PROJECT MANAGEMENT AND PROCUREMENT:

AN ESKOM SURVEY

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Declaration of authenticity

I declare that the research project, *Project Management and Procurement: An Eskom Survey,* is my own work and that each source of information used has been acknowledged by means of a complete reference. This dissertation has not been submitted before for any other research project, degree or examination at any university.

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Summary

Eskom has an internal procurement support function to source goods and services required in the organisation. The relationship between procurement and project management in Eskom tends to be confrontational rather than cooperative in order to meet project objectives. The research question in this study is: “Whether or not an integrated team approach between the procurement and project management functions would ensure that the challenges are addressed to ultimately lead to project success”.

With the purpose of answering the research question and to achieve the main objective of the study, the researcher applied a qualitative research method to identify the technical, general and risk questions of the study. These methods were researched by consulting various resources. The data collection period lasted from 2012 to 26 February 2016.

The research was accomplished by means of a questionnaire to gather information on an integrated team approach between the procurement and project management functions.

Specific technical and general questions were researched during the study. The findings of the research have shown that Eskom has developed project management within the organisation, however, project management principles have not been effectively implemented or universally accepted by Eskom employees.

The matters needing attention, which the study has identified within the project management environment, include effective integration between project management and other organisational functions.

Indications are that there is an opportunity to build on the current body of available resources with skills in project management methodologies. As the financial benefits of project management are not measured in Eskom, an opportunity also exists to encourage the sharing of knowledge by scheduling time for workshops to share project requirements and procurement knowledge.

Procurement processes are ineffective and time consuming. Furthermore, effective cooperation needs to be improved and common ownership of problems should be recognised. Therefore, within the ambit of cooperation, there is an opportunity to improve information dissemination and communication and, to address technology restraints.

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List of acronyms

Where acronyms are referenced in this dissertation, these have the following meanings:

BRA	Benefit Realisation Approval
BU	Business Unit
CIPS	Chartered Institute of Purchasing and Supply
CFO	Chief Financial Officer
CPO	Chief Procurement Officer
CRA	Concept Release Approval
CSP	Concentrated Solar Power
DoE	Department of Energy
DRA	Definition Release Approval
ERA	Execution Release Approval
ESC	Electricity Supply Commission
EPMO	Eskom Project Management Office
E&PM	Engineering and Project Management
FIFA	Fédération Internationale de Football
FRA	Finalisation Release Approval
GDP	Gross Domestic Product
HOA	Hand Over Approval
IDM	Integrated Demand Management
IPP	Independent Power Producers
IRM	Integrated Risk Management
IRMSA	The Institute of Risk Management South Africa
IRP	Integrated Resource Plan
ISMO	Independent System and Market Operator
KPI	Key Performance Indicator
MV	Megavolt ampere
MTPP	Medium-Term Purchase Programme
ND	No Date
NMPP	New Multi-Product Pipeline
OCGT	Open Cycle Gas Turbine
PLCM	Project Life Cycle Model
PMBOK	Project Management Body of Knowledge
PPPFA	Preferential Procurement Policy Framework Act
P&SCM	Procurement and Supply Chain management
PTC	Procurement and Tender Committee
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
RFP	Request for Proposal
RFQ	Request for Quotation
SADC	Southern African Development Community
SCCF	The Swedish Construction Client Forum
SD&L	Supplier Development and Localisation
SL	*Sine Locō* (Latin: without place of publication)
SLA	Service Level Agreement
SN	*Sine Nomine* (Latin: without name)

SOC	State Owned Corporation

List of definitions

Words referenced in this dissertation – which have been highlighted in this list - should be interpreted in line with the definitions allocated to these.

a. Centre-led approach

Strategic decisions are managed centrally whereas transactional activities are decentralised across the organisation, with the support of a cross-functional team (Eskom SOC Limited, 2011).

b. Competitive tenders (RFQs, RFPs)

A tender is a written competitive offer, quotation or proposal that is prepared by a supplier, in a recommended or specified manner. This document is in reply to an invitation to tender or competitive enquiry for providing assets, goods or services (Eskom SOC Limited, 2011). A competitive tender includes a Request for Quotation (RFQ) and Request for Proposal (RFP).

A Request for Quotation (RFQ) is an invitation for suppliers to submit a quotation for the supply of assets, goods or services where a requirement is clearly defined. The price is the main contemplation for contract or order award (Eskom SOC Limited, 2011).

A Request for Proposal (RFP) is a competitive process whereby suppliers need to propose innovative resolutions to a problem or where an end-user cannot define his/her requirements sufficiently (Eskom SOC Limited, 2011).

c. Cross-functional team

A cross-functional team consists of a combination of end-users and other subject-matter specialists concerning a particular commercial transaction (Eskom SOC Limited, 2011).

d. End-user

The end-user is accountable for specifying sufficient descriptions and quantities for preparation and procurement of organisational requirements within his/her domain of accountability. The end-user is also liable for swiftly responding to any requests for clarification by or through the applicable procurement department (Eskom SOC Limited, 2011).

e. Procurement and Tender committees (PTCs)

A tender committee must consist of Eskom employees, who have been given the authority to provide the procurement practitioner with a directive to initiate a procurement process (Eskom SOC Limited, 2011).

f.	**Procurement practitioner**	A procurement practitioner is an individual employed to manage and/or perform a process contained in the Eskom Procurement and Supply Chain management (P&SCM) procedure (32-1034), or within the approved process control manuals pertaining to procure-to-pay practices arising from the approved procurement framework (Eskom SOC Limited, 2011).
g.	**Project Life Cycle Model (PLCM)**	The Project Life Cycle Model (PLCM) consists of five stages: Concept Release Approval (CRA), Definition Release Approval (DRA), Execution Release Approval (ERA), Hand Over Approval (HOA) and Finalisation Release Approval (FRA) (Eskom SOC Limited, 2011).
h.	**Project Sourcing Department**	"The mandate of the Project Sourcing Department is the effective sourcing and contracting of capital assets, goods, services and projects for Group Capital, execution of project procurement across Eskom for all projects greater than R300m, support and advice on project procurement for projects less than R300m, management of all procurement funded by Development Funding Institutions (DFI) including the World Bank, African Development Bank and procurement and commercial support in electricity retail transactions from IPPs including energy savings initiatives" (Eskom SOC Limited, 2011).
i.	**Supplier Development and Localisation (SD&L)**	"Supplier Development and Localisation (SD&L) incorporates all governmental socio-economic requirements including, but not limited to, Broad-Based Black Economic Empowerment (B-BBEE), localisation, skills development, industrialisation, and job creation under a single centralised function in order to maximise local supplier development opportunities within the supply chain, through consolidated strategies" (Eskom SOC Limited, 2011).

CHAPTER 1

INTRODUCTION TO THE CONTEXT OF THE STUDY

1 Introduction to the context of the study

Conventional procurement procedures, which concentrate on the three project performance measures of cost, time and quality, initiate confrontational relations and numerous complications in each phase of the procurement process. Even though a procurement process must be altered to improve project goals, customers use procurement processes that they are familiar with (Eriksson & Vennström, 2013).

The Project Management Body of Knowledge (PMBOK) (Project Management Institute, 2013) states that Project Procurement Management consists of processes designed to procure products, services or results that are required from external resources. Project procurement management consists of contract management and change control processes that are necessary to acquire and manage contracts or purchase orders emanating from official project team members.

According to Business Monitor International Ltd., the South African infrastructure is one of the best developed in Sub-Saharan Africa. Infrastructure projects developed for the 2010 FIFA World Cup stimulated additional improvements in the South African transport system (Business Monitor International, 2011).

The South African Gross Domestic Product (GDP) has increased by 67% since 1994. This economic growth has led to a 14% increase in generation of electricity demand. This increase has caused an energy supply shortage since 2005 and has resulted in the spate of load shedding in 2007 and 2008 and recently in 2014 and 2015. This has caused disruptions to the public and has affected South Africa's attractiveness as an investment destination (Eskom SOC Limited, 2011).

The South African government has an Integrated Resource Plan (IRP) that governs energy resources. This IRP was established to be an active plan, which should be revised every two years by the Department of Energy (DoE) to include continuous developments in the South African energy sector. The increased demand for electricity supply in South Africa has influenced the selection and the life cycle of projects at Eskom. One of the implications of the South African government's changes is that projects within Eskom will in future be selected by the IRP 2010 and not by Eskom, as was the case in the past. The Independent System and Market Operator (ISMO) entity within Eskom will allocate the various options or elements indicated in the IRP 2010 to Eskom or other participants in the power sector, for example the DoE's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) (Eskom SOC Limited, 2011).

Eskom has an internal procurement support function to source goods and services required in the organisation. Prior to 2011, procurement in Eskom consisted of various divisional procurement departments. The procurement departments within the different divisions had different policies and procedures. Eskom embarked on a

project to develop one policy and one procedure to ensure that the whole company uses the same procedures. Eskom's procurement function was traditionally structured as a transaction-based service rather than on the basis of a strategic unit. This strategic unit was called "Group Commercial".

1.1 Background: Ontology

Viljoen (Viljoen, 2012) defines 'ontology' as a representation of social reality that relates to the manner in which individuals observe how things actually occur. Ontology verifies 'the way things are' and is the initiating point of all research. The researcher deduces from this definition that ontology is not a static process but rather a process that incorporates changes in understanding by means of continuous reasoning and a process of critique on the human and social interaction.

The researcher started working in the Eskom project environment in 2007. Subsequently in 2012, the researcher occupied a procurement practitioner's position within the Project Sourcing environment. During this period the researcher procured assets, goods and services on behalf of project managers, named end-users, within the Eskom project environment. During the procurement process the researcher was governed to follow certain policies and procedures to procure the assets, goods and services for the relevant projects.

The Eskom P&SCM procedure 32-1034 sets out the procedures that will assist a procurement practitioner to produce the required outputs with clarity, effectiveness and accountability so ensuing accuracy and consistency in decision-making and the realisation of the strategic objectives of Eskom Group Commercial and the organisation as a whole. Procurement practitioners consequently procure assets, goods and services on behalf of an end-user, within the Eskom-approved Procurement Framework (Eskom SOC Limited, 2011).

During the researchers' time as a procurement practitioner it was observed that project managers are subjected to stringent deadlines to execute their projects successfully. Consequently the researcher gained an interest in applying project management principles during the procurement process to determine whether project management principles could assist in streamlining the time-consuming procurement process within Eskom.

Additional to the time-consuming procurement process the researcher observed that in the relationship between an end-user and a procurement practitioner, aligned strategic objectives may not exist. The procurement practitioner will endeavour to achieve the cost-saving objective, whereas the end-user requires operational and capital funding to meet operational objectives. For example, power generation depends significantly on coal. Coal contributes approximately 90% of the power generation energy combination. When this primary energy source is unavailable, it

results in a reduction of power generation capability (Business Monitor International, 2011). Therefore, during the 2010 World Cup, Eskom had to ensure that the "Keeping the Lights On" objective was achieved through cogeneration, curtailment of electricity export and energy savings initiatives.

1.2 General problem statement

The problem being investigated by the researcher can be explained by referring to an example of neighbours. Fences are built between two neighbours to divide their respective properties. Neighbours can be confrontational regarding aspects relating to their properties. The dividing fence is a good representation of the current barrier that exists between the project management and procurement functions in Eskom:

- Procurement practitioners are obliged to follow all Eskom policies, procedures and guidelines during the procurement process.
- This potentially time-consuming process causes project managers to believe that projects are delayed as a result of inefficiencies in the procurement department. However, there are no measuring instruments at this stage that can illustrate this and prove the customer is right or wrong.

The researcher noticed complaints were made by project managers about delays in the projects. The researcher realised that there was no proof supporting the prevailing perception that the lack of effective integration of the procurement and project management processes causes friction and project delays from the project managers' point of view.

In an ideal world, process integration, effective interface planning and a common objective shared by all parties of achieving the project delivery objectives involved should result in delivering projects on time, within budget and scope, and to the required quality standard. However, the prevailing perception within Eskom regarding the current relationship between project management and procurement is that procurement delays projects, the centre-led approach disconnects procurement practitioners from projects and Eskom policies, and procedures are operations oriented and do not serve project requirements. Therefore, it was determined that there was a need to undertake a comprehensive study on a selected target audience in the Eskom project environment.

1.3 Objectives of the study

The main objectives of the study are:

- To explore determinants of seamless integration between procurement and project management at Eskom, and

- To explore factors that ensure independence of procurement and project management at Eskom, whilst pursuing their integrated functioning in order to enable the fulfilment of Eskom's objectives, for example project success.

The purpose of the study is to determine and evaluate the complaints - made by project managers about delays in the projects and whether these complaints could be the cause of friction. This will be done by undertaking a comprehensive qualitative study on a selected target audience of project managers and procurement practitioners to determine whether or not there could be grounds for establishing an integrated framework between the two functions. The results could then be used to develop an integrated framework between procurement and project management.

To achieve the purpose of the study, specific technical and general questions were investigated. Technical questions include:

- Has project management been developed adequately within Eskom?
- Have project management processes been developed and implemented effectively within Eskom?
- What issues have been identified with project management within Eskom?
- Is procurement seen as an important production ingredient?
- What issues have been identified with procurement in Eskom?

General and risk questions include:

- Does procurement contribute towards project delays?
- What are the benefits of effective procurement?

The dissertation will strive to determine whether or not an environment can be created within which an integrated team approach between project management and procurement would be feasible to ensure project success.

1.4 Question/objectives stated explicitly

In order to meet project objectives, procurement and project management in Eskom tend to be confrontational rather than cooperative. The question this study asks is: "Would an integrated team approach between the procurement and project management functions ensure that the challenges are addressed in a way that would ultimately lead to project success?"

To answer the question, the researcher has evaluated the project managers' and procurement practitioners' practical experience and has established the root causes for the lack of understanding between the procurement and project management functions. The researcher also explored the lack of mutual understanding of the integration and scope of the project which causes friction and project delays.

The purpose and main objectives of the study have therefore been achieved by developing an integrated framework that is feasible for integrating the procurement and project management functions. The recommendations of this study include changes to Eskom policies and procedures, implementation of training and knowledge-sharing workshops, implementation of effective communication and technologies, and the management of the effective integration framework through continuous improvement. The effective integration framework must be monitored and reviewed by studying lessons learned and actively involving senior management. The lessons learned must be addressed and included in the Eskom policies and procedures to ensure continuous improvement resulting in an effective integrated framework.

1.5 Introduction to research methodology

With the purpose of answering the research question and to achieve the main objective of this study, the researcher anticipated that numerous data sources could improve the development of concepts and the research context.

While the researcher occupied a procurement practitioner position within the Eskom Group Commercial (Project Sourcing function), conflict between procurement practitioners and project managers was noticed. Therefore, this dissertation uses a qualitative research method as it is more applicable and allows easier assessment of the possible integration between the procurement and project management functions.

The researcher collected data between 2012 and 26 February 2016, which was mainly subjected to others' practical experience. The data included qualitative characteristics of the research context. The sources that were used to collect data included Eskom policies and procedures, books and web-based source on the relevant subjects, as well as questionnaires.

1.6 Structure of the rest of the dissertation

The dissertation is structured as follows:

Chapter 1 Introduction to the context of the study

This chapter introduces the context of the study by providing a brief background of the research problem and what the study is aimed at achieving. The context of the study discussion was followed by an introduction to the research methodology used in the study.

Chapter 2 Conceptual Framework and literature review

The literature review includes a discussion on the global and South African context of the study. The discussion includes reference to the Eskom Capacity Expansion Programme and the challenges of efficient procurement. Project management and procurement within Eskom is emphasised to determine whether the relationship between these functions has been established. The discussion is concluded by depicting the different variables that the literature sources describe within the project and procurement environments in a causal loop.

Chapter 3 Research design and research methodology

This chapter discusses the research design and research methodology which the researcher uses to enhance developing concepts and the research context. The research methodology discussion will include sampling, data collection methods, duration of data collection, data analysis and integrity of research processes used. This is addressed with the purpose of answering the research question and achieving the main objective.

Chapter 4 Results

The research is based on a qualitative research approach, which is accomplished by means of a questionnaire to gather information on an integrated team approach between the procurement and project management functions. This chapter presents the research results of the questionnaire.

Chapter 5 Evaluation and discussion of results

To achieve the purpose of the study, specific technical and general questions were researched. The findings of the research are discussed in detail in this chapter.

Chapter 6 Framework on how findings should be implemented

The chapter provides guidelines on how the results could then be implemented to develop an integrated framework between procurement and project management.

CHAPTER 2

CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

2 Conceptual framework and literature review

2.1 Introduction

Eskom, together with the Integrated Resource Plan (IRP) has embarked on a massive capital expansion drive. In order for Eskom to deliver on this capital expansion programme, it is imperative to meet deadlines to assure sustainable electricity supply through the delivery of additional electricity as per projected energy needs at the time to the the South African grid. However, the expansion requires project management and procurement functions to support each other in order to achieve a project plan that is on time, within scope and within budget.

Eskom's current Capacity Expansion Programme includes returning 23 generation units to service, building new power stations such as Medupi, Kusile and Ingula and the open cycle gas turbine power stations (OCGT). Furthermore, renewable projects, independent power producer (IPP) projects, as well as Medium-Term Purchase Programme (MTPP) have been embarked upon.

To ensure that a project's goods and services are procured, a procurement request must be submitted to the procurement department. Within Eskom, a procurement requirement may be sourced tactically, strategically or through a project based on its risk, impact and cost (Eskom SOC Limited, 2011). Occasionally, the various options available are misunderstood by an end-user and the procurement request is sent to the wrong procurement department. The receiving of the goods and services is delayed until the correct department receives the procurement request.

A cross-functional team (consisting of financial, commercial and technical specialists) is not always able to provide accurate procurement specifications and quantities to the procurement department. The procurement process consists of various principles that procurement practitioners must adhere to. Should the correct material, equipment or services not be delivered within an agreed time and/or the supplier fails to respond timeously, the procurement process is delayed. This delay results in additional costs and unnecessary friction between procurement practitioner and the project manager.

In order to complete a project successfully, one of the crucial components that have to be relied on is procurement. Therefore, it is important for the procurement department to ensure that the project manager and the cross-functional team are continuously informed of the project status. The various Eskom project management departments are generally of the opinion that procurement lacks professional communication skills. They further believe that communication within Eskom among the various functions is not consistent owing to reasons such as information overload, strict deadlines, the complexity of Eskom's organisational structure and workload.

Furthermore, it is the impression of the project management departments that the manner in which procurement approaches the project requirements affects the outcome of the relationship between the different functions. Ineffective communication may thus initiate conflict between the procurement practitioner and end-user, which in turn may negatively affect the quality and outcome of a project and customer satisfaction.

There are numerous ways in which to approach project management. With so many methodologies available, it is challenging to decide which is best for a prospective project and the organisation. The researcher's own reference examples of approaches are:

- PMBOK;
- Prince2;
- Ten-Step Model;
- Six Sigma;
- Agile Methodology; and
- Waterfall Methodology.

The Project Life Cycle Model (PLCM) and PMBOK principles are adopted in all Eskom projects. During the researcher's tenure as a procurement practitioner in the Project Sourcing department, she experienced that there are only a small number of procurement practitioners within this department who truly understand the PLCM and PMBOK. A centre-led approach may have caused procurement practitioners at head office to be disconnected from the projects they service. In addition, they may not completely understand the requirements of the end-user.

2.2 Global context

2.2.1 *Impact of procurement on project performance*

A survey was conducted (Eriksson & Vennström, 2013) on 106 Swedish construction customers to identify how procurement procedures impact project performance. The investigation contains eight hypotheses based on a literature review and was verified through the data collected from the survey.

The data collection was conducted through a questionnaire that was sent to 140 construction customer organisations who were members of The Swedish Construction Client Forum (SCCF). The forum consists of regional, national and international industrialised and property businesses, municipalities and provincial authorities, as well as government services and agencies. Therefore, this forum offered an appropriate representation of Swedish construction customers. Only 106 utilisable responses were obtained, resulting in a 76% response rate (Eriksson & Vennström, 2013).

The study concluded that a cross-functional procurement process approach enables improved relationships, which in turn impacts positively on project performance (Eriksson & Vennström, 2013).

2.2.2 *Procurement complications in Iranian gas projects (case study)*

Delays in procurement in Iranian gas projects are familiar. In the first decade of the 21st century, research was conducted by Vafaiee, Owlia, Vahdat and Vafaiee. They established that these delays were because of increased time, costs and contractual claims (Vafaiee, M., Owlia, M. S., Vahdat, M. A. & Vafaiee, M., 2010). The goal of the research was to assemble perceptions of project managers on the implication of the procurement delays (Vafaiee, et al., 2010).

The implications of procurement complications of Iranian gas mega-projects were initially identified through a relevant local literature review. A total of 74 questionnaires were distributed to randomly nominated samples. The samples were nominated from publicly accessible sources, as well as consulting engineering firms, expert contractors, as well as management contractor and suppliers operational in the gas trade. Sixty-five responses were obtained, ensuing in an 88% response rate (Vafaiee, et al., 2010).

The following problem categories were identified (Vafaiee, et al., 2010):

- Client-associated;
- Consultant-associated;
- Contractor-associated;
- Supplier-associated;
- Infrastructure challenges;
- Financial and banking challenges; and
- Legal and contractual issues.

The research indicated that although the various stakeholders contributed to the delays in some way, financial problems have the greatest affect and supplier complications have the lowest impact on projects (Vafaiee, et al., 2010).

It was observed that there was no specific reference to the procurement process or to governance interfering with procurement and delivery lead times. This implies that, in the context of Iranian gas projects, the procurement process was not the main cause for projects being delayed.

2.3 South African context (case studies)

South Africa embarked on various infrastructure projects – Gautrain, Transnet, FIFA World Cup, and Eskom's Capacity Expansion Programme. An overview of these projects is briefly discussed in this section.

2.3.1 *Gautrain*

Gauteng had experienced traffic congestion on main highway routes, particularly between Johannesburg and Pretoria (The transport facilities between these two cities were predominantly road-based). The rapid rail system was chosen to alleviate traffic congestion, contribute towards infrastructure and economic development, as well as reduce the carbon footprint of motor-vehicles (Gautrain, 2010).

According to Murray and Roberts, the Gauteng Premier, at the time Mbhazima Shilowa announced the Gautrain project in February 2000. Construction commenced on 28 September 2006. The project consisted of constructing nine railway stations in Johannesburg, Sandton, Pretoria and at OR Tambo International Airport. Other stations along the route are Rosebank, Marlboro, Midrand, Centurion and Rhodesfield (Murray and Roberts, 2010).

The first phase of the Gautrain project, from OR Tambo International Airport to Sandton, commenced 19 days ahead of schedule. The second phase, connecting Rosebank to Hatfield commenced commercial operation on 2 August 2011. An estimate of 3 million passenger trips was reached during the first 13 months of operations of the Gautrain (Murray and Roberts, 2010).

The success of the project can be attributed to the following achievements (Murray and Roberts, 2010):

- Operation of the first phase commenced 19 days ahead of schedule;
- Within the first month of operation, an estimated 400 000 passenger trips were documented on Gautrain trains and buses; and
- By July 2010, an estimated 65 million man-hours had been documented on the infrastructure phase of this project.

2.3.2 *Transnet*

Transnet aims to generate a complementary, united structure of regional ports and rail corridors to construct a trans-shipment hub connecting Southern Africa with the globe (Transnet, 2013).

Transnet identified a number of infrastructure development fields:

- Rail freight;
- Ports; and
- New Multi-Product Pipeline (NMPP).

Transnet budgeted R151 billion to renovate South Africa's outdated ports and construct new ports. Once complete, the port capacity will increase to an aggregate landside area of 9 218 hectares, signalling a 70% infrastructure growth. The aggregate quayside distance will grow to 92 kilometers, showing a 170% growth (Transnet, 2013).

2.3.3 *Fédération Internationale de Football (FIFA) World Cup*

In May 2004, FIFA's Sepp Blatter announced that the host of the 2010 FIFA World Cup would be South Africa. The joy of the masses of people was the foundation of Johannesburg's process to initiate preparation for 2010 (City of Johannesburg, 2009).

The motivation for the governmental investment in the infrastructure expansion was to promote sporting infrastructure and increase economic growth. The government initially reserved R8.4 billion for stadium construction. However, owing to cost increases, the initially budgeted amount rose to R13.5 billion. The host cities contributed R2.1 billion towards the stadium expansion (Sports and Recreation South Africa, 2013).

The project identified risks and lessons learned - as illustrated in table 1. Despite the risks, all match venues were completed ahead of schedule (Sports and Recreation South Africa, 2013) and the 2010 FIFA World Cup was a huge success.

Table 1: Stadia major risks and lessons learned

Risk	Lessons learned
Subcontractors were employed according to the provisional sums in the bills of quantities and not the complete tendered amount.	Accurate monitoring controls must be engaged to manage the project effectively.
The 2009 labour disputes delayed the progress at some stadiums. The Mbombela Stadium was one of the most highly affected.	Tactical strategies must be in place with well-defined contingency fundamentals.
Exchange rate fluctuations and scope creep brought about increased project expenses in eTthekwini.	Make provision for escalations and take forward cover for imported goods.

Risk	Lessons learned
Cash-flow forecasts submitted by municipalities were not aligned with their particular actual monthly expenses.	Accurate accounting and audit systems should be finalised before the project commences.
The project had difficulties in receiving information and an accurate format timeously from some of the municipalities.	Communiqué and reporting channels should be well defined from project commencement.
The financial reports from certain municipalities are still outstanding.	Timeframes and goals are communicated and established prior to the project start.

(Source: Sports and Recreation South Africa, 2013)

2.3.4 *Eskom's Capacity Expansion Programme*

South Africa faces an energy-restricted future as do many developed and developing countries. Research conducted by Eskom has demonstrated that South Africa is more electricity demanding than countries with comparable per capita GDPs. The variance is thought to arise from the consumption of less energy-efficient technology and production processes (Eskom SOC Limited, 2011).

The South African government introduced changes to the long-term planning and procurement of the new electricity capacity. The planning and development of South Africa's electricity sector is governed by the following legislation:

- The National Energy Act 34 of 2008;
- The Electricity Regulation Act 4 of 2006;
- The ISMO Bill; and
- The IRP 2010.

In response to the energy restrictions experienced in South Africa, Eskom has undertaken to assure electricity supply through allocated projects. The following projects were recognised and developed prior to the legislation and form part of the classification:

- Eskom's current Capacity Expansion Programme, which includes returning 23 generation units (3 741MW) to service and building new power stations of Medupi (4 800MW), Kusile (4 800MW) and Ingula (1 332MW);
- MTPP (400MW);
- OCGT (2 084MW); and
- Independent Power Producer (IPP) projects (1020MW).

Eskom received a further mandate to construct two additional projects:

a. Sere (100MW, wind) [Project was completed in 2015]; and
b. Concentrated Solar Power (CSP)-1 (100MW CSP with a load factor of up to 70%).

In order to achieve the IRP 2010, Eskom has introduced the Capacity Expansion Programme which is set to achieve 17 384MW of capacity, 9 756km of transmission lines and 42 470 MVAs (Megavolt Ampere). Thus far, 6 137 MW, 5 497km and 27 565 MVAs were added to the South African grid, demonstrating that Eskom has only achieved 35% of their goals. Eskom aims to expand its total capacity to 80 000MW by 2026 (Eskom, 2014).

To understand how the Capacity Expansion Programme and projects interact with procurement, an Eskom context is required.

2.4 Eskom business context

2.4.1 *Nature of the business*

Eskom was founded in 1923 as the Electricity Supply Commission (ESC). The company is responsible for the generation, transmission and distribution of electricity to industrial, mining, commercial, agricultural and domestic consumers, as well as to municipalities, which in turn distribute electricity to companies and households. In July 2002, Eskom was changed into a public entity (company), solely owned by the South African government (Eskom SOC Limited, 2015).

Currently, Eskom forms part of the top 20 global utilities with a self-generation capacity of 41 995MW. An estimate of 95% of South African electricity consumption is generated by Eskom and it is further estimated that 45% of the electricity consumption in Africa is consumed in South Africa (Eskom SOC Limited, 2015).

Eskom focuses its operations on South Africa, but also supplies other countries within the South African Development Community (SADC) region, repeatedly or on demand. Eskom imports electricity from Mozambique and Namibia. Certain neighbouring countries, such as Swaziland and Lesotho, depend on Eskom to provide between 50 and 90% of their electricity as these countries are small compared to South Africa. Eskom anticipates expanding the relationships to gain mutual benefits, as described in the Government's New Growth Path (Eskom SOC Limited, 2015).

2.4.2 *The Eskom Business Model*

The Eskom business model includes the electricity infrastructure, operations and preservation of the assets, as well as electricity sales. The material concerns and risks in the business model consist of the following fundamentals:

- Construction;
- Primary energy;
- Electricity generation (renewable and non-renewable);
- Electricity transmission and distribution;
- Customer service; and
- Service and strategic functions regarding key issues, e.g. finance, procurement, safety, health, environmental and quality issues.

The visual representation of the Eskom business model is illustrated below.

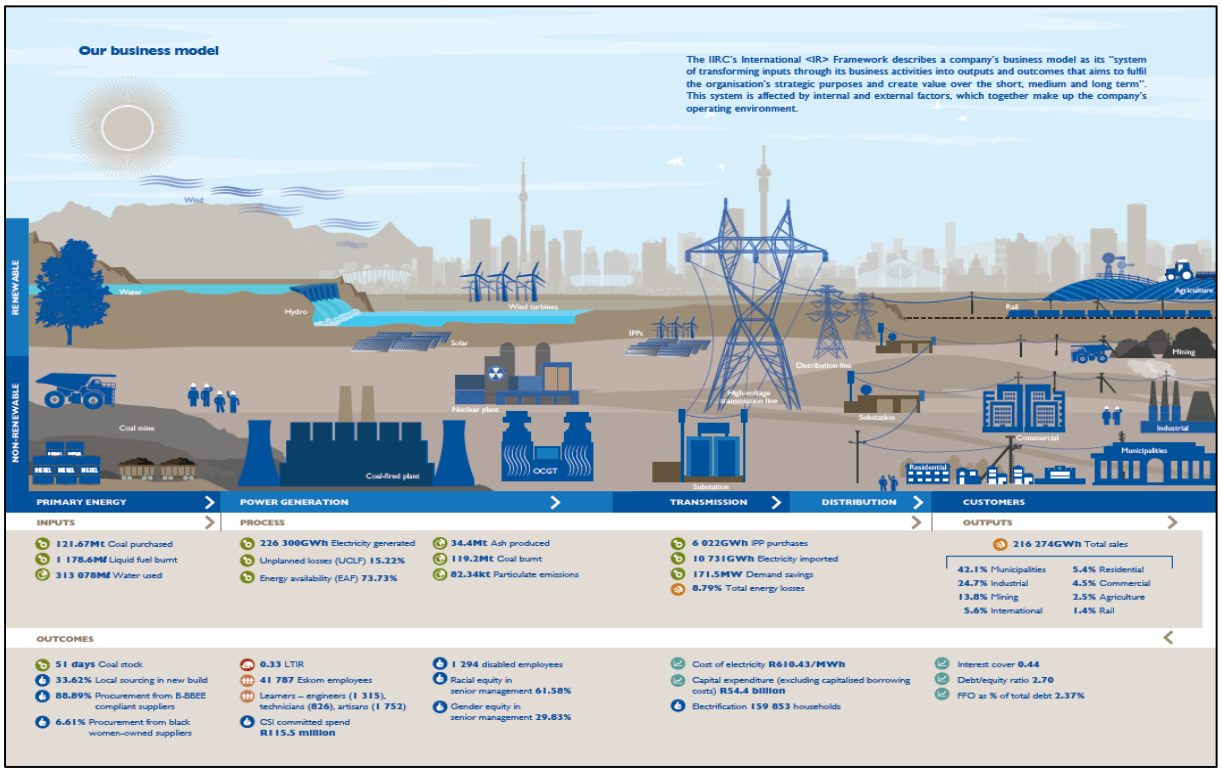

Figure 1: Eskom Business Model
(Source: Eskom SOC Limited 2015)

2.4.3 *Operational structure*

Eskom's operational structure consists of primary operational functions and support functions. The line functions drive the business and focus on creating value. The service functions protect and manage Eskom's assets, provide intelligence about standardised services, and optimise the various functions throughout the

organisation, for example procurement. Strategic functions are aimed at developing the organisation, as well as implementing changes in performance and providing broader strategic support to the Eskom Group (Eskom SOC Limited, 2015).

Figure 2: Operational structure of Eskom
(Source: Eskom SOC Limited, 2015)

2.4.4 *Eskom's purpose, values and strategic objectives*

Eskom's purpose is to: "provide sustainable electricity solutions to grow the economy and improve the quality of life of the people in South Africa and in the region" (Eskom SOC Limited, 2014).

Since 2010, a complete strategy review involving Eskom's leadership and the broader organisation was performed and was concluded in the Eskom Corporate Business Plan 2011/12 to 2016/17 and approved by the Eskom Board. Based on the mandate defined in the Shareholder Compact, Eskom's purpose, vision and values have been reviewed with respect to the realities and issues it was undergoing since 2010 (Eskom SOC Limited, 2012).

Eskom's strategy is aimed at addressing the energy and financial constraints and to stabilise the business. The primary driver is to stabilise the business and thereafter re-energise business for the longer-term sustainability and growth. Eskom has a turnaround strategy and it is necessary for this to be implemented. Part of the stabilisation strategy is to refocus revenue including the protection and collection of the revenue to maintain 3 000MW for the health of the generation fleet as well as to implement Integrated Demand Management (IDM) response programmes and IPP.

Once the above strategies have been implemented, the focus will be on staff morale to support the growing business. This, together with the financial and operational recovery, will build on the reputation of Eskom (Eskom SOC Limited, 2015).

In order for Eskom to grow, five strategic objectives have been identified (Eskom SOC Limited, 2015):

- Attaining and guaranteeing security and consistency of electricity supply;
- Realising and guaranteeing Eskom's business and financial sustainability;
- Decreasing Eskom's carbon footprint and environmental impact by, among other activities, setting out and applying a clear roadmap towards compliance with environmental legislation and pursuing low carbon-emitting prospects;
- Supporting and aligning with government's strategic initiatives, such as expediting the induction of IPPs and pursuing regional incorporation of the energy sector; and
- Motivating industrialisation and alteration of the economy and the procurement landscape.

2.5 Group Commercial context

Group Commercial forms part of the Eskom service functions under the leadership of the Chief Financial Officer (CFO). Group Commercial ensures that contracts are placed with suppliers of goods and services that the business requires. This is a link between Eskom project management and Eskom procurement.

The Eskom Group Commercial business plan (Eskom SOC Limited, 2012) explains that procurement as a process was not used as a strategic tool in business value creation. This business plan identified that the disjointed procurement structure created incoherent decision-making across procurement, ineffective contract management, end-users having opinions that procurement lead times are lengthy, and benchmarks and Key Performance Indicators (KPIs) that are not standardised across procurement.

It is noticeable that the overarching shortcomings, which are illustrated in the above paragraph, is that the procurement process has a rather negative impact on the performance of the Eskom Group Commercial business plan.

The Eskom Group Commercial business plan (Eskom SOC Limited, 2012) explains that, in 2005, a benchmark study was conducted among Eskom and other companies. The results of this benchmark study indicated that Eskom's Procurement and Supply Chain was not effectively developed in certain areas, e.g. strategic focus. In 2007 further research by Eskom showed related challenges in these areas. In 2010, interviews were conducted and performance challenges were identified, which included:

- Inadequate emphasis on leveraging purchasing power and savings, e.g. divisional silos and non-standardised tools;
- Lack of data transparency; inadequacies in the procurement process, e.g. extended lead times owing to non-standardised KPIs;
- Non-standardised tracking and monitoring; cumbersome and time-consuming tender procedures;
- Inconsistent adherence to policies and best practices, e.g., Service Level Agreements (SLAs) not standardised and/or defined;
- Staff mind-set not customer-centric; and
- Uncoordinated Local Supplier Development Management, e.g., suppliers playing one division against another; inconsistencies in supplier performance and experience-sharing.

With the focus on the Capacity Expansion Programme and the continuous challenges of efficient procurement of essential primary energy resources, all the efficient procurement divisional policies had to be consolidated into one collective standard across Eskom (Eskom SOC Limited, 2012). The objective of this exercise was to ensure:

- Sustainable cost savings;
- Operational effectiveness; and
- A strong emphasis on risk and governance.

2.5.1 *The operational model*

The Eskom Group Commercial operational model was developed based on the relative strengths of Eskom. The ownership of commodities was categorised into three parts: centre-led commodities, natural-owned commodities and decentralised commodities. This categorisation concentrates on business requirements, not only on the amount of money spent on a commodity (generally referred to as spent volumes) and to a large degree informs the role of the Group Commercial Department and its interaction with the broader organisation (Eskom SOC Limited, 2012):

- Centre-led commodities are those that can be optimised through economies of scale owing to commonality across Eskom. These have no real natural owner,

e.g. travel, transformers, steel, primary energy, cables and conductors. These commodities are performed at a centre-led function within Group Commercial.

- Natural-owned commodities are those that have a high relative importance to a particular business area, e.g. chemicals and boiler maintenance. These commodities are executed by Divisional Commercial within Group Commercial.
- Decentralised commodities are of local importance to operations and of partial relevance to the larger group. These are tactical in nature, e.g. gardening, catering and specific labour contracts and are executed at the plant/regional/grid level.

2.5.2 *Cross-functional support*

Achieving the centre-led vision will involve support to synchronise systems, tools, processes and skills through Group Commercial. Supporting these guiding principles is an operating model that incorporates essential Procurement and Supply Chain capabilities as illustrated figure Figure 3, concerning Operations and Group Commercial along the Eskom Business Model as demonstrated in figure Figure 1.

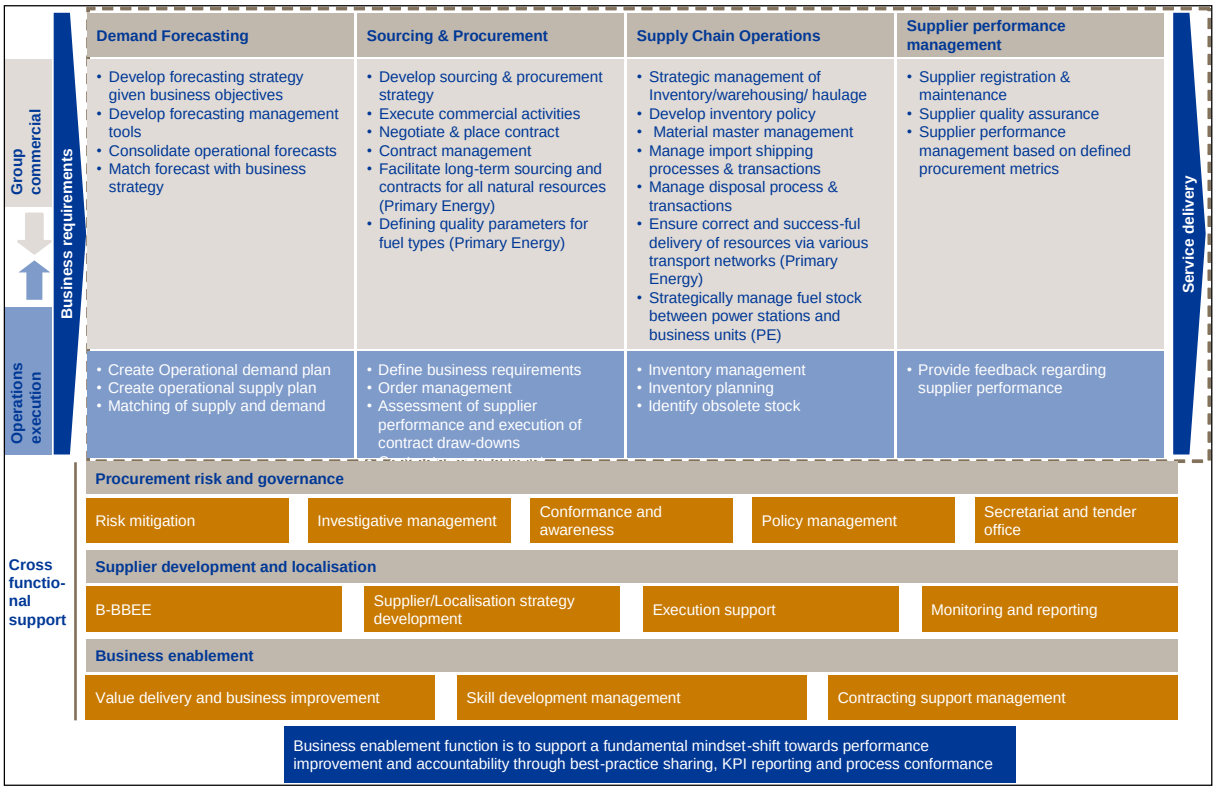

Figure 3: Group Commercial Operating Model
(Source: Eskom SOC Limited, 2012)

2.5.3 *Group Commercial structure*

Group Commercial provides an internal support function to various divisions within Eskom. The Group Commercial structure, as illustrated in Figure 4: Group Commercial High-Level Structure has been developed to ensure that all divisional needs are taken into account. It has been divided into core and support functions:

- The core functions include project sourcing, strategic (commodity) sourcing, tactical (divisional) sourcing, supply chain operations and primary energy.
- The three support functions include supplier development and localisation, business enablement, as well as procurement risk and governance.

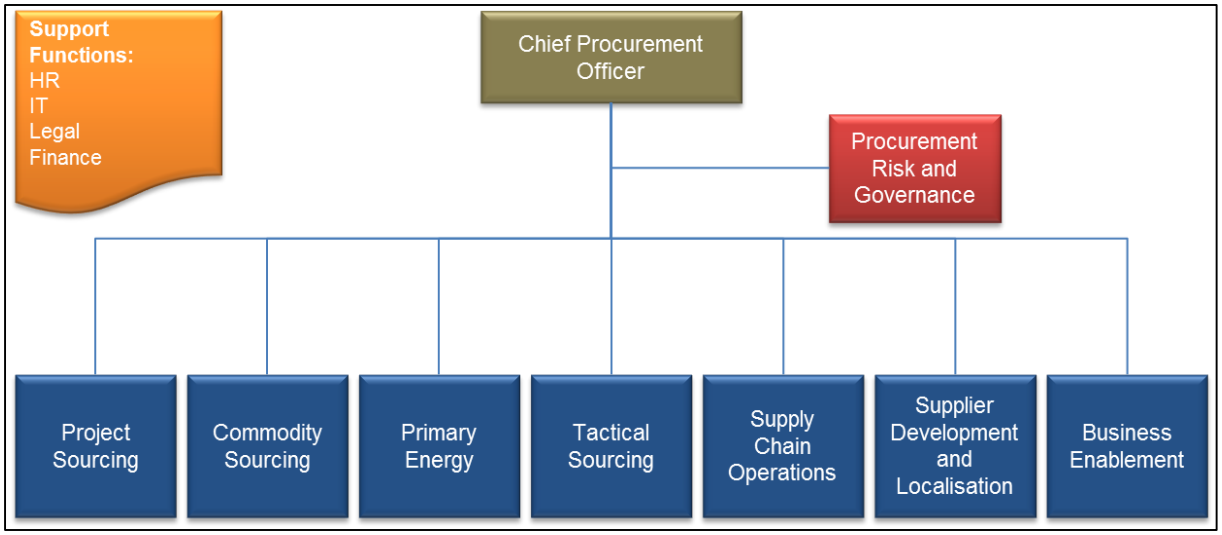

Figure 4: Group Commercial High-Level Structure
(Source: Eskom SOC Limited 2012)

2.6 Project Sourcing context

The Eskom P&SCM Procedure 32-1034 (Eskom SOC Limited, 2011) explains that Project Sourcing relates to procuring assets, goods and services against an approved project where costs will be assigned against an approved project budget. The PLCM and PMBOK principles will be applied to execute the project and the lead time for the procurement of requirements is linked to a contractually approved project programme.

It is explained (Esterhuyzen, 2011) that the Eskom procurement process followed within Project Sourcing is governed by the Constitution of South Africa and the Public Finance Management Act (PFMA) and, more recently, the Preferential Procurement Policy Framework Act (PPPFA), which states that an organisation such as Eskom should have in place “an appropriate procurement and provisioning system which is fair, equitable, transparent, competitive and cost-effective”.

The procurement process consists of various administrative activities contained in process control manuals. The general project procurement process followed according to the researcher's experience as a procurement practitioner is:

- The description of the business need is defined by an end-user. The need is communicated to the procurement department through a procurement request.
- A contract strategy is compiled to formulate the objective of the business need and the procurement process to be followed.
- When the contract strategy is approved, the project will be presented to the market in the form of a competitive tender (request for quotations, request for proposals).
- Once the tender period closes, the market responsiveness is evaluated by the cross-functional team.
- The evaluation findings are presented to the applicable Procurement and Tender Committee (PTC) for approval.
- When approval has been received from the PTC, Eskom negotiates to conclude a contract with the successful tenderer.
- The contract between Eskom and the successful tenderer is concluded when both the parties are satisfied with the content.
- Feedback regarding the outcome of the negotiation and conclusion of the contract is given to the PTC.
- The contract is managed by the end-user who submitted the procurement request.

2.7 Theoretical framework

The introduction to the context of the study establishes the background and business context to what is currently being experienced by procurement practitioners and project managers within the Eskom project and procurement environment. From this, the context of the study and research has to be determined. The framework of this study emanates from the researcher's initial conviction that an integrated team approach between the procurement and project management functions could ultimately lead to project success.

The dissertation will concentrate on project management and procurement management, specifically relating to their interaction with each another. Emphasis is placed on project management and procurement within Eskom to ensure that the research is clearly quantified, and the relationship between these functions is established, both internal and external to Eskom.

The researcher will endeavour to gain knowledge of these two functions and their interaction, which will allow the identification of the gap between them, whether these functions could be integrated and keep these independent at the same time. It is

important to gain this knowledge as the topic has not been comprehensively researched. Insight into project management and procurement processes will be obtained by consulting various literatures to establish if an integrated framework has been achieved in other companies and which solutions have been implemented. To establish if this has been previously achieved, an in-depth literature review will be conducted to understand the various concepts and their relationship to each other.

2.8 Epistemology

'Epistemology' is described as the way the researcher moves toward realisation of the research problem (Viljoen, 2012).

The researcher formerly occupied a procurement practitioner position within the Eskom Group Commercial, Project Sourcing Department, which has revealed to the researcher what procurement practitioners are subjected to during the course of their relationship with project managers as well as their specific frustrations. In contrast, the frustrations voiced by project managers include, among others, the time-consuming procurement processes, the responsibilities of the various functions, and the poor quality of communication between project managers and procurement practitioners.

Eskom Group Commercial and project management have certain policies, procedures, regulations and legislation to adhere to. In an organisation as big as Eskom, the entire system cannot be changed at once. Therefore, the dissertation will also explore the lack of mutual understanding of the integration and scope of the project, which causes probable friction and project delay.

2.8.1 *Project management*

The PMBOK (Project Management Institute, 2013) defines a 'project' as "a temporary endeavour to create a unique product, service or result". The temporary nature of projects specifies an assured start and end.

Project management is the use of knowledge, expertise, tools and techniques in the various project actions to meet the project objectives. Project management is achieved through the applicable solicitation and incorporation of the 47 rationally grouped project management processes, which are grouped under five process groups (Project Management Institute, 2013):

- Initiating;
- Planning;
- Executing;
- Monitoring and Controlling; and
- Closing.

2.8.2 *Project life cycle*

A project life cycle is the sequence of stages that a project goes through, from start to finish. The stages are normally chronological, according to the project and business requirements. These stages may be subdivided by purposeful or fractional objectives, transitional outcomes or milestones, or budget allowance. The stages are usually time constrained, with a specified start and end (Project Management Institute, 2013).

Projects differ in magnitude and complexity. Each project may be charted according to the following general life cycle structure (Project Management Institute, 2013):

- Starting the project;
- Organising and preparing;
- Carrying out the project work; and
- Closing the project.

The graphical depiction of the stages of the project life cycle structure is shown in Figure 5: Generic Project Life Cycle Structure below:

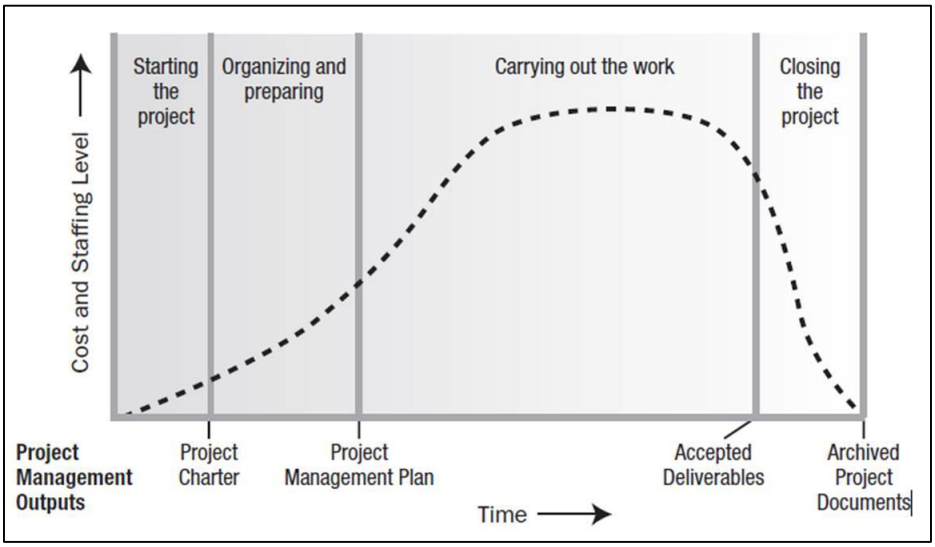

Figure 5: Generic Project Life Cycle Structure
(Source: Project Management Institute, 2013)

Eskom implemented the PLCM, which is based on the PMBOK Project Life Cycle, in 2010 for their major projects. The PLCM is a more detailed and comprehensive model, based upon the Eskom project environment. The Eskom PLCM is depicted in Appendix A: Eskom Project Life Cycle Model.

It is explained that during the lifecycle of any project, specific approvals are required and procurement is included in these approvals (Van Jaarsveldt, 2012). The time consumed in obtaining approval from procurement contributes to project delays. The

procurement process actions have a direct influence on a project schedule. These influences can be categorised in the following components:

- **Human interaction** — Human interaction has a direct negative impact on the project schedule owing to the various project stakeholders not always being available as the stakeholders continue with their Business Unit (BU)-related work. This results in project-related work not continuously being addressed and, consequently, the stakeholders do not share the same interest in the project. Another factor that may affect the project schedule is the time taken to peruse the project information efficiently to ensure that the transaction is approved without any risk to the project or the business.

- **Communication** — Inadequate communication is one of the main causes of project failure. Further unforeseen project delays occur because of the length of the procurement process. Communication between procurement and project managers during the procurement process is essential to ensure that the project manager is aware of any procurement delays which could potentially lead to project delay.

- **Procurement process and undue governance** — A detailed procurement process is essential for governance and financial management in projects. However, a procurement process that may not be influenced by procurement process participants could initiate a drawn-out and infuriating process.

- **Work overload** — The manner in which project and procurement activities are distributed among the various stakeholders may lead to crucial obstructions, resulting in project delays.

Human interaction is necessary during the procurement process. Therefore, this influence cannot be removed. Teamwork among the project team and the adjudication committees must be improved by reducing the number of adjudication committees. It is also necessary to incorporate main adjudication stakeholders, into the project team, on a permanent basis. This will ensure that the approval process is simplified and reduced significantly (Van Jaarsveldt, 2012).

It is recommended that assigning a procurement practitioner to the project environment may reduce the obstructions (Van Jaarsveldt, 2012) as the procurement practitioner will only have the project's work, and not the BU's related work, to

complete. By integrating these changes, Van Jaarsveldt (2012) emphasises that the project procurement process may be effectively improved and reduce the number of individuals participating in the procurement process, which will not cause the procurement governance to be affected. This is evident from the research conducted by Van Jaarsveldt (2012), which found that project-related disagreements among stakeholders can be prevented.

2.8.2.1 *Project delays*

Kombargi, Masuy, Sastry and Ozeir (2012) are well-versed in development and transformation where organisations are required to consider vital components when executing large-scale capital projects. These components are depicted in figure 6 below:

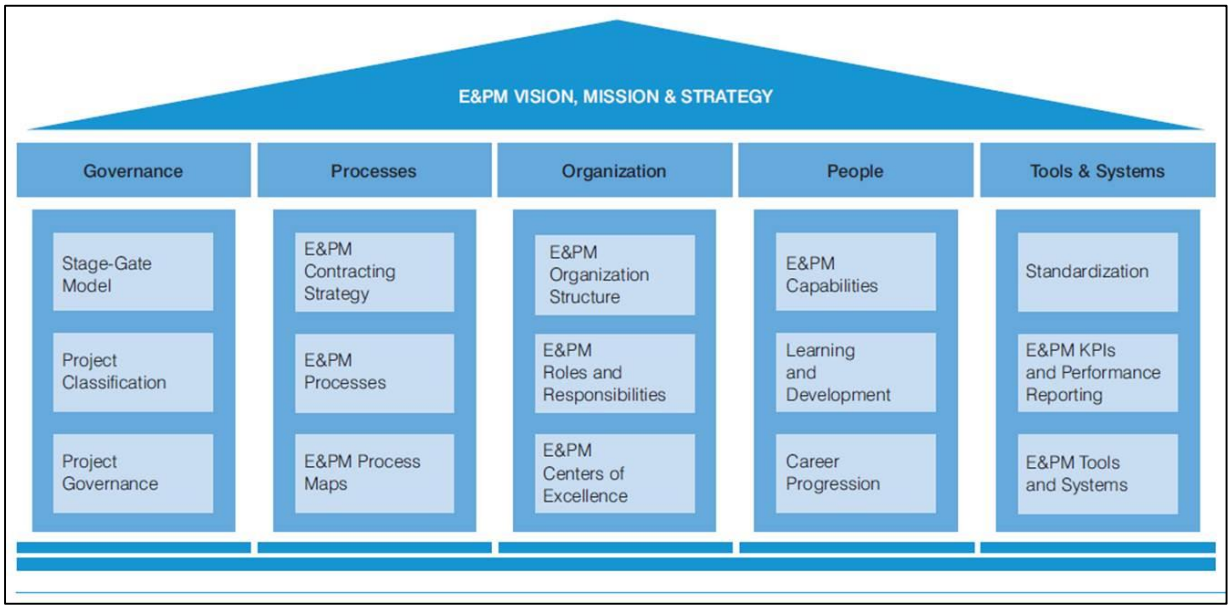

Figure 6: Large-scale project pillars
(Source: Kombargi et al., 2012)

Kombargi et al. (2012) recognise the following components that can influence project delivery:

a. Governance — Not adhering to the business governance model for project delivery may cause the project scope to be amended, often drastically, indicative surplus work, cost increase, as well as project delays.

b. Processes — Insufficient value engineering, project assurance, risk management, and various best practice processes, together with inadequate assessments and stabilities in the processes. Consequently, reluctance in implementing best practice processes has been felt.

c.	Organisation	With uncertain roles and responsibilities throughout the different phases, businesses are frequently unsuccessful in defining the boundaries as the project advances through the phases.
d.	People	Absence of experienced resources and skills.
e.	Tools and systems	Large businesses that do not instigate standardisation within their projects may result in a substantial loss of time and increased costs.

Morgan and Gbedemah, in a report entitled “How poor project governance causes delays”, illustrate the degree to which poor project governance impacts the timeline for projects as a whole. This could ultimately lead to cost increases and project delays. The report identified the causes of project delays (Anthony & Sena, 2010). These are listed below:

- Absence of distinct relations between the project and the company’s key strategic objectives, including established measures of success;
- Absence of distinct senior management as well as ministerial ownership and leadership;
- Absence of efficient interaction with stakeholders;
- Absence of expertise as well as an established approach to project management and risk management;
- Absence of knowledge of, and interaction with, the supply industry at senior management level in the company;
- Insufficient consideration of the need to divide development and implementation into controllable phases;
- Assessment of proposals motivated by the original price instead of long-term value of costs; and
- Absence of efficient project team integration among customers, suppliers and the supply chain.

2.8.2.2 *Factors critical to project success*

A study was published showing the primary factors that are vital to the success of construction projects in Malaysia. It established their significance as perceived by numerous participants, including customers, consultants and suppliers (Yong & Mustaffa, 2012). The survey identified the following factors that are critical to project success:

- Financial capability;
- Proficiency of project team members and stakeholders;
- Teamwork in solving problems;

- Commitment of stakeholders;
- Skilled employees;
- Appropriateness of design details and specifications;
- Communication among project stakeholders;
- Participation in monitoring the project advancement;
- Efficient allocation of labour;
- Collective authority and responsibility amongst customers, consultants and suppliers; and
- Weather conditions.

The findings of the survey indicate that a relationship-based approach to procurement, that endeavours to improve greater participation, trust, commitment and closer relationships among project members is said to be one of the most appropriate solutions for many of the industry's challenges that spawned from a confrontational relationship (Yong & Mustaffa, 2012).

Further findings of the survey indicate a clear uniformity in opinion among participants in identifying the importance of human-related factors such as proficiency, commitment, communication and participation, contributes to the success of construction projects. These factors being the primary component in relationship-based procurement strengthened the need and feasibility of procurement approaches to the Malaysian construction industry (Yong & Mustaffa, 2012).

2.8.2.3 *Risk management*

Project risk management as identified by PMBOK, consists of performing risk management planning; identification, analysis, response planning; and monitoring risk on projects. The intention of project risk management is to encourage the possibility and consequences of positive events, and reduce the possibility and consequences of negative events in projects (Project Management Institute, 2013):

a.	Plan risk management	The process of identifying how to perform risk management activities for a project.
b.	Classify risks	The process of establishing which risks could impact the project and recording their attributes.
c.	Perform qualitative risk analysis	The process of prioritising risks for additional assessment or action by evaluating and combining their likelihood of occurrence and impact.
d.	Perform quantitative risk analysis	The process of numerically evaluating the consequence of the classified risks on project objectives as a whole.

e. Plan risk responses — The process of exploiting alternatives and activities to encourage opportunities and to decrease threats on project objectives.

f. Control risks — The process of applying risk-response plans, monitoring classified risks, monitoring enduring risks, recognising new risks, and assessing risk process efficiency during the project.

Project risk, as identified by PMBOK, is an uncertain occurrence or circumstance that, if it transpires, has a positive or negative consequence on one or more project objectives for instance scope, schedule cost, and quality. A risk might have one or more motives and, if it transpires, it might have one or more consequence. This motive may be a particular or possible prerequisite, assumption, limitation or circumstance that establishes the likelihood of negative or positive consequences (Project Management Institute, 2013).

Companies observe risk as the consequence of uncertainty for projects and company objectives. Companies and stakeholders are prepared to agree to variable degrees of risk subject to the company's risk attitude. The risk attitudes of the company and the stakeholders may equally be affected by numerous aspects (Project Management Institute, 2013).

In order for a company to be successful, it should constantly attend to risk management proactively during the project. A sensible decision should be made at every level of the company to recognise and pursue efficient risk management throughout the life of the project. It should be noted that project risk could occur instantly when a project is started. Proceeding with a project without a pre-emptive concentration on risk management may possibly lead to additional complications emanating from unmanaged threats (Project Management Institute, 2013).

Figure 7**:** Project risk management processes give an outline of the project risk management processes. The subsequent processes interrelate with each other (Project Management Institute, 2013):

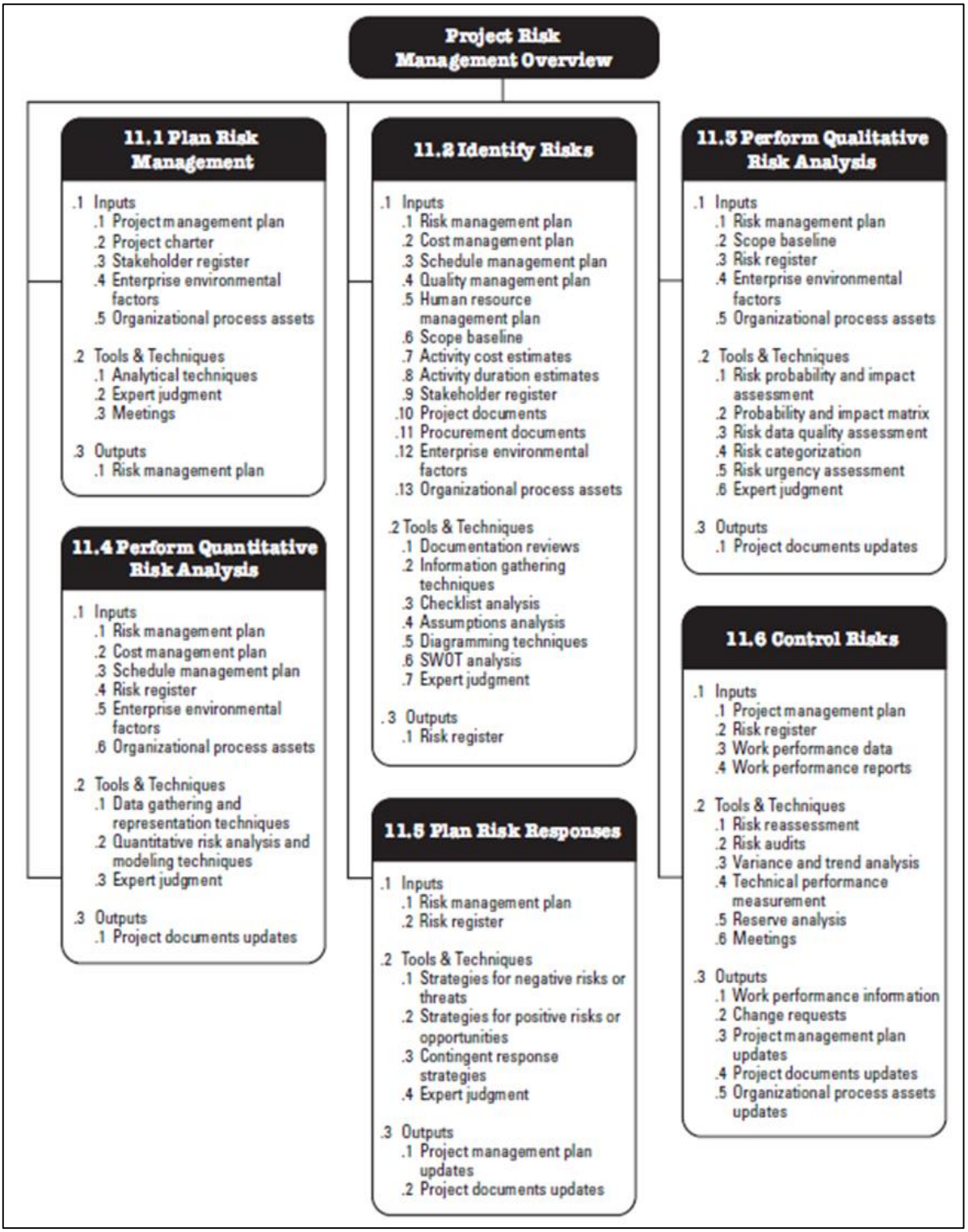

Figure 7: Project risk management processes
(Source: Project Management Institute, 2013)

Probability and impact matrix

Risks can be prioritised for further quantitative analysis and developing risk responses substantiated by their risk ranking. Rankings are allocated to risks and these grades are substantiated by their measured probability and impact. The

assessment of each risk's significance and priority for attentiveness is usually performed via a look-up table, or a probability and impact matrix. Such a matrix stipulates combinations of probability and impact that lead to ranking the risks as low, moderate or high priority. Expressive terms or numeric values may be applied subject towards a company's inclination of risk (Project Management Institute, 2013).

Probability	Threats					Opportunities				
0.90	0.05	0.09	0.18	0.36	0.72	0.72	0.36	0.18	0.09	0.05
0.70	0.04	0.07	0.14	0.28	0.56	0.56	0.28	0.14	0.07	0.04
0.50	0.03	0.05	0.10	0.20	0.40	0.40	0.20	0.10	0.05	0.03
0.30	0.02	0.03	0.06	0.12	0.24	0.24	0.12	0.06	0.03	0.02
0.10	0.01	0.01	0.02	0.04	0.08	0.08	0.04	0.02	0.01	0.01
	0.05/ Very Low	0.10/ Low	0.20/ Moderate	0.40/ High	0.80/ Very High	0.80/ Very High	0.40/ High	0.20/ Moderate	0.10/ Low	0.05/ Very Low

Figure 8: Probability and impact matrix
(Source: Project Management Institute, 2013)

Each risk is ranked according to its probability of occurrence and impact on an objective if it does arise. The company should establish which combinations of probability and impact consequently lead to a classification of high, moderate and low risk. In a black-and-white matrix, these circumstances are depicted using various shades of grey. In figure 8, the dark grey area (with the largest numbers) denotes high risk, the medium grey area (with the smallest numbers) denotes low risk, and the light grey area (with intermediate numbers) denotes moderate risk. Ordinarily, these risk-ranking guidelines are quantified by the company prior to a project and incorporated in company process assets. Risk ranking guidelines can be personalised in the plan risk management process of the particular project (Project Management Institute, 2013).

Risk monitoring system within Eskom

Eskom instigated a risk monitoring system to detect potential risks. The risk monitoring is performed at various levels, namely departmental, regional, operating units and subsidiary levels. The findings are consolidated and reported upwards to corporate and are included in the annual Eskom Integrated Report. The risk profile is assessed to establish the business risks facing Eskom during project development and execution. The risks are communicated to all stakeholders (Eskom SOC Limited, 2015).

The Eskom risk management process can be depicted as follows:

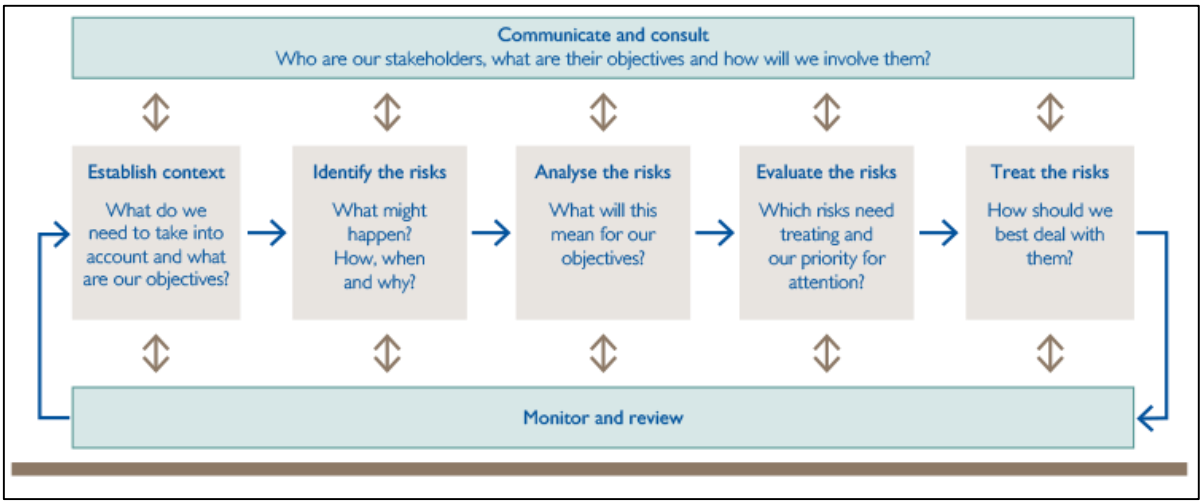

Figure 9: Eskom risk management process
(Source: Eskom SOC Limited, 2015)

2.8.3 *Procurement management*

The Chartered Institute of Purchasing and Supply (CIPS) Australasia defines 'procurement' as the business support function that guarantees external resources, which a business requires or may possibly require to achieve its strategic objectives, are identified, sourced, accessed and managed. Procurement exists to investigate supply market opportunities. Procurement is required to initiate resourcing strategies that ensures the most viable supply opportunity for the company, its stakeholders and clients (CIPS Australasia, 2013).

Procurement involves various activities prior to concluding a contract and post-contract, along with general management actions in relation to contracts (CIPS Australasia, 2013):

a. Prior to concluding a contract	Preparation, identification and exploration of requirements and procuring the required goods and/or services.
b. Post-contract	Contract management, supply chain management and discarding of resources.
c. Universal actions	Supplier relationship management, judicial compliance, and corporate governance.

PMBOK recognises that project procurement management consists of the processes required to procure products, services or outcomes required from external parties. The business can be the buyer or seller of the products, services or outcomes for a project (Project Management Institute, 2013).

The supply management experts, Ardent Partners, recognised that several opportunities, challenges and risks are continually increasing within the current global business environment. Therefore, all businesses must be innovative about strategic sourcing in order to achieve a competitive advantage. Ardent Partners identified four pillars of strategic sourcing, which should be the basis for a strategic sourcing programme: spend analysis, sourcing, contract management and supplier management (Bartolini & York, 2015).

Each business must invest effective time and resources in developing a leading sourcing department. The business must understand that the transformation plan, the procurement team and the implementation plan are crucial to ensure that the four pillars assist to enhance team performance (Bartolini & York, 2015).

Ardent Partners (Bartolini & York, 2015) identified in their study "CPO rising 2015: The Agility Agenda" that 66% of Chief Procurement Officers (CPOs) have confidence that if procurement becomes involved earlier in projects, it will ensure that more procurement opportunities are unravelled in the future. Other top drivers that have been identified include:

- New or enhanced technology;
- Experienced employees;
- Improved communications plan; and
- Improved team performance.

2.8.3.1 *Conduct procurement*

Conducting procurement involves the process of obtaining seller responses, deciding on a seller, and awarding a contract as identified by PMBOK. The fundamental benefit of this process is that it encourages an alignment of internal and external stakeholder anticipations as a result of an established agreement (Project Management Institute, 2013).

2.8.3.2 *Benefits of procurement management*

CIPS Australasia (CIPS Australasia, 2013) identified various benefits of procurement. These benefits include cost saving, continuous supply and the encouragement of strategic objectives, for example market development. The seven primary benefits of procurement are:

- Guaranteed supply of resources;
- Cost saving;
- Controlled risk management;
- Increased quality;
- Increased value-adding;

- Improved proficiency; and
- Innovation.

2.8.3.3 *Challenges of procurement management*

Ardent Partners (Bartolini & York, 2015) conducted a survey in 2015 relating to sourcing pressures and challenges. In this survey, 51% of the participants indicated that saving costs is not such a big challenge compared to the 65% of participants who recorded that cost saving was the top challenge in 2011. The top challenges recorded in 2015 are:

- Challenges in aligning procedures and systems;
- Employee and talent restrictions;
- Inadequacy of technology infrastructure; and
- Budget restrictions.

The most significant, recurring procurement challenges were identified (Bauer, 2011). These include:

- Inadequate time:
    a. The procurement process cannot be performed owing to the urgency of the project; and
    b. Allowance of adequate time for the procurement process while the project is being planned.

Precautionary actions to ensure that indiscretions owing to procurement challenges are addressed – were identified (Bauer, 2011). The precautions include:

- Developing knowledge management:
    a. Schedule sessions and continuing support for authorised projects; and
    b. Provide current information on project and procurement processes and procedures.

Ardent Partners (Bartolini & York, 2015) had found since 2011 that cost saving is the biggest procurement challenge. Bauer (2011) found that process and time are the main challenges in procurement. Thus, it could be interpreted that the more cumbersome the process is, the more time it takes to complete the procurement process, which in turn results in higher costs. It is the opinion of Ardent Partners that process and time are the main challenges in procurement, and not cost savings.

2.8.3.4 *Factors influencing procurement best practice*

Procurement practices were evaluated in a paper entitled “Big Energy Upgrade: Procurement and Supply Chain report - Green Deal and Energy Efficiency

Retrofitting Supply Chains Delivery". During the research for this paper, the authors identified the following factors influencing procurement best practices (Koh,L. Genovese, A. Acquaye, A., 2012):

- Committed support from senior management;
- Profound comprehension of cost drivers;
- Cooperative supplier relationships;
- Culture of persistent improvement;
- Cross-functional team approach;
- Appreciation of progressive communications technology; and
- Investing in procurement/supply management.

Concerning the context of best practice in procurement, the following components should be contemplated in the establishment of procurement best practice principles (Koh, et al., 2012):

- Cooperative and interrelated relationships;
- Training and education for procurement practitioners;
- Integrate health and safety aspects during the life of the project;
- Procurement performance indicators should be monitored and benchmarked with similar projects to establish opportunity for improvement; and
- Probity may be included during the course of the procurement process.

2.8.3.5 *Control procurement*

PMBOK (Project Management Institute, 2013) identified that control procurement involves the management of procurement relationships, monitoring contract performance, and making modifications to contracts as and when applicable. The fundamental benefit of this process is that it encourages both the seller's and buyer's performance to meet procurement prerequisites in accordance with the conditions of the legal contract.

As a result of different company structures, numerous companies regard contract administration as an administrative function independent from the project environment. Despite the fact that a procurement practitioner might be on the project team, this individual naturally reports to another department (Project Management Institute, 2013).

2.8.3.6 *Procurement's contribution to project performance*

Smart Procurement (SmartProcurement, 2011) recognised that one of procurement's main objectives is to supply goods and services of the right quality and price, in the right quantity, at the right time from the right supplier. Then, project managers and procurement practitioners will be on the right path to achieve project objectives.

Therefore, a precise project plan will not suffice if the subsequent aspects remain unclear (SmartProcurement, 2011):

- A clear understanding regarding the scope, budget and milestones must be in place. Due diligence must be depicted in the project business plan to ensure that the project is completed within budget.
- Professionals must be involved in all phases of the project. This will ensure that there is sustainable discipline through the project, resulting in achieving project milestones.
- Project managers must have the authority to achieve the project objectives for which they are responsible. This will ensure that no opportunities are lost during the project.
- To ensure that all project stakeholders perform efficiently, each stakeholder should be assigned appropriate accountability.

The business-as-usual approach in a project environment may not suffice. Therefore, procurement is able to facilitate positive results through the implementation of cooperative cost saving (SmartProcurement, 2011):

- Ensure that business objectives are aligned throughout the various functions before developing a project.
- Ensure that the project team manages the process as a matter of urgency.
- Ensure senior management participation to ensure noticeable direction and support.
- Include cross-functional teams to authenticate and execute ideas.

The nature and attributes of project procurement management were assessed (Tayade, B. Raut,D.N. Shrawage, A, 2012). An improved structure for procurement is recommended by connecting the models of Supply Chain Management and critical chain management. The procurement management establishes guidelines and processes to ensure quantifiable and adequate performance against contractual requirements. Furthermore, it describes and records the selection, procurement and management of supplier endeavours, guaranteeing quality performance and on time delivery at the best cost.

Projects face numerous challenges which include interdependency of activities, stage overlaps, intricate company structure and vagueness in the forecast of preferred results. Project activities are vastly interdependent as they are intricately related and have a complex process relationship. The length of project activities is variable in nature. The necessity to interchange information among suppliers can further delay the procurement time. The significance of successful procurement management may lead to improved performance in project deliverables (Tayade, et al., 2012).

The following aspects are needed for improved project performance (Tayade, et al., 2012):

- Regard procurement as a strategic connection in the project delivery value chain and use procurement to expand stakeholders' value;
- Restructure the process to decrease the time of the procurement process; and
- Persistently improve to eliminate process limitations and to encourage project productivity by reducing supply and demand uncertainties.

2.8.3.7 *Risk management*

South Africa risks

The Institute of Risk Management South Africa (IRMSA) (The Institute of Risk Management South Africa, 2016) presented the annual risk report which highlights the most substantial risks applicable to South Africa. The report was put together in collaboration with IRMSA associates, other professional bodies and subject matter experts. Data was gathered through online surveys and proceedings. The participants in the risk report were divided as follows: 58% from the private sector and 42% from the public sector. This report assists risk managers and company leadership to make decisions for their company.

The report made the following findings (The Institute of Risk Management South Africa, 2016):

- Clarity in procurement contributes to the risk of inadequate electricity supply for South Africa;
- Non-transparent procurement is a main cause of the risk of vast escalation in organised crime and unlawful trading in South Africa; and
- Ethical procurement, with transparent outcomes, is an efficient risk response when industries deal with governance failure.

Work performance information as a procurement risk

PMBOK recognises that work performance information offers a foundation for the identification of existing or possible complications to support future claims or new procurement. By reporting on the performance of a supplier, the company escalates knowledge of the performance of the procurement, which supports improved forecasting, risk management and decision-making. Performance reports similarly contribute in the event that a dispute with the supplier occurs. Work performance information comprises reporting contract compliance, which offers procuring companies a method to track particular deliverables required and expected from suppliers. Contract compliance reporting encourages efficient communication with

suppliers to ensure that possible problems are attended to punctually, to the satisfaction of all participants (Project Management Institute, 2013).

In relation to the performance of a supplier, the Eskom P&SCM Procedure 32-1034 made provision for the reconsideration of supplier registration status in the event that a supplier is in breach of any standard conditions of the Eskom tender process, any standard conditions of the Eskom registration as a supplier, and any terms and conditions of a contract. In the event that a supplier breaches these conditions, Eskom will undertake necessary process to ensure that the particular supplier is reconsidered for registration (Eskom SOC Limited, 2011).

The process of reconsidering supplier registration is managed by the Standing Committee (Supplier Reconsideration) which is a permanent committee that resides in the Group Commercial Risk and Governance department. The Standing committee will investigate whether a supplier is in breach of the stipulated conditions. In the event that the Standing Committee's finding is there are grounds for supplier reconsideration, the supplier and relevant stakeholders will be notified of the actions implemented by Eskom as a consequence of these findings (Eskom SOC Limited, 2011).

Eskom, in conjunction with Sivest and Mondial, presented an integrated risk report entitled "Proposed installation of an additional 500m³ bulk storage fuel oil tank at Grootvlei Power Station". During this risk assessment, an outline of the Eskom risk assessment methodology that was surveyed as well as the results of the process had been documented in the report (Eskom Holdings SOC, 2012).

The risk assessment process surveyed was based on the Eskom Group Integrated Risk Management (IRM) Framework and ISO 31000:2009 as depicted below (Eskom Holdings SOC, 2012):

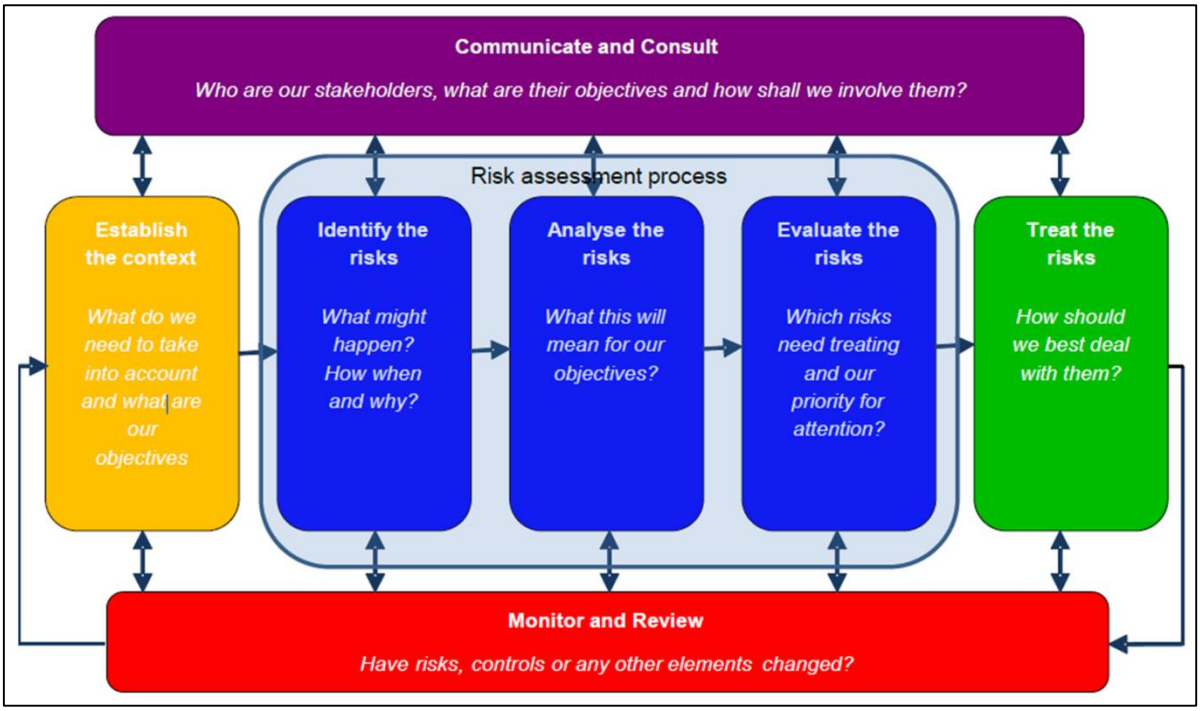

Figure 10: Risk framework
(Source: Eskom Holdings SOC, 2012)

During the risk assessment, it was established that the risks identified showed knowledge of uncertainties that could affect Grootvlei Power Station achieving its project objectives. Of the risks identified and recorded, compliance with Eskom processes and policies was ranked as a significant risk to the project (Eskom Holdings SOC, 2012). The assessment indicated that the compliance with Eskom's processes and policies relating to vendor registration, non-responsive tenders and delayed announcement of tenders might lead to potential project delays (Eskom Holdings SOC, 2012).

In order to mitigate the identified risk, Eskom employs a centralised and reputable procurement process. Procurement schedules site clarification meetings prior to any tenders being submitted. This department has recurring internal and external audits executed on the Eskom procurement process (Eskom Holdings SOC, 2012).

2.9 Conclusion

This chapter includes a discussion on the Eskom Capacity Expansion Programme and the challenges of efficient procurement. Group Commercial provides an internal support function to ensure that contracts are placed with suppliers of goods and services that the business requires.

Eskom Group Commercial and project management have certain policies, procedures, regulations and legislation to adhere to. The Project Sourcing department procures assets, goods and services against an approved project. PLCM

and PMBOK principles are applied to execute the project and prescribe the lead time for procurement of the project requirements. This forms a link between Eskom project management and Eskom procurement.

Emphasis is placed on project management and procurement within Eskom to determine whether the relationship between these functions is established, both internal and external to Eskom.

By consulting various literature sources, the researcher gained knowledge about the different variables that impact projects and procurement. The causal loop below depicts the different variables that the literature sources experienced within the project and procurement environments.

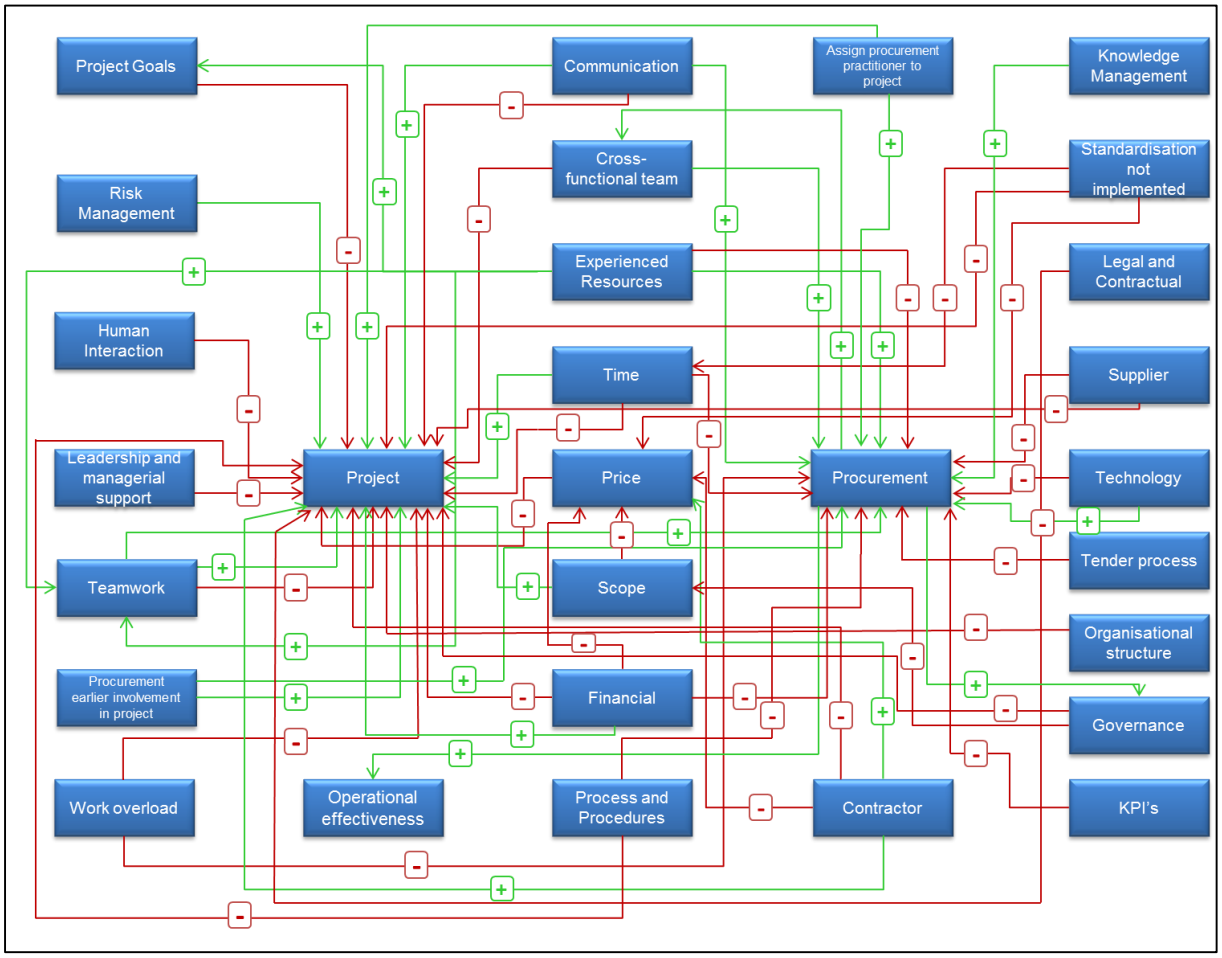

Figure 11: Casual loop of literature sources experience

After careful consideration of the various variables that the literature sources experienced within the project and procurement environments, the following authors' work will be utilised as a departure point for this study:

- Van Jaarsveldt (2012), Kombargi, Morgan and Gbedemah (2012), and Eskom (2012) have underlined variables that contribute to project delays.

- The views of Yong and Mustaffa (2012), Ardent Partners and Smart Procurement (2011), as well as Tayade (2012) on variables that effectively lead toward project success.
- The opinion expressed by CIPS Australasia (2013), Koh, Genovese and Acquaye (2012) on variables that could improve the procurement process.
- Ardent Partners' (2015) and Bauer's (2011) interpretation of variables that contribute to procurement challenges.

Against the information collected from the literature review, which serves as a conceptual framework, the next chapter will discuss the research design and research methodology.

CHAPTER 3

RESEARCH DESIGN AND RESEARCH METHODOLOGY

3 Research design and research methodology

3.1 Introduction

In the previous chapter, the literature review conducted serves as a conceptual framework for this study. The focus of this review is on project management and procurement. This was necessary for the effective assessment of the variables that the authors referenced in the literature review addressed within the project and procurement environments.

The aim of this chapter is to discuss the operationalisation of project management and procurement as well as the operationalisation of the research question. The discussion includes the research design and research methodology. The research methodology discussion will include sampling, data-collection methods, duration of data collection and data analysis. The chapter is concluded by discussing the integrity of research processes used.

3.2 Research design

'Research design' can be described as the rational plan stipulating the methods and processes for collecting data and analysing the required information. The research design indicates the type of research conducted, research theory, method of sampling, data sources, data collection processes and measurement limitations as well as data analysis (The Da Vinci Institute for Technology Management (Pty) Ltd, 2016).

The research design is determined by the type of research and the rationale of the study. The types of research design include exploratory research, descriptive research and casual research (The Da Vinci Institute for Technology Management (Pty) Ltd, 2016).

3.2.1 *Exploratory research*

'Exploratory research' aims to unpack the research questions and does not present absolute and decisive resolutions to existing problems. This method does, however, assist one to understand the problem. During exploratory research, the researcher must be prepared to alter direction when new data and insights are discovered. This research design is used on subjects which have been studied very briefly before or not at all (Dudovskiy, 2016).

3.2.2 *Descriptive research*

'Descriptive research' is considered to endeavour to define, explain or identify how things are. This research provides a better understanding of the matter or problem by

means of data collection. Descriptive research explains characteristics and/or behaviour of the sample population (Dudovskiy, 2016).

3.2.3 *Causal research*

'Causal research' identifies the level and character of cause-and-effect relationships. The research evaluates the effect of specific variations on present norms and several processes. Causal research concentrates on the analysis of a condition or a particular problem to describe the patterns of relationships between variables (Dudovskiy, 2016).

3.2.4 *Research design approach (in this study)*

While the researcher formerly occupied a procurement practitioner position within the Eskom Group Commercial, Project Sourcing function, the researcher made an assumption about what procurement practitioners are subjected to in their relationship with project managers as well as their personal experience.

The researcher applied the exploratory research design to clarify and define the complaints made by project managers about delays in the projects and whether these complaints could be the cause of friction. To define the problem, the researcher had to answer technical, general and risk questions.

Technical questions include:

- Has project management been developed adequately within Eskom?
- Have project management processes been developed and implemented effectively within Eskom?
- What issues have been identified with project management within Eskom?
- Is procurement seen as an important production ingredient?
- What issues have been identified with procurement within Eskom?

General and risk questions include:

- Does procurement contribute towards project delays?
- What are the benefits of effective procurement?

3.3 Research methodology

Viljoen (2012) describes 'research methodology' as the way a researcher obtains and depicts what is understood about the reality. The research methodology section includes the processes used to collect information.

Types of research methodology are the quantitative method, qualitative method, mixed method, action research method, and integral research (The Da Vinci Institute for Technology Management (Pty) Ltd, 2016).

3.3.1 *Quantitative method*

Dudovskiy (2016) indicates that quantitative research explains and evaluates the intensity of occurrences based on numbers and calculations. This study method commonly asks “how many?” and “how often?”. The objective approach applied with this research method uses quantitative data to analyse the research. Typical research methods under the quantitative method include close-ended questionnaires, experimentations, correlations, regression analysis methods and other (Dudovskiy, 2016).

The Da Vinci Institute for Technology Management (2016) concurs with Dudovskiy (2016) that the quantitative research method is accomplished through gathering appropriate data measured by means of numerical values. This method is fundamentally objective with arguments established purely through analytical methods that analyse the data and derive objective conclusions. Personal opinions are mostly disregarded apart from where conclusions are derived from personal opinions of those participating in the study (The Da Vinci Institute for Technology Management (Pty) Ltd, 2016).

3.3.2 *Qualitative method*

Dudovskiy (2016) describes ‘qualitative research’ as informational and intends to deliver a deepness of understanding. This design method is founded on words, perception and feelings. It consists of experimentations, interviews, focus groups and questionnaires with open-ended questions. This method was developed when it was noted that the quantitative research design method was unable to convey human emotions. Therefore, this method is used to provide data about actual people and situations, and to understand behaviour and comprehend behaviour within the wider setting (Dudovskiy, 2016).

The Da Vinci Institute for Technology Management (2016) agrees with Dudovskiy (2016) that qualitative research includes a vast degree of subjectivity, personal opinions and perceptions. This method is applied when it is necessary to understand human behaviour (The Da Vinci Institute for Technology Management (Pty) Ltd, 2016). Creswell (2013) indicates that a researcher gathers open-ended, emergent data with the main intention of developing arguments from it and endeavours to determine the meaning of the phenomenon from the participants’ point of view (Creswell, 2003).

3.3.3 *Mixed method*

Collecting and analysing quantitative and qualitative data jointly in one study is referred to as ‘mixed-method research’. This method encourages the application of various data-collection methods. Although every research method has its limitations, researchers believe that preconceptions in a single study could counterbalance the preconception of other methods (The Da Vinci Institute for Technology Management (Pty) Ltd, 2016).

3.3.4 *Action research method*

‘Action research’ can be described as a method in which the researcher and representative of the organisation work together to identify the problem that exists in the organisation and develop a solution based on the findings. This method assumes that the social world is continuously changing, therefore, both the researcher and the research form part of the continuous change (Dudovskiy, 2016).

3.3.5 *Integral research*

‘Integral research’ is a newly evolving research paradigm that permits a researcher to select among four, or a grouping of two or more, research paths that conform to the criteria, namely showing assorted modes of thinking and being, recognising culture and the significance thereof to the particular context to which they are applied, and interlinking research design and methodology which are founded on a significant social matter to transformative action (The Da Vinci Institute for Technology Management (Pty) Ltd, 2016).

3.3.6 *Research methodology approach (in this study)*

The researcher applied a qualitative research method in this dissertation because it is more progressive and makes it more appropriate to gain knowledge and assess the possible interconnection between the procurement and project management functions.

The researcher studied several literature sources to establish whether a relationship between project management and procurement had been formed that is external to Eskom. The literature sources included books on the relevant research subject as well as web-based sources and journals. By collecting data from the literature sources, the researcher was able to gain knowledge about the factors that impact projects and procurement. Through identifying these factors that impact projects and procurement, the researcher established if an integrated approach had been achieved outside Eskom.

This study researched two specific functions, namely project management and procurement. The objective of this study is to gain an understanding of the experience, interpretation and behaviour of the relevant functions. The researcher gained knowledge about the two functions through the questionnaire which included open-ended comments in addition to the close-ended questions. The questionnaires were analysed and incorporated with the knowledge gained from the literature sources to understand the behaviour within the wider Eskom.

The researcher studied case studies during the literature review, which is used in qualitative studies. The researcher did not use statistical analysis and results in the literature study because this analysis is qualitative in nature. (A quantitative study has statistical results from other studies, which are not applicable in this study's literature review.)

The informational-, perceptions- and feelings-based nature of this study, and an attempt to address people, situations and behaviour, make a qualitative approach the most suitable.

A closed-ended questionnaire (usually for quantitative studies) was used in this study to obtain a comparative guide between project managers' and procurement practitioners' opinions with respect to the issues. This was supported by asking open-ended queries which were added to the study. No descriptive statistical analysis was intended with the questionnaire since this study is qualitative.

3.4 Sampling

Given (2008) defines 'sampling' as a standard used to choose participants of a population to take part in the study. The significant size of certain study populations makes them challenging to work with directly. Therefore, methods have been created to draw samples from these populations. Researchers can work with the population representatives to make conclusions about the population. The definition of sampling can be applied to the qualitative as well as the quantitative research methods, however, the procedure in collecting data differs for both these research methods (Given, 2008).

3.4.1 *Sampling strategy*

Sampling methods can be divided into two groups: probability and non-probability. 'Probability sampling' means that each member of the population has an equal opportunity of participating in the study (Dudovskiy, 2016). With non-probability sampling, the researcher is unable to approach all members of the population. Therefore, only particular members have the opportunity to partake in the study (The Da Vinci Institute for Technology Management (Pty) Ltd, 2016).

During this study, the researcher applied the non-probability sample method. Snowball sampling was used for project managers while convenience sampling was applied to procurement practitioners.

3.4.1.1 *Snowball sampling - Project managers*

Snowball sampling forms part of the non-probability sampling method. It consists of primary participants recommending that other potential participants to join in the study. Participants are recruited via chain referral. This method is popular in business studies - concentrating on a specific company - that collect primary data from the employees of that company (Dudovskiy, 2016).

Snowball sampling consists of three designs: snowball sampling, exponential non-discriminative snowball sampling, and exponential discriminative snowball sampling. Exponential non-discriminative snowball sampling involves the first participant suggesting other potential participants. These potential participants are explored until the key data is collected from an appropriate number of samples (Dudovskiy, 2016).

The researcher applied the exponential non-discriminative snowball sampling method during this study. The primary project management participants were requested to nominate other project managers, from various projects, to partake in the study. This method was selected as the project manager population within Eskom is significant and the researcher did not have access to all project managers within the Eskom project management environment.

3.4.1.2 *Convenience sampling – Procurement practitioners*

‘Convenience sampling’ refers to the process of collecting data from population members. It is convenient for these individuals to participate in the study. The sampling method invites all members to partake and no inclusion criteria are identified prior to selecting participants (Dudovskiy, 2016).

The researcher applied convenience sampling to procurement practitioners as the researcher formerly worked as a procurement practitioner within the Project Sourcing environment. The researcher was acquainted with some of the procurement practitioners in this environment. Convenience sampling is also a cost-effective and a time-saving method.

3.4.2 *Criteria for choosing participants*

This section lists the criteria that the researcher used for selecting individuals to participate in the study. The researcher divided the participants into two groups according to the research context, namely project managers and procurement practitioners.

3.4.2.1 *Project managers*

Project managers were invited to participate in this study according to the following criteria:

- Project managers involved with the Eskom project environment; and
- Project managers exposed to other project environments.

3.4.2.2 *Procurement practitioners*

The criteria that were used to select procurement practitioners to participate in the study include:

- Procurement practitioners within and exposed to the Project Sourcing environment.

3.4.3 *Population of study*

The 'population' of this study refers to the resources from which the sample has been collected. For this study, the researcher selected subject-matter experts directly involved in this field of study. The participants were selected based on their field of expertise and involvement with the Eskom project environment as well as the Project Sourcing environment.

The population for this study included project managers within the Eskom project environment and procurement practitioners within the Project Sourcing environment. Some of the participants were either previously or currently involved within these environments and were exposed to other project environments that are not necessarily within the Eskom business.

3.4.4 *Size of sampling*

The questionnaire was distributed to 25 project managers within the Eskom project environment and 22 procurement practitioners within the Project Sourcing environment. The researcher invited these participants to ensure that both fields of study were equally represented.

3.5 Data collection methods

The publication by Given (2008) explains that 'data collection' in qualitative research refers to gathering words of the participants, or exploratory evidence for the study, to develop their argument (Given, 2008). The Da Vinci Institute for Technology Management (2016) describes typical data-collection methods as questionnaires

interviews, literature reviews, observations, focus groups and case studies (The Da Vinci Institute for Technology Management (Pty) Ltd, 2016).

The data collection in this study was mainly accomplished through exploring the practical experience of participants and the qualitative characteristic of the research context. The data-collection methods are discussed in this section, which includes Eskom procedures and policies, literature review and questionnaire. This section depicts the discoveries that have impacted the data collection, the benefit of these methods, and the obstacles or limitations of the methods.

3.5.1 *Eskom procedures and policies*

The researcher studied the Eskom procedures and policies, specifically the Eskom Project Life Cycle Model (PLCM) and the Procurement and Supply Chain Management policy (P&SCM) in order to determine whether project management and procurement have been adequately developed and implemented within Eskom. The researcher endeavoured to establish how the respective disciplines operate and interact with one another.

The advantage of applying this method indicates that Eskom procedures and policies are well structured, clear and concise. However, this method also highlighted that the topic has not been addressed in Eskom's procedures and policies.

3.5.2 *Literature review*

The researcher reviewed various literature sources to determine whether a relationship between project management and procurement has been established within Eskom as well as external to Eskom. It was essential to gain knowledge about the elements that impact projects and procurement. The literature sources included books on the relevant research subject, web-based sources and journals.

The benefit of studying literature sources is that it was cost effective to obtain comprehensive data. However, the challenges that impacted this data-collection method is that it was time consuming, the data is limited to historical information and the topic has not been adequately researched.

3.5.3 *Questionnaire*

To gain an understanding of whether the project manager is dependent on the services of the procurement practitioner, which suggests the existence of a relationship between project management and procurement management, a questionnaire was developed. (This questionnaire can be found in Appendix B: Questionnaire.)

The questionnaire consists of the following sections and includes a brief description of what has been questioned in the relevant section:

I. Defining project management (PM)	Whether project management is important enough to Eskom that it is reflected in the company's practices and procedures and whether Eskom's PLCM is adequately developed.
II. Project management in an organisational context	Whether the role of project management in the development of practices and processes has evolved and whether the real contribution of project management to project outcomes is measured in Eskom.
III. Issues with the application of project management in the organisation	Whether commitment, support, understanding and cooperation of project management and procurement exists in Eskom. Furthermore, the importance of cooperation between these functions.
IV. The procurement value chain	Whether commitment, support and understanding of the procurement value chain exist in Eskom.

These sections consist of questions and statements. These statements had to be rated according to the participants' experience and perception with reference to the relevant question. The five values offered to the participants, to express their opinions, have been defined in order to qualify their opinions. (These are discussed in chapter 4.) The participants were given an opportunity to make additional open-ended remarks in addition to the close-ended questions regarding the sections if they wished to do so.

The researcher believes that this method provides structure and objectivity in the collection of data. It is also the belief of the researcher that the questionnaire method was less invasive for the participants and ensured the confidentiality of participants' answers. The time spent to complete the questionnaire was also acceptable compared to personal interviews with participants, which could be time consuming according to the researcher's experience.

The obstacles of this method include the following:

i. Different perceptions of questions by participants;

ii. Participants did not return the questionnaire;
iii. Questions were unclear for participants; and
iv. Honesty of participants.

3.5.4 *Duration of data collection*

The purpose of developing a theoretical framework was for the researcher to gain knowledge of the project management and procurement functions and how these interact, which allowed the researcher to identify the possibility of whether these functions could be integrated while keeping them independent at the same time.

Therefore, the data collection took place over an extended period of time between 2012 and 26 February 2016. In addition, the data collected during this period is directly applicable to the project management and procurement functions and their relationship with each other. The situation between the project management and procurement functions did not change during this period.

3.6 Data Analysis and Integrity processes

3.6.1 *Data analysis*

According to the Da Vinci Institute for Technology Management (2016:58) “The data collection method must always fit the research question”. Therefore, data collected by means of the qualitative questionnaire is deemed complete, unique by the researcher, and it allows easier access to relevant qualitative information to answer the research question whether an integrated team approach between the procurement and project management functions would ensure that challenges are addressed in a way that would ultimately lead to project success. The data analysis considered the conversion of information into knowledge.

The analysis of the qualitative data received from the participants (54% of the responses returned come from project managers and 46% come from procurement practitioners) will be presented in chapter 4.

The information collected by means of the research questionnaire indicates that the questionnaire as a research method measured what it was intended to measure in order to arrive at a point where the true picture of the relationship between how procurement and project management think could be derived.

3.6.2 *Integrity to validate the research results*

The accuracy and repeatability of the data can be relied upon, in terms of validity, reliability and representativeness, as it is relevant to the Eskom environment.

The ethics and integrity of the information collected is borne out by the gathering of information within the Eskom environment. This information will be used to answer the research question that relates to an Eskom problem. The statistical information depicted in paragraph 4.2 (see chapter 4) is testament to the representativeness of participants from both disciplines making up the population of respondents.

3.7 Conclusion

With the aim of answering the research question and to achieve the main objective of this study, this chapter discussed the research design and data-collection process which the researcher used to enhance developing concepts and the research context. The researcher applied the qualitative research method to identify the technical, general and risk questions of the study.

The next chapter presents the research findings to establish whether the complaints by project managers, about delays in projects, are valid. The discussion will include whether these complaints could be the cause for friction between project management and procurement.

CHAPTER 4

RESULTS

4 Results

4.1 Introduction

The previous chapter discussed the operationalisation of project management and procurement, as well as the operationalisation of the research question. The discussion included research design and research methodology. The research methodology discussion included sampling, data collection methods, duration of data collection and data analysis. The chapter was concluded by discussing the integrity processes used.

To determine project managers' and procurement practitioners' practical experiences with the other functions, and to establish the root causes for the lack of understanding of these functions, the researcher gathered information on whether an integrated team approach between the procurement and project management functions could be the cause of the accusations flowing between procurement and project management. The researcher collected the information by means of a qualitative questionnaire.

4.2 Statistical information of questionnaire participants

The section depicts the statistical information of the questionnaires. The sample size was divided in the following ratio: 54% project managers and 46% procurement practitioners.

4.2.1 *Sample size response rate*

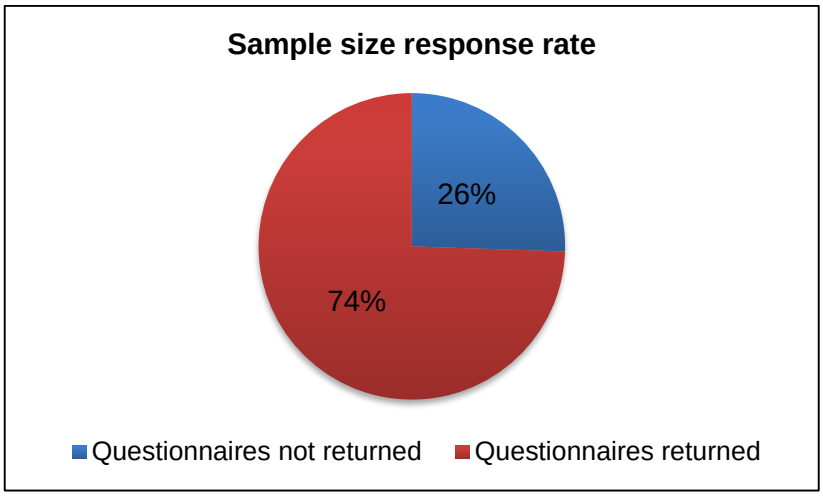

Figure 12: Sample size response rate

The average usable responses, collected from both fields of study, resulted in a 74% response rate.

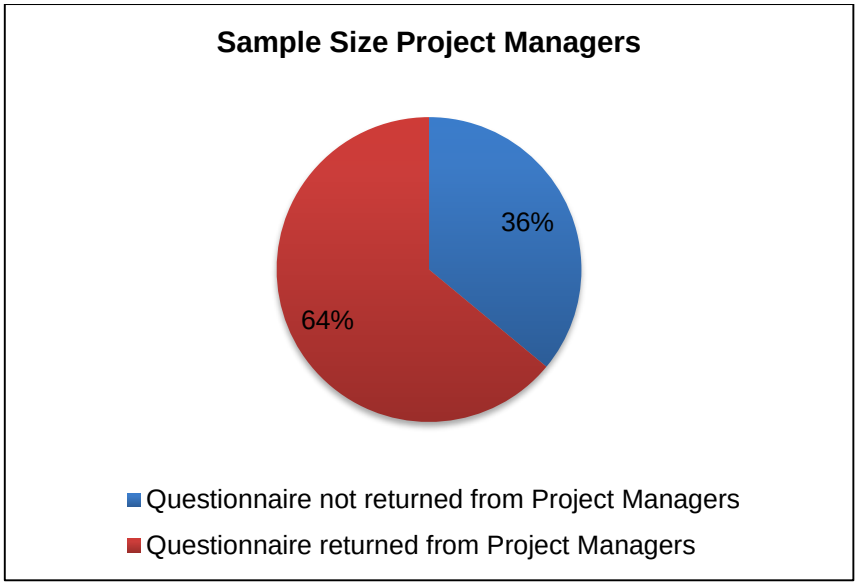

Figure 13: Sample size project managers

Sixteen responses of the 25 distributed, were collected from project managers. This equates to a 64% response rate.

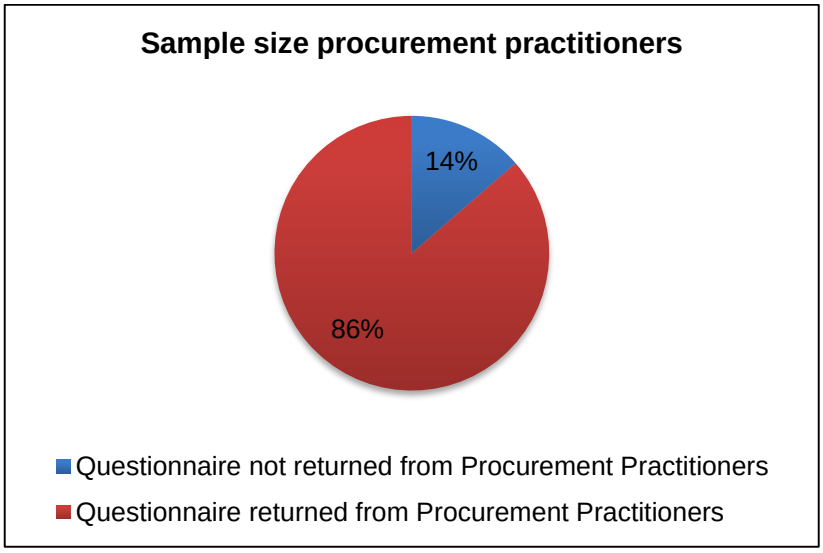

Figure 14: Sample size procurement practitioners

Responses that are suitable for use were collected from 19 procurement practitioners of the 22 distributed. This equates to 86% response rate.

4.2.2 *Statistical information of questionnaire participants*

The participants who returned the questionnaire represent an appropriate representation of the sample population. This section depicts the work environment, the age range and highest academic qualification of the participants from both fields of study.

4.2.2.1 *Work environment of questionnaire participants*

The work environment of the questionnaire participants is evaluated in the following two graphs to depict the spread between project managers and procurement practitioners as well as internal and external to Eskom.

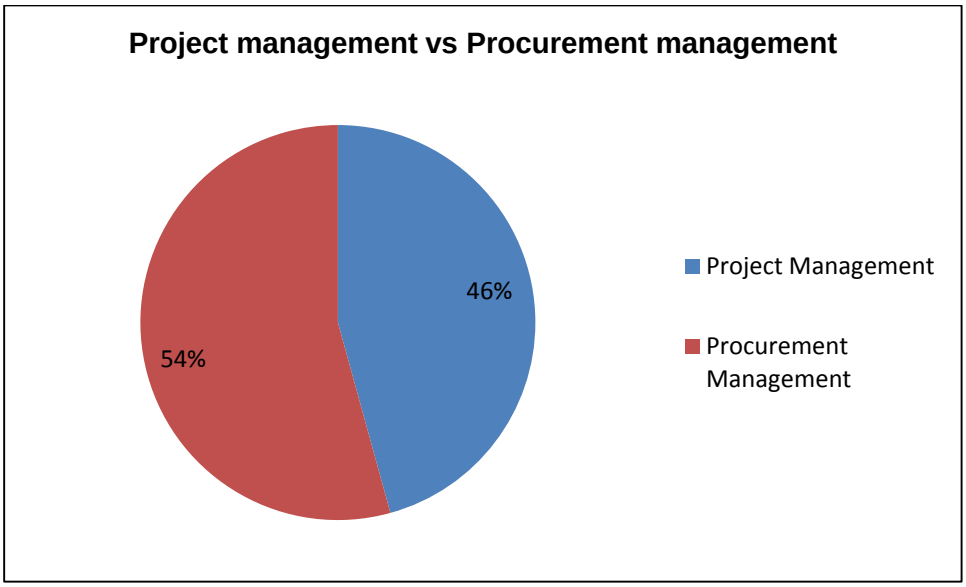

Figure 15: Project management vs procurement management

Sixteen of the 35 participants (46%) are working in project management, whilst the other 19 participants (54%) work in procurement management.

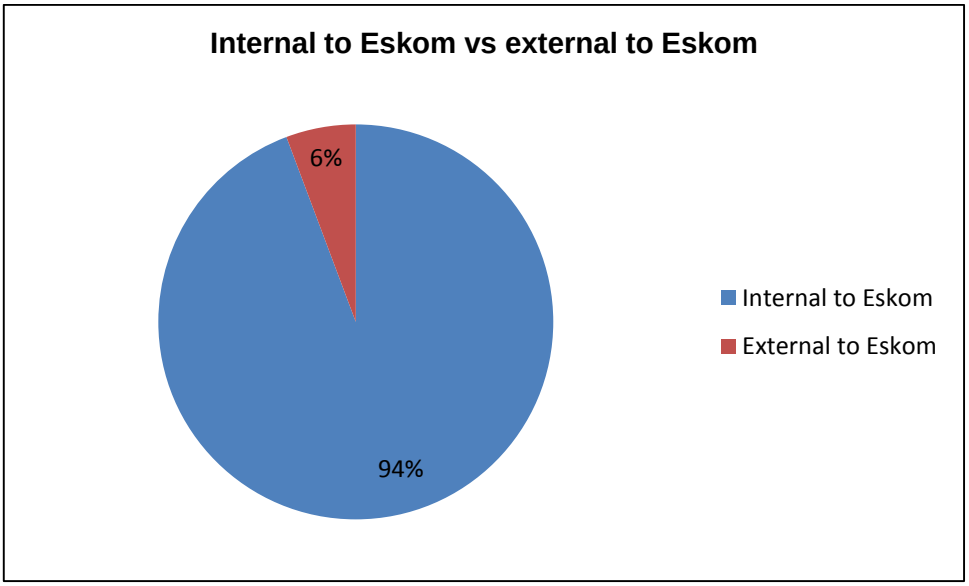

Figure 16: Internal to Eskom vs external to Eskom

Thirty-three participants (94%) were internal to Eskom. Two participants (6%) was external to Eskom, however, these participants have been involved with Eskom previously or is currently in Eskom.

4.2.2.2 *Age range of questionnaire participants*

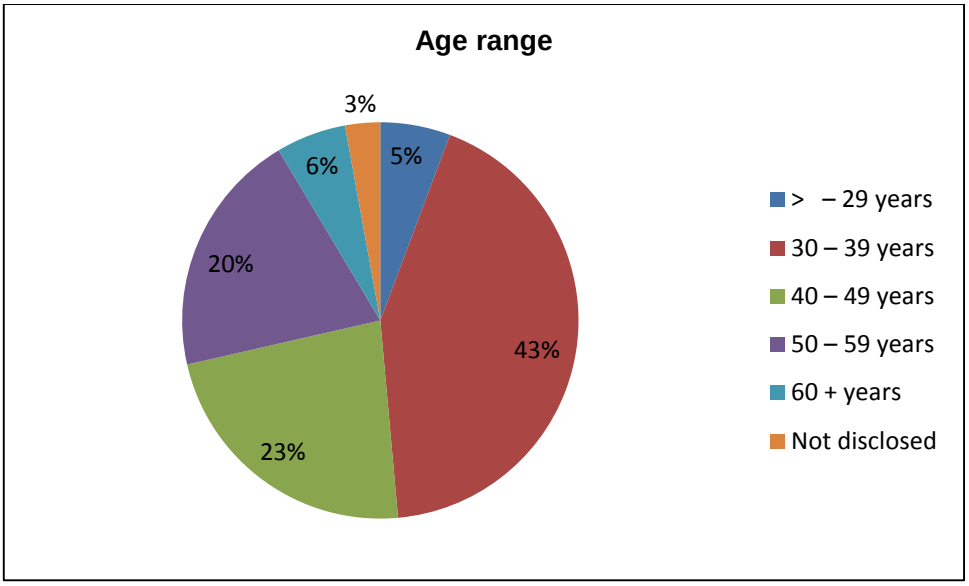

Figure 17: Age range of participants

The age range of the 35 participants comprised of:

- Two of the participants under the age of 29 years (5%);
- Fifteen of the participants between the ages of 30 – 39 years (43%);
- Eight participants between the ages of 40 – 49 years (23%);
- Seven participants between the ages of 50 – 59 years (20%);
- Two participants over the age of 60 years (6%); and
- One participant did not disclose their age (3%).

4.2.2.3 *Highest academic qualification of questionnaire participants*

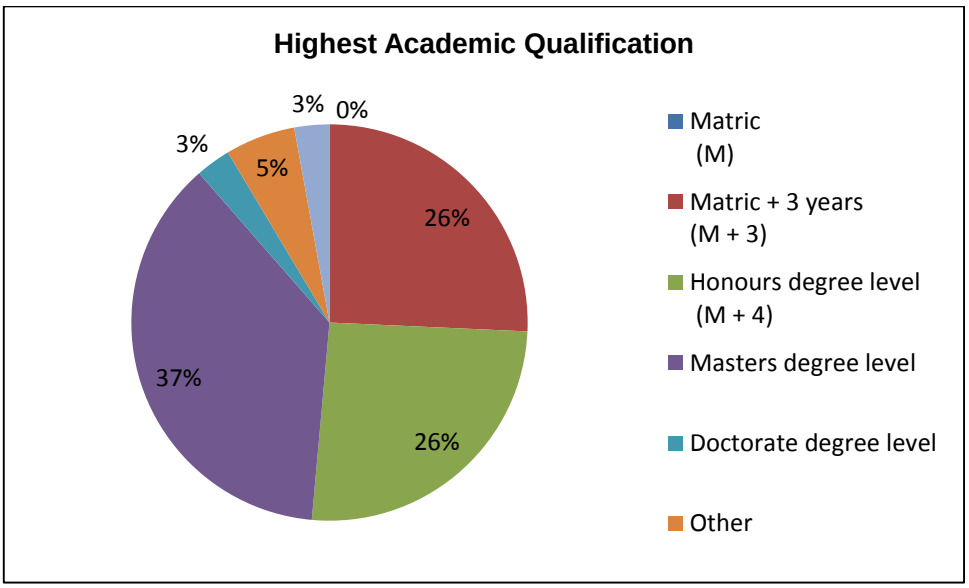

Figure 18: Highest academic qualification of participants

The 35 participants disclosed their highest academic qualification as follows:

- None of the participants selected Matric (M) as their highest qualification (0%);
- Nine participants selected Matric + 3 years (M + 3) (26%);
- Nine participants selected Honours degree level (M + 4) (26%);
- Thirteen participants selected Masters degree level (37%);
- One participant selected Doctorate degree level (3%);
- Two participants selected Other (6%);
- One participant did not disclose their highest qualification (3%).

4.3 Data analysis of results: evaluation of questionnaire

The questionnaires results were analysed by studying the tabulated information derived from the questionnaires returned, and evaluated against the qualitative values in the results from questionnaires received.

The compiled data tables below were used to present the data as received for each of the four parts of the questionnaire:

- Defining project management (PM);
- Project management in an organisational context;
- Issues with the application of project management in the organisation; and
- The procurement value chain.

The questionnaire referred to is included in Appendix B: Questionnaire to the document.

4.3.1 *Table column headings*

The interpretation of each question has been compiled in data tables. The table column headings referenced in this list should be interpreted in line with the definitions allocated to these.

a. Reference to results table	The five values used in the questionnaire are A: Not at all, B: Very little, C: Somewhat, D: Agree and E: Totally Agree.
b. Project management value (questionnaire)	The results received from project management participants regarding the five values used in the questionnaire, are presented in a summary format.
c. Procurement value (questionnaire)	The results received from procurement participants – regarding the five values used in the questionnaire, are presented in a summary format.

d. Interpretation of value — The five values used in the questionnaire are A: Not at all, B: Very little, C: Somewhat, D: Agree and E: Totally Agree. For the purpose of data interpretation, the values of A and B are interpreted as "Little Agreement", the value of C is interpreted as "Somewhat Agree", the values of D and E are interpreted as "Greater Agreement".

e. Project management value percentage — The results received from project management participants – regarding the five values used in the questionnaire, are presented in a percentage format.

f. Procurement value percentage — The results received from procurement participants – regarding the five values used in the questionnaire, are presented in a percentage format.

4.3.2 *Part I: Defining project management (PM)*

Participants were asked to what extent they agree with the following statements concerning their present occupation. The participants were given the opportunity to express their perceptions and or personal experience relating to the relevant section.

4.3.2.1 *Considering project management to be important enough to the organisation that it is reflected in the organisation's practices and procedures*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
1A	0	0	Little agreement	0%	5%
1B	0	1			
1C	0	1	Somewhat agree	0%	5%
1D	7	12	Greater agreement	100%	89%
1E	9	5			
Results total	**16**	**19**			

4.3.2.2 *The organisation's Project Lifecycle Model (PLCM) is adequately developed to support project management effectively*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
2A	0	0	Little agreement	6%	0%
2B	1	0			
2C	4	3	Somewhat agree	25%	16%
2D	6	14	Greater agreement	69%	84%
2E	5	2			
Results total	**16**	**19**			

4.3.3 *Part II: Project management in an organisational context*

Participants were asked to test the applicability of these statements to their present work situation. The participants were given the opportunity to express their perceptions and or personal experience relating to the relevant section.

4.3.3.1 *The role of project management in the practices and processes development has evolved over time to its present status rather than being the result of a direct effort by management to integrate it as a functional management process*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
1A	0	0	Little agreement	0%	16%
1B	0	3			
1C	2	7	Somewhat agree	13%	37%
1D	12	6	Greater agreement	88%	47%
1E	2	3			
Results total	**16**	**19**			

4.3.3.2 *The inability to measure the real contribution of project management on project outcomes is a constraint in the effort to embed it as a practice/methodology in the organisation*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
2A	1	1	Little agreement	25%	21%
2B	3	3			
2C	3	5	Somewhat agree	19%	26%
2D	5	9	Greater agreement	56%	53%
2E	4	1			
Results total	**16**	**19**			

4.3.4 *Part III: Issues with the application of project management in the organisation.*

Participants were asked to indicate to what extent they agree with the application of each of the statements regarding the use of project management in their present work situation. The participants were given the opportunity to express their perceptions and/or personal experience relating to the relevant section.

4.3.4.1 *Senior management demonstrates commitment to successful project management*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
1A	2	0	Little agreement	38%	16%
1B	4	3			
1C	5	4	Somewhat agree	31%	21%
1D	5	11	Greater agreement	31%	63%
1E	0	1			
Results total	**16**	**19**			

4.3.4.2 *Appropriate technology to support project management is available*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
2A	0	1	Little agreement	13%	21%
2B	2	3			
2C	6	2	Somewhat agree	38%	11%
2D	8	12	Greater Agreement	50%	68%
2E	0	1			
Results total	**16**	**19**			

4.3.4.3 *Motivational practices are used to promote the accepting of project management*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
3A	1	2	Little agreement	44%	26%
3B	6	3			
3C	8	10	Somewhat agree	50%	53%
3D	1	3	Greater agreement	6%	21%
3E	0	1			
Results total	**16**	**19**			

4.3.4.4 *There is an effective integration between project management and other organisational processes such as procurement, finance, etc.*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
4A	2	1	Little agreement	50%	11%
4B	6	1			
4C	5	11	Somewhat agree	31%	58%
4D	3	6	Greater agreement	19%	32%
4E	0	0			
Results total	**16**	**19**			

4.3.4.5 *Resources with skills in project management methodologies are available*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
5A	1	1	Little agreement	31%	26%
5B	4	4			
5C	8	7	Somewhat agree	50%	37%
5D	3	7	Greater agreement	19%	37%
5E	0	0			
Results total	**16**	**19**			

4.3.4.6 *The financial benefits of project management are measured in our organisation*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
6A	3	2	Little agreement	50%	53%
6B	5	8			
6C	3	5	Somewhat agree	19%	26%
6D	4	4	Greater agreement	31%	21%
6E	1	0			
Results total	**16**	**19**			

4.3.4.7 *There is an understanding of project management and the benefits of the application of project management to the organisation*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
7A	1	0	Little agreement	31%	16%
7B	4	3			
7C	6	8	Somewhat agree	38%	42%
7D	5	7	Greater agreement	31%	42%
7E	0	1			
Results total	**16**	**19**			

4.3.4.8 *There is an organisational culture that encourages the sharing of knowledge*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
8A	1	1	Little agreement	44%	26%
8B	6	4			
8C	5	9	Somewhat agree	31%	47%
8D	3	5	Greater agreement	25%	26%
8E	1	0			
Results total	**16**	**19**			

4.3.4.9 *Adequate time is available for workshops to share project requirements and procurement knowledge and ideas*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
9A	1	2	Little agreement	44%	63%
9B	6	10			
9C	8	6	Somewhat agree	50%	32%
9D	1	1	Greater agreement	6%	5%
9E	0	0			
Results total	**16**	**19**			

4.3.4.10 *Organisational culture that is not conducive to the effective cooperation*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
10A	1	2	Little agreement	19%	37%
10B	2	5			
10C	4	9	Somewhat agree	25%	47%
10D	9	3	Greater agreement	56%	16%
10E	0	0			
Results total	**16**	**19**			

4.3.4.11 *Senior management is involved in project management*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
11A	0	0	Little agreement	25%	0%
11B	4	0			
11C	7	9	Somewhat agree	44%	47%
11D	4	10	Greater agreement	31%	53%
11E	1	0			
Results total	**16**	**19**			

4.3.4.12 *An understanding of the importance of cooperation between project management and procurement*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
12A	0	1	Little agreement	31%	26%
12B	5	4			
12C	3	3	Somewhat agree	19%	16%
12D	8	9	Greater agreement	50%	58%
12E	0	2			
Results total	**16**	**19**			

4.3.4.13 *Common ownership of problems not recognised*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
13A	0	1	Little agreement	13%	11%
13B	2	1			
13C	7	4	Somewhat agree	44%	21%
13D	5	10	Greater agreement	44%	68%
13E	2	3			
Results Total	**16**	**19**			

4.3.4.14 *Information, communication and technology restraints*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
14A	0	1	Little agreement	19%	16%
14B	3	2			
14C	6	8	Somewhat agree	38%	42%
14D	6	6	Greater agreement	44%	42%
14E	1	2			
Results total	16	19			

4.3.4.15 *Ineffective procurement process*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
15A	0	4	Little agreement	19%	47%
15B	3	5			
15C	3	8	Somewhat agree	19%	42%
15D	6	2	Greater agreement	63%	11%
15E	4	0			
Results total	**16**	**19**			

4.3.4.16 *The impact of staff turnover*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
16A	0	0	Little agreement	0%	21%
16B	0	4			
16C	5	2	Somewhat agree	31%	11%
16D	6	10	Greater agreement	69%	68%
16E	5	3			
Results total	**16**	**19**			

4.3.4.17 *The non-dedication of procurement practitioners to the objective of the project*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
17A	0	3	Little agreement	31%	53%
17B	5	7			
17C	2	7	Somewhat agree	13%	37%
17D	6	2	Greater agreement	56%	11%
17E	3	0			
Results total	**16**	**19**			

4.3.4.18 *Current project management and procurement technologies are adequately integrated to deal with problems encountered in the delivery of contracts, equipment, spares and other deliverables to the right person at the right time*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
18A	1	1	Little agreement	44%	53%
18B	6	9			
18C	4	4	Somewhat agree	25%	21%
18D	4	4	Greater agreement	31%	26%
18E	1	1			
Results total	**16**	**19**			

4.3.4.19 *Project managers and procurement practitioner alike often blame their own non-delivery and failures on the system and/or one another*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
19A	2	1	Little agreement	19%	11%
19B	1	1			
19C	4	7	Somewhat agree	25%	37%
19D	7	6	Greater agreement	56%	53%
19E	2	4			
Results total	**16**	**19**			

4.3.5 *Part IV: The procurement value chain*

Participants were asked to indicate to what extent they agree with each of the following statements. The participants were given the opportunity to express their perceptions and/or personal experience relating to the relevant section.

4.3.5.1 *There are internal processes geared to providing the organisation with knowledge and information regarding the procurement value chain*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
1A	0	0	Little agreement	25%	5%
1B	4	1			
1C	2	5	Somewhat agree	13%	26%
1D	9	8	Greater agreement	63%	68%
1E	1	5			
Results total	**16**	**19**			

4.3.5.2 *The procurement process (value chain) is seen as an important production ingredient*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
2A	0	0	Little agreement	13%	16%
2B	2	3			
2C	2	3	Somewhat agree	13%	16%
2D	10	9	Greater agreement	75%	68%
2E	2	4			
Results total	**16**	**19**			

4.3.5.3 *Procurement is the reason for projects to be on time*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
3A	4	3	Little agreement	50%	53%
3B	4	7			
3C	5	3	Somewhat agree	31%	16%
3D	3	3	Greater agreement	19%	32%
3E	0	3			
Results total	**16**	**19**			

4.3.5.4 *The proximity and availability of a procurement practitioner during the procurement process and afterwards is important for successful project execution*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
4A	0	0	Little agreement	0%	0%
4B	0	0			
4C	2	2	Somewhat agree	13%	11%
4D	4	9	Greater agreement	88%	89%
4E	10	8			
Results total	**16**	**19**			

4.3.5.5 *Procurement management and project management are working as an integrated team during the procurement process in the organisation*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
5A	1	0	Little agreement	25%	16%
5B	3	3			
5C	8	5	Somewhat agree	50%	26%
5D	4	9	Greater agreement	25%	58%
5E	0	2			
Results total	**16**	**19**			

4.3.5.6 *The procurement process in the organisation is recognised as time consuming and bureaucratic*

Reference to results table	Project management value (questionnaire)	Procurement value (questionnaire)	Interpretation of value	Project management value percentage	Procurement value percentage
6A	0	0	Little agreement	0%	0%
6B	0	0			
6C	3	7	Somewhat agree	19%	37%
6D	4	5	Greater agreement	81%	63%
6E	9	7			
Results total	**16**	**19**			

4.4 Conclusion

The research in this chapter is based on a qualitative research approach. A questionnaire was used to gather information on an integrated team approach between the procurement and project management functions. This was to gain clarity on the accusations flowing between procurement and project management. This chapter presents the research results of the questionnaire.

The following chapter presents the evaluation and discussion of the results of the questionnaires and will be used to draw findings from the information gained from the literature review as well as the analysis and interpretation of the questionnaires.

CHAPTER 5

EVALUATION AND DISCUSSION OF THE RESULTS

5 Evaluation and discussion of the results

5.1 Introduction

The purpose of the study is to determine and evaluate the complaints by project managers about delays in projects and whether these complaints could be the cause for friction between project management and procurement. This supposition was evaluated by undertaking a comprehensive qualitative study on a selected target audience of project managers and procurement practitioners in Eskom to determine whether or not there could be grounds for establishing an integrated framework between the two functions.

To achieve the aim of the study, specific technical and general questions were evaluated. The current chapter will include a discussion and evaluation of the results within the context of the study. The discussion will determine whether the research question has been answered.

5.2 Evaluation and discussion of the results

It is critical for Eskom project management to have a structured procurement process. This study was conducted through the literature review and questionnaire. The evaluation of the questionnaire is discussed in detail, against each question, and will be compared and evaluated by using the knowledge gained during the literature review.

5.2.1 *Part I: Defining project management (PM)*

5.2.1.1 *Considering project management to be important enough to the organisation that it is reflected in the organisation's practices and procedures*

The qualitative assessment in paragraph 4.3.2.1 indicates that 100% of project managers and 89% of procurement practitioners agree that project management is considered important enough to the organisation that it is reflected in the company's practices and procedures. However, project managers are more positive, as depicted in paragraph 4.3.2.1.

Participants noted that the challenge is not in defining project management, but in the capability of effecting application within the organisation which must be determined. The results of this question apply to corporate departments, for example information technology (IT), capital-build programmes and project delivery. Therefore, these apply less to operational departments.

Furthermore, participants explained that the effectiveness of project management is affected by the degree to which the front-end planning and engineering is defined

and clarified. Insufficient front-end planning leads to project management endeavouring to define the scope and costs while the project is already in the execution phase. Subsequently, the attention becomes concentrated on clarification instead of the management of project activities. This has a negative impact on Eskom's operations.

5.2.1.2 *The organisation's Project Lifecycle Model (PLCM) is adequately developed to support project management effectively*

Project managers and procurement practitioners agree that the Eskom's PLCM has been adequately developed to support project management effectively. However, procurement practitioners are more strongly inclined to this view (84% against 69%).

Participants noted that although the PLCM is adequately developed, it has not been effectively implemented within the organisation. The PLCM within Eskom is believed to be overcomplicated by having various models for the numerous kinds of projects. Furthermore, project managers within the organisation must be familiarised with, and trained in, the PLCM and should be monitored accordingly in their work outputs.

One participant noted that project management should be an integral part of the procurement process. The participant further added that it is regrettable that procurement practitioners are not skilled in project management. Consequently, they do not employ project management principles to improve the procurement process.

The project life cycle reflects the structure of project phases from start to finish. These phases are altered for each project according to project and business requirements. The stages are usually time-constrained, with a stipulated start and end. During the life cycle of projects, procurement approval impacts planned project completion. These impacts can be classified under the following factors:

- The procurement process is time-consuming.
- Human interface, as illustrated in paragraph 4.3.4.4, where a general negative opinion prevails in both disciplines concerning effective integration between project management and other organisational processes. It is conceivable that project management processes are not supported, nor accepted across the whole organisation.
- Line-function employees performing project manager's activities. The objectives of project team members are not aligned, as illustrated in paragraph 4.3.4.19 where both disciplines agree that project managers and procurement practitioners frequently criticise their own non-performance and failures on the system and/or one another.
- Ineffective communication. As illustrated in paragraph 4.3.4.8 there is a general negative opinion of knowledge-sharing in Eskom. Furthermore, in paragraph 4.3.4.9 both disciplines agree that there is inadequate time

available for workshops to communicate project requirements and procurement knowledge and ideas.

- Procurement process and undue governance. As illustrated in paragraph 4.3.4.15, 63% of project managers agree that the procurement process is ineffective and just 11% of the procurement respondents agree. To support this negative opinion, it was noted that the governance process does not provide for an approachable procurement process and timelines are prolonged and ineffective, as depicted in paragraph 4.3.5.6; and
- The manner in which project and procurement activities are distributed among the various stakeholders may lead to crucial obstructions, as illustrated in paragraph 4.3.4.7 whereby the responses do not paint an encouraging picture. This relates to the opinion that the financial benefits are not quantified in Eskom.

Conversely, as illustrated in paragraph 4.3.2.2, both disciplines agree that the Eskom's PLCM is effectively developed to support project management. However, it is not successfully implemented within Eskom. Thus, procurement practitioners are not subjected to project management processes.

5.2.2 *Part II: Project management in an organisational context*

5.2.2.1 *The role of project management in the practices and processes development has evolved over time to its present status rather than being the result of a direct effort by management to integrate it as a functional management process*

Project managers agree, to an overwhelming extent (88%), that the role of project management in the development of practices and processes has evolved over time rather than being the result of a direct effort by management to integrate it as a functional management process.

Procurement practitioners are less strongly inclined as only 47% agree. Thus procurement practitioners view project managers with a higher esteem than project managers regard themselves.

5.2.2.2 *The inability to measure the real contribution of project management on project outcomes is a constraint in the effort to embed it as a practice/methodology in the organisation*

One participant claimed that the Eskom environment is not supportive of project management endeavours as the organisation does not understand project management. This is attributable to its inability to make expeditious decisions within project timelines or not make decisions whatsoever.

Furthermore, it is explained that the project management structures within the organisation do not essentially follow best practices but rather structures that are amended to be in line with management's preferences.

This comment and the fact that 56% of project managers and 53% of procurement practitioners agree that the inability to measure the real contribution of project management to project outcomes is a constraint to embedding project management as a functional management process. This is interpreted as functional management not believing in the value of embedding project management in functional management processes.

Not adhering to the business governance model for project delivery results in an inability to quantify the real contribution of project management on project results. It is therefore a limitation in the endeavour to embed it as a practice/methodology in Eskom. The financial benefits of project management are not calculated in Eskom. Thus, it is essential to implement standardisation principles within every project across Eskom.

5.2.3 *Part III: Issues with the application of project management in the organisation.*

5.2.3.1 *Senior management demonstrates commitment to successful project management*

A total of 63% of procurement practitioners and 31% of project managers agree that senior management demonstrates commitment to successful project management. However, project managers do not hold this belief as strongly as procurement practitioners.

5.2.3.2 *Appropriate technology to support project management is available*

Fifty percent of project managers and 68% of procurement practitioners agree that appropriate technology to support project management is available.

5.2.3.3 *Motivational practices are used to promote the accepting of project management*

It was found that 44% of project managers and 26% of procurement practitioners do not agree with the statement. Fifty percent of procurement practitioners and 53% of procurement practitioners agree to a certain extent that motivational practices are not used to promote the accepting of project management.

5.2.3.4 *There is an effective integration between project management and other organisational processes such as procurement, finance, etc.*

Both procurement practitioners and project managers have an ambivalent view regarding effective integration between project management and other organisational processes, with 50% of project managers stating that there is little agreement on this issue and 58% of procurement practitioners stating that they somewhat agree in this regard. This is interpreted to mean that project management processes are neither understood nor promoted or accepted across the organisation.

The method in which project and procurement activities are allocated among the different stakeholders may result in project delays requiring project stakeholders to understand project management and the benefits of the application of project management to the organisation. This contributes towards the reason for both procurement practitioners' and project managers' ambivalent view regarding effective integration between project management and other organisational processes.

There is a perception that line function employees may have to act as project managers while at the same time performing their day-to-day functions. Project team members do not share the same priorities and therefore project activities may come second. This may result in project managers and procurement practitioners alike regularly attributing their own non-delivery and failures to the system and/or one another. In addition, effective integration between project management and other organisational processes does not exist.

5.2.3.5 *Resources with skills in project management methodologies are available*

Altogether, 50% of project managers and 37% of procurement practitioners agree, to some extent, that resources with skills in project management methodologies are available. Nineteen percent of project managers and 37% of the procurement practitioners agree that resources with skills in project management methodologies are available. Thus, the project managers mostly agree that resources with skills in project management methodologies are not available. Procurement practitioners agree more positively that resources with skills in project management methodologies are available.

Furthermore, a participant noted that in the project environment capable project managers aspire to contribute and ensure the success of projects however, the protracted processes, procedures and management discourage their endeavours.

5.2.3.6 *The financial benefits of project management are measured in our organisation*

Project managers (50%) and procurement practitioners (53%) do not agree with this sentiment. However, 19% of project managers and 26% procurement practitioners somewhat agree, in relation to the 31% of project managers, and 21% of procurement practitioners agree with the sentiment. Therefore, both disciplines strongly agree the financial benefits of project management are not measured in Eskom.

5.2.3.7 *There is an understanding of project management and the benefits of the application of project management to the organisation*

The numbers in table 4.3.4.7 do not indicate a positive picture and it corresponds with the view that the financial benefits of project management are not measured in the organisation.

A total of 31% of project managers and 42% procurement practitioners agree that there is an understanding of project management and the benefits of the application of project management to the organisation. It was seen that 38% of project managers and 42% procurement practitioners agree to some extent. In contrast, 31% of project managers and 16% of procurement practitioners do not agree.

It was noted by one of the procurement practitioners that although they work in the project procurement environment, this individual does not have knowledge about project management.

5.2.3.8 *There is an organisational culture that encourages the sharing of knowledge*

Only 25% of project managers and 26% procurement practitioners agree that there is an organisational culture that encourages the sharing of knowledge. This indicates a very negative view of knowledge-sharing in general.

It is however encouraging that more than 50% of respondents from both disciplines agree, somewhat, that there is an organisational culture that encourages the sharing of knowledge.

5.2.3.9 *Adequate time is available for workshops to share project requirements and procurement knowledge and ideas*

Project managers (44%) and procurement practitioners (63%) do not agree that there is adequate time available for workshops to share project requirements, procurement knowledge and ideas. In relation, 50% of project managers and 32% of procurement

practitioners agree, to a certain extent, that there is not adequate time available for workshops.

Thus, within Eskom there is an organisational culture that inspires the disclosure of knowledge. However, there is insufficient time available for workshops to disclose project requirements, procurement knowledge and initiatives.

5.2.3.10 *Organisational culture that is not conducive to the effective cooperation*

A total of 81% of project managers and 63% of procurement practitioners agree either strongly or to some extent that the organisational culture is not conducive to effective cooperation. This result indicates that there is a likely mutual agreement between project managers and procurement practitioners which would warrant further research to warrant why.

5.2.3.11 *Senior management is involved in project management*

It was found that 44% of project managers and 47% of procurement practitioners appear, to a certain extent, to agree that senior management is involved in project management. A total of 31% of project managers and 53% of the procurement practitioners unambiguously agree that senior management is involved in project management. Thus, more than 50% of respondents from both disciplines agree that senior management is involved in project management.

5.2.3.12 *An understanding of the importance of cooperation between project management and procurement*

Project managers (50%) and procurement practitioners (58%) strongly agree that there is an understanding of the importance of cooperation between project management and procurement. A further 19% of project managers and 16% of procurement practitioners somewhat agree.

5.2.3.13 *Common ownership of problems not recognised*

Project managers (44%) and procurement practitioners (68%) strongly agree that common ownership of problems is not recognised. A total of 44% of project managers and 21% of procurement practitioners agree, to a certain extent, that common ownership of problems is not recognised.

5.2.3.14 *Information, communication and technology restraints*

Project managers (38%) and procurement practitioners (42%) somewhat agree with the statement. In contrast, 44% of project managers and 68% of procurement

practitioners strongly agree that Eskom experiences information, communication and technology restraints.

5.2.3.15 *Ineffective procurement process*

Project managers (63%) strongly agree that the procurement process is ineffective and only 11% of the procurement respondents agree. A total of 19% of project managers and 42% of procurement practitioners agree that the procurement process is ineffective. In addition, 19% of project managers and 47% of procurement practitioners do not agree that the procurement process is ineffective. To underline the negative view of the project management respondents, a participant noted that the governance process does not make provision for a receptive procurement process and timelines are protracted and ineffective.

5.2.3.16 *The impact of staff turnover*

Project managers (69%) and procurement practitioners (68%) agree that staff turnover influences projects and the procurement process. A participant noted that in general there is a lack of adequate resources, equally in terms of staff and competency.

5.2.3.17 *The non-dedication of procurement practitioners to the objective of the project*

A total of 56% of project managers agree that the lack of dedication of procurement practitioners is the reason for the outcome of the project to be affected, whereas more than 50% of the procurement practitioners indicate little agreement with this notion. It is therefore interpreted that this variance in opinion has its origins in a lack of information and experience of Eskom's project in procurement environments and procedures.

5.2.3.18 *Current project management and procurement technologies are adequately integrated to deal with problems encountered in the delivery of contracts, equipment, spares and other deliverables to the right person at the right time*

Project managers (44%) and procurement practitioners (53%) do not agree with the notion compared to the 25% of project managers and 21% of procurement practitioners who somewhat agree with the notion. Thus, both disciplines agree that current project management and procurement technologies are not adequately integrated to deal with problems encountered in the delivery of contracts, equipment, spares and other deliverables to the right person at the right time.

5.2.3.19 *Project managers and procurement practitioner alike often blame their own non-delivery and failures on the system and/or one another*

Project managers (56%) and procurement practitioners (53%) agree that project managers and procurement practitioners often blame their own non-delivery and failures on the system and/or one another. A total of 25% of project managers and 37% of procurement practitioners somewhat agree with the statement.

A participant noted that completing a project on time requires a collaborative effort from both disciplines. It is therefore important that roles and responsibilities are clear. This will result in eliminating the tendency of project managers and procurement practitioners to blame their own non-delivery and failures on the system and/or one another.

One procurement practitioner noted that the unspoken perception about procurement must still be changed within Eskom, as well as organisations at large. There is a perception that procurement practitioners are often blamed for project delays (see paragraph 4.3.5.3 above).

Projects are time-constrained owing to the anticipated start and end dates for every project. Project managers and the project team can accomplish project objectives if the project plan consists of a well-defined scope, budget and milestones. Thus, it is essential to ensure that the project objectives are achieved and that each project team member performs efficiently. Consequently, each team member should be assigned suitable accountability and common ownership of problems should be recognised. It is essential for senior management to take part in projects in order to ensure direction and support.

A cross-functional procurement process approach empowers enriched relationships, which consequently influences project performance positively. Cross-functional teams may successfully authenticate and execute initiatives.

5.2.4 *Part IV: The procurement value chain*

5.2.4.1 *There are internal processes geared to providing the organisation with knowledge and information regarding the procurement value chain*

Project managers (63%) and procurement practitioners (68%) agree that there are internal processes geared to providing the organisation with knowledge and information regarding the procurement chain. However, procurement expressed a slightly more positive view.

One of the participants noted that adequate processes, accurate guidance and consistent interpretation are required. There are frequently exceptions to the

standard process. There is a perception that these exceptions are repeatedly motivated by reasons which are not in the best interest of the project. These exception decisions are taken by upper management, which results in the project and procurement teams being disempowered. In addition, an opinion exists that the lack of ownership and accountability of attention to details results in an inefficient process.

5.2.4.2 *The procurement process (value chain) is seen as an important production ingredient*

Project managers (75%) and procurement practitioners (68%) agree that the procurement process (value chain) is seen as an important production ingredient. However, project management leans more towards this view.

Additional procurement opportunities will be uncovered should procurement participate in the project process earlier. Other lead components include new or enriched technology, experienced employees, value-adding team performance, and an enhanced communication plan, as illustrated in paragraph 5.2.4.1. Both disciplines agree that internal processes implemented are geared to ensure that the organisation is provided with knowledge and information concerning the procurement value chain.

The procurement process has several benefits and as a result, the procurement process is understood as an essential production factor. The performance challenges consist of inefficiencies in the procurement process such as the procurement practitioners' approach that is not customer-centric, there is a scarcity of competent resources and proficiency, the staff renewal turnover rate has an influence and there is a contradictory adherence to policies and best practice processes. Other benefits of procurement include:

- Improved value-adding, as illustrated in paragraph 5.2.4.2, whereby both disciplines agree that the procurement process (value chain) is perceived as a noteworthy production component.
- Improved competence, as illustrated in paragraph 5.2.4.4. Both disciplines agree that procurement immediacy supports the interpretation that procurement is an important component of production.

The procurement best practice can be improved through the dedicated support from senior management, as illustrated in paragraph 5.2.3.11. Implementing a cross-functional team approach may navigate towards an improved procurement value chain as illustrated in 4.3.5.5.

5.2.4.3 *Procurement is the reason for projects to be on time*

Both disciplines agree that procurement is the reason for projects to be delayed as there is little agreement among 50% of the project managers and 53% of the procurement practitioners on this issue. Thus, less than 50% of respondents agree that procurement is the reason for projects to be on time.

Factors that may impact project delivery are:

- Scope creep - as illustrated in paragraph 5.2.3.13 - where both disciplines agree that common ownership of problems is not acknowledged.
- Alignment of procedures and systems challenges - as illustrated in 5.2.1.1, where both disciplines agree that it is essential to reflect project management in the company's procedures.
- Non-conformance to the business governance model for project delivery - as illustrated in paragraph 5.2.2.2 - where functional management does not consider the importance of embedding project management in functional management processes.
- Competent resources and expertise are absent - as illustrated in paragraph 5.2.3.5 - where there is potential to establish processes to expand the current resources with expertise in project management methodologies. Furthermore, as illustrated in paragraph 5.2.3.16, both disciplines agree that the impact of staff turnover affects projects and the procurement process negatively.
- Application of standardisation principles within projects, as illustrated in paragraph 5.2.2.1, where the interpretation is that procurement practitioners hold project managers in higher esteem than they do themselves.
- Supplier related non-performance, as illustrated in paragraph 5.2.3.18, where both disciplines agree that current project management and procurement technologies are not effectively incorporated to manage complications encountered in the delivery of contracts, equipment, spares and other deliverables to the right person at the right time.
- Infrastructure challenges, as illustrated in paragraph 5.2.3.14. Both disciplines agree that the organisation is subjected to information, communication and technology restraints.
- Financial and funding challenges, as illustrated in paragraph 5.2.3.6, where both disciplines agree that the financial benefits of project management are not quantified in Eskom.

Innovation is essential in the project environment. Procurement can contribute towards a positive outcome by implementing cost-saving initiatives incorporating the following aspects:

- Strategic objectives should be aligned across the business prior to planning a project.

- Each project team member must be committed to achieving project success, as illustrated in paragraph 5.2.3.17, where there is a variance of opinion between the disciplines regarding whether or not procurement practitioners should be committed to projects.
- Ensure direction and support through senior management involvement, as illustrated in paragraph 5.2.3.1, where project managers indicated that they are not empowered to manage projects contrary to a clear assurance from procurement practitioners. Conversely, in paragraph 5.2.3.11, both disciplines indicated there is agreement that senior management is involved in project management.
- Cross-functional teams are valuable in ensuring that project objectives are substantiated and achieved, as illustrated in paragraph 5.2.3.12. Both disciplines understand the magnitude of cooperation between project management and procurement.

5.2.4.4 *The proximity and availability of a procurement practitioner during the procurement process and afterwards is important for successful project execution*

Project managers (88%) and procurement practitioners (89%) overwhelmingly agree that the proximity and availability of a procurement practitioner during the procurement process and afterwards is important for successful project execution.

It can be concluded, from the results, that the procurement process (value chain) is seen as an important production ingredient (see paragraph 5.2.4.2 above) by both project managers and procurement practitioners. A participant noted that communication between the procurement value chain and the organisation is entirely absent.

The continuous challenges of efficient procurement require that all the procurement divisional policies have to be merged into one united standard throughout Eskom, with the intention of sustainable cost reduction by means of economies of scale, operational efficiency and a substantial emphasis on risk and governance. Following a centre-led procurement approach necessitates support to synchronise systems, tools, processes and expertise throughout the procurement department. Nevertheless, by allocating a procurement practitioner to the project environment may lessen obstacles, considering that the procurement practitioner will only have the project's activities to fulfil. This will consequently lead to the project procurement process being successfully enhanced and control the number of individuals taking part in the procurement process, which will not affect the procurement governance.

5.2.4.5 *Procurement management and project management are working as an integrated team during the procurement process in the organisation*

Half (50%) of the project managers and 26% of procurement practitioners “somewhat agree” that procurement management and project management work as an integrated team during the procurement process. In addition, 25% of project managers and 58% of the procurement practitioners agree that procurement management and project management work as an integrated team during the procurement process. A cross-functional procurement process approach engenders better relationships, which influences project performance positively. This is illustrated in paragraph 5.2.4.5.

In order to stimulate an integrated team approach during the procurement process, it was indicated that a centre-led procurement approach might not be the best solution for a project environment. Allocating procurement practitioners to projects may lessen obstacles. Consequently, procurement practitioners do not have to focus on the Business Unit’s work and can focus on completing the project’s work. This will effectively improve the procurement process and decrease the number of individuals taking part in the procurement process, without affecting the procurement governance. This was illustrated in paragraph 5.2.4.3 where both disciplines agree that procurement is a root cause for projects being delayed.

5.2.4.6 *The procurement process in the organisation is recognised as time consuming and bureaucratic*

More than three-quarters (81%) of project managers and 63% of the procurement practitioners agree that the procurement process in the organisation is recognised as time- consuming and bureaucratic.

Project management participants noted that the procurement department within Eskom is understaffed and the experience level of procurement practitioners is generally low. In addition, they noted that bureaucracy in the procurement process is damaging the organisation.

In addition, participants noted that the PLCM involves excessive governance and it can be just as time consuming. Although project management principles are applied to manage projects within Eskom, projects are still delayed and occasionally there are failed projects. The participants believe that the amount of bureaucracy that is introduced is overwhelming. In conclusion, project information is duplicated in the process which does not add value to the process.

Participants noted that corporate bureaucracy within the organisation and the contradictory objectives of the organisation make it challenging to execute projects efficiently. However, procurement practitioner participants noted that project

managers take the procurement lead time into account while planning their project. Procurement practitioners also agree that the procurement process is time consuming.

The procurement process should be safeguarded against a procurement transaction being performed as a consequence of the urgency of the project. It is crucial for a project manager to plan for sufficient time for the procurement process to be performed. This way it ensures that more imminent procurement possibilities can be undertaken. Further challenges that influence time consumption are challenges in the alignment of procedures and systems, employee and expertise constraints, an inadequate technology infrastructure and financial constraints.

5.3 Conclusion

To achieve the purpose of the study specific technical and general questions were researched. The findings of the research are summarised below:

5.3.1 *Technical questions*

To achieve the aim of the study, the following technical questions were researched:

- Has project management been developed adequately within Eskom?
- Have project management processes been developed and implemented effectively within Eskom?
- What issues have been identified with project management within Eskom?
- Is procurement seen as an important production ingredient?
- What issues have been identified with procurement within Eskom?

The evaluation of the above questions was performed by gaining knowledge through a literature review and questionnaire. The findings that resulted from the research questions are discussed in below:

- Eskom has developed an adequate project management function within the organisation.
- Eskom's project management processes and principles have been adequately developed to support the project management function. However, the project management processes and principles are not effectively implemented or accepted within Eskom.
- The issues that have been identified with project management include:
    - Effective integration between project management and other organisational functions does not exist.
    - There is an opportunity to put processes in place to build on the current body of available resources regarding skills in project management methodologies.

        - The financial benefits of project management are not measured in Eskom.
        - An opportunity exists to encourage the sharing of knowledge and schedule time for workshops to disclose project requirements and procurement knowledge.
        - It is necessary to improve effective cooperation.
        - Common ownership of problems is not recognised.
        - There is an opportunity to improve information, communication and technology restraints.
        - The procurement process is ineffective and time consuming.
- Procurement is seen as an important production ingredient. However, project management is more inclined to disagree with this interpretation.
- The issues that have been identified with procurement include:
    - Procurement contributes towards project delays.
    - An opportunity exists to improve the integrated team approach during the procurement process.
    - The Eskom procurement process is recognised as time consuming and bureaucratic.

5.3.2 *General and risk questions*

To achieve the purpose of the study the following general and risk questions were researched:

- Does procurement contribute towards project delays?
- What are the benefits of effective procurement?

The evaluation of the general and risk questions was accomplished through the literature review and the questionnaire. The findings from these research questions are discussed below:

- The procurement process is time consuming. Therefore, procurement is one of the elements that contribute towards project delays.
- The benefits of effective procurement include:
    - Improved value-adding, whereby the procurement process (value chain) is an important production component.
    - Improved competence.
    - The committed support from senior management.
    - Implementing a cross-functional team approach.
    - Strategic objectives should be aligned across the business before planning a project.
    - Procurement practitioners should be committed to achieve project success.

The next chapter will provide guidelines on how the results should then be implemented to develop an integrated framework between procurement and project management.

CHAPTER 6

FRAMEWORK ON HOW FINDINGS SHOULD BE IMPLEMENTED

6 Framework on how findings should be implemented

6.1 Introduction

The discussion of an effective procurement process and the delays it causes forms the basis for this study. It has shown that numerous problems experienced in Eskom are similar to those experienced in organisations external to Eskom. The success of project management and procurement must be based on a solid value-adding integrated approach in all processes within Eskom.

These recommendations presented in this chapter are applicable to Eskom and related operational organisations and are interconnected to both the technical-findings and the general- and risk-findings, as presented in paragraph 5.3.

6.2 Framework on how findings should be implemented

Gordon B Hinckley (Hinckley, n.d.) averred that “You can't build a great building on a weak foundation. You must have a solid foundation if you're going to have a strong superstructure.” To ensure that the “strong superstructure” continues to be developed throughout the whole of Eskom, the following recommendations should be implemented, as depicted in Figure 19:

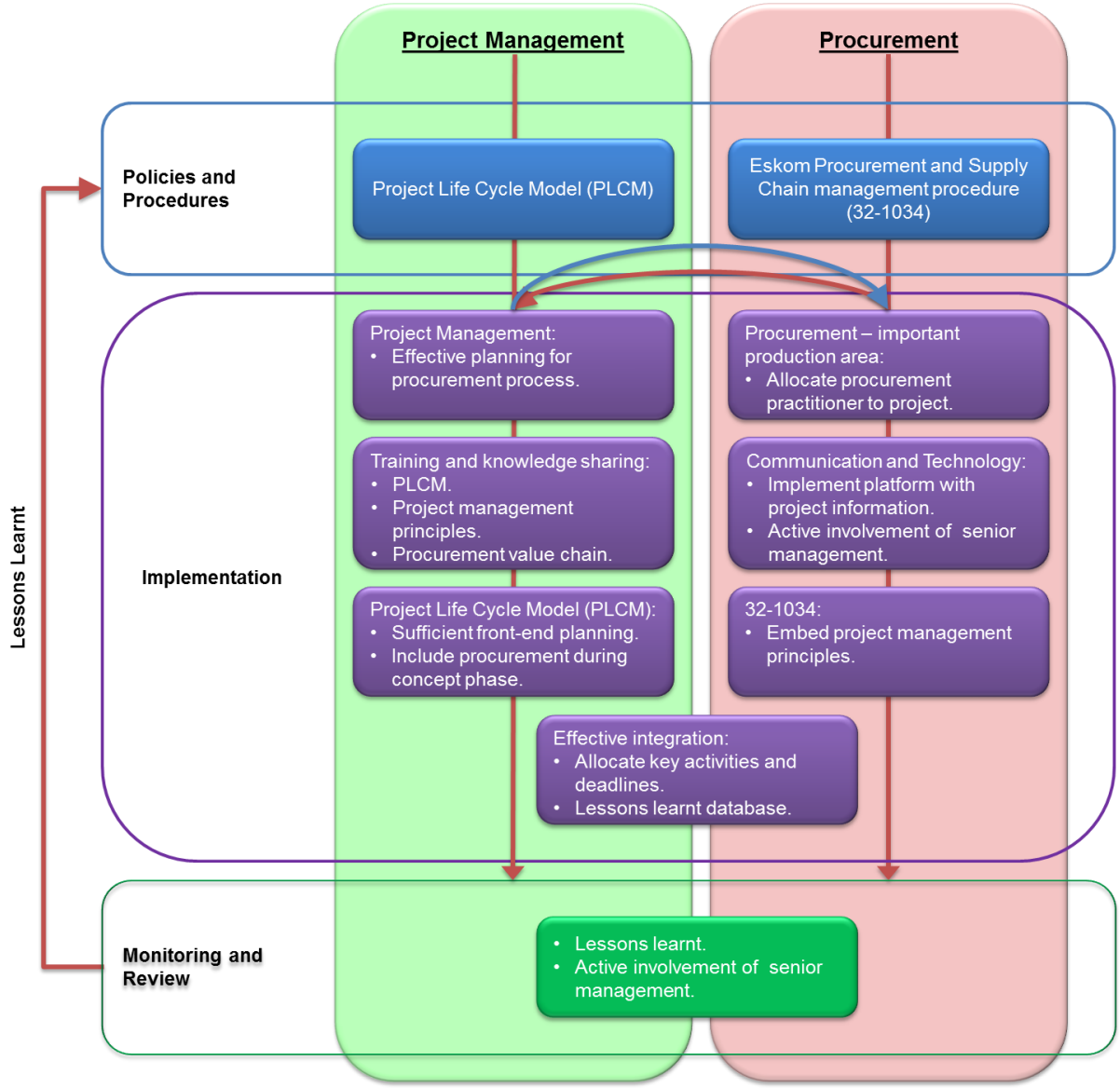

Figure 19: Framework of effective integration

6.2.1 *Policies and procedures*

6.2.1.1 *Project management*

Eskom's PLCM should be implemented adequately according to each project's need within the organisation.

A Project Life Cycle Model (PLCM) articulates the process and steps to be taken to complete a project successfully (see paragraph 2.8.2 above). By developing and implementing a PLCM successfully, project managers will understand the correct process to follow to ensure that high quality standards are maintained within every project and organisational objectives are achieved. Implementing standardised

policies and procedures within an organisation will ensure that the process and steps are always completed in a consistent manner.

6.2.1.2 *Procurement*

The P&SCM procedure (32-1034) should be amended to improve any time-consuming activity in the procurement process. This can be done by embedding project management principles in the P&SCM.

Every organisation should develop an effective procurement procedure, which should provide a framework of the required steps and activities that a procurement practitioner should perform during the procurement process. Detailing the steps and activities in the procurement procedure contributes towards an effective customer-orientated environment, which encourages procurement practitioners to meet the customers' expectations. It additionally ensures that business procurement procedures and policies are adhered to, in accordance with corporate governance requirements.

Further, the procurement procedure should be utilised as a performance measurement tool, to determine if the correct procurement process has been followed by the procurement practitioner. A checklist should be included in the procurement procedure to simplify the procurement process and serve as a recollection tool for procurement practitioners regarding the steps and activities to follow during the procurement process, as well as expectations.

6.2.2 *Implementation*

Developing an effective Project Life Cycle Model (see paragraph 6.2.1.1) as well as a procurement procedure (see paragraph 6.2.1.2) within an organisation is a valuable investment for the organisation. These policies and procedures should be used as a tool to train project managers and procurement practitioners to enable them to complete their allocated tasks and activities. This ensures that there is uniformity in project and procurement processes and encourages the effective and consistent achievement of organisational objectives. Training and workshops assist an organisation to identify concerns in the project and procurement processes, which could be utilised by management during the monitoring and review process (see paragraph 6.2.3).

6.2.2.1 *Project management*

It is important for project managers to understand the procurement process and the related time involved to perform said process. Thus, the procurement practitioner should be involved from the conception phase in order for the project manager to plan effectively for sufficient time for the procurement process to be performed. It is

crucial to ensure that all cross-functional team members' objectives are aligned to complete the project successfully.

Project managers and project procurement practitioners in Eskom should be educated on project management principles. The understanding of project management by procurement practitioners and its benefits should be embedded in the procurement environment by means of compulsory workshops as well as an amendment to the Eskom P&SCM Procedure.

Although not satisfactory, there is a recognised positive base from which knowledge-sharing could be developed positively. The negative view should spur management to put mandatory workshops in place to address the need to share project requirements and procurement knowledge and ideas.

Eskom's policies and procedures should be amended to include sufficient front-end planning in the pre-project planning phase of the PLCM to eliminate scope and cost change during the project execution phase.

The root causes of an ineffective procurement process should be identified and assessed. To assist with the effectiveness of the procurement process, the PLCM should be amended to include a procurement practitioner in the project concept phase.

6.2.2.2 *Procurement*

Procurement, as an important and strategic production area, should be assessed through brainstorming sessions. The fundamental principles that cause it to be effective should be identified. Management should scrutinise the commitment and dedication of procurement practitioners to projects, along with the impact of proximity and availability of procurement practitioners to the project to implement a sustainable solution for successful project execution. It is therefore recommended that procurement practitioners are allocated to specific projects from concept phase through to finalisation phase of the PLCM. Allocating procurement practitioners to the project will moderate obstacles such as the time-consuming procurement process. This will consequently lead to the project procurement process being effectively enhanced and lessen the number of individuals taking part in the procurement process, so reducing resource requirements, mitigating risk and complexities and increasing success.

Management should concentrate on understanding the restrictions and limitations on communication and technology, and then determine how to eliminate these. Thus, procurement and project management should implement appropriate technology/ies to ensure that both collaborate. Through technology, a platform can be implemented whereby all stakeholders have access to the system that contains the project

information. The platform can be used to communicate relevant information with all project stakeholders. The platform will manage the common ownership of problems. This will afford functional management an opportunity to achieve an effective integration between project management, procurement and other organisational processes. Senior management can be more actively involved by having access to this platform and may provide direction and support on the platform.

Project management principles should be embedded in the Eskom P&SCM Procedure (32-1034) to improve any time-consuming activity in the procurement process, such as the approval process of a procurement request.

6.2.2.3 *Effective integration between procurement and project management*

For effective integration between project management and other organisational processes, each stakeholder should have an allocated list of key activities with agreed delivery dates. The project manager, as leader of the project, should monitor the activities and ensure that these are achieved in the allocated time.

Effective integration between procurement and project management could assist organisations to effectively achieve their organisational objectives. This can be accomplished by allocating a project manager who provides the team with the necessary support to achieve project requirements. The project manager should ensure that all team members share the same project vision and that the team understand the purpose and goals of the project. By having a project vision and goal, the team will be committed and motivated to achieve project requirements.

The success of an integrated team approach is dependent upon each team member understanding their key activities and the delivery dates of these activities. By allocating key activities to the team members provides the team with a clear focus and reinforces the team's motivation and commitment to achieve project requirements.

Eskom's management should concentrate on encouraging effective integration among the project management and procurement functions, and strengthening this relationship. In endeavouring to strengthen the relationship between procurement and project management, management should be in a favourable position to take what has been learned and apply it in their efforts to move procurement and project management closer to one another. Management should implement and maintain a lesson-learned database that allows project managers to search for related challenges and rewards, using keywords, within the database.

Developing and maintaining a lesson-learned database contributes towards an organisation's knowledge management system. The lessons learnt during the project and procurement process, whether these are positive or negative, assist future

project managers and procurement practitioners to complete the required processes and not to have to reinvent the activities and actions to follow.

6.2.3 *Monitoring and review*

Effective integration between project management and other organisational processes should be monitored and reviewed continuously to ensure that the lessons learned can be included in the database. This requires active involvement of senior management to ensure that the integration framework does not collapse. The lessons learned must be incorporated into the relevant policies and procedures, either the Eskom PLCM and/or the P&SCM Procedure (32-1034). This will ensure continuous improvement of an effective integrated framework.

When procedures and policies are reviewed continuously by management, to understand the lessons learnt and employee experiences, it serves as a tool to improve the way in which processes are performed and improve the existing processes. This will further enhance and develop the effective integrated framework.

6.3 Conclusion and further research

The main objective of the research is to determine how to break down the wall between procurement and project management and for the two disciplines to maintain their independence while pursuing their integrated functioning in pursuit of project success within Eskom.

The research strives to determine whether or not an environment can be created within which an integrated team approach between project management and procurement would be feasible in ensuring project success. In paragraph 5.2.1.1, research results indicate that Eskom's project management processes and principles have been adequately developed to support project management. However, the project management processes and principles are not effectively implemented or accepted within Eskom. The research results in paragraph 5.2.4.2 also indicate that procurement is seen as an important production ingredient. However, project management is more inclined to disagree with this interpretation.

The results of the qualitative study were used to develop a comprehensive integrated framework between procurement and project management. The outcome of the research therefore determines that the success of project management and procurement must be based on a solid value-adding integrated approach in all processes within Eskom.

The researcher has endeavoured to make the framework complete, however, there are areas in which further work is necessary. These include:

- A strategy for the effective integration of project management and procurement functions;
- Implementation of an “Introduction to procurement in Eskom” training programme for project managers to understand the procurement value chain; and
- A complete curriculum for project procurement practitioners to educate themselves on project management principles and the PLCM.
- Compilation of a quantitative study to explore the situation further to obtain a better understanding.

7 References

Anthony, M. & Sena, G., 2010. *How poor project governance causes delays.* Available at: http://www.pwc.co.uk/assets/pdf/society-of-construction-law-oct10.pdf. [Accessed 2 June 2016].

Bartolini, A. & York, M., 2015. *The State of Strategic Sourcing 2015: The Four Pillars of Sourcing Success,* United States: Ardent Partners.

Bauer, C., 2011. *Docplayer - Public Procurement Challenges and Solutions.* Available at: http://docplayer.net/10435076-Public-procurement-challenges-and-solutions-christina-bauer-20-october-2011-london.html. [Accessed 22 February 2016].

Business Monitor International, 2011. *South Africa Infrastructure Report Q1 2011,* London: Business Monitor International.

CIPS Australasia, 2013. *The Definitions of Procurement and Supply Chain Management.*Available at: https://www.cips.org/Documents/Knowledge/Procurement-Topics-and-Skills/13-SRM-and-SC-Management/Supplier-Relationship-Management/definitions_of_procurement_and_scm.pdf. [Accessed 16 March 2016].

City of Johannesburg, 2009. *Joburg Archive.* Available at: http://www.joburg-archive.co.za/2009/pdfs/idp/chapter10.pdf. [Accessed 23 January 2015].

Creswell, J. W., 2003. *Research Design: Qualitative, Quantitative and Mixed methods approaches.* Second ed. Thousand Oaks, London, New Delhi: SAGE Publications.

Dudovskiy, J., 2016. *Research Methodology.* Available at: http://research-methodology.net/sampling-in-primary-data-collection/. [Accessed 23 April 2017].

Eriksson, P. E. & Vennström, A., 2013. *Procurement procedures effect on project performance.* Available at: http://pure.ltu.se/portal/files/3593766/Procurement_procedures_effect_on_project_performance_CIB.pdf. [Accessed 10 March 2013].

Eskom Holdings SOC, 2012. *Impact Risk Assessment.* Available at: http://www.eskom.co.za/OurCompany/SustainableDevelopment/EnvironmentalImpactAssessments/1376/Documents/Risk_Assessment1.pdf. [Accessed 7 June 2016].

Eskom SOC Limited, 2011. *Eskom Procurement and Supply Management Procedure 32-1034.* Sunninghill: Eskom. Internal Procedure.

Eskom SOC Limited, 2011. *The Eskom Factor.* Available at: http://www.eskom.co.za/OurCompany/SustainableDevelopment/Pages/The_Eskom_Factor.aspx. [Accessed 3 November 2012].

Eskom SOC Limited, 2012. *Group Commercial Business Plan,* Sunninghill: Eskom. Internal Report. Eskom SOC Limited, 2014. *Eskom Business Vision.* Available at: http://www.eskom.co.za/c/article/224/business-vision/. [Accessed 26 February 2015].

Eskom SOC Limited, 2015. *Eskom Company Information.* Available at: http://www.eskom.co.za/OurCompany/CompanyInformation/Pages/Company_Information_1.aspx. [Accessed 15 November 2015].

Eskom SOC Limited, 2015. *Eskom Company Information.* Available at: http://www.eskom.co.za/OurCompany/CompanyInformation/Pages/Organisational_Structure.aspx. [Accessed 15 November 2015].

Eskom SOC Limited, 2015. *Eskom Heritage.*Available at: http://www.eskom.co.za/sites/heritage/Pages/early-years.aspx. [Accessed 26 February 2015].

Eskom SOC Limited, 2015. *Integrated Report 2015.* Available at: http://www.eskom.co.za/IR2015/pages/default.aspx. [Accessed 9 August 2015].

Eskom, 2014. *Eskom Holdings SOC Limited Standard Presentation.* Sunninghill, Eskom.

Esterhuyzen, P., 2011. *Procurement Strategy in the new build environment.* Sunninghill, Eskom SOC Limited. Internal presentation.

Gautrain, 2010. *Gautrain.* Available at: http://www.gautrain.co.za/about/uploads/2010/04/feasibility_analysis1.pdf. [Accessed 25 September 2015].

Given, L. M., 2008. *The SAGE Encyclopedia of qualitative research methods.* One and Two ed. United States of America: SAGE Publications.

Hinckley, G. B., n.d. *Gordon B. Hinckley quotes.* Available at: http://www.brainyquote.com/quotes/quotes/g/gordonbhi539629.html. [Accessed 19 March 2016].

Koh, L., Genovese, A. & Acquaye, A., 2012. *BIG Energy Upgrade: Procurement and Supply Chain report – Green Deal and Energy Efficiency Retrofitting Supply Chains Delivery,* United Kingdom: Centre for Energy Environment and Sustainability.

Murray and Roberts, 2010. *Murray and Roberts projects detail.* Available at: http://www.murrob.com/projects_detail.asp?project=4. [Accessed 15 March 2015].

Project Management Institute, 2013. *A Guide to the Project Management Body of Knowledge.* Fifth ed. Newtown Square, Pa: Project Management Institute.

SmartProcurement, 2011. *How can procurement influence suppliers to deliver projects on time, on budget?.* Available at: http://www.smartprocurement.co.za/archives/how_can_procurement_influence_suppliers_to_deliver_projects_on_time_on_budget.php#more. [Accessed 21 March 2016].

Sports and Recreation South Africa, 2013. *Sport and Recreation South Africa.* Available at: http://www.srsa.gov.za/45156EDC-4F04-4D1F-931B-C30A2462CC5B/FinalDownload/DownloadId-B206E3C8D118D0883ED5879D5A2B7DC2/45156EDC-4F04-4D1F-931B-C30A2462CC5B/MediaLib/Home/DocumentLibrary/SRSACountryReport2013-withcover.pdf. [Accessed 25 January 2015].

Tayade, B., Raut, D. N. & Shrawage, A., 2012. *Role and Importance of Procurement Process in an Implementation of Supply Chain.* s.l., s.n.

The Da Vinci Institute for Technology Management (Pty) Ltd, 2016. *Da Vinci Research Guide for Postgraduates.* s.l.:s.n.

The Institute of Risk Management South Africa, 2016. *South Africa Risks 2016,* Sandton: The Institute of Risk Management South Africa.

Transnet, 2013. *Transnet - External magazine.* Available at: http://www.transnet.net/BusinessWithUs/MDS/External%20Magazine%20-%20Final.pdf. [Accessed 15 November 2015].

Vafaiee, M., Owlia, M. S., Vahdat, M. A. & Vafaiee, M., 2010. *Procurement Management Challenges in Gas Projects of Iran.* Available at: http://www.iieom.org/paper/Final%20Paper%20for%20PDF/278%20Vafaiee.pdf. [Accessed 2 February 2015].

Van Jaarsveldt, M., 2012. *An Engineering Management view of the impact of the Procurement cycle on the Project Schedule of an outsourced PMO in a Matrix-Style organisation.* s.l.:s.n.

Viljoen, R., 2012. *Research paradigms and logic of research.* s.l., s.n.

Yong, Y. C. & Mustaffa, N. E., 2012. Analysis of factors critical to construction project success in Malaysia. *Engineering, Construction and Architectural Management,* 19(5), pp. pp. 543-556.

8 Appendices

8.1 Appendix A: Eskom Project Life Cycle Model

Source: Eskom SOC Limited, 2014

8.2 Appendix B: Questionnaire

Project Management and Procurement: An Eskom Survey

Dear Participant

Project Management (PM) is the planning, organising, directing and controlling of company resources that also uses the systems approach to management by having functional personnel assigned to a specific project. Procurement or, acquisition of goods and services is a process that involves at least two parties with different objectives (buyer and seller), and who interact in a given market segment.

The project manager is dependent on the services of the procurement manager which suggests the existence of a relationship between project management and procurement management.

This research is undertaken as part of a Masters degree [MSc (MOTI) – Management of Technology and Innovation] at the da Vinci Institute. The Academic and Field Supervisor is Drikus de Beer MSc (MOTI) and an Audit Manager at Eskom Holdings (SOC).

The questionnaire should take approximately 20 minutes to complete. Please ensure that you provide your work environment by highlighting the applicable box where requested. Your personal information is not compulsory but will be treated as absolutely confidential together with your responses.

The questionnaire uses a five-point scale for most questions. For each statement only tick or make a cross (“X”) in the box which corresponds the best to your view. There is no right or wrong answer, the only criteria being that you answer the questions in terms of your conviction and experience. When you have completed the questionnaire please check that all questions have been responded to prior to returning the completed questionnaire.

If you prefer, your electronic responses must please be e-mailed to Chantal.duplooy@eskom.co.za. The consolidated results of this research will be made available upon request or may be accessed via a link to HyperWave, when available.

It will be appreciated if you can return the completed questionnaire on or before 26 February 2016.

Thank you very much for your assistance.

Chantal Du Plooy
RESEARCHER

Drikus de Beer
ACADEMIC/FIELD SUPERVISOR

PERSONAL DETAILS (OPTIONAL)	
Email:	
Phone:	
Position:	

WORK ENVIRONMENT (COMPULSORY) If external to Eskom indicate in the appropriate box.					
1 Project Management	2 Procurement Management	3 Internal to Eskom	4 External to Eskom	5 EPMO	6 Other Environment

DEPARTMENT/AREA (This also applies if you are a non-Eskom respondent) Please indicate, e.g. Project Management, Information Management, etc.

Please respond to the following information required by either highlighting the appropriate box or by placing an “X” in it.

Please indicate your age:	
• > – 29 years	
• 30 – 39 years	
• 40 – 49 years	
• 50 – 59 years	
• 60 + years	

Please indicate your highest academic qualification completed	
Matric (M)	
Matric + 3 years (M + 3)	
Honours degree level (M + 4)	
Masters degree level	
Doctorate degree level	
Other	

The questionnaire consists of the following sections:

I Defining Project Management (PM);

II Project Management in an organisational context;

III Issues with the application of Project Management in the organisation; and

IV The Procurement Value-Chain.

PART I: DEFINING PROJECT MANAGEMENT						
Question	To what extent do you agree with the following statements concerning your present occupation? (rate them both)	Not at all	Very little	Somewhat	Agree	Totally Agree
1	Considering Project Management to be important enough to the organisation that it is reflected in the organisation's practices and procedures.					
2	The organisation's Project Lifecycle Model (PLCM) is adequately developed to support project management effectively.					
Should you have additional comments regarding Defining Project Management, please include them below:						

PART II: PROJECT MANAGEMENT IN THE ORGANISATIONAL CONTEXT						
Question	Test the applicability of these statements to your present work situation (rate them both).	Not at all	Very little	Somewhat	Agree	Totally Agree
1	The role of project management in the practices and processes development has evolved over time to its present status rather than being the result of a direct effort by management to integrate it as a functional management process.					
2	The inability to measure the real contribution of project management on project outcomes is a constraint in the effort to embed it as a practice/methodology in the organisation.					
Should you have additional comments regarding Project Management in the Organisational Context, please include them below:						

PART III: ISSUES WITH THE APPLICATION OF PROJECT MANAGEMENT IN ORGANISATION						
Question	Indicate to what extent you agree with the application of each of the statements regarding the application of project management in your present work situation (rate them all).	Not at all	Very little	Somewhat	Agree	Totally Agree
1	Senior management demonstrates commitment to successful project management.					
2	Appropriate technology to support project management is available.					
3	Motivational practices are used to promote the accepting of project management.					
4	There is an effective integration between project management and other organisational processes such as procurement, finance, etc.					
5	Resources with skills in project management methodologies are available.					
6	The financial benefits of project management are measured in our organisation.					
7	There is an understanding of project management and the benefits of the application of project management to the organisation.					
8	There is an organisational culture that encourages the sharing of knowledge.					
9c	Adequate time is available for workshops to share project requirements and procurement knowledge and ideas.					
10	Organisational culture that is not conducive to the effective cooperation.					
11	Senior management is involved in project management.					
12	An understanding of the importance of cooperation between project management and procurement.					
13	Common ownership of problems not recognised. The reference is to 'problems' for example changing delivery lead times, delivery of damaged goods, delivery of incorrect equipment even though the engineer and buyer specifications are correct, etc.					
14	Information, communication and technology restraints.					
15	Ineffective procurement process.					
16	The impact of staff turnover.					
17	The non-dedication of procurement practitioners to the objective of the project.					
18	Current project management and procurement					

PART III: ISSUES WITH THE APPLICATION OF PROJECT MANAGEMENT IN ORGANISATION						
Question	Indicate to what extent you agree with the application of each of the statements regarding the application of project management in your present work situation (rate them all).	Not at all	Very little	Somewhat	Agree	Totally Agree
	technologies are adequately integrated to deal with problems encountered in the delivery of contracts, equipment, spares and other deliverables to the right person at the right time.					
19	Project managers and procurement practitioner alike often blame their own non-delivery and failures on the system and/or one another.					
Should you have additional comments regarding Application of Project Management in the Organisation, please include them below:						

PART IV: THE PROCUREMENT VALUE CHAIN						
Question	Indicate to what extent you agree with each of the following statements (rate them all)	Not at all	Very little	Somewhat	Agree	Totally Agree
1	There are internal processes geared to providing the Organisation with knowledge and information regarding the procurement value chain.					
2	The procurement process (value chain) is seen as an important production ingredient.					
3	Procurement is the reason for projects to be on time.					
4	The proximity and availability of a procurement practitioner during the procurement process and afterwards is important for successful project execution.					
5	Procurement management and project management are working as an integrated team during the procurement process in the Organisation.					
6	The procurement process in the Organisation is recognised as time consuming and bureaucratic.					
Should you have additional comments regarding the Procurement Value Chain, please include them below:						