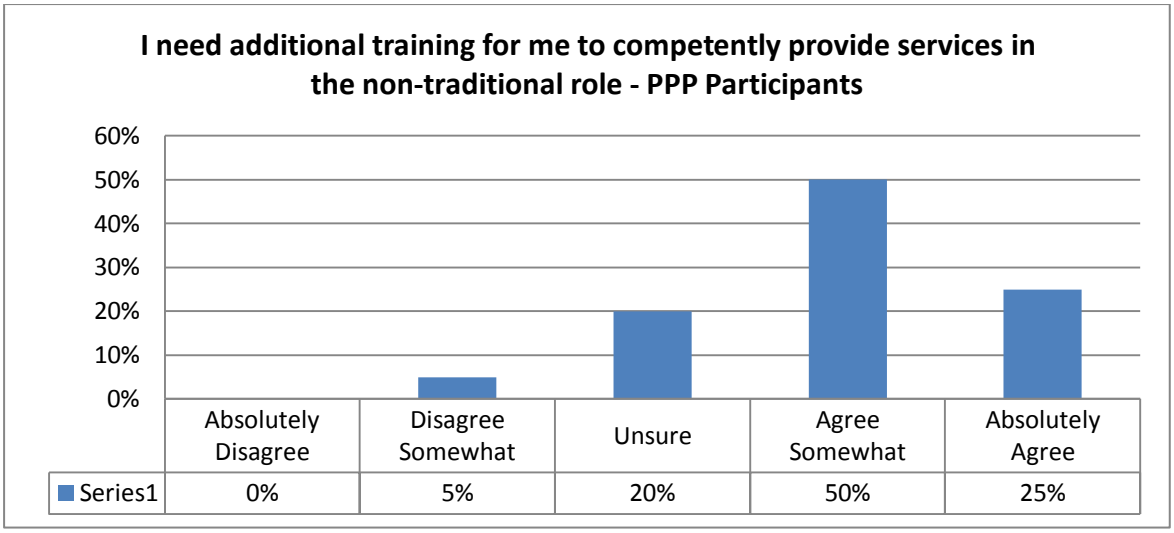


Figure 5.33: I need additional training for me to completely provide services in the non-traditional roles – PPP Participants

From the results of question 21, it may be concluded that the majority of quantity surveyors believe that additional education would be beneficial in equipping them for their non-traditional roles.

Question 22: Training or Courses in non-traditional roles should be offered as certificate courses by tertiary or other institutions.

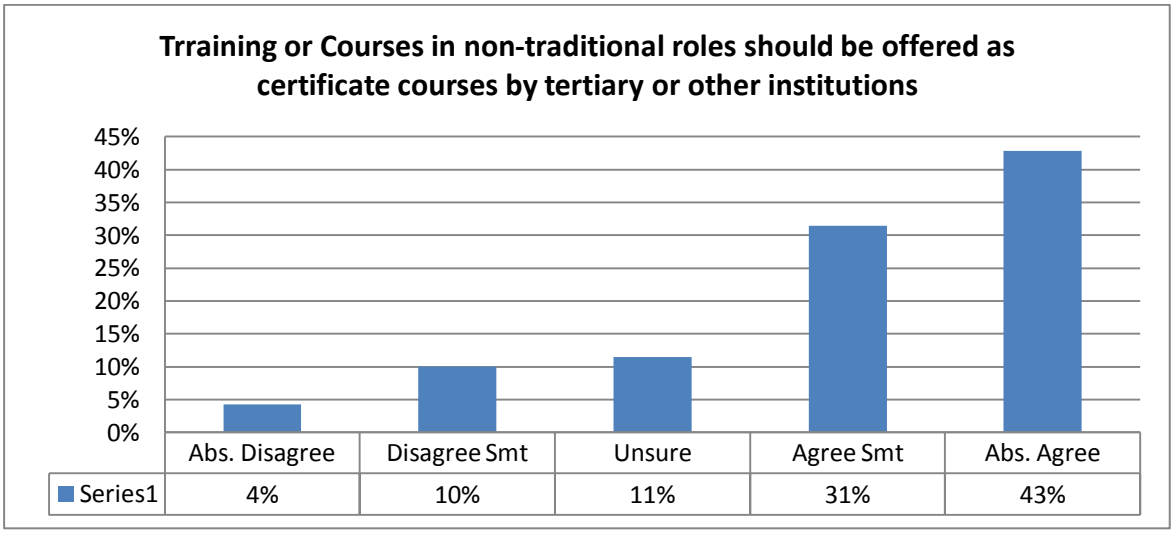
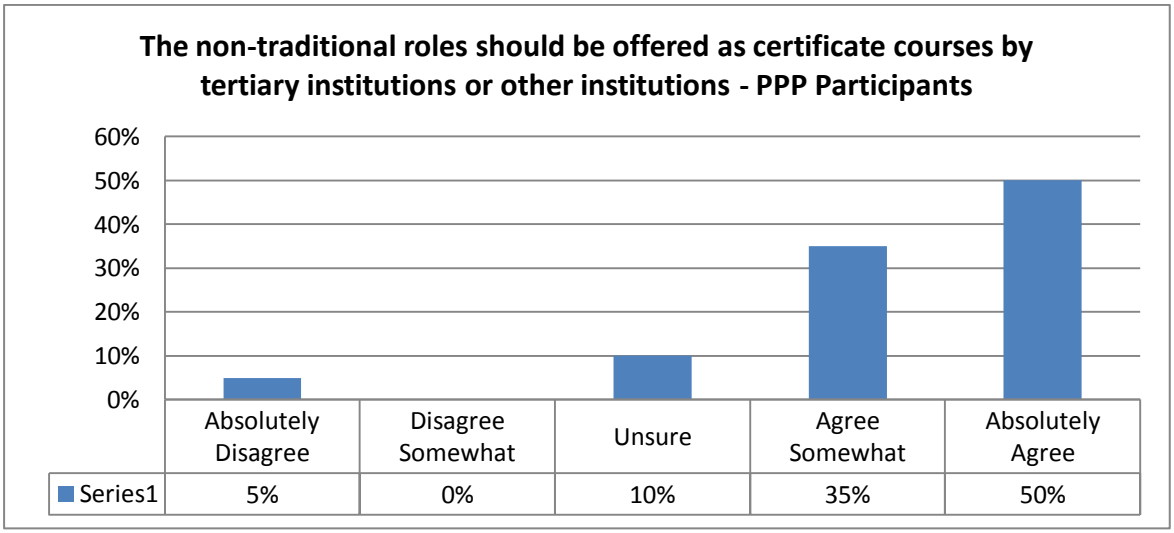


Figure 5.34: Training or Courses in non-traditional roles should be offered as certificate courses by tertiary institutions or other institutions.

Question 22's aim was to determine whether quantity surveyors saw the value of tertiary institutions offering additional courses in non-traditional roles. The assumption was that if the value was high, then more quantity surveyors would study further. Therefore, the influence of further education would be more participation in the non-traditional roles.

A total of 74% of the respondents either absolutely agreed (43%), or somewhat agreed (31%) that the non-traditional roles should be offered as certificate courses by tertiary or other institutions (see Figure 5.34). There is not much difference for those respondents who had participated in PPPs and for those who had not participated in PPPs. As many as 50% absolutely agreed; and 25% agreed somewhat with the statement (75% overall).



Question 5.35: Non-traditional roles should be offered as certificate courses by tertiary institutions or other institutions – PPP Participants

Even though most quantity surveyors believe that their initial tertiary education has adequately prepared them for their non-traditional role (refer to figures 5.22 to 5.31), from the results of question 21 and question 22, it can be concluded that the majority of quantity surveyors believe that additional educational is needed in non-traditional roles; and tertiary institutions must provide this education by offering certificate courses.

5.5.1 Summary of Results from Section 4 of the Questionnaire

From the results in section 4, it may be concluded that most quantity surveyors hold the perception that their education has adequately prepared them for both their traditional and non-traditional roles, and that quantity surveying skills can be transferred to non-traditional roles. However, further training in their non-traditional roles would probably be beneficial. Their competency in both roles, traditional and non-traditional roles, seems to be largely dependent on their education.

5.6 Section 5: Further Education

The purpose of section 5 was to determine the level of further formal education undertaken by quantity surveyors after graduation. The researcher wanted to test the hypothesis that further education in non-traditional roles influenced the participation of quantity surveyors in non-traditional roles.

Question 23: Do you have any other formal training or skill in the non-traditional roles of a quantity surveyor?

The majority of the respondents did not have any formal training in non-traditional roles (66%) (refer to Figure 5.36). For those respondents who had participated in PPPs, the percentage was 75% (refer to Figure 5.37).

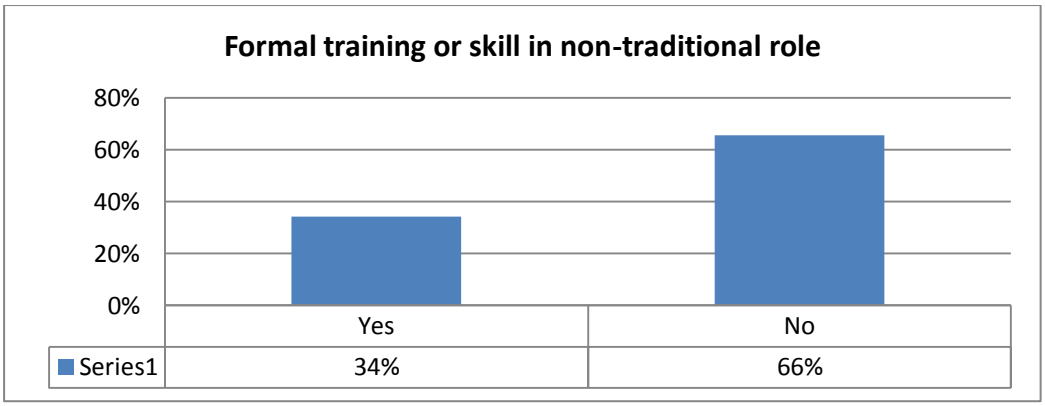


Figure 5.36: Other formal training or skill in any non-traditional quantity surveying

Comparing the results of Figures 5.36 and 5.37; the results confirm the conclusion made in section 4 that the education of quantity surveyors seems to be adequate in preparing them for both their traditional and non-traditional roles.

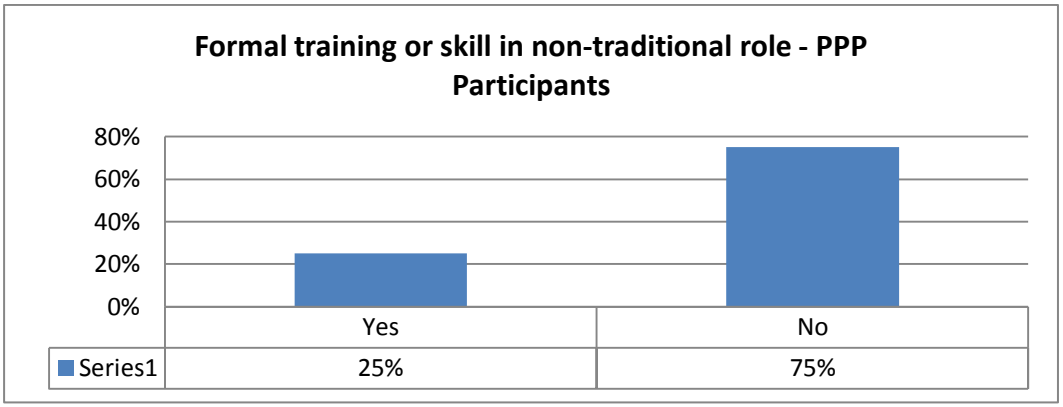


Figure 5.37: Other formal training or skill in any non-traditional quantity surveying – PPP Participants

Question 24: What other formal education or training, apart from traditional quantity surveying, do you have?

The participants in question 24 were required to tick all the relevant boxes. The data were analysed on the basis that for each option there are 24 possible respondents, and 5 for those who had participated in PPPs. These comprise the number of quantity surveyors who have indicated that they have formal education training apart from traditional quantity surveying for each category. Therefore, the number of the responses for each option was divided by 24 respondents for non-participants in PPPs, and by 21 for PPP participants, in order to get a percentage.

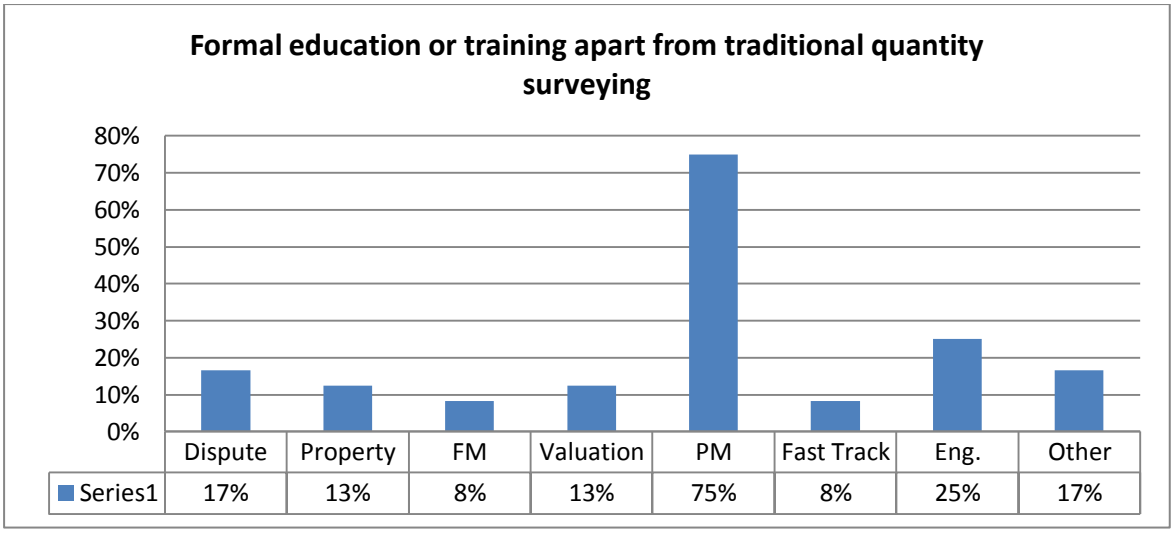


Figure 5.38: Other formal education or training apart from traditional quantity surveying

Most of the respondents have had formal training in project management (75%), (refer to Figure 5.38). For those respondents who have participated in PPPs, the percentage is 80% (refer to Figure 5.39). It may, therefore, be deduced that most quantity surveyors participate in project management because they have formal training in project management (refer to Figure 5.17). The results of question 24, therefore, correlate with the results of section 4. Competency depends on education.

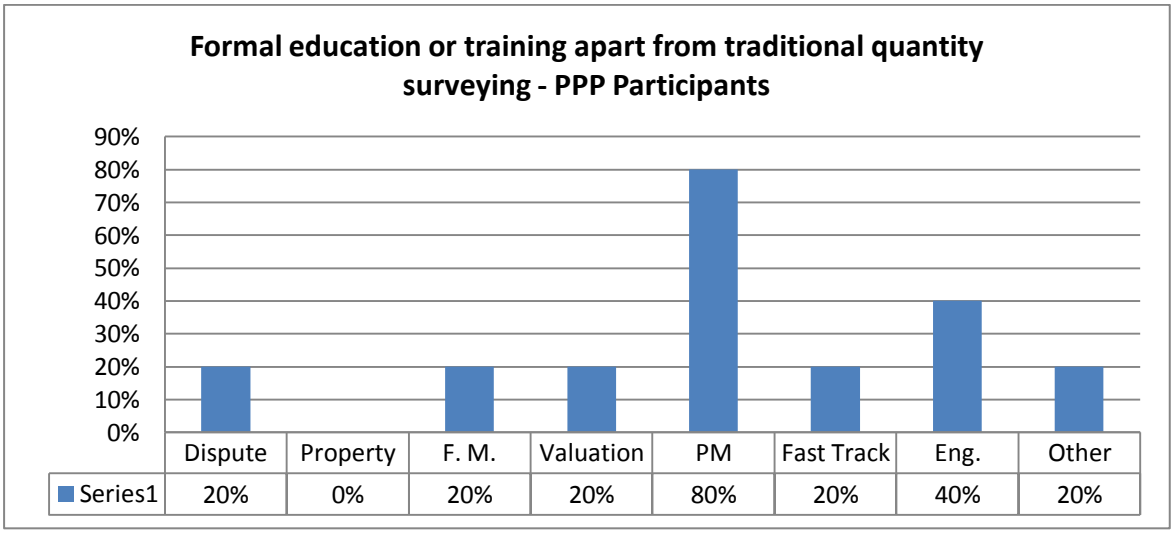


Figure 5.39: Other formal education or training apart from traditional quantity surveying – PPP Participants

Question 25: What other formal education or training, apart from traditional quantity surveying, would be useful in your organisation?

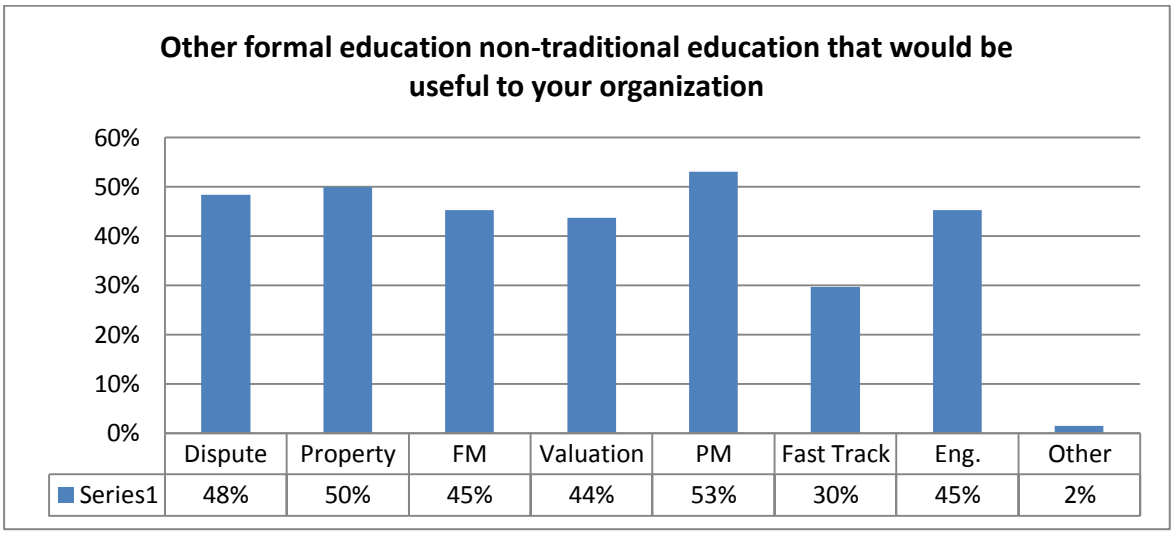


Figure 5.40: Other formal education or training, apart from traditional quantity surveying, that would be useful in your organisation

Question 25's aim was to establish what type of education or training respondents felt would be useful for their organization. It is important to ensure that the education or training that institutions provide is relevant to that which the industry requires.

The participants in question 25 were required to tick all the relevant boxes. The data were analysed on the basis that for each option there are 71 possible respondents; and 21 for those who have participated in PPPs. There were 70 responses for non-PPP participants; and 18 responses for PPP participants. The number of the responses for each option was divided by 70 respondents for non-participants in PPPs, and by 18 for PPP participants, in order to get a percentage.

According to Figure 5.40, most respondents indicated that the most useful training to their organisation would be project management (53%). The results are slightly different for those respondents who had participated in PPPs (see Figure 5.41). The majority indicated that the most useful training for their organisation was in valuation (61%). As many as 56% of the participants in PPPs rated project management, quantity surveying in engineering, facilities management, and property development second to valuation (all at 56%).

Non-participants in PPPs results for quantity surveying in engineering, facilities management and property development comprised 45% for both quantity surveying in engineering and facilities management, and 50% for property development (see figure 5.40).

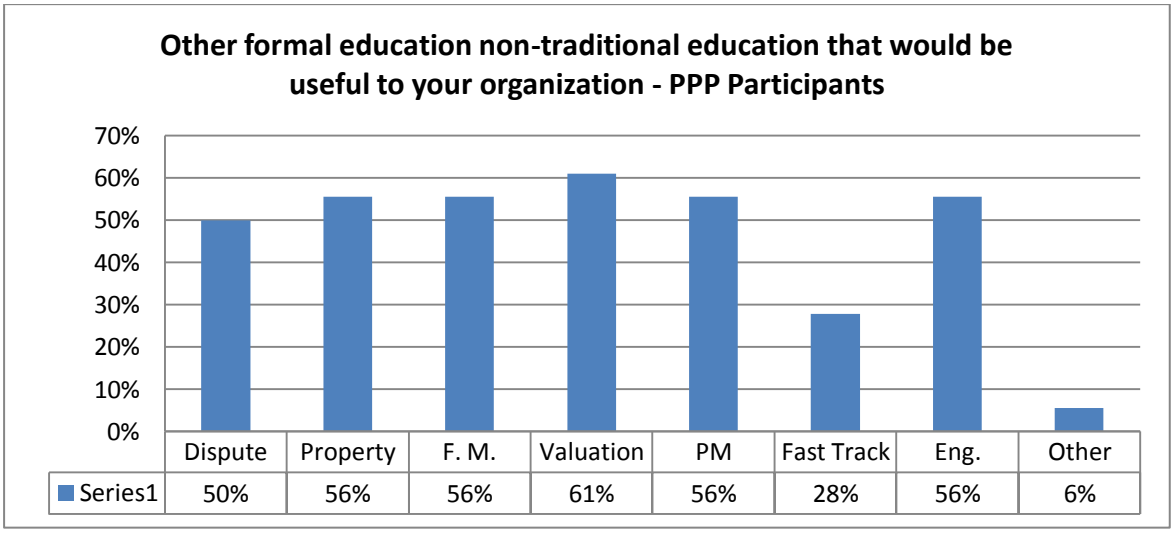


Figure 5.41: Other formal education or training, apart from traditional quantity surveying, that would be useful in your organisation – PPP Participants

From the results of question 25, project management training seems to be the most valued training in the industry. According to the results of question 12, there must therefore be a perception among quantity surveyors that there are more opportunities for project management services in the industry.

5.6.1 Summary of the Results from Section 5

The results of section 5 reveal that the majority of quantity surveyors do not have further training in non-traditional roles. For the majority of those who have further training in non-traditional roles, their training is in project management. Since most quantity surveyors have participated in project management (refer to Figure 12), it may be concluded that this is because they are: (i) Trained in project management; or (ii) there is a good market for project management skills; or (iii) it is for reasons (i) and (ii).

5.7 Summary of Chapter 5

In Chapter 5, the results of the survey have been presented and discussed in relation to the research questions, hypotheses and the literature review. Below is a summary of the results:

- Participation in PPPs is not determined by the size of the firm and career experience. However, quantity surveyors in more economically active provinces in private firms are more likely to participate in PPPs.
- Most quantity surveyors are familiar with PPPs. Although the bulk of their familiarity is average to very low, it is not the degree of their familiarity that determines their involvement in PPPs.
- The current role of quantity surveyors in other non-traditional roles (other than PPPs) is an indication that many are likely to embrace PPP as one of their non-traditional roles.
- Most quantity surveyors hold the perception that their education has adequately prepared them for both their traditional and non-traditional roles; and that quantity surveying skills can be transferred to non-traditional roles.
- The majority of quantity surveyors do not have further training in any non-traditional roles.

In Chapter 6, the results of the case study will be presented and discussed.

Chapter 6

Presentation and Discussions of the Results of the Case Study

6.1 Introduction

In this chapter the results of the case study will be presented and discussed with reference to the research questions, the research hypotheses and the literature review. The design and methodology, including the shortcomings and errors of the data, were discussed in Chapter 4.

The case-study results are discussed here under the following headings;

- Background information of the study case;
- Results of the interview with the project officer, the transaction advisor, and the private party;
- Results of the interview with the project quantity surveyor;
- Results of the interview with other PPP participants;
- A summary of the conclusions.

6.2 Background Information of Department of Basic Education (DBE) PPP Accommodation Project

A PPP agreement for office accommodation, between the Department of Education and the private party, was entered into on the 20th April 2007. The type of PPP agreement entered into was for the financing, constructing, operating and maintenance of the facility. The construction period was two years. The period for operating and maintaining the facility was for 25 years after construction (Department of Basic Education, 2011).

The project is currently valued at R403 million. The construction area is approximately 52000m^2 and the rentable area is about 34000m^2 (Group Five, 2010). Figure 6.1 shows the main entrance to the building.

Figure 6.1: Department of Basic Education (DBE) in Pretoria. Source: DBE

6.3 Results of the interview with the project officer, the transaction advisor and the private party

As stated before in Chapter 4, semi-structured questions were used to direct the interviewee in the right direction. The interviewees were also given the liberty to respond in an unstructured manner.

The researcher conducted an interview with the public party and the transactions advisor using semi-structured questions. The private party was “interviewed” via self-administered email questions. He responded to the email and questions posed to him in an unstructured manner.

The interview questions were divided into three categories. The first two categories of questions were intended to establish whether the stakeholders included quantity

surveyors in their teams; secondly, to determine what services quantity surveyors provided, and whether those services were provided satisfactorily; thirdly, to determine whether quantity surveyors added value to the project; and lastly, whether quantity surveyors would be recommended for future work in PPPs. The third and last category of questions' aim was to establish the stakeholders' knowledge of the quantity surveying profession.

The aim of the first two sets of questions was to test hypothesis three. This states that quantity surveyors' skills can be transferred to their non-traditional roles. The following questions made up the first set of questions:

i. Did quantity surveyors form part of your team?
ii. If yes; what services were they expected to deliver?
iii. Did they deliver those services satisfactorily? Kindly elaborate.
iv. Did they offer additional services in addition to the ones they were expected to deliver?
v. Would you recommend that quantity surveyors form part of your team?
vi. Why, or why not?
vii. What value did quantity surveyors add to the project?

If the interviewee had given a negative response to the first question (i) of the first set of questions, he was asked to answer set two of the questions:

viii. Why were they not part of your team?
ix. At which stage of the project were quantity surveyors engaged?
x. What services were they expected to deliver?
xi. Did they deliver those services satisfactorily? Kindly elaborate.
xii. Did they offer additional services beyond those they were expected to deliver?
xiii. Would you recommend that quantity surveyors form part of your team?
xiv. Why, or why not?
xv. What value did quantity surveyors add to the project?

From the first question (viii) of the second set of questions, the researcher wanted to determine the reasons for not including quantity surveyors as part of the team. The

expected reasons included: ignorance of quantity surveying skills, quantity surveying skills were not necessary; or, alternatively, other professionals were used to provide the required services.

From the second question (ix) of the second set of questions, the researcher wanted to establish whether quantity surveyors were involved at a later stage of the project. The researcher deemed the response to both questions important; as the responses would reveal the awareness of the quantity surveying profession and services in the PPP market – especially, given that the literature review showed that the profession is regarded as an obscure profession.

The question was also posed to test hypothesis six, which states that other stakeholders in the provision of infrastructure are unaware of the quantity surveying profession, or of its services.

The third set of questions was asked to determine the level of knowledge of quantity surveyors services amongst PPP stakeholders. The assumption made was that every interviewee would have an opinion about what quantity surveying services are – regardless of whether they had worked with quantity surveyors, or not. Their responses would reveal whether the stakeholders have a correct knowledge of quantity surveyors, or not. Incorrect knowledge or understanding of quantity surveyors amongst PPP stakeholders can be problematic.

Limited knowledge of quantity surveying services may lead to the limited involvement of quantity surveyors in PPP projects. While misconceptions of quantity surveying services has the potential of causing frustration and disappointment for all parties involved, quantity surveyors may be expected to perform duties that are not suited to their competencies and skills. In such instances, the potential for error becomes great. The result would consequently be disappointment and frustration – quite apart from wasted resources.

Below is a third set of questions posed to PPP stakeholders:

xvi. What is your understanding of quantity surveying services?

xvii. Before this project, did you ever engage the services of a quantity surveyor?

xviii. If so, what services did they provide?

xiv. If not, why?

Another important aspect of quantity surveying services to which the researcher wanted to draw the stakeholders' attention was their use of quantity surveying services prior to this PPP project. Prior knowledge would reveal to some extent whence their opinion of quantity surveyors emanated. The response may also provide a link between the understanding of quantity surveying services and participation in PPP projects. The assumption for the third set of questions was: If stakeholders know from previous working experience what quantity surveyors' services are, they would then be more likely to involve quantity surveyors in PPP projects.

Table 6.1 shows the responses from the public sector, the transaction advisor and the private party.

Table 6.1: Response of the public sector, transaction advisor and the private party

Description	Public Sector	Transaction Advisor	Private Party
QS as team player	No. There were no QSs employed within the department for this project.	QSs were part of the transaction advisor's team.	Yes. They play an important role in PPPs.
Expectation from QS	To provide capital cost and to determine project risk.	Feasibility – capital costing and life cycle costing. Procurement- services are limited. May be requested to check bid prices Development, Delivery and Closure – Qs may be expected to check variation orders' cost.	Quantity surveyor in construction group determines bid price for building. Private party and lenders interface with QS to ensure that the construction group bid price is fair and reasonable.
Satisfaction with QS services	QS services were satisfactory. They were value for money.	QS provided excellently on their services.	Yes.
Additional services provided by QS	QS provided additional services on an ad hoc basis.	No additional services were offered as quantity surveyors are secured.	Answer not provided.
Recommendation of the use of QS in PPPs	Yes, quantity surveyors are recommended for the future in PPPs.	Yes	Quantity surveyors' skills are indispensable in PPP projects.
Reason for recommending or not recommending quantity surveying in PPPs	They are indispensable part of the team.	They are vital members of the team.	Quantity surveyors' skills are indispensable in PPP projects.
Engagement of quantity surveyors' prior to project	The project officer never engaged services prior to this PPP project.	Yes. The transaction advisor is an engineer by profession and the quantity surveyors who were involved in the project were in-house quantity surveyors. The firm he worked for was a multi-disciplinary firm.	The private party has worked with quantity surveyors prior to this project.

Understanding of quantity surveyors' services	Prior to the PPP project, the project officer had limited knowledge about quantity surveying services. After the PPP project, the department is engaging more quantity surveyors in their infrastructure projects.	Yes. The transaction advisor has worked with quantity surveyors throughout his career that spans over 40 years.	The private party has worked with quantity surveyors prior to this project.
Other comments on QS services	Generally satisfied with quantity surveyor's services.	Quantity surveyors that usually form the transaction advisor's team are professional quantity surveyors (PrQS) at partner or senior level. The reason for this requirement is that the determination of the capital cost is paramount in a PPP.	The private party has had extensive dealings with quantity surveyors and continues to work with them and believes their skills set are indispensable in PPP projects.
Other comments on PPPs	Very satisfied with the current PPP's performance. The building has won an award on cleanliness.	The nature of a PPP project requires highly qualified people as the funds and risk involved are enormous.	Not provided.

6.3.1 Discussion of the response from the project officer.

The project officer, who acted as a representative of the public party in the project, prior to this project's implementation, had not interacted with quantity surveyors before. There were also no quantity surveyors employed in his department prior to the implementation of this project. Their engagement with quantity surveyors was through the transaction advisor's quantity surveyor during the project. According to Table 6.1, they were very satisfied with the services offered by the quantity surveyor. They have since retained the quantity surveyor for the entire duration of the PPP project.

Since the implementation of the DBE PPP project, the department has started to engage more quantity surveying services. The success of this project has spurred other government departments to consider PPP as an alternative procurement method. The departments include StatsSA and the Department of International Relations and Co-operation (DIRCO).

From Chapter 3 of the literature review, the project officer is defined by Treasury Regulation 16 as a, " … *person identified by the accounting officer or accounting authority of an institution, who is capable and appropriately qualified to manage a PPP, to which that institution is party from its inception to its expiration or termination."* He must have professional expertise and experience. PPP knowledge

and experience or comparable experience is important. The project officer must possess the relevant knowledge and skills in law, finance, public administration and document management. Project management, resource management, quality management, risk management, change management, variation management, knowledge management and monitoring are some of the skills and competencies required to function as a project officer.

The project officer for the DBE project is an educator by profession, with over twenty years of working experience in administration and management in various government departments. Change management skills, people management skills and relationship management, knowledge of law, and years of experience in the field are the skills the project officer regards as being important for a project officer to possess.

The conclusions that can be drawn from the interview with the project officer are as follows:

- Quantity surveyors play an important role in PPPs; as they determine the capital cost of the project and determine the project risk. This information is important in influencing the government's decision to pursue PPPs, or the traditional route. Hypothesis one is thus supported; the education and training of quantity surveyors enables them to be able to transfer their skills and competencies to their non-traditional roles.
- The set skills required for a project officer are wide and many. It seems improbable for one person to possess all these skills. From the interview with the project officer, it would seem as if one person has at least some of the skills required for the project officer's function; and that would be sufficient. The project officer for DBE has some of the skills required and many years of experience in various departments. Therefore, the skills and competency requirements for the project officer seem to be rather unrealistic.
- The fact that the DBE project officer's first interaction with quantity surveyors was via the transaction advisor indicates that hypothesis six is correct; and

that other stakeholders in the provision of infrastructure are not aware of the wide range of services that quantity surveyors can offer.

6.3.2 Discussion of the response from the transaction advisor

As mentioned before, in Chapters 2 and 3 of the literature review, the transaction advisor is made up of one, or of a few consulting firms, acting as a consortium. Members of the consortium must be able to deliver on the financial, technical, BEE and legal work requirements of the PPP agreement. The member of the transaction advisor team interviewed is from the technical team of the transaction advisory team.

The interviewee holds a BSc. degree in Civil Engineering, a Graduate Diploma in Engineering, as well as an MBA. He has 40 years of career experience in facilities management, PPP advisory, infrastructure development, management advisory and programme management. He has worked on numerous PPP projects as technical advisor, transaction manager, facilities manager and technical advisor – both in South Africa and outside South Africa.

As the member of the transaction advisor interviewed was from a technical side and from a multi-disciplinary quantity surveying firm, he had in-depth knowledge of the quantity surveying profession. He has interacted with quantity surveyors in numerous projects in his over 40 years of experience. According to Table 6.1, he was pleased with the excellent service provided by the quantity surveyors. He believes that quantity surveyors are vital members of any PPP project; as they determine the capital costs, which can be used as an acid test for a South African PPP.

Some of the conclusions that can be drawn from the interview with the transaction advisor are as follows:

- Quantity surveyors play a vital role in PPPs; as they provide a benchmark (capital cost), which is then used as an acid test for the whole PPP lifespan in

a South African PPP. It is, therefore, correct to assume that the education and training of quantity surveyors enables them to be able to transfer their skills and competencies to their non-traditional roles (hypothesis 1).

- Hypothesis six states that other stakeholders in the provision of infrastructure are not aware of the wide range of services that quantity surveyors can offer. This is thus disproved. However, this statement must be qualified; as this particular member of the transaction advisor team is an engineer; and engineers, due to the nature of their work, are expected to interact with quantity surveyors on various construction projects. Therefore, it is not conclusive to state that hypothesis six has been rejected.

6.3.3 Discussion of the response from the private party

From Chapter 3, Figure 6.2 was provided to show the relationships and role players in a typical PPP.

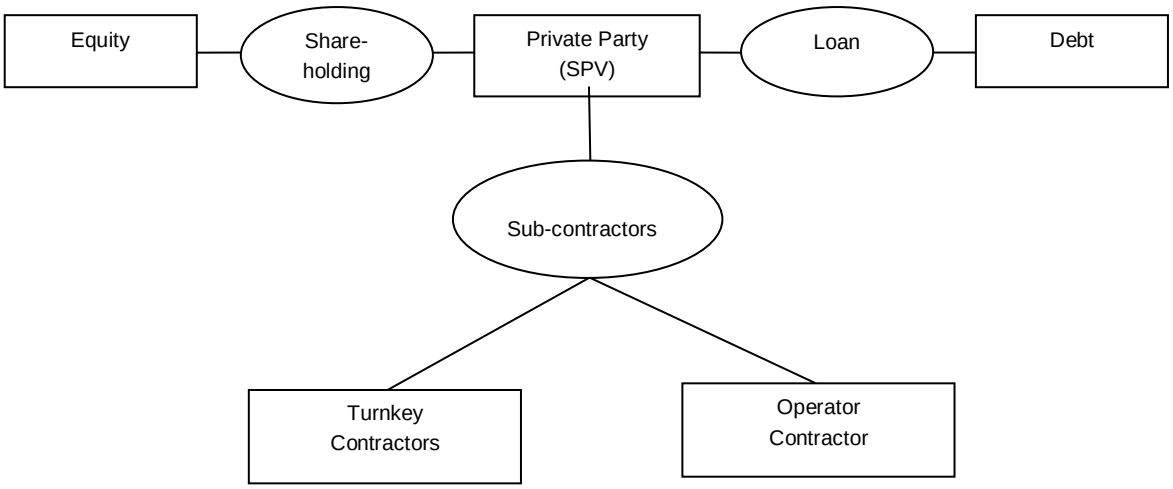


Figure 6.2: The relationships of role players of the private party in a PPP (Adapted from the South African National Treasury: PPP Unit, 2005)

The interviewee in this DBE project is from the private party, and has immense PPP experience – having worked in three other successful PPP projects in South Africa.

The SPV representative believes that quantity surveyors are indispensable members of any PPP project; as their skills set would be more suited for a PPP project (refer to Table 6.1). As the interview was in the format of a self-administered email questionnaire, there were no details given as to which specific quantity surveying services are more suited for a PPP. From the results of the survey in Chapter 5, it can be assumed that there is no distinct quantity surveying skill that is better suited for a PPP than the other.

However, he mentioned that the quantity surveying services tend to decrease after construction is completed.

Even though the interviewee did not provide his career background and experience, he claims that he has worked with quantity surveyors his whole working life. Given that he is from an SPV, and that most of PPP SPV in South Africa are usually big construction companies, his claims are, therefore, quite plausible.

Some conclusions that can be drawn from the interview with the private party are as follows:

- Quantity surveyors are indispensable in a PPP project. Their skills are required mostly in phases two to four of a PPP for a private-sector client. Most private-party stakeholders have their own quantity surveyors. Lenders, SPV and contactors have their own quantity surveyor, providing different services for each party during the PPP project. Once again, hypothesis three is supported: the education and training of quantity surveyors enables them to be able to transfer their skills and competencies to their non-traditional roles.

- Quantity surveyors' services diminish after construction. It is important to note that even though quantity surveyors may provide whole life-cycle costs, their services are not deemed necessary after completion.

6.4 Discussion of the response from the transaction advisor's quantity surveyor

The interview was via a self-administered questionnaire. It was the same questionnaire used for the online survey (refer to annexure 6). Due to the busyness of the interviewee, the self-administered questionnaire was the best option, under the circumstances. The advantages and disadvantages of self-administered questionnaires were discussed in Chapter 4. The results of the response are given in Table 6.2.

By interviewing a quantity surveyor who has worked in a successful accommodation PPP, the researcher wanted to test the validity of hypotheses 1, 3 and 5, as mentioned in Chapter One.

Table 6.2: Response from the project quantity surveyor

	Questions	Responses
1	Size of organisation: How many people are employed in your organization (Local branch if more than one branch)?	Over 100
2	In which province in RSA is your organization located? (Local branch if more than one branch)?	Gauteng
3	Indicate the economic sector in which the main activity of your company falls.	Private Quantity Surveying
4	Indicate the number of years in the quantity surveying profession.	Over 25 years
5	Are you familiar with PPP as defined by Treasury Regulation No.16?	Yes
6	Rate your familiarity of PPP on a scale of 1-5.	Very High (5)
7	Have you ever worked on a PPP projects?	Yes
8	If your answer to question 7 was "yes", who were you consulting for?	• Public entity • private party (spv), • transaction advisor, • consortium contractor, • lender's technical advisor, • independent certifier and • operations' sub-contractor.
9	If your answer to question 7 was "yes", which quantity surveying services did you provide?	• Feasibility and viability studies, • estimating and cost advice, • financial control and • whole life cycle
10	If your answer to question 7 was "yes", which phases of a PPP were you involved in?	• inception

		• feasibility study, • procurement, • development, • delivery, • exit and • whole life cycle costing
11	From the services you provided in 9 & 10 above, which distinctive quantity surveying skills did you apply?	• Measurement, • contractual advice and arrangement, • forecasting and budgeting, • analysis, • cost planning, • cost controlling and • whole life cycle costing.
12	The following roles are regarded as non traditional roles or specialist roles of quantity surveyors. Indicate by ticking the appropriate boxes if you have offered services in any of these roles in your career.	Dispute resolution, property development, facilities management, project management
13	How often does your organization undertake non-traditional quantity surveying work?	Regularly
14	If your answer in the previous question was "Seldom "or " Never", please indicate the reason(s) for your answer:	Not applicable
15	My education and training has adequately prepared me for the traditional quantity surveying role	Agree somewhat
16	My education and training has adequately prepared me for the non-traditional quantity surveying role	Absolutely disagree
17	Tertiary education has adequately incorporated courses on non-traditional roles in their training	Unsure
18	My competency in the non-traditional role is largely due to my initial education from a tertiary institution	Absolutely disagree
19	I feel just as comfortable in my non-traditional role as I do in my traditional role.	Absolutely agree
20	My quantity surveying education and training knowledge and skills can easily be transferred to the non-traditional role.	Absolutely agree
21	I need additional training for me to competently provide services in the non-traditional role.	Agree somewhat
22	Non-traditional roles should be offered as certificate courses by tertiary institutions or other institutions	Agree somewhat
23	Do you have any other formal training or skill in a non-traditional role of a quantity surveyor.	Yes
24	What other formal education or training, apart from traditional quantity surveying do you have	Leadership and Management, Facilities Management & PPP Course (In house).
25	What other formal education or training apart from traditional quantity surveying would be useful to your organization?	Not answered

Some conclusions that can be drawn from the interview with the transaction advisor's quantity surveyor:

- From the results of the interview, hypothesis one, which states that quantity surveyors with many years of quantity surveying experience, from big quantity surveying private firms in more economically developed provinces, would be more likely to participate in PPPs, is supported. However, the results of this

case study must be read in conjunction with the results of the survey – in order to get a fuller picture. The results of the survey revealed that the majority of quantity surveyors currently involved in PPPs need not have a long career record; nor do they need to be in big firms. Their geographic location and their economic sector may influence their inclination to participate.

- Hypothesis three states that the education and training of quantity surveyors enables them to be able to transfer their skills and competencies to their non-traditional roles. This was supported. The results of the interview are consistent with the results of the survey on this issue.
- Similar to the survey results in Chapter 5, the results of the interview are not all conclusive regarding hypothesis five: that education and training in non-traditional roles plays a role in quantity surveyors' participation in PPPs. Education in non-traditional roles should enhance the skills of quantity surveyors; but a quantity surveyor's initial education seems to be adequate in preparing them for their non-traditional roles.

6.5 Results from an interview with a PPP Consultant

As mentioned in Chapter 4, it was the aim of the researcher to investigate three case studies; however, for the reasons alluded to in Chapter 4, only one case was investigated. However, one PPP participant, who has extensive knowledge of PPPs, agreed to provide some insight regarding PPPs.

The researcher decided to include some of the salient points from the interview. The aim was to get another vantage point regarding PPPs in South Africa from someone with a wealth of knowledge and experience of South African PPPs.

The interviewee is a quantity surveyor by profession. His training as a quantity surveyor was done in the UK. He is a fellow of the Royal Institution of Chartered Surveyors (FRICS), a fellow of the Chartered Institute of Building (FCIOB), a member of the Association of South African Quantity Surveyors (MAQS), and an associate of the Association of Arbitrators (AAArb). He has been an independent PPP consultant from March, 2006 to date. His previous work experience includes

working for a big construction firm in South Africa for 32 years, of which 25 were as a director. During that time, he served on a number of boards dealing with construction, property development and concessionary contracts. He is often invited to lecture at various universities, particularly to Masters' students. He was the co-ordinator for the private party and the contact person for the government in the first successful PPP in South Africa for a maximum security correctional facility for 3000 inmates. He also served on the SPV board for five years.

The interview with the independent PPP consultant was conducted via a telephonic interview. This was due to time and financial constraints. The interview was semi-structured. Below are the results from the interview in point format:

- PPPs are a very transparent procurement method. There is little room for corruption. Risk is transferred to the party best suited to handle it.
- Government inefficiencies in the delivery of infrastructure can be remedied to a significant amount by the involvement of the private sector in PPPs.
- PPPs are relatively small in South Africa. In 2009, PPPs made up only 1% of the South African infrastructure budget. At the same period in the UK, they comprised 43% of the infrastructure budget.
- All those quantity surveyors who had been involved with the private party, were in-house quantity surveyors; as the risks are too high to engage an external quantity surveyor.
- The quantity surveyor's role usually ends with the construction phase, or with the development phase.

Conclusions that can be drawn from the interview with the independent PPP consultant are as follows:

- The South African government's intentions of ensuring compliance with PFMA (refer to Chapter 2 of the literature review) can be realised by the use of PPPs. PPPs promote open and effective competition.

- According to the literature review in Chapter 2, private party expertise could reduce public inefficiencies significantly.
- The PPP market in South Africa is relatively small; as was also revealed by the survey results.
- Quantity surveyors are not usually involved in all the phases of a PPP project.

6.6 Summary of Chapter 6

In Chapter 6, the results of the case study have been presented and discussed in relation to the research questions, the hypotheses and the literature review. Below is a summary of the results:

- The results of the case study were not conclusive in supporting or rejecting hypothesis one, which states that quantity surveyors with many years of quantity surveying experience from big quantity surveying private firms in more economically developed provinces, would be more likely to participate in PPPs. The results of the case study must be compared with the survey results in Chapter 5 – in order to get a full picture.
- That Quantity surveyors' education has adequately prepared them for both their traditional and non-traditional roles, and that quantity surveying skills can be transferred to non-traditional roles, has been adequately demonstrated. Most participants were satisfied with the services provided by the quantity surveyor. This supports hypothesis three.
- The public sector seems to be unaware of the services of quantity surveyors. All other stakeholders in the case study were aware of quantity surveying services. The assumption that other stakeholders in the provision of infrastructure are not aware of the wide range of services that quantity surveyors can offer, as hypothesis six purports, is partially rejected.
- Although education in non-traditional roles might enhance the skills of quantity surveyors, quantity surveyors' initial education seems to be adequate in preparing them for their non-traditional roles.
- The skills and competency requirements for the project officer seem to be somewhat unrealistic.

- Quantity surveyors' services tend to decrease after the construction phase.

In Chapter 7, the conclusions to the study, as well as some recommendations are provided.

Chapter 7
Conclusions and Recommendations

7. 1. Introduction

Chapter 1 of the study provided the background and justification for the study. In Chapters 2 and 3, the available literature on PPPs and quantity surveyors was reviewed. The research design and methodology, including the shortcomings and sources of errors for the data, were explained in Chapter 4. The findings of the survey and the case study were provided in Chapters 5 and 6, respectively.

The main objective of Chapter 7 is to draw conclusions, and to make recommendations from the main findings of the study in the light of the literature review, the research questions and the research hypotheses.

7.2 Conclusions on the Research Questions

7.2.1 What is a PPP and its role in the delivery of infrastructure projects?

Although many scholars and researchers differ on the definition of PPPs; according to the literature review in Chapter 2, PPPs in South Africa are defined and regulated by Treasury Regulation No.16. Any partnership between the public party and the private sector that does not meet the requirements of Treasury Regulation 16 cannot be regarded as a legal PPP in South Africa.

Another inference can be made from the literature review in Chapter 2, that although PPPs are seen as an alternative procurement method, and that there are currently few PPP projects in the market (UN, 2008), there is room to believe that the market for PPPs will probably increase. The South African government has demonstrated its intention to use PPPs as an alternative procurement method – by establishing legislation on PPPs and a PPP Unit.

PPP Unit's mandate includes, among others, regulating the implementation of PPP projects in South Africa. There are currently sixty-nine projects that are under consideration for PPPs (South African National Treasury PPP Unit, 2015).

7.2.2 What is the current role of QS in PPPs?

From the findings of the survey and the case study, it was observed that firstly, the majority of quantity surveyors are familiar with PPPs; and secondly, that although their education, skills and competencies are arguably more suited for a PPP, they do not participate, mainly because of their perception that there is no market for PPPs.

7.2.3 What is the future role of QS in PPPs?

From the literature review, given the South African government's commitment to PPPs and the global trends on PPPs, it may reasonably be concluded that PPPs will increasingly be used as an alternative means of delivering public services. There is, therefore, an opportunity for quantity surveyors to play a greater role in PPPs in the future.

Another reason to believe that there is an increased role for South African quantity surveyors in PPPs is that, from the survey and case study results, many quantity surveyors and other stakeholders believe that their education and competencies could play a vital role in PPPs. In the UK, many quantity surveyors are involved in PPPs (Cartlidge, 2011).

7.3 Conclusions on the Research Hypotheses

7.3.1 Hypothesis One

From the findings of the survey in Chapter 5 , the hypothesis which states that quantity surveyors with many years of quantity surveying experience, from big quantity surveying private firms in more economically developed provinces, are more likely to participate in PPPs, was not entirely supported.

Although, quantity surveyors in more economically active provinces in private firms are likely to participate in PPPs, participation in PPPs is not determined by the size of the firm and the level of career experience.

The conclusion that can be drawn from the survey results and the case study is that: economic activity in a region contributes to the participation of quantity surveyors in PPPs. The greater the economic activity, the more the likelihood of infrastructure development; and the greater the likelihood that quantity surveyors would participate in PPPs.

7.3.2 Hypothesis Two

Hypothesis two was rejected in its entirety. According to the findings of the survey, the main reason why the majority of quantity surveyors do not participate in PPPs is not because they are not familiar with PPPs; rather it is mainly due to a perceived limited market for PPPs. It is, therefore, the market that determines PPP participation rather than any familiarity with PPPs.

7.3.3 Hypothesis Three

Hypothesis three, which purports that the education and training of quantity surveyors enables them to be able to transfer their skills and competencies to their non-traditional roles was supported by both the survey and the case study in its entirety.

Quantity surveyors' education and training is, therefore, adequate in the development of quantity surveyors – for both their traditional and non-traditional roles.

7.3.4 Hypothesis Four

The results of the survey supported that quantity surveyors do not prefer their traditional role to their non-traditional role. Hypothesis four was, therefore, rejected in its entirety. It is the market that determines their participation in PPPs.

7.3.5 Hypothesis Five

Although education and training are important in developing skills and competencies in quantity surveyors, the survey results revealed that there was no great need for specific non-traditional role training for quantity surveyors to participate in PPPs. Their initial tertiary education was adequate for ensuring that quantity surveyors can execute their services – in both the traditional and non-traditional roles. However, further education in non-traditional roles could enhance quantity surveying skills. Hypothesis five was thus partially supported.

7.3.6 Hypothesis Six

From the results of the case study, it may be deduced that the majority of the stakeholders in the provision of infrastructure were aware of the wide range of services that quantity surveyors can offer. However, there seems to be some lack of awareness of quantity surveying services from the public sector. Hypothesis six is, therefore, not entirely rejected.

7.4 The recommendations

Based on the findings of the research project (provided in Chapters 5 and 6) and the conclusions drawn, the following recommendations are made:

- Quantity surveyors must familiarize themselves with PPPs through education and participation. The South African government and a few institutions offer training in PPPs. Familiarity and education would boost confidence; and it might increase their future participation.
- The future participation of quantity surveyors can be increased through the marketing of quantity surveying skills to stakeholders – especially the public sector. The public sector is the initiator of PPPs in South Africa, and a key economic driver; and it is therefore important that government should be aware of the wide range of quantity surveying skills that are available. Unless, there is a greater awareness of quantity surveying skills in government, some

government inefficiencies would not be eliminated; and quantity surveyors would only get a small share of the economic pie.

- The SACQSP, ASAQS and other voluntary quantity surveying organizations must be the leading drivers in the marketing of quantity surveying skills.
- Quantity surveyors must familiarize themselves with the plans of government regarding infrastructure development through self-study and participation in government conferences and seminars. Through such initiatives, they would be able to identify any existing or future opportunities for their services.
- Quantity surveyors must seek employment in other economic sectors – especially in government and in the academic field.
- There is a greater need for interaction between quantity surveyor practitioners, researchers and tertiary institutions. Through interaction, tertiary institutions would be able to provide education that is relevant for the needs of the market and the country.
- There must be more quantity surveying researchers. Research can provide innovation for the profession, and predict the future trends in the industry.
- Tertiary institutions should offer non-traditional role education as certificate courses to quantity surveyors. This would enhance the skills and competencies of quantity surveyors in non-traditional roles.

7.5 The study's contribution to the quantity surveying profession

Quantity surveying skills are diverse and can be applied in a wide range of sectors within the economy. The study has firstly, highlighted the importance of education in enabling quantity surveyors in the performance of both their traditional and non-traditional roles. Secondly, poor marketing of the quantity surveying profession especially to government has the potential of narrowing the role of quantity surveyors in the economy. Thirdly, during an economic downturn, quantity surveyors do not have to close shop but can position themselves in such a way that they can apply their skills in other markets that will yield economic benefits.

7.6 Further Research

The study was limited to the role of quantity surveyors in PPPs in South Africa; and as such, the role of quantity surveyors was studied in the South African context. Future research could investigate their role in PPPs in other countries, such as other first- or third-world countries.

The extent of tertiary education's role in the preparation of quantity surveyors for their non-traditional roles could make an interesting study.

Other professionals, such as medical professionals and lawyers, specialize in a specific field of their profession. Similarly, there is a need for specialization in the quantity surveying profession also. This issue can only be properly addressed through research.

7.7 Conclusion of Chapter 7

In this chapter, the researcher has shown how the research questions and hypotheses were addressed through the literature review, the survey and the case study. Conclusions regarding the role and the future role of quantity surveyors have been made. Recommendations and suggestions for future studies have also been suggested.

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ANNEXURE 1

Dear Sir/Madam

I am Josephine Llale, a registered quantity surveyor and an MSc Student at the University of Pretoria. My research
topic is;" The Role of Quantity Surveyors in Public Private Partnerships."

The main aim of my research is to;

1. Investigate how quantity surveyors can add more value beyond their traditional roles in PPP projects.
2. Highlight possible opportunities that exist for the quantity surveying profession in future in PPP projects.

My research questions are;

1. What is a PPP and what is its role in the delivery of infrastructure projects?
2. What is the current role of a quantity surveyor in a PPP project?
3. What is the possible future role of a quantity surveyor in a PPP project?

My questionnaire which has been approved by the University of Pretoria's Ethics Committee. The result of the research will form part of my Masters' dissertation and can be made available to the ASAQS and other interested parties.

Kindly record your response by linking to the questionnaire on this web link https://www.surveymonkey.com/s/QSPPPSA . The survey is web-based and the results are captured and processed electronically and takes 10 – 15 minutes to complete. Individual responses will be treated anonymously and confidentially. Kindly complete the survey by **Friday 14th November 2014**.

For any queries please contact me, Josephine Llale at 083 488 4235 or llale.josephine@gmail.com or

Mr Hoffie Cruywagen (study leader) at 012 420 4973 or Hoffie.Cruywagen@up.ac.za

Please note that you can claim 30 CPD minutes in category 2. Refer to www.asaqs.co.za (edutech/student research).

Thanking you in advance for your assistance in this survey.

Regards,

Josephine

ANNEXURE 2

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Reference number: EBIT/57/2014

22 September 2014

Ms J Llale
P.O. Box 50198
Mafikeng South
2791

Dear Ms Llale,

FACULTY COMMITTEE FOR RESEARCH ETHICS AND INTEGRITY

Your recent application to the EBIT Ethics Committee refers.

1 I hereby wish to inform you that the research project titled "The role of QS in PPP's in SA" has been approved by the Committee.

This approval does not imply that the researcher, student or lecturer is relieved of any accountability in terms of the Codes of Research Ethics of the University of Pretoria, if action is taken beyond the approved proposal.

2 According to the regulations, any relevant problem arising from the study or research methodology as well as any amendments or changes, must be brought to the attention of any member of the Faculty Committee who will deal with the matter.

3 The Committee must be notified on completion of the project.

The Committee wishes you every success with the research project.

Prof JJ Hanekom
Chair: Faculty Committee for Research Ethics and Integrity
FACULTY OF ENGINEERING, BUILT ENVIRONMENT AND INFORMATION TECHNOLOGY

ANNEXURE 3

P.O.Box 50198

Mafikeng South

2791

16 July 2014

Dear Sir/ Madam

Re: Case Studies on the Role of Quantity Surveying in Public Private Partnerships in South Africa

I am an MSc Student at the University of Pretoria. My topic is;" The Role of Quantity Surveyors in Public Private Partnerships." (Refer to the letter from my study leader attached hereto). As part of my research, I would like to request permission to do a case study on a PPP project that you or your organization was involved in.

Awaiting your favourable response.

Regards,

Josephine Llale

083 488 4235

llale.josephine@gmail.com

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Departement Konstruksie-ekonomie/
Department of Construction Economics/
Mokgahlo wa Matlotlo a Leago
hoffie.cruywagen@up.ac.za
Tel: (012)420 4973
Fax: (012)420 3598

15 July 2014

TO WHOM IT MAY CONCERN

This is to confirm that Me Josephine Llale is a registered student for the MSc-degree in Quantity Surveying at the University of Pretoria. I hereby request your assistance in providing Me Llale with information in order for her to complete this research project.

Kind regards

JH CRUYWAGEN
SNR LECTURER/STUDY LEADER

ANNEXURE 4

Annexure 4

Dear Sir/Madam

I am currently doing my Masters degree in Quantity Surveying with the University of Pretoria (see attached letters). My research topic is; “The Role of Quantity Surveyors in PPPs in South Africa.”

As your company was appointed as transaction advisors for the Department of Basic Education PPP, I would like to get your views
regarding your interaction and services you received from quantity surveyors as part of my case studies. It would be great if I could set
up a meeting with Mr X or any other person who was involved in the project for next week to assist me in my research.

The following questions are of particular interest to me;

1. Did quantity surveyors form part of your transaction advisory team?
2. If yes; what services were they expected to deliver?
3. Did they deliver those services satisfactorily? Kindly explain
4. Did they offer additional services above the ones they were expected to deliver?
5. Would you recommend that quantity surveyors form part of the transaction advisor’s team?
6. Why or why not?
7. What value did quantity surveyors add to the project?

If the answer to question no.1 is no

8. Why were they not part of the transaction advisory team?
9. At which stage of the project were quantity surveyors engaged?
10. What services were they expected to deliver?
11. Did they deliver those services satisfactorily? Kindly explain.
12. Did they offer additional services above the ones they were expected to deliver?
13. What value did the quantity surveyor add to the project?
14. Would you recommend the services of quantity surveyors in a PPP project?
15. Why or why not?

Generally

16. What is your understanding of quantity surveyors services?
17. Before this project did you ever engage the services of a quantity surveyor?
18. If so, what services did they provide?
19. If not, why?

I will contact you by telephone before Friday, 22nd August 2014 to discuss the possibility of an interview next week.

Thanking you in advance.

Regards,
Josephine

ANNEXURE 5

THE ROLE OF QUANTITY SURVEYORS IN PUBLIC PRIVATE PARTNERSHIPS IN SOUTH AFRICA

Respondent number

*Please answer all the questions by marking with a **"X"** in a yellow box.*

SECTION 1: BACKGROUND INFORMATION

1. Size of organisation: How many people are employed in your organisation (local branch only if more than one branch)?

1)	0 - 5		3)	11 - 20		5)	51 - 100	
2)	6 - 10		4)	21 - 50		6)	> 100	

2. Location: In which province in the RSA is your organisation located (local branch if more than one branch)?

1)	Eastern Cape		4)	KZN		7)	Northern Cape		
2)	Free State		5)	Limpopo		8)	North West		
3)	Gauteng		6)	Mpumalanga		9)	Western Cape		

3. Economic sector: Indicate the economic sector in which the **main** activity of your company falls

THE ROLE OF QUANTITY SURVEYORS IN PUBLIC PRIVATE PARTNERSHIPS IN SOUTH AFRICA

Respondent number

*Please answer all the questions by marking with a **"X"** in a yellow box.*

THE ROLE OF QUANTITY SURVEYORS IN PUBLIC PRIVATE PARTNERSHIPS IN SOUTH AFRICA

Respondent number

*Please answer all the questions by marking with a **"X"** in a yellow box.*

SECTION 1: BACKGROUND INFORMATION

1. Size of organisation: How many people are employed in your organisation (local branch only if more than one branch)?

1)	Yes		2)	No	

6. Rate your familiarity of Public Private Partnership on a scale of 1 - 5.

	1) very low	2) low	3) average	4) high	5) very high
Public Private Partnership as defined by Treasury Regulation No.16					

7. Have you ever worked on a Public Private Partnership project?

1)	Yes		2)	No	

8. If your answer to question 7 was "yes", who were you consulting for?

1)	Public Entity	
2)	Private Party/ Special Vehicle Purpose Company	
3)	Transaction Advisor	
4)	Consortium Contractor	
5)	Other (please specify)	

9. If your answer to question 7 was "yes" , which quantity surveying services did you provide? Please tick all the appropriate boxes.

1)	Feasibility and Viability Studies	
2)	Estimating and Cost Advice	
3)	Advice on tendering procedures & contractual arrangement	
4)	Preparation of tender documents	
5	Financial control	

)		
6)	Valuation of work in progress	
7)	Cash Flow	
8)	Final Account	
9)	Other (please specify):	

10. If your answer to question 7 was "yes", which phases of a Public Private Partnerhip were you involved in? Tick all the relevant boxes

1)	Phase 1 - Inception	
2)	Phase 2- Feasibility Study	
3)	Phase 3 - Procurement	
4)	Phase 4 - Development	
5)	Phase 5 - Delivery	
6)	Phase 6 - Exit	
7)	Other (please specify):	

11. From the services you provide in 9 & 10 above, which distinctive quantity surveying skills did you apply? Tick all the relevant boxes

1)	Measurement	
2)	Valuation	
3)	Contractual Advice & Arrangement	
4)	Forecasting or Budgeting	
5)	Analysing	
6)	Cost Planning	
7)	Cost Controlling	
8)	Accounting	
9)	Other (please specify):	

SECTION 3: TRADITIONAL AND NON-TRADITIONAL ROLE OF QUANTITY SURVEYORS

***Note** :The traditional role of a quantity surveyors includes, estimating, preparation of bills of quantities, evaluation of tenders, interim payment certificates and final account.*

12 The following roles are often regarded as non traditional roles or specialist roles of quantity surveyors. Indicate by ticking the appropriate boxes if you have offered services in any of these roles in your career.

1)	Dispute Resolution	
2)	Property Development	
3)	Facilities Management	
4)	Valuation (for property, insurances, etc)	
5)	Project Management	
6)	Fast Track Construction	
7)	QS in respect of civil, mechanical, & electrical work	
8)	Other (please specify):	

13. How often does your organisation undertake non-traditional quantity surveying work:

1)	Regularly	
2)	Seldom	
3)	Never	

14. If your answer in the previous question was "Seldom" or "Never", please indicate the reason(s) for your answer:

1)	Lack of knowledge and skills	
2)	Preference to traditional role	
3)	Not enough market for non-traditional role	
4)	Too risky	
5)	Other (please indicate the reason):	

SECTION 4: **YOUR PERCEPTION REGARDING THE EDUCATION AND COMPETENCY OF A QUANTITY SURVEYOR (to what extent do you agree/disagree with the following statements?)**

Note *:The traditional role of a quantity surveyors includes, estimating, preparation of bills of quantities, evaluation of tenders, interim payment certificates and final account.*

		1) absolutely disagree	2) disagree somewhat	3) unsure	4) agree somewhat	5) absolutely agree
15.	My education and training has adequately prepared me for the traditional quantity surveying role					
16.	My education and training has adequately prepared me for the NON traditional quantity surveying roles					
17.	Tertiary education has adequately incorporated courses on non-traditional roles in their training					
18.	My competency in the non-traditional role is largely due to my initial education from a tertiary institution					
19.	I feel just as comfortable in my non-traditional role as I do in my traditional role.					
20.	My quantity surveying education and training knowledge and skills can easily be transferred to the non-traditional role					
21.	I need additional training for me to competently provide services in the non-traditional role.					
22.	Non-traditional roles should be offered as certificate courses by tertiary institutions or other institutions					

SECTION 5: **FURTHER EDUCATION**

23 Do you have any other formal training or skill in a non-traditional role of a quantity surveyor (project management, facilities management, real estate, etc.)

1)	Yes		2)	No	

24. What other formal education or training, apart from traditional quantity surveying do you have?

25. What other formal education or training, apart from traditional quantity surveying would be useful to your organisation?

Thank you for your time and co-operation

PLEASE MAIL THIS QUESTIONNAIRE BACK TO:

llale.josephine@gmail.com

or FAX it to: (086) 586 9936