The Effectiveness of the project management life cycle in Eskom Limpopo Operating Unit

By:

Gideon Baloyi

[redacted]

Mini Dissertation Submitted In Partial Fulfilment Of The Requirements For The Degree Of:

Master Of Business Administration (MBA)

in the

TURFLOOP GRADUATE SCHOOL OF LEADERSHIP (TGSL),

FACULTY OF MANAGEMENT AND LAW,

UNIVERSITY OF LIMPOPO

Supervisor: Prof J Chibaya Mbuya

January 2016

DECLARATION

I Gideon Baloyi, hereby declare that the content of this Mini-dissertation represents my own work and that the opinions contained herein are my own and not necessarily those of Eskom Holdings.

GIDEON BALOYI….
(Name and surname)
…….
(Signature of student)
. . . . . .
(Date)
POLOKWANE, LIMPOPO, South Africa
(City/town of student's residence)

ACKNOWLEDGEMENTS

Firstly, I wish to thank our Heavenly Father for guidance, strength, perseverance and faith, which I was blessed with throughout my academic year at TURFLOOP GRADUATE SCHOOL OF LEADERSHIP, and thank my supervisor Prof. John Mbuya for clear and concise guidance.

A special gesture of gratitude to my family 2 little girls Kholofelo and Tshepiso for their love and patience, particularly my wife and my study partner, Maggy Baloyi for the support in every way she could and for the faith she have always displayed in me. Eskom Holdings staff for their participation in this research.

This document is the end result of a long road travelled that contributed to my personal growth and development, and would not have been possible without the collective contributions by all mentioned above.

ABSTRACT

South Africa is a developing state; the roles of the state owned entities in encouraging economic growth and contributing to the mitigation of unemployment and poverty eradication are unavoidable.

Project management from an engineering development perspective and as an industrial discipline has been investigated and published throughout the past period. It could be said that the subject is mature, as recent publications on project management fail to bring new knowledge to light particularly in Eskom.

This mini dissertation studies the most significant serious success factors in the effective project management in different departmental conditions within Eskom. Projects are being used daily in Eskom to achieve the company goal. In recent years researchers have become increasingly interested in factors that may have an impact on project management effectiveness and the success of projects. However, there is little research that shows how effectively projects are managed in a business organisational context like Eskom.

My Study aims to partly fill this gap by presenting results from a case study and surveys of Eskom as an organisation practising project management. It also aims to investigate the effectiveness of project management in terms of Eskom Divisional structures, technical competency, Eskom Project leadership ability and the characteristics of an effective project manager. In managing projects, it is significant to know how to handle both the tools and the people and to achieve a balance between the two. Experience, especially in the management of change was perceived to be a significant factor in project success.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONMYS

DX	Distribution Division
DX PLCM	Distribution Division Project Life Cycle Model
CPD	Capital Programme Department
CRA	Concept Release Approval
DRA	Definition Release Approval
ERA	Executive Release Approval
FRA	Finalisation Release Approval
PCA	Project Cancellation Approval
DPA	Development Plan Approval
NACVC	Network Asset Creation Value Chain
ACVC	Acquire Customer Value Chain
CIP	Capital Investment Process
OGC	Office of Government Commerce
PMBOK	Project Management Body of Knowledge
RIC	Regional Investment Committee
PLC	Project Life Cycle
PLCM	Project Life Cycle Model
PERT	Project Evaluation and Review Technique
CPM	Critical Path Model
LOU	Limpopo Operating Unit
GOU	Gauteng Operating Unit
WBS	Work Breakdown Structure
SWOT	Strength Weakness Opportunity Threat
PDRA	Project Definition Readiness Assessment

DEFINITION OF CONCEPTS

Project

Project is a temporary endeavour undertaken to create some unique product or service; it could be of any nature like scientific (electrical, mechanical, civil, chemical, medical etc.), social, entrepreneurial etc. (Crawford & Pollack and Englan, 2006).

Project Management

Project Management is the application of knowledge, skills, tools and techniques to project activities in order to meet project's requirement (Steyn, 2011). Project Management is recommended to be a practice of nine knowledge areas (Crawford & Pollack and Englan, 2006).

Project Life Cycle

Project Life Cycle is a collection of project phases. Each phase intends to deliver pre-defined deliverables at its accomplishment (Schwalbe, 2004). A project is meant to yield some product that could be any tangible good or intangible services or software (Cooke-Davies & Cicmil & Richardson, 2007). To lead project to successful end, it is necessary for project managers to learn and follow the Project Life Cycle while performing the activities required for Project Management (Steyn, 2011).

Project Human Resource Management

This includes the processes required to make most effective use of the people involved in the project. It caters for all stakeholders like; sponsors, customers, project team members, support staff, suppliers etc. (Schwalbe, 2004).

Effective

Effective is having the anticipated results (Cooke-Davies & Cicmil & Richardson, 2007). In this research, effective project life cycle within Eskom Limpopo Operating Unit means that the project officials are able to deliver their projects in time, within the approved budget and the quality of the work done being compliant to ISO 2001 requirements.

Successful project

A project is successful when:

1. The objective of the project have been achieved to the full satisfaction of the users
2. All close-out activities have been completed, and
3. All designated interest, including the project's sponsor and/or initiator officially accepts the project result or products and closes the project (Wideman, 2002).

Organizational conditions

Organizational conditions include the general background and the context where project management is carried out. It includes factors such as the organisational form, size, and industry of the organisation as well as some more specific context factors such as project size, type, and the number and experience of the people involved in the project.

Project Management system

A project management system includes process, organisation, and techniques, tools and methods. Project phases build a process. Project phases includes: definition, planning and organizing, implementation and control, and closeout.

Success factors/ Critical success factors

Critical factors are factors that will ensure achievement of success criteria. While critical success factors are essential for completing the project success, other success factors are also needed, but they have merely a contributing role. Success criteria are criteria to be used for judging if the project is successful. Project success criteria are the criteria upon which the relative success or failure of the projects may be judged. Three basic sets of criteria can be identified:

1. From the sponsoring organization, owner or user.
2. The traditional or classical project management one of on time, in budget or to specification
3. Project profitability

It is important to note that criteria change with time. The fact that the original objectives were not achieved does not necessarily mean the project was a failure (Wideman, 2002).

CHAPTER 1: INTRODUCTION

1.1 BACKGOUND

The communication in the 2014 Annual Report gives a clear distinction of the role of Eskom in relation to the state expectations such as providing electricity and being the driver for development of both the state and the previously disadvantaged majority. Eskom, as a state-owned enterprise, has a greater role to play in addition to the supply of electricity. It also supports South Africa's growth and development objectives. Eskom's value proposition to the country can be summarised as follows:

Electricity is a necessary and important input to all economic activity, and in particular is important for realising national socioeconomic objectives. The consequences of operating a power system with a limited reserve margin became apparent in January 2008 when Eskom was forced to introduce emergency load shedding. Investment in electricity generation and transmission infrastructure is a necessary precondition for sustained economic growth (Eskom Holdings Limited Annual Report, 2014).

Fundamentally, new investments in other sectors can only proceed if the future supply of electricity is secure. Over and above supplying electricity, the size of the organisation's current operations and expansion makes Eskom an important economic stimulant. For example, as electricity generation uses approximately 50% of the country's coal production, the continued operation of Eskom is therefore an integral part in ensuring sustainability of the coal mining sector and related industries – sectors that provide substantial employment(Eskom Holdings Limited Annual Report, 2014).

Eskom's affirmative procurement strategy has a direct bearing on redistributing wealth and income in society (Eskom Holdings Limited Annual Report, 2014). Eskom continues to support procurement with BEE and BWO suppliers, thereby channelling significant amounts of money into these sectors. Creating jobs and new industries. Over the five years from March 2013 Eskom planned to spend R385 billion on capital expenditure (Eskom Holdings Limited Annual Report, 2014). This is the biggest build programme in the country and will have large spin-offs through the awarding of contracts, investment by suppliers and purchasing of goods and services sourced from South Africa. This will help to create approximately 40 000 direct and indirect new jobs, with the related skills development

benefits. For direct foreign investment, a secure and reliable electricity supply is a prerequisite. Eskom must ensure that South Africa remains an attractive investment destination (Eskom Holdings Limited Annual Report, 2014).

According to Distribution Network Asset Creation-IDP Document 2012 it is stated that Eskom generates approximately 95% of the electricity used in South Africa and approximately 45% of the electricity used in Africa. Eskom generates, transmits and distributes electricity to industrial, mining, commercial, agricultural and residential customers and redistributors. Limpopo Operating Unit (LOU) is one of the 9 provincial operating unit established to align Eskom Distribution with the nine province of South Africa. The province is renowned for its richness in wildlife, spectacular scenery and a wealth of historical and cultural treasures, agricultural and tourism attractions. Asset Creation is the department in Eskom Distribution which is sub divided in the following sub section: Network Planning, Network Engineering & design, Capital Programme and Project Execution with the following personnel involved in executing the projects Planning & Design Engineers, Project Co ordinators; Clerk of works and Projects Managers to mention the few who ensure that the projects goes through the Project Management life cycle within the division (Distribution Network Asset Creation-IDP Document, 2012).

The current knowledge on project management in Eskom Limpopo Operating is insufficient in relation to the success of new builds and maintenance projects. Limpopo Operating Unit is one of the other operating units under Eskom Distribution with huge new substations builds & refurbishment projects backlogs. To remedy this, the Operating unit management outsourced some of the projects to the consultants. Currently researchers have become increasingly interested in factors that may have an impact on project management effectiveness and the success of projects (Jugrev & Muller 2005, Crawford & al. 2006). However, there is a little study that shows how effectively projects are being managed in business organizational context like Eskom (Steyn, 2011).A project is a temporary endeavour undertaken to create some unique product or service; it could be of any nature like scientific (electrical, mechanical, civil, chemical, medical etc.), social, entrepreneurial etc. (Steyn, 2011).

Project Management is the application of knowledge, skills, tools and techniques to project activities in order to meet project's requirement. Project Management is recommended to be a

practice of nine knowledge areas. These knowledge areas are the management of Scope, Time, Cost, Quality, Risk, Procurement, Communication, Human Resource (HR) and Integration of all. The first four knowledge areas (Scope, Time, Cost and Quality) are ranked primary functions whereas the other four areas (Risk, Procurement, HR and Communication) are declared secondary functions of Project Management (Schwalbe, 2004). The ninth knowledge area 'Project Integration Management' is considered vitally important for guiding how to practice effectively the mentioned eight knowledge areas simultaneously (Schwalbe, 2004). Every knowledge area dictates practice of some predefined activities/functions to the project manager in order to manage and lead the projects effectively. These knowledge areas are recommended to be exercised in five processes that are initiating, planning, executing, controlling and closing (Project Management Institute [PMI], 2004; Schwalbe, 2004; Dinsmore, 1990). Project management research has shown that conventional project management approaches and practice are rational and linear, proving ineffective in successfully managing project complexity and the entire project life cycle in general (Atkinson, Crawford, & Ward, 2006; Cooke-Davies et al., 2007; Williams, 1999).

1.2 PROBLEM STATEMENT

Preliminary investigation revealed that in actual practices of Project Management life cycle undertaken by Asset Creation department for managing projects in the Eskom Distribution Division, Limpopo Operating Unit, programme managers and project managers invested more energy in practicing identified primary functions (Scope, Time, Cost and Quality). This study will further experimental that the secondary functions (Human Resource, Communication, Risk and Procurement) of Project Management are not given due attention. There is inconsistency in following the developed project life cycle in Eskom Distribution Division particularly the Limpopo Operating Unit. A major reason for negligence towards the exercise of secondary functions was that programme managers and project managers within the division used to find it difficult to maintain balance in application of all (nine) knowledge areas of Project Management. (Distribution Network Asset Creation-IDP Document, 2012)

In this context, the least privileged knowledge area among the four secondary knowledge areas was reported to be Human Resource (HR) especially in organizations where projects had been suffering. Existing literature about Project Management does provide frameworks for HR and Project Management (Steyn, 2011). However, these frameworks do not specify the precise number of the minimum HR functions that a project manager must practice and

further do not provide an easy mechanism to exercise the functions of HR in effective manner. Further, in context of the nine knowledge areas a project manager is declared responsible for all of them whereas actual industry practices indicate that project manager's role can be restricted to limited knowledge areas (Steyn, 2011).

This study will determine how proficient project managers are in practicing all the knowledge areas of Project Management and the functions of HR Management in the projects. In the preliminary study done in pursue of this research the selected sample, explained in , near half of the subjects (Polokwane project managers and their team) were found not well acquainted with all the nine knowledge areas (Scope, Time, Cost, Quality, Human Resource, Communication, Risk, Procurement and Integration which are further discussed in details in Chapter 2 section 2.3)considered essential for effective Project Management. More than half of the subjects that were qualified in Project Management remained more inclined to the practice of primary knowledge areas and neglected the good practice of secondary knowledge areas (Distribution Network Asset Creation-IDP Document, 2012)

There is a growing need for competent programme managers and project managers in Asset creation environment within the Distribution division who has knowledge of factors enabling the success of projects (Distribution Network Asset Creation-IDP Document, 2012).

1.3 MOTIVATION/RATIONALE FOR THE STUDY

The study is motivated by what the researcher has observed with the success of projects in the Limpopo Operating Unit (LOU) where shortage of skilled project management personnel are causing overspending on projects, Most of the projects within the operating unit to be late and the quality of the work done on those projects not complying with ISO 2001 requirements.

This study is also motivated by the need to see improvements on the Eskom Project lifecycle management. For the success of Limpopo Operating Unit in providing the reliable and efficient electricity to the people of Limpopo it is of utmost importance to ensure that the problem of shortage of skilled project management personnel and the backlog of the current projects is addressed as a matter of urgency. Electricity is as an important resource is needed in the area. This study will explore what Eskom Limpopo Operating Management has already done and what they are doing in order to address the effectiveness of project management life cycle in the province.

1.4 SIGNIFICANCE OF THE STUDY

The study will contribute to existing knowledge and obstacles of project management life cycle within the Eskom Distribution Limpopo Operating Unit. There is a need to explore what is known about the problem in the area and also the obstacles that hinder the quality, cost effectiveness and the execution of project in time. Currently there is no research that has being done on the effectiveness of the project management life cycle in Eskom. The study is also expected to inform the Eskom Distribution and provincial management on the strategies to use in dealing with the backlog and skills shortage of personnel. There is a need for the Eskom provincial management to come up with strategies that will ensure that there is effective project management. The people of Limpopo need reliable electricity supply for the economic growth of the province.

1.5 AIM OF THE STUDY

The aim of this study is to determine the effectiveness of the project management life cycle in Eskom Limpopo Operating Unit. There is a need to come up with effective strategies that will help the provincial unit to ensure that projects are done in time , within the approved budget and the quality of work done comply with the ISO 2001 requirements.

1.6 OBJECTIVES OF THE STUDY

The following objective will be investigated:

- To determine the factors influencing its project management life cycle performance. In order to achieve the objectives of the study, there is a need to determine what factors are influencing the performance of the project management life cycle. There is a need to determine the factors that are obstacles to the delivery of projects in time and within the approved budget.
- To improve the existing framework for maintaining balance in application of all nine knowledge areas (Scope, Time, Cost, Quality, Human Resource, Communication, Risk, Procurement and Integration) of Project Management such that it could help project managers by mentioning precise number of minimum essential functions of Human Resource Management explaining an easy and effective manner to exercise them.

1.7 RESEARCH QUESTIONS/HYPOTHES

In an attempt to research on the effectiveness of the project management life cycle in Eskom Limpopo Operating Unit. The main research question generated is: How effective is the current project management life cycle?

Subsidiary questions are meant to assist in answering the main question was also generated as well. Subsidiary questions were generated as follows:

- What constitutes projects to be executed late?
- What strategies are being implemented?
- How are the strategies working?
- What are the obstacles to have the effective project management life cycle?

These research questions will be addressed by a literature review; surveys; and prototyping.

1.8 CHOICE AND RATIONALE OF RESEARCH DESIGN

There are two basic approaches to doing research: quantitative and qualitative (Steyn, 2011). Each research approach has evolved to fulfil specific research aims and functions, and specific methodological styles and conventions have developed within each tradition (Steyn, 2011). Both the quantitative and qualitative research approaches will be used in conducting this study because they are concerned with understanding, analysing, explaining, natural observation and controlled measurement and views the subject exploration of reality from the perspective of an insider (Maree, 2007). Qualitative research focuses on understanding people's beliefs, experiences, attitudes, behaviour and interaction (Schwalbe, 2004). It is an approach used to answer questions about the complex nature of a phenomenon usually with the purpose of describing and understanding a phenomenon from the participants' point of view (Schwalbe, 2004).

Creswell (2013) argues that a qualitative approach is one in which the inquirer often makes knowledge claims based primarily on constructivist perspectives (in other words, the multiple meanings of individuals experiences, meanings socially and constructed with an intent of developing a theory or patterns) or advocacy (participatory perspectives or change oriented) or both. I will inquire about the strategies Eskom Distribution Management and project officials use to address the ineffective of project management life cycle adopted by the organisation. There are four common research designs in qualitative approach (Creswell, 2013). They are outlined as Case study, Ethnography, Phenomenological study, Grounded Theory Study (Leedy & Ormrod 2010). A case study approach will be used because the study

will seek to determine how efficient the current Eskom project management life cycle is and aim to address the challenges experienced by Asset Creation department. In a case study, a particular individual, program, or event is studied in depth for a defined period of time. (Leedy and Ormrod, 2010) stress that "A case study may be especially suitable for learning more about a little known or poorly understood situation. It may also be useful for investigating how an individual or program changes over time, perhaps as the result of certain circumstances or interventions.

1.9 STUDY AREA

Asset Creation Department is found on Eskom Distribution Limpopo Operating Unit which is sub divided in sections; Network Planning, Network Engineering & Design, Capital Programme and Project execution. Those sections are also being subdivided in to the following five zones; Polokwane, Tzaneen, Groblersdal, Thohoyandou and Lephalale to cover the Limpopo Province, South Africa. Polokwane Zone is one of the poorest performers among other zones in executing projects effectively in LOU. There is shortage of skilled resources in the area.

1.10 ETHICAL CONSEDARATIONS

Permission to conduct the study will be sought from the Eskom Asset Creation Management (Senior Manager and the Programme Manager).The recruitment of participants in the research will be conducted in an open and democratic way. Ethical issues namely: informed consent, confidentiality, respect, anonymity and discontinuance will also be observed.

INFORMED CONSENT

To comply with the requirements of this principle, all the participants will be asked to sign a consent form and the following will be done before the form is signed: a clear explanation of the procedures to be followed and their purposes; a description of the attendant discomforts and risks reasonably to be expected; a disclosure of appropriate alternative procedures that might be advantageous to the participants, an offer to answer any inquiries concerning the procedures; an instruction that the person is free to withdraw consent and to discontinue participation in the project at any time without prejudice.

CONFIDENTIALITY

Confidentiality means that although researchers know who has provided the information or able to identify participants from the information given, they will in no way make the connection known publicly; the boundaries surrounding the shared secret will be protected (Cohen, Manion, and Morrison, 2007)

1.11 RESEARCH LIMITATIONS

The research will interpret that all the functions of Distribution Project Life Cycle Model identified and discussed are applicable to project management. Nevertheless, the study will clarify that for establishing the theoretical framework it has specifically focused on the Distribution Project Life Cycle Model functions that a project manager can adopt during the project execution. Further, it has kept the scope of the selected independent variables up to the extent to which the project manager's and his teams' role is required. The researcher will not be able to get information that Eskom Asset Creation Manager will classify as confidential. Time and the availability of resources i.e. executives to interview and answer questionnaires are regarded as the limiting factors for this research. The findings of this study may not be generalized to other organizations.

1.12 PREVIOUS RESEARCH

Wideman (2004) did comprehensive research into the role of project life cycle approaches in project management. The researcher could not locate any research done within Eskom on the effectiveness of the Project Life Cycle Model in Eskom Distribution..

1.13 WORK PLAN INCLUDING TIMETABLE

Milestone	Start Date
Introduction to research Problem	February 2015
Foundation of the study	February 2015
Review of the literature	June 2015
Research Methodology	June 2015
Analysis and findings	August 2015
Critical reflection	August 2015
Conclusion and recommendation	September 2015
Editing	October 2015
References	October 2015

First draft of Thesis	October 2015
Proof reading	November 2015
Final draft of Thesis	November 2015

1.14 SUMMARY

This research study is important as it serves to make Eskom Limpopo Operating unit management aware of the As-it-is state in terms of the adequacy of the Distribution Division (DX) Project Life Cycle Model (PLCM) and how effectively it is applied in managing Eskom Distribution projects. It includes suggestions to achieve the As-it-should-be state that will assist Eskom Limpopo Operating unit management to make decisions regarding possible interventions to be implemented.

The research study makes Eskom Limpopo Operating unit management (the client) aware of their role to ensure that proper project governance and direction are applied to successfully deliver Eskom projects. The outcome of this research is important for project managers and engineers as it makes them aware of their roles in the effective application of the DX PLCM to ensure that projects are delivered successfully. It further makes the support functions (e.g. Finance, Buying/Procurement, Asset Management/TP Coordination and Environmental) aware of the significant role they play though their support of the project managers and engineers.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

All projects are required to conform to an approved standard project life cycle model which is used to govern the work of the project and the management approval and project investment process (Cooke-Davies & Cicmil & Richardson, 2007). The introduction of the Group Capital Division and the requirement to establish a single, standard version of business and project portfolio management processes within the Eskom High Performance Utility Model (HPUM) requires a standard project life cycle model to be defined and implemented. Eskom recognized the prerequisite to establish a standard project life cycle model to govern the structuring and management of projects, necessary to ensure effective management control and decision capability across the span of the project.

For effectively managing any project, throughout the Project Life Cycle the project manager has to utilize the human as well as machine resources available to his project (Schwalbe, 2004). As machines are also dependent on human resources for their usage, it is mainly the human resources that drive the project. This study therefore perceives human resources the fundamental driving force required for the success of any project. It is therefore important to understand how a project manager should manage the human resource during the entire Project Life Cycle (Creswell, 2013).

The review provides the context for delivering the projects in time and within the approved budget in Eskom Distribution Limpopo Operating Unit and explains the role of different phases of project life cycle. It also explains the theoretical framework and determinants of effectiveness of project lifecycle. An attempt is also made to summarize existing studies which have been undertaken in this area (Creswell, 2013).

At detail level, needs are identified in the business. These needs are analysed and a project is defined which will best meet the needs of the business. These identified projects are prioritised, and released into the defined project process, which has a pre-project planning phase, a concept phase, a Definition phase (detailed design). The project is then constructed/ refurbished based on this detailed design, commissioned and placed in service (commercial operation). The project is closed out in the finalization phase (McMillan and Schumacher, 2006).

These various phases are managed and controlled by a series of Project Forms which are approved by Investment Committees (McMillan and Schumacher, 2006).

All these identified and released projects details and approved values are captured into a system where the data is rolled up to give the Monthly Reports, Rolling Plan and Business Plans required in the Macro process. (McMillan and Schumacher, 2006).

2.2 THE CONCEPT OF LITERATURE REVIEW

The postulation taken regarding literature review is that previous knowledge has been gathered and that researchers can use it to find out what is already known in the area they intend to research before they embark on answering it themselves (Neuman, 2006).The theory of literature is important for any research, as it spikes a particular research in a specific position in relation to what is already known. With this in mind, various explanations are given as to why literature review is important for any research. The concepts of literature review are explored, starting with contextualization, about which Henning (2004) argues: "The literature review is used first and foremost in the contextualization of your study to argue a case, identify a position to be occupied by your own research and so on." Sharing information on the results of other studies closely related to the study with other readers, providing a framework for reasons why the study is important, and benchmarking for comparing the results with other findings are some of the concepts articulated by Creswell (2003).

In the view of other academics having been discussing the same topic before oneself, the analogy of first listening to discussions before contributing is used by Bak (2004), who argues: "You can only contribute fruitfully to a conversation once you know what it is all about." The concept of literature review as an integral part of the entire research process is explained by Kumar (2005), who argues: In the initial stages of research, it helps you to establish the theoretical roots of your study clarify your ideas and develop your methodology, but later on the literature review serves to enhance and consolidate your knowledge base and helps to integrate your findings with the existing body of knowledge.

The concept of using literature review to know your topic very, very well as a researcher is supported by Leedy and Ormrod (2005), who argue:

1. It can offer new ideas, perspectives, and approaches that may not have occurred to you.
2. It can inform you about other researchers who conduct work in this area −individuals whom you may want to contact for advice or feedback.

3. It can show you how others have handled methodological and design issues in studies similar to your own.
4. It can reveal sources of data that you may not have known exist.
5. It can introduce you to measurement tools that other researchers have developed and used effectively.
6. It can reveal methods of dealing with problem situations that may be similar to difficulties you are facing.
7. It can help you interpret and make sense of your findings and, ultimately, help you tie your results to the work of those who have preceded you.
8. It will bolster your confidence that your topic is one worthy studying, because you will find that others have invested considerable time, effort, and resources in studying it.

The literature review concepts are summarized in the form of goals by Neuman (2006), who argues:

1. To demonstrate a familiarity with a body of knowledge and establish credibility. A review tells a reader that the researcher knows the research in an area and knows major issues. A good review increases a reader's confidence in the researcher's professional competence, ability, and background. To show the path of prior research and how a current project is linked to it.
2. A review outlines the direction of the research on a question and shows the development of knowledge. A good review places a research project in a context and demonstrates its relevance by making connections to a body of knowledge.
3. To integrate and summarize what is known in an area. A review pulls together and synthesizes different results. A good review points out areas where prior studies agree, where they disagree, and where major questions remain. It collects what is known up to a point in time and indicates the direction for future research.
4. To learn and stimulate new ideas. A review tells what others have found so that a researcher can benefit from other efforts of others. A good review identifies blind alleys and suggests hypotheses for replication. It divulges procedures, techniques, and research designs worth copying so that a researcher can better focus hypotheses and gain new insights.

This literature review will consist of the following concepts: strategy, leadership, project management, programme management, organizational structures, effectiveness, and

efficiency. The theoretical framework that describes this research will conclude the literature review

2.3 DESCRIPTION OF PROJECT MANAGEMENT

Project Management is the application of knowledge, skills and tools required to manage any project (PMI, 2004).

Project Life Cycle

A project is a non-routine, temporary undertaking, which has a unique definition and scope of work, with clearly defined start and end points and time bound deliverables, to achieve a unique goal within defined schedule, cost and performance parameters. It is also meant to yield some product that could be any tangible good or intangible services or software. To lead project to successful end, project managers are required to understand the following 9 Knowledge Area:

1. Scope,
2. Time,
3. Cost,
4. Quality,
5. Risk,
6. Human Resource,
7. Communication,
8. Procurement and
9. Integration

They are also to follow the Project Life Cycle while performing the activities required for Project Management. As per various publications that this study consulted, Project Life Cycle is a collection of project phases. Each phase intends to deliver pre-defined deliverables at its accomplishment. Schwalbe (2004) summarized the phases of Project Life Cycle well in the graphical manner that this study adopted as Figure 2-1.

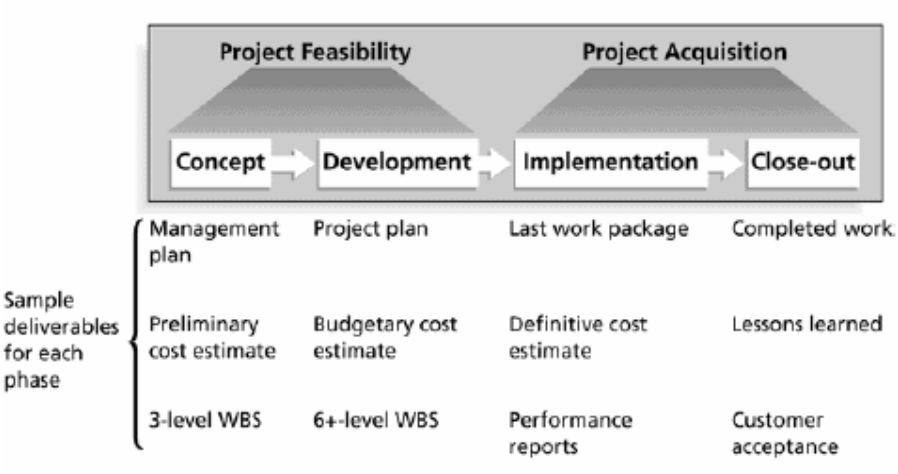

Figure 2-1: Summarized the phases of Project Life Cycle well in the graphical manner

Source: Schwalbe, 2004

It is clear from Figure 1 that Schwalbe (2004) explains that the initial two phases of project life cycle as Project Feasibility while the last two are categorized as Project Acquisition. Project Feasibility comprises of Concept and Development of project work whereas Project Acquisition consists of Implementation and Close-Out. It mainly involves 9 knowledge areas, like brainstorming the required idea to have proper scope, cost needed to be incurred, time required to complete the tasks, Risk involved and details of tasks to be undertaken. Management Plan, Preliminary Cost Estimate and 3 – Level WBS are recommended to be the primary deliverables of this phase. Under Project Feasibility, Development is the next phase that demands project managers to work out Project Plan, Budgetary Cost Estimate and more detailed Work Breakdown Structure (WBS), preferably up to level 6 as recommended in Figure 1. Project Acquisition demands carrying out the due work for project and is known as Implementation (McMillan and Schumacher, 2006). Wrapping up the project work after achieving the targeted outcome is Close-Out. Actual work done, actual cost incurred and actual performance are the three main achievements of the phase Implementation as shown in Figure 2-1. Closeout occurs when project work gets accomplished; customer provides his/her acceptance and project team feels satisfied for having learnt new lessons.

The study declares the details of each mentioned deliverable in Figure1 out of its scope. However, it has entertained the key terms like WBS and cost management related terms in the next sections of this Chapter. For effectively managing any project, throughout the Project Life Cycle the project manager has to utilize the human as well as machine resources

available to his project. As machines are also dependent on human resources for their usage, it is mainly the human resources that drive the project. This study therefore perceives human resources the fundamental driving force required for the success of any project. It is therefore important to understand how a project manager should manage the human resource during the entire Project Life Cycle.

2.4 THE PROJECT MANAGEMENT PROCESS

Literature advises to view and practice Project Management as a process. A process is the series of actions directed toward a particular result (Project Management Institute, 2004). With consensus, the author (Prof. Herman Steyn, University of Pretoria) whose publications this study will select declared that the process of Project Management comprises of the following five actions where each of them further demands specific subtasks:

1. **Initiating the project**: This process is to define business and user needs, scope, boundaries and Rough Order Magnitude (ROM) of the project work and objectives or target of the project that are intended to be achieved (Steyn, 2011). Although project manager is considered the human resource responsible for initiating any project, but it is not possible without top management's interest and support.
2. **Planning the project**: This process targets defining and documenting the project plan that addresses every knowledge area, as it should relate to project at that point in time (Steyn, 2011). The study understands that mainly planning is the first Project Management process from where the project manager needs to incorporate the Human Resource Management. (Jugrev, Kam, and Muller, Ralf, 2005).
3. **Executing the project:** To carry out project work by establishing coordination between the project stakeholders and all other resources according to the plan (Steyn, 2011). For the project manager, this study finds execution as a real art of managing human and machine resources together under the constraints of budget, time, scope and various external factors.
4. **Monitoring and controlling the project**: This process ensures that project team members achieve the project objectives and produce all deliverables as per predefined quality standards following the project plan. This is the only process that initiates in the beginning of Project Life Cycle and lasts until its close out (Steyn, 2011) and (Sekeran, 2009).

5. **Closing the project:** It refers to formalizing acceptance of some project phase and ending it efficiently by finalizing its documentation, products and their implementation and training for the end use (Sekeran, 2000). Project manager effectively closes a project only when rich standards for closing project are adopted. Ensuring conformance to standards during closing is as important as it is during planning phase (Lenfle, 2011).

For developing the theoretical framework, this study consulted the existing knowledge of the subjects Project Management and Human Resource Management from relevant publications. For this purpose, the study perused a range of existing books, magazines and websites (for e-books) about the two mentioned subjects. This Chapter first describes the summary of the description of Project Management, then that of the Human Resource Management and later the literature from relevant studies and practices in the local IT industry of the identified variables.

Five Project Management Process

1. Initiating Process
2. Planning Process
3. Executing Process
4. Monitoring and Controlling Process
5. Closing Process

Figure 2-2 below summarizes the order in which the five mentioned Project Management processes should be performed and how they could be overlapped or run parallel.

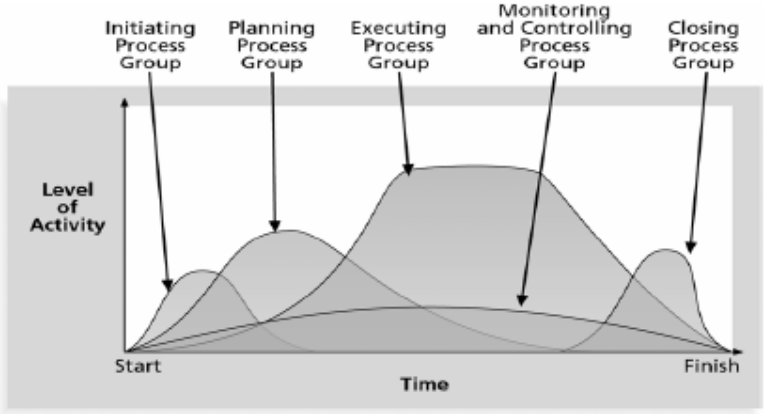

Figure 2-2: The Project Management Process

Source: Schwalbe, 2004

Next, the study describes each process in a brief manner based on its understanding from various sources it selected. The Project Initiation is an activity that is needed for delivering a Project Charter and Project's Preliminary Scope (Schwalbe, 2004). Project Charter is a form or template that documents project's title, start date, finish date, budgetary information, name and brief profile of the project manager, objectives of the project and approach recommended for its management with well-defined roles and responsibilities of the necessary team (Vysochi, Beck and Crane,2009). Scope Statement of any project is a document used to develop and confirm a common understanding of the quantitative work involved in creating the products of the projects and processes used to create them (Cetro, 2009). This is how Project Initiation process addresses the knowledge area of Project Integration since the beginning of the project life cycle. The study further understood that scope statement of any project triggers the need of performing Human Resource Planning and relevant time and cost management right after the initiation of the project. In a new environment or organization, this process may trigger Strength Weakness Opportunity Threat (SWOT) analysis (McMillan and Schumacher, 2006).

From figure 2-2 Planning Process is the most critical process of project management and it is compulsory for the project manager to exercise planning for all the nine knowledge areas (Scope, Time, Cost, Quality, HR, Risk, Procurement, Communication and Integration) of Project Management. Completeness, accuracy and rationality in doing the planning are the key to project success (PMI, 2008). Project planning requires project managers to make decisions for what deliverables relevant to each knowledge area must be planned and prepared. Planning deliverables for all areas generally includes Work Breakdown Structure (WBS), Gantt chart, and Resource Sheet and Histograms, Network Diagram, Estimated Budget Statement etc. (McMillan and Schumacher, 2006).The details of these deliverables of the planning process would be provided under the description of each knowledge area in the upcoming section (Maree, 2007). For this purpose employing software meant for Project Management like MS Project 2003, Primavera etc. is not only considered useful; rather, their use is strongly recommended for producing effective project plan (Maree, 2007). Planning for all the knowledge areas is a real challenge, but adequate knowledge of Project Management, experience in relevant field and competency of the project manager make it easy for the project managers to plan well (PMI, 2008). The study understood that planning for all the knowledge areas is equally important in the mentioned process (Maree, 2007).

Project Executing requires acquiring/forming and mobilizing the human and machine resources to carry out work as per the project plan. For IT projects, execution process includes conducting, leading and managing phases of Product Life Cycle like analysis, design, development, testing, debugging etc. (Kerzner, 2009). Simultaneously the execution process demands undertaking the Quality Assurance that is performed by skilled and experienced quality assurance staff or department in liaison with the project manager. Quality Assurance should be performed for IT projects as a Recurring Task that is performed repeatedly as per predetermined times and schedule for all phases of product life cycle. Further, during execution the distribution of the relevant information among all stakeholders, especially project team members, is declared a key to progressive growth and project success. Project manager is rendered responsible at this stage to keep appropriately frequent and regular flow of necessary information, which indicates that a project manager needs to perform extensive communication during project's execution involving all the stakeholders especially the project team. Execution process demands procurement of the necessary tangibles that the project requires which leads project manager take cost related decisions. The deliverables of execution process are tangible and intangible outcomes of the work performed, definitive cost and expense statements and overall performance reports about each phase of product life cycle. The study interprets that communication management and performance monitoring are the two key HR functions based on which project managers usually execute their projects. Project Monitoring and Controlling is the process that begins right from Project Initiation and lasts until the project ends. Like project planning, project monitoring and controlling is the second process that obliges project manager to address all the nine knowledge areas (Maylor, 2002). In simple words, controlling project means mitigating or even eliminating the probabilities for Scope Creep, Cost Expansion, Schedule Extension, and Compromise on Quality Standards, Conflicts among Stakeholders, Compromise on Performance, Ineffective Risk Management and Contract Administration. Like controlling, Quality Assurance is another recurring task for projects requiring longer time span. Utilizing Tracking Gantt Chart through MS project 2003 or Primavera is suggested to be an easy and effective tool for keeping track of project's progress. To conduct controlling effectively, project managers require support of the top management, regular and proper cash flows, and skilled staff (Schwalbe, 2004).

Concept Release Approval (CRA)

The CRA stage ensures that a specific project becomes part of the 24-month rolling -plan as part of the semi-fixed projects for Year 2 (Distribution Network Asset Creation-IDP Document, 2012) The CRA form is required for each specific project (sometimes emanating from a development plan). A CRA does not cover more than one job category and can only be allocated to one business category.

Definition Release Approval (DRA)

The DRA stage ensures that a specific design alternative has been agreed to before the detailed design begins and the project becomes part of the fixed plan in the 24-month rolling capital plan (Steyn, 2011). There might, however, be exceptions where, for sub-transmission projects, this stage may be longer than one year. The DRA stage is the critical investment decision stage at which the project is approved by the relevant investment committee. (Note: Once the detailed design has been reached and long lead-time materials have been ordered it becomes very difficult to cancel a project without incurring Eskom in considerable unnecessary expense.) (Distribution Network Asset Creation-IDP Document, 2012)

Execution Release Approval (ERA)

Approval of the ERA indicates permission to spend the stated capital and to start construction of the project against a detailed design scope of works and estimated project capital expenditure (Steyn, 2011)..

This phase in the process allows for:

- The tendering process and comparison to standard design building block costs;
- Fixing the total resources planned and adjustments from project registration;
- Progression management against planned activities and costs; and
- Provision for the commissioning phase of the project and the hand-over processes.

Finalisation Release Approval (FRA)

The FRA signifies the end of the project construction and commissioning, and all the related costs from project registration to completion as well as the transfer of all assets to the asset register (Steyn, 2011).

This phase in the process allows for:

- Evaluating planned costs and scope of works to actual expenditure and execution;
- Placing of assets into commercial operation; and

- Handing-over the assets for operating and maintenance thereof.
-

Project Cancellation Approval (PCA)

The PCA allows the relevant IC to control the events that are associated with the cancellation of a project (Steyn, 2011). It also serves as an official instruction to the whole value chain that all work must stop on the specific project. The relevant IC decides on how to deal with any expenditure that has been incurred, materials ordered etc. (Steyn, 2011). The form provides for these details to be listed and the decision of the relevant IC to be recorded.

Confidence Levels

Each stage in the process complies with an acceptable confidence level that rates the level of technical scope, time and costing (Steyn, 2011). The minimum requirements for each stage are:

- Planning Project Register -50%
- Concept Release Approval -65%
- Definition Release Approval -85%
- Execution Release Approval -95%

A confidence level means that, at the time the form is compiled, the confidence level of what has to be done (scope) is the percentage referred to (Steyn, 2011). The costs attached to that scope will be derived from the best costing tool that is available at that time. It should be 100% accurate in terms of the known scope and risks (rock, angles, environment etc.). As we go through the preliminary and detailed design processes, and then eventual contract values, these are based on more and more defined scopes. This will result in equivalent costs that have equivalent confidence levels.

Investment Committees

The distribution business has sufficient structures in place to justify investment committees at different levels within the organisation. Investment decisions can be categorised in terms of elements of the delivery system with very specific degrees of risk exposure attached to the type of investment (De Marco, 2005)

It is critical that all the investment committees check that all target indicators are met or reasons are valid in any cases where they are not met. It is important to note that these

indicators are averages and may not be met by each individual project (Cooper & Schindler, 2003). The following investment committees exist within the distribution business:

- Divisional Board Investment Committee. Level 1
- Regional Investment Committee. Level 2
- Head Office Investment Committee. Level 2
- Regional Investment Committee. Level 3
- Head Office Investment Committee. Level 3

2.4.1 PROJECT MANAGEMENT versus PROJECT LIFE CYCLE

Projects are the way that new work gets delivered in an organisation. It takes both the work of project management and the work associated with actually building the project deliverables to complete a project successfully (Maree, 2007). The work associated with building the project deliverables is referred to as the project life cycle (Cooper & Schindler, 2003). For example, project management is used to build the schedule, but the vast majority of the work in the schedule is the life cycle work associated with building the project deliverables.

Projects can be managed using a common set of project management processes that entail the work of initiation, planning, execution, monitoring and controlling, and closing of a project (Steyn, 2011). The project management processes include the management of nine knowledge areas (scope, time, cost, quality, risk, human resources, communication, procurement, and Integration). These project management processes gets executed within the control framework of a project life cycle approach (Steyn, 2011).

A project life cycle approach allows a project to be considered from the start to the end of the project as a sequence of phases which provides the structure and approach for progressively delivering the required outputs (Creswell, 2013). A project phase is a collection of logically related project activities, usually culminating in the completion of a major deliverable. As the deliverables of each project differ, the activities in the life cycle also differ, and therefore the life cycle of each project is unique (Cooke-Davies & Cicmil & Richardson, 2007).

Many organisations have developed a common scalable project life cycle approach with methods and procedures detailing the standard practices to be used for managing projects throughout the project life cycle (Maree, 2007). One of the valuable things about having a common scalable project life cycle approach in an organisation is that the same processes can be used on all projects (Cooke-Davies & Cicmil & Richardson, 2007).

Jainendrakumar (2008) distinguishes between the project life cycle phases and the project management process groups (PMBOK® Guide) with reference to IT project management.

Jainendrakumar (2008) continues to describe the five phases of IT projects namely analyse, design, develop, test and implement. Jainendrakumar (2008) concludes that the project life cycle defines the phases that connect the beginning of a project to its end.

Project Management Section

The project management section in Eskom Distribution focuses on planning, organising, managing resources, and monitoring and controlling activities of all projects allocated to the programme (Distribution Network Asset Creation-IDP Document, 2012) its core function has been discussed in 2.2 above, though, in addition to that, it is to execute projects to meet the business plan and ensure effective capital expenditure.

The project management functions include:

- Developing a project plan from project approval to completion with resources properly allocated and timelines set;
- Liasing with the relevant stakeholders to ensure proper communication; therefore, ensuring project success;
- Assisting the procurement department in the appointment of contract personnel;
- Ensuring commissioning of assets and transferring to commercial operations in order to limit interest accumulated during construction on capital funds; and
- Ensuring that correct control measures are in place to ensure effective time, cost and quality management.

Contract Management

The contracts department provides professional contract management services (Distribution Network Asset Creation-IDP Document, 2012). It also assists with the drawing up of tender documents, and creating and monitoring the contracts (Distribution Network Asset Creation-IDP Document, 2012). Its core function includes but is not limited to:

- Providing cost estimations to ensure proper planning of project cost;
- Providing comprehensive enquiry documents involving measurements in terms of development systems, and compiling the most suitable type of documentation for bills of quantities;
- Monitoring services and payments to consultants and contractors appointed to carry out specific duties; and
- Performing evaluation on service providers in order to enhance performance.

Project Services

This section focuses on assisting the project management section in controlling and monitoring the finances of the projects (Distribution Network Asset Creation-IDP Document, 2012). It also assists in drawing up a detailed rolling out plan, which is incorporated into the business capital expenditure plan. It renders a supportive administrative function to the Regional Investment Committee (RIC) (Distribution Network Asset Creation-IDP Document, 2012). It is also responsible for: Ensuring effective implementation and maintenance of the project approval process by acting as the secretariat of the RIC, scheduling its activities and scrutinising projects for completeness prior to submission to the RIC;

- Developing a project filing system and ensuring that regular audits are implemented to ensure they meet the required project reporting procedures;
- Taking responsibility for capital investment procedures and audit requirements by ensuring compliance; and
- Ensuring proper expenditure and alignment to the project budget.

Capital Investment Process (CIP)

The capital investment process starts with the identification of needs. The needs can refer to an area of the business; for example, demographics, refurbishment, new loads, additional computers or power supply quality. A need could result from customer services, field services, plant, network delivery processes, customer complaints, general load growth etc. The analysis of these needs results in identified projects. These projects can be directly released or are included in development plans. The development plan consists of a number of projects. A project may consist of one or more interdependent jobs, which form an integral part of the same network (Distribution Network Asset Creation-IDP Document, 2012).

The distribution business invests approximately R3 billion per annum in capital expenditure. In order to effectively manage this investment programme, a well-defined process is developed with bodies at specific points in the process where approval must take place. In order to ensure effective management of the business investment, a business plan is compiled annually, and a project rolling plan is reviewed quarterly. The project rolling plan is controlled in terms of the capital investment process to ensure that the investment programme is managed optimally (Distribution Network Asset Creation-IDP Document, 2012). A monthly report is also submitted, which only provides information on the current year's

expenditure as well as the capital index and the status of the investment programme in terms of approved stages (Distribution Network Asset Creation-IDP Document, 2012).

Development Plans (DP)

Development plans have a maximum of a 5-year horizon and consider all aspects of the business. Development plans are produced in all areas of the distribution business. The development plan consists of a number of projects (Distribution Network Asset Creation-IDP Document, 2012). A project may consist of one or more interdependent jobs, which form an integral part of the same network (Steyn, 2011). These projects are listed on the planning project register with the interdependent jobs identified and clearly grouped together (Steyn, 2011). Where the projects have various phases, they are identified separately. These projects will only be released as concept release approvals when the triggers that have led to the need/investigation are about to be realised on the network (PMI, 2008).

The Network Services Manager (NSM) analyses and approves the overall network development plan (NDP). The NSM also ensures the necessary integration and alignment to the distribution business planning indicators (PMI, 2008).

Planning Project Register

The planning project register is the summary of the development plan, or part thereof, which details projects describing the optimum demand-side and supply-side actions necessary to satisfy customer needs (Cooke-Davies & Cicmil & Richardson, 2007). It is at this point that the decision is part of the procedure: Capital investment in the distribution business reference is taken as to the optimum capacity configuration (PMI, 2008). This is therefore the point at which the greatest saving can be made. It is also the point at which the consequences of incorrect decisions are the greatest. For this reason, the analysis by the planner must be comprehensive and detailed in the development plan.

Value Chains

Eskom Distribution has a number of value chains that are used to develop processes that will assist the business to run effectively (PMI, 2008). The project management related value chains are: Network asset creation: Planning, designing, building and commissioning of network assets Acquire customers: Processing of customer applications to provide them with a quotation and to ensure that their first bill is produced (Distribution Network Asset Creation-IDP Document, 2012). Maintain network: To ensure that maintenance conforms to

approved standardised technical and non-technical requirements; accountabilities, responsibilities, activities, KPIs, data and financial controls are clear at any stage of the process; contingencies for all maintenance situations are in place, e.g. freak storms, civil unrest; alignment with the other value chains and business processes, e.g. outage management, optimisation of customer interaction, etc.(Distribution Network Asset Creation-IDP Document, 2012).

Manage availability of supply: The manage availability of supply (MAOS) value chain deals with the continuity, quality and security (integrity/stability) of power supply to meet customer expectations in the case of both planned and unplanned events (PMI, 2008).

Perform financial management: The purpose of this process is to ensure funding and to control disbursement of financial resources (PMI, 2008). It is enabled by a periodic investment and operational budget established and approved by the business. It takes into consideration funding alternatives, clear budget ownership, and control of actual spending, cost justification and awareness of total cost of ownership (PMI, 2008).

Network Asset Creation Value Chain Process

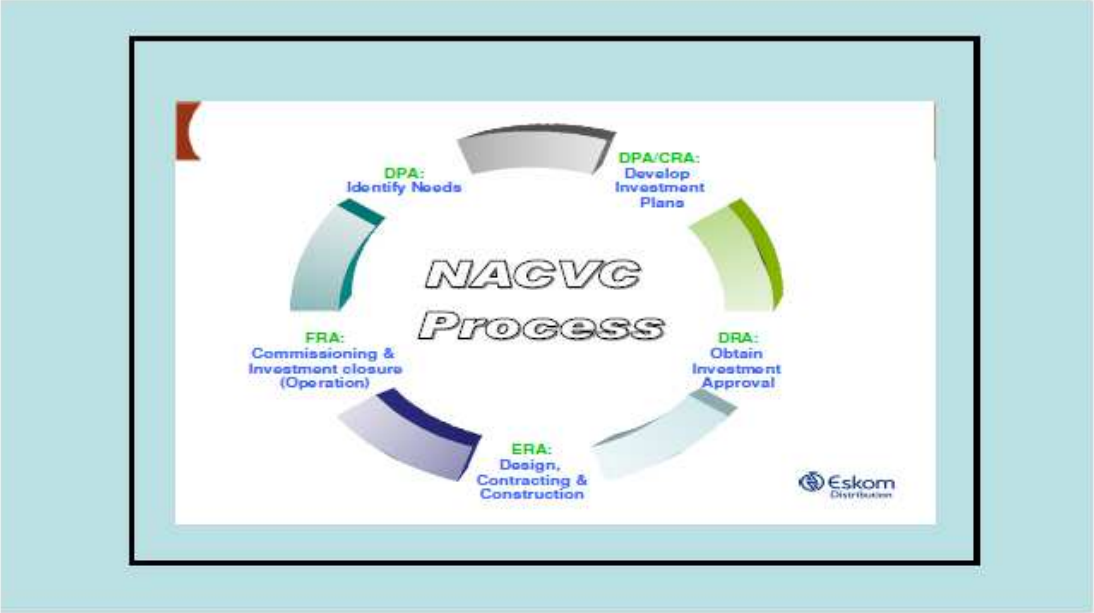

Figure 2-3: Network Asset Creation Value Chain Process

Source: www.eskom.co.za – Limpopo Operating Unit

The network asset creation value chain (NACVC) process is largely used within Distribution as a project life cycle model that is identified with Eskom Distribution. In this document, these processes will be referred to, as they form part of the methodology followed within

Eskom Distribution. It is a process that is followed as the need is identified (DPA), an investment plan developed (CRA), investment approval obtained (DRA), design, contracting and construction (ERA), then FRA to commission and investment closure, and handed over to operation (Distribution Network Asset Creation-IDP Document, 2012).

Acquire Customer and Network Asset Creation (ACNAC)

Based on the information above, a tool to be used as a workflow process guide was developed called Acquire Customer and Network Asset Creation (ACNAC). ACNAC is tools used to manage projects associated with acquiring customer and network asset creation value chains. This workflow caters for the seamless flow of business processes to minimise loss and redundancy in the business (Distribution Network Asset Creation-IDP Document, 2012).

2.4.2 PROJECT GOVERNANCE ACROSS THE LIFE CYCLE

Project governance provides a comprehensive, consistent method of controlling the project and ensuring its success (Cooke-Davies & Cicmil & Richardson, 2007). The project governance approach should be described in the project management plan (Maree, 2007). A project's governance must fit within the larger context of the program or organization sponsoring it (Cooke-Davies & Cicmil & Richardson, 2007).

Within those constraints, as well as the additional limitations of time and budget, it is up to the project manager and the project management team to determine the most appropriate method of carrying out the project. Decisions must be made regarding who will be involved, what resources are necessary, and the general approach to completing the work. Another important consideration is whether more than one phase will be involved and, if so, the specific phased structure for the individual project (Maree, 2007).

The phase structure provides a formal basis for control. Each phase is formally initiated to specify what is allowed and expected for that phase (Cooke-Davies, 2002). A management review is often held to reach a decision to start the activities of a phase. This is especially true when a prior phase has not yet completed. An example would be when an organization chooses a life cycle where more than one phase of the project progresses simultaneously. The beginning of a phase is also a time to revalidate earlier assumptions, review risks and define in more detail the processes necessary to complete the phase deliverable(s).For example, if a

particular phase does not require purchasing any new materials or equipment, there would be no need to carry out the activities or processes associated with procurement(Creswell, 2013) .
A project phase is generally concluded and formally closed with a review of the deliverables to determine completeness and acceptance. A phase-end review can achieve the combined goal of obtaining authorization to close the current phase and start the subsequent one. The end of a phase represents a natural point to reassess the effort underway and to change or terminate the project if necessary. A review of both key deliverables and project performance to date to a) determine if the project should continue into its next phase and b) detect and correct errors cost effectively should be regarded as good practice. Formal phase completion does not necessarily include authorizing the subsequent phase. For instance, if the risk is deemed to be too great for the project to continue or if the objectives are no longer required, a phase can be closed with the decision to not initiate any other phases (Cooke-Davies, 2002).

2.4.3 PROJECT LIFE CYCLE METHODOLOGY versus PROJRCT LIFE CYCLE MODEL

According to the PMBOK® Guide a methodology is a system of practices, techniques, processes and rules used by those who work in a discipline. Weaver (2009) says that a project life cycle methodology defines the processes, responsibilities and workflows needed to achieve an objective. It includes a defined series of steps and describes each step in adequate depth so that a project team understands what has to be done to deliver their project.
Archibald (2004) says that a project life cycle model portrays a project as an overall process or system. Their purposes include the following:

- To enable all to understand the overall process
- To capture best experience and enable improvement
- To relate roles, responsibilities, systems and tools to all elements of the project.

2.5 ESKOM STANDARD PROJECT LIFE CYCLE MODEL POLICIES.

In this chapter the effectiveness of the project management life cycle is reviewed in order to establish the current role of communication in the management of property development projects. Project management in general is also reviewed, including, programme management, and specifically project management; the life cycle and life cycle phases used in Eskom projects execution department are also included (Cleland & Ireland, 2002).

Project managers and the other stakeholders are reviewed in respect of the role of integration and communication skills in the profession. Management by projects plays a central role in the organisations of the future where project management needs to be described in terms of the fundamentals applicable to business development (De Marco, 2005). The Life cycle approach developed in Europe for use in business development can be seen as driver or engine that leads successful project management. The life cycle approach to project management is seen as essential for the development of third world economies (Cooke-Davies, 2002).

It is the policy of Eskom that all projects of capital nature undertaken by Divisions, Departments or Sections that are required to pass through decision control gates for investment and implementation decisions, will conform to the standard Eskom project life governance framework, which is used to govern the management approval procedure to proceed with the project and the investment decision process (PMI, 2008).

The Group Capital Division, Enterprise Programme Management Office (EPMO) is currently the central custodian of the Eskom Project Life Cycle Model (PLCM) standards and they coordinate and approve the project life cycle models defined for specific project types, ensuring they align to the standard Eskom PLCM (Distribution Network Asset Creation-IDP Document, 2012).

The Group Capital Division, Enterprise Programme Management Office (EPMO) is accountable for the maintenance and issuing of regular updates to the standard Eskom PLCM to keep the model current with best practice and improvements as they will be identified (PMI, 2008). The project management life cycle of all projects of capital nature is governed through the following key principle:

- The initiation, definition, execution and finalisation of a project is govern by a standard Eskom project life cycle model comprising four standards project phases and five phase gates.
- The four standard phases comprise mandatory work elements specific to each phase which will be required to be completed prior to and as an input to the phase gate approval process. The project life cycle model includes standard stages and stage gates as applicable to the relevant project type.

- The phases and phase gates have standard naming, uniform objectives with uniform standard inputs, and a standard review and approval procedure and governance framework, and uniform standard outputs.
- The level of scope definition, design definition (where design is applicable) and classes of cost estimate is the standard for the four phases of the standard project life cycle model for all project types.
- All projects must adhere to an approved project life cycle model defined for that specific type of project. Each approved unique project life cycle model will be aligned to and comply with the principles applicable to the overarching standard Eskom project life cycle model.

The standard Eskom project life cycle is comprised of four phases. Each phase has a phase gate which is applicable to the pre-defined Eskom governance and Divisional management structures authorised to allocate additional resources, approve additional financial investment and take on additional risk for projects (PMI, 2008).
The four phases of the standard Eskom project life cycle are:

- The Pre-Project Planning Phase
- Definition Phase
- Execution Phase
- Finalisation Phase

The five phase gates of the Standard Eskom project life cycle are:
Concept Release Approval – CRA
Definition Release Approval – DRA
Execution Release Approval – ERA
Hand Over Approval – HOA
Finalisation Release Approval – FRA

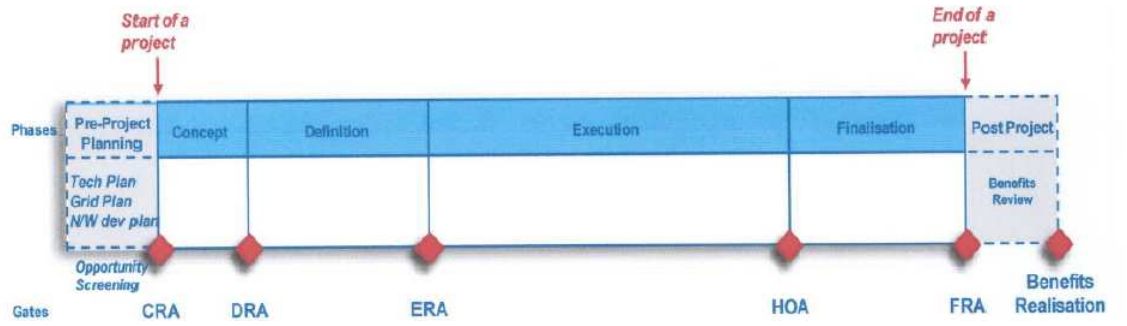

Figure 2-4: Standard Eskom Project Life Cycle Model

Source: (Eskom Standard Policy doc no. 32-11550)

The Pre-Project Planning Phase:

This Planning Phase, where a planning solution is released in order to fulfil one or more business needs (PMI, 2008). The Planning Report should be summarized for each Job in the Concept Release Approval Forms (CRA Forms). Concept design costs are approved in the CRA Form for resources to investigate all possible requirements that need to be considered for each Job. An amount for Long Lead Time Materials may also be approved at the CRA Stage where it is deemed to be necessary for the timeous completion of the Job. (Note: - A separate CRA Form is prepared for each Job identified for the Project.) (PMI, 2008).

The CRA Form/s are presented to a Resource Planning Meeting (RPM) where Design costs, Total Job Costing, projected Dates and Resources requirements are considered and agreed and captured in the CRA Form and associated Costing sheet. (The Project Prioritisation Register (PPR) must be updated and funding in the 3 year Rolling Plan confirmed) All associated project jobs must be presented together at the same RPM (PMI, 2008).

The levels of cost to completion, engineering design completion (or design completion, where engineering is not applicable) and project scope definition have to be applied using a standard approach to each life cycle phase and will be applicable to all projects and project types (McMillan and Schumacher, 2006) .

Research projects and pilot and demonstration projects will need to be assessed based on their intent as these projects are designed to define the business case for the commercialisation of technology or system. After Acceptance at the RPM each Job CRA Form is submitted for approval to the Investment Committee (IC), based on the approval limits. All associated project jobs must be approved at the same time by the IC (McMillan and Schumacher, 2006).

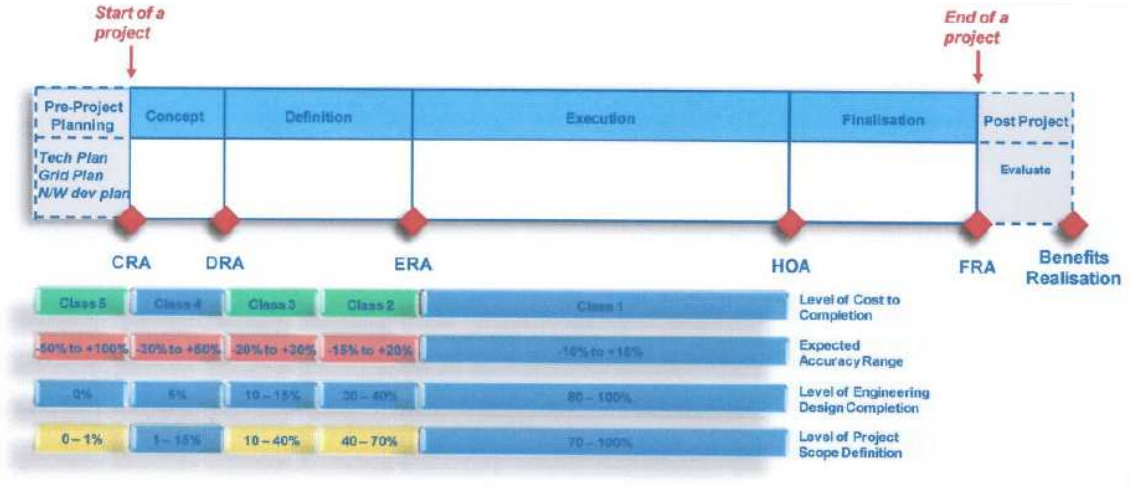

Figure 2-5: Standard levels of Estimate source:

(Source: Eskom Standard Policy doc no. 32-11550)

One of the earliest comprehensive texts on project management is Archibald's (2006) book *Managing High-Technology Programs and Projects*. In it, Archibald explains the project life cycle as follows: “The project life cycle has identifiable start and end points, which can be associated with a time scale. A project passes through several distinct phases as it matures. The life cycle includes all the phases from the point of inception to the final termination of the project. The interfaces between phases are rarely clearly separated". Archibald refers to phases namely, concept, definition, design, manufacture [development], installation [application] and post completion [project termination]. Archibald goes on to say the following: "Major review of the entire project occurs at the end of each phase, resulting in authorisation to proceed with the next phase, cancellation of the project, or repetition of a previous phase." Archibald's project life cycle is shown in Figure 5. (Archibald, 2006)

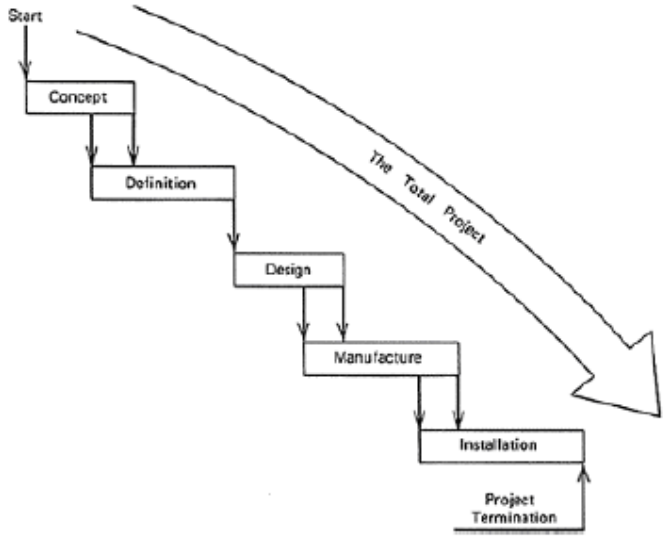

Figure 2-6: Project life cycle
(Source: Archibald, 2007)

Purposes of Project Life Cycle Process Models: The purposes of designing and documenting the overall project life cycle process for any project or project category (Archibald, 2007) are to:

- Enable all persons concerned with creating, planning and executing projects to understand the processes to be followed throughout the life of the project.
- Capture and document the best experiences within the organization so that the processes within each project phase can be improved continually and applied on future similar projects.
- Enable all the project roles and responsibilities and the project planning, estimating, scheduling, monitoring and control methods and tools to be appropriately related to the overall project management life cycle process; this includes most importantly assigning qualified persons to the roles of Project Executive Sponsor and Project Manager at the proper points in the project life cycle phases, as discussed later in this paper.
- Enable the effective application of project management software application packages that are integrated with all appropriate corporate information systems.

In other words a well-documented project life cycle model enables us to apply systems thinking to creating, planning, scheduling, and managing the project through all of its phases, and to evaluating both the success and the value of both the project and the results that the

project has produced. This is of greatest benefit to the project owner, key stakeholders, the ultimate user of the project results, and the social beneficiaries of those results -- whether it is a new process plant, a highway, a new business process or system, or a new product. It will not be of similar interest to a project manager or an organization that only holds responsibility for one phase, or one aspect of one phase, of the entire project. Unless a well-documented, integrated, understandable picture of the overall life cycle process – the model -- for each project category/sub-category exists, it will be difficult to achieve the full benefits of modern, systematic project management (Cooke-Davies, 2002).

Life Cycle Phases and Decision Points: There is generally held understanding (PMI, 2008) that the four broad, generic project phases are as shown in Figure 2-1.

- Starting the project (concept, authorization, initiation, identification, selection, project charter and business case, planning, scheduling.)
- Organizing and Preparing (definition, feasibility confirmation, development, demonstration, design prototype, quantification.)
- Carrying out the work (execution, implementation, realization, production and deployment, design/construct/ commission, installation and test.)
- Closing the project (handover of the project results to the user, project termination, sometimes including post-completion evaluation.)

Each of these phases contain critical decision points (proceed, cancel, revise scope/cost/schedule/quality.) The first formal textbook of the Project Management Institute (PMI) was "The Implementation of Project Management" edited by Stuckenbruck (2006). Stuckenbruck (2006) described the project life cycle as follows: “A project consists of sequential phases. These phases are extremely useful in planning a project since they provide a framework for budgeting, manpower and resource allocation, and for scheduling project milestones and project reviews. The method of division of a project into phases may differ somewhat from industry to industry, and from product to product, but the phases are basic." Stuckenbruck's (2009) project life cycle phases are shown in Figure 2-6.

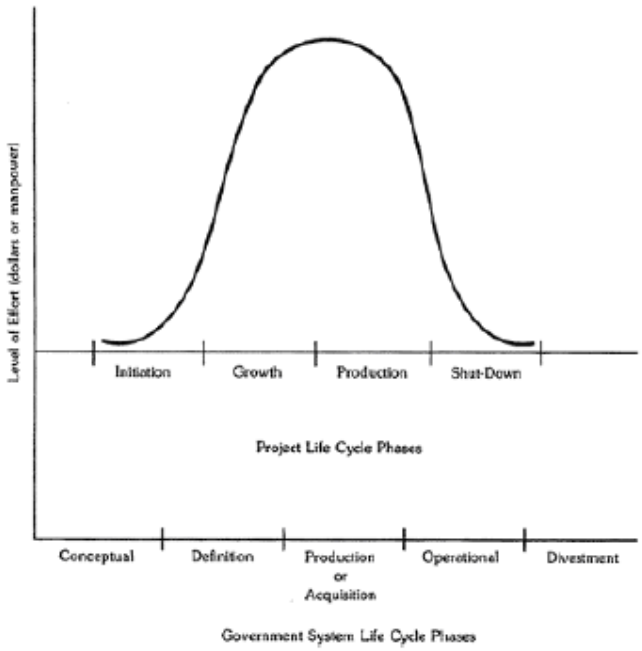

Figure 2-7: Project life cycle phases

(Source: Stuckenbruck, 1981)

Stuckenbruck (1981) also tabulated what must be done in each phase by both top management and, as the project matures, by the project manager as shown in Table 2-1.

Table 2-1: Project phase actions (Source: Stuckenbruck, 1981)

Concept or initiation	**Growth or organisation**	**Production or operational**	**Shut-down**
Management decides that a project is needed.	Organisational approach is defined.	The major work of the project is accomplished (i.e. design, development, construction, production, testing, site activation, etc.)	Project is terminated.
Management establishes goals and estimates the resources needed.	Project plan and schedule for operational phase are defined.		Manpower, resources, and commitments are transferred to other organisations.
Management 'sells' the need for project management to the	Project objectives, tasks (WBS), and		

organisation.	resources are defined.		
Management makes key appointments.	Project team is built-up.		

During the 1980s project management became a recognisable discipline largely inspired by the International Project Management Association (IPMA) in Europe. Patzak (1990) published an IPMA book *Dimensions of Project Management,* which discussed the systems approach to project planning. He wrote: "The starting point for the analysis of the phenomenon 'project' is to look at a process, the process of transferring an initial state I [Input, or problem] into a desired final state O [Output, or problem solution]. In state O all, more or less intended outcomes of the process 'project execution' are available having been produced during the whole process. These outputs are concrete (products, organisations, etc.) or abstract (plans, knowledge, experiences, emotional states, etc.) or both. They may be distinguished into: outputs during the process (e.g. satisfaction of personnel, gain of experience) and outputs at the end of the process (e.g. final products, state of knowledge).
So, it is obvious that the total process output is much more than the product that is the object to be produced in the project under consideration. Management has to be concerned with all dimensions of process output." "The problem solving process – the project execution – shows a typical cycle of project life, which is structured into the following pattern of phases:

Objectives definition phase (what is to be accomplished)

- Design phase (what/how to do it)
- Realisation phase (doing it)
- Implementation phase (hand-over of it).

These phases can be observed in any problem solving process, they do not change with different project definitions." Patzak (1990) goes on to observe that in every phase there is both a management function as well as an execution function.
The influence from the USA during this period was reflected in books such as Kerzner's (1989) *Project Management: A Systems Approach to Planning, Scheduling, and Controlling* and Cleland's (1990) *Project Management: Strategic Design and Implementation.* Kerzner draws a clear distinction between the project life cycle and the product life cycle. Kerzner's research and development (R&D) product life cycle is depicted in Figure

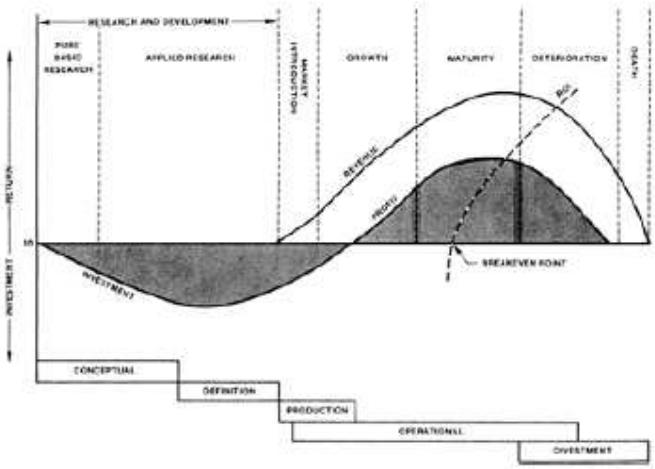

Figure 2-8: R&D product life cycle
(Source: Kerzner, 1989)

According to Isgrig (1991) the business view of the life cycle is useful for top management, sponsors and clients for a general feel for where the efforts stand with respect to getting started, developing, implementing and phasing down to termination.

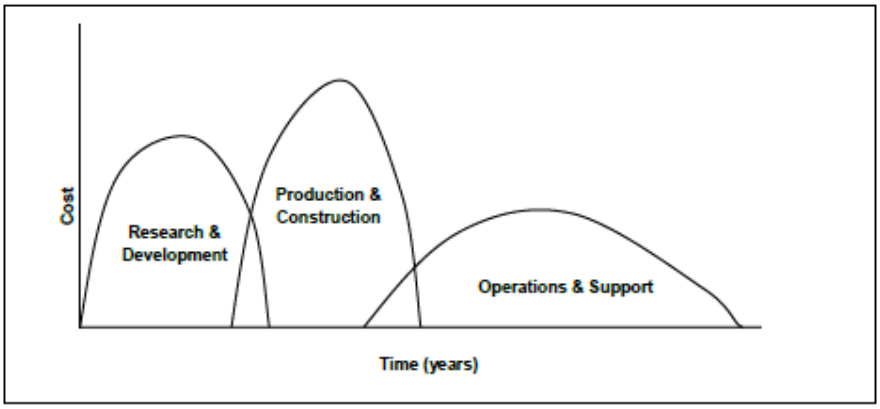

Figure 2-9: Technical view of life cycle of projects and programmes
(Source: Isgrig, 1991)

According to Isgrig (1991) the technical view of the life cycle names the stages by the major phases of effort which consumes resources. Isgrig (1991) further mentions that competitive pressures to deliver to the market resulted in overlapping of stages. This kind of effort emphasises cooperation and high rate of information among project team contributors. Significant shorter development sequences are possible through overlapping the stages of the life cycle as can be seen in Figure 2-9.

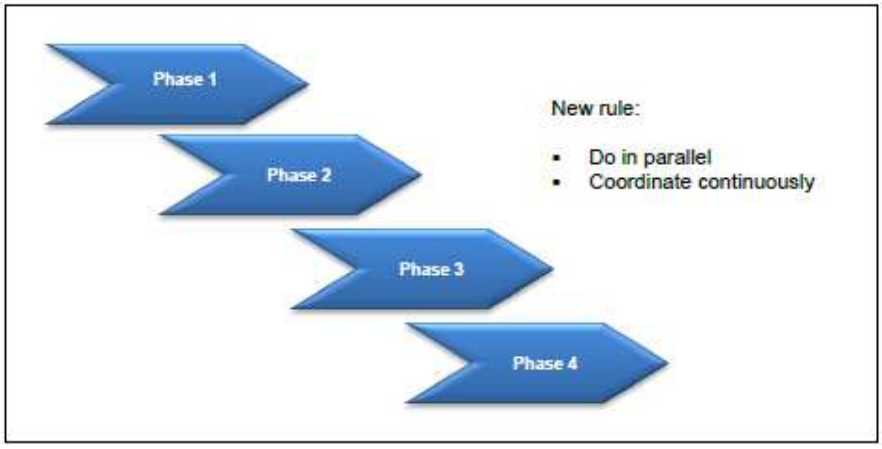

Figure 2-10: Life cycle with overlapping phases

(Source: Isgrig, 1991)

Isgrig (1991) further elaborates on the functional life cycle. The life cycle of activities are explained in Table 2.

Table 2-2: Functional life cycle (Isgrig, 1991)

Stage	**Stage description**
Idea and conceiving.	The idea for the project leads directly, or eventually, to conceiving through the analysis and determination of needs, operations and support requirements.
Creating.	The creating stage of designing, modelling, and prototyping account for the progression from preliminary configuration to the more mature collection of thoughts which can be built with reasonable levels of confidence.
Proving.	The proving stages include simulating, verifying, validating, testing and evaluating to assure that physical and logical manifestation of concept can be properly fabricated, assembled, operated and supported.
Facilitating.	The facilitating stage, for the proven configuration, collects and prepares the resources for production or construction. Training of people and checkouts of fabrication, assembly, and quality capability are included.
Producing or constructing.	The producing or constructing stage is thought of inclusively with emphasis on deliverables (products, manuals, spare parts, support, equipment, etc.).
Operating and supporting.	In the operating and supporting stage the emphasis shifts to underpinning the owner, client and user. The logistics of spare parts, maintenance, training, etc. for the delivered configuration and capability would usually be included.
Overhauling, modifying and updating.	The overhauling, modifying and updating stage which eventually is considered for many classes of product or plant, often thought of as a follow-on or modernisation project. Technology infusion, increased effectiveness and efficiency to enhance the configuration capability are common.
Disposing.	A formal disposing stage for product and plant configuration, and

	residual parts and equipment, eventually arrives. For classes of items which have environmental implications, this can be a major resource consumer.

Allen (2009) consolidated the general view of the project life cycle in a paper titled "The Universe of Project Management: A Comprehensive Project Management Classification Structure (PMCS) to Update and Expand the Dimensions of PMI's PMBOK® Guide ". Allen (2009) describes the project life cycle as follows: "[The] project life cycle (time) dimension defines the principle 'major management phases' of virtually any type of project and acknowledges that project management functions and their application often change as the project moves through the various phases of its life cycle." Allen's project life cycle is shown in Figure 2-10.

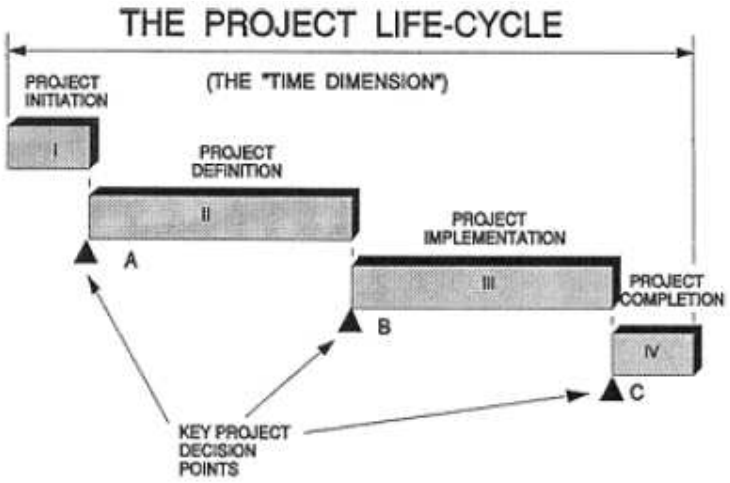

Figure 2-11: Generic project life cycle
(Source: Allen, 1991)

Wideman (2009) further mentions that in 1996 the PMI's PMBOK® Guide publication was a complete rewrite of the 2007 version. As a part of this rewrite, a section was devoted to project phases and the project life cycle. The sample generic life cycle offered was denuded to the point of illustrating only the beginning and end of a project. The same illustration was repeated in the 2010 Edition update (see Figure 11).

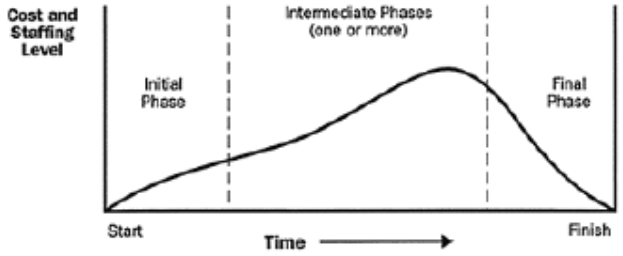

Figure 2-12: Sample generic project life cycle
(Source: PMI, 2010)

Wideman (2009) continues that the PMI Standards Committee was perhaps influenced by a presentation made to an information systems group from a paper by Kapur (2009) titled: "The Seven Deadly Sins of Project Management". Sin number 5 pointed to the lack of a robust project management process. Kapur (2009) proposed a set of six stages as illustrated in Figure 12. The red triangles between each stage represent the specific deliverables shown in the boxes immediately below.

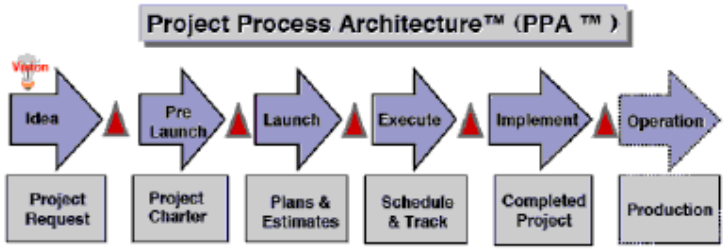

Figure 2-13: Information system project life span
(Source: Kapur, 2009)

Wideman (2009) says that others expanded their vision of project management, for example Morris (2009) wrote: "Too many people see project management as beginning when the project is set up. Yet all the lessons of modern management – and indeed all the lessons of project management history – show that time spent up front in defining needs, exploring options, modelling, testing, and looking at different business benefits are central to producing a successful project. The decisions made at the early definition stages set the strategic framework within which the project will subsequently develop. Get it wrong here, and the project will be wrong for a long time – perhaps forever. Get it right, and you are half way there. Defining the problem is half the solution; 90% of the outcome is defined in the first

10% of the project. This is one of the most crucial areas of project management professional input." Morris (2009) includes a graphic of his project life cycle as shown in Figure 13.

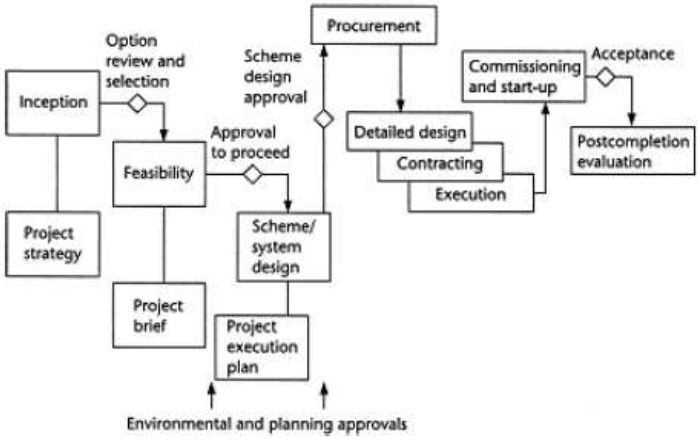

Figure 2-14: Project life cycle
(Source: Morris, 1998)

Wideman (2004) then states that Morris's project life cycle looks more like a flow diagram with inputs and outputs rather than a time based life cycle display.

Wideman (2004) says that Frame (1998) mirrors Morris's view. He wrote: "If the traditional four-phase project life cycle is viewed from the customer perspective, we encounter a dramatic revelation. The phases that customers worry most about are the very ones that have been down played in the theory and practice of project management. Customers care most about phases 1 and 4. With respect to phase 1, their concern is: 'Did you get my needs and requirements right (governance focus)?' If not, then the planning and implementation activities of phases 1 and 2 are a waste of time. With respect to phase 4, their concern is: 'Are you about to hand me a deliverable that meets my needs and is it operable and maintainable?' The link between project close-out and the level of customer satisfaction with project effort should be obvious."

Wideman (2004) continues and mentions that companies, such as Dupont and Abitibi (1996), became more thorough with front-end work, especially if their market position depended on capital-intensive projects. Figure 14 shows the introductory graphic to a presentation promoting the idea of front-end loading of the project development phases.

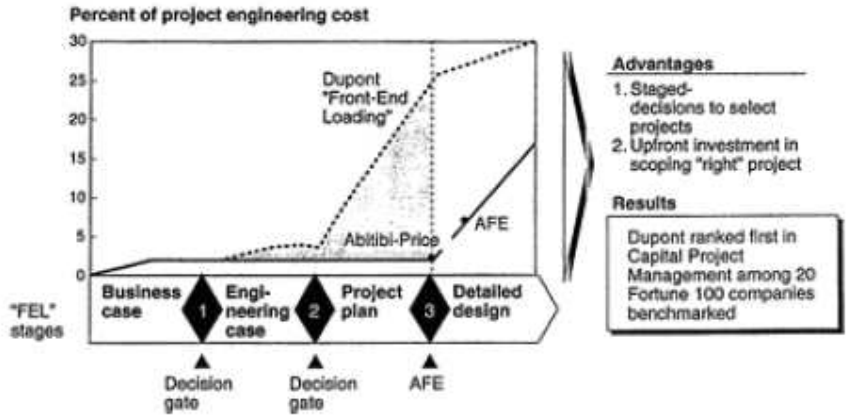

Figure: 2-15: Front End Loading of project development
(Source: Dupont & Abitibi, 1996)

Wideman (2004) next refers to Thoms (1998) that described three stages of the project life cycle in terms of motivation, which brings in the 'people' (or human resources) aspect:

- "**Getting started.** The goal of the first stage is to get the team and each individual member moving and motivated. Part of the process of motivating the project team is explaining the project, yet many managers fail to inform their team why the project is important
- **Project development.** In the next stage, the day-to-day work on the project proceeds and the project develops. A project manager who provides an exciting launch for a project needs to keep energy flowing when the team gets bogged down in details and runs into problems
- **Wrapping up the project.** The final stage of a project can sometimes be the most difficult. Often teams are tired of the work, bored with the technical details, and anxious about the next project. This stage varies with the length of the project and the attention span of each individual."

Thoms (1998) then went further and associated different phases of the generic project life cycle with different project manager personality types as best suited to the management of that particular phase: "The 'concept' phase of the four phase high-level project life cycle should start out with the 'explorer' type; then proceed with a 'coordinator' type in the 'development' (definition or planning) phase; move to an assertive 'driver' type in the 'execution' phase; and conclude with the 'administrator' type in the clean-up 'finishing' phase."

Wideman (2004) further mentions that the software development industry followed a different approach. The so-called *waterfall* model of the conventional software engineering process or workflow, shown in Figure 15, was touted by many but decried by others. This model is technology specific, but its essential difference is that the major activities overlap significantly. However, the real difficulty with this model is software development's essential need to progress iteratively.

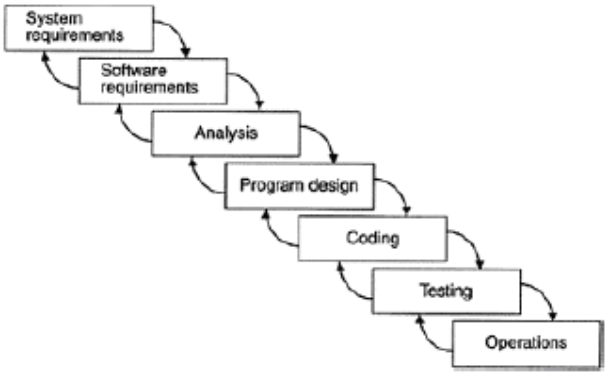

Figure 2-16: Conventional waterfall model of software development
(Source: adopted by Wideman, 2004)

An iterative strategy was offered by Boehm (1998) in a 'spiral' model as shown in Figure 16.

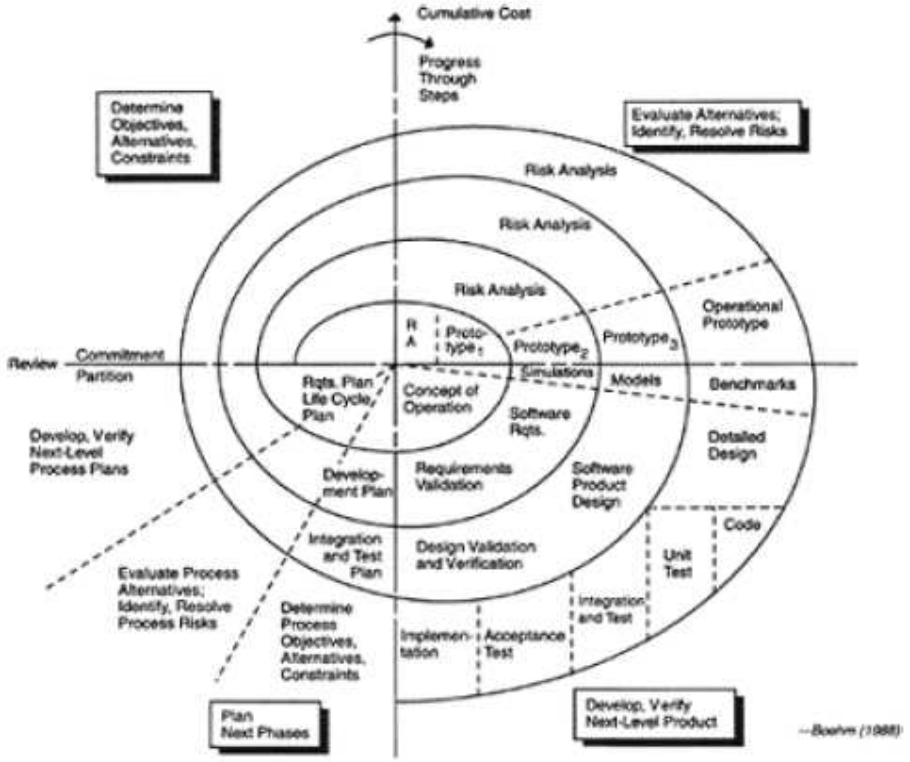

Figure 2-17: Spiral model of software development

(Source: Boehm, 1998)

Royce (2008) suggested the relationship between the spiral model and the project life cycle as shown in Figure 17.

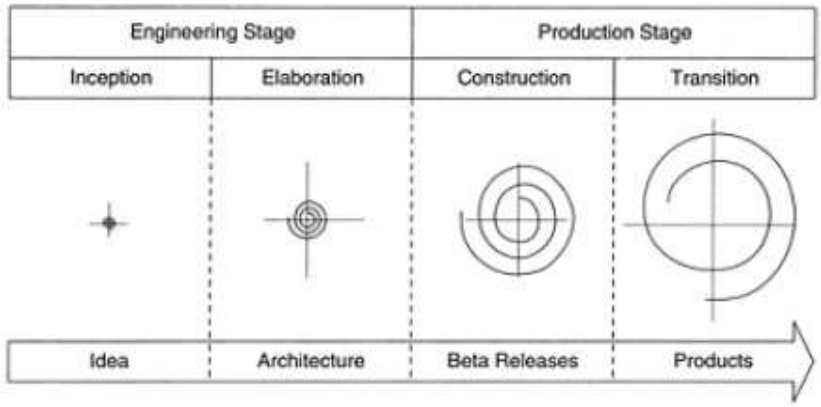

Figure 2-18: Life span view of the spiral model

(Source: Royce, 2008)

2.6 PROJECT LIFE CYCLE IN MODERN AGES

Wideman (2004) then continues that in recent years, the accelerating pace of technological development has led to the need to administer and manage multiple projects to maintain competitive advantage. He mentions that the focus of project management has moved "upstream" into programme management and project portfolio management that requires senior management's attention not just on one project but multiple projects competing for resources, cash flow and contribution to corporate strategic objectives. This in turn requires closer attention to screening or filtering out potential projects that do not make the grade during the course of the portfolio-programme-project life span.

According to Wideman (2004) Forsberg *et al*. (2000) suggest that the project life cycle has three aspects, namely business, budget and technical. "The business aspect contains the necessary business events related to customer management, justifying the project, the overall business management events, and associated contractor and sub-contractor management. The budget aspect depicts the activities and events necessary to fuel the project with funds throughout its project life cycle. The budget activities and business management activities are combined with the technical aspects to yield the complete project cycle. The technical events are often the most significant force driving the project length and cost, and they're often the most difficult to manage."

Archibald (2003) observes on the importance of designing and documenting project life cycle processes: "Designing and documenting project life cycle processes will:

- Enable all concerned with creating, planning, and executing projects to understand the process to be followed during the life of the project.
- Capture the best experience within the organisation so that the life cycle process can be improved continually and duplicated on future projects
- Enable all the project roles and responsibilities and the project planning, estimating, scheduling, monitoring, and control methods and tools to be appropriately related to the overall project management life cycle process.

Unless a well-documented, understandable picture of the life cycle process for each project category exists, it will be impossible to achieve the full benefits of modern, systematic project management."

Wideman (2004) refers to Cooper, Edgbert and Kleinschmidt's Stage-Gate™ typical gating process that is shown in Figure 2-18.

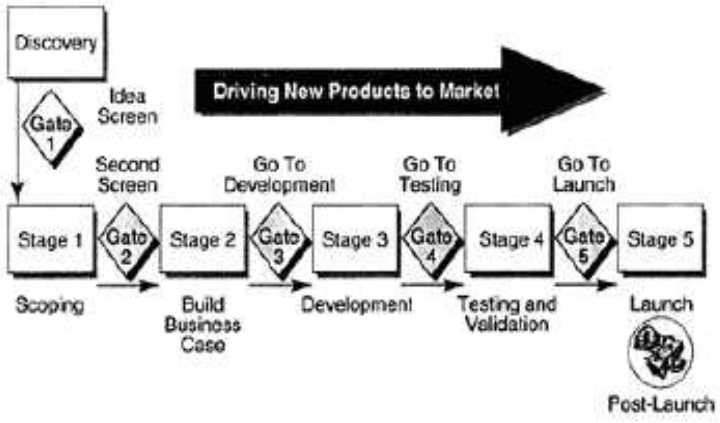

Figure 2-19: Stage-Gate process

(Source: Cooper, Edgbert & kleinschmidt)

Archibald (2003) also clarifies the generic project life cycle as follows: "There is general agreement that the following broad, generic project phases [common alternative terms shown in parenthesis] are:

- Concept [initiation, identification, selection]
- Definition [feasibility, development, demonstration, design prototype, quantification]
- Execution [implementation, production, deployment, design/construct/commission, install and test]
- Close-out [termination and post completion evaluation].

Wideman (2004) says that these phases are so broad and the titles so generic that they are of little value in documenting the life cycle process so that it can be widely understood, reproduced, and continually improved."

Wideman (2004) continues that in a paper titled "An Improved Project Lifecycle Model", Furlonger, 2005 looks at the project life cycle from the perspective of the chemical process industry. He provides a rationale for a more robust second level model by subdividing each of the four generic phases each into two for a total of ten if you include 'sanction' and 'audit' stages that are beyond the control of the project manager. He also arranges the model into a 'Vee' display as shown in Figure 2-19, an arrangement strongly espoused by Forseberg et al (2000).

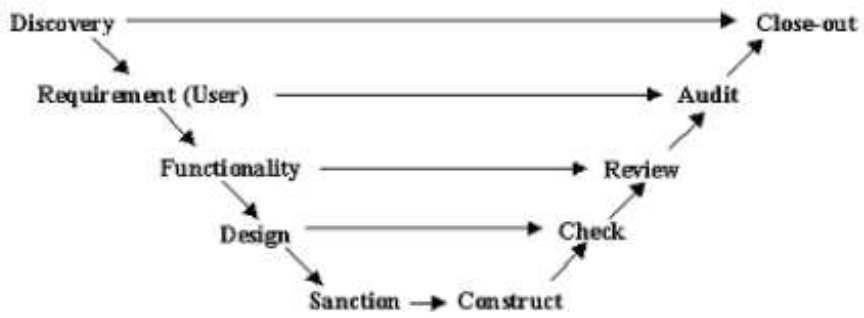

Figure 2-20: "Vee" model of project life cycle
(Source: Fish, 2006)

Morris uses this 'Vee' shape to describe the waterfall development cycle of IT projects as shown in Figure 20.

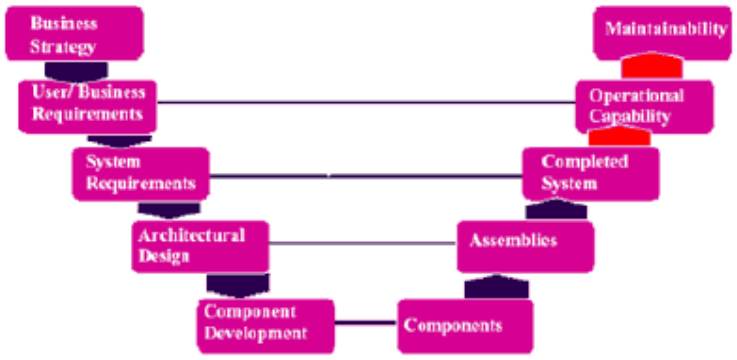

Figure 2-21: Waterfall development cycle
(Source: Morris, 2013)

Wideman (2004) notes the difference between Fish, E and Morris displays. The left side of Fish's 'Vee' describes products (documents) while the right side describes activities. Morris

(2003), on the other hand displays all products. However, Morris (2013) also offers a generic project development cycle as shown in Figure 2-21.

Figure 2-22: Generic project development cycle

(Source: Morris, 2013)

Finally, Morris (2013) provides an example of a standard drug development process, as shown in Figure 2-22. Examples of research and development project life cycles are not often seen.

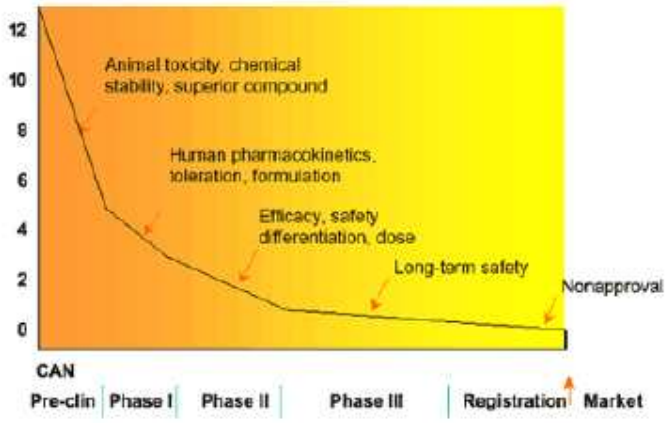

Figure 2-23: Standard drug development process

(Source: Morris, 2013)

Archibald (2003) summarises high-technology project life cycle models into two types:

- Predictive
    - Waterfall – linear ordering phases, sequential or overlapping, no phase repeated
    - Prototyping – functional requirements and physical design specs are generated simultaneously
    - Rapid Application Development – based on an evolving prototype that is not thrown away
    - Incremental Build – decomposition of large development effort into a succession of smaller components

- Spiral – repetition of the same set of life cycle phases such as plan, develop, build, and evaluate until development is complete

- Adaptive
  - Adaptive Software Development – mission driven, component based, iterative cycles, time boxed cycles, risk driven, change tolerant
  - Extreme Programming – teams of developers, managers, and users; programming done in pairs; iterative process; collective code ownership.

David and Maynard (2007) identify three primary life cycle characteristics that all projects share: cost/staffing, completion probability, and influence. The completion probability characteristic starts low at the beginning of the project, and gets progressively higher as the project continues. The influence characteristic is higher at the start of the project and gets progressively lower as the project continues (e.g. stakeholders' influence). The cost/staffing characteristic is low at the start of the project, higher towards the end of the project and drops rapidly as the project draws to conclusion.

To examine the interactions of these 3 characteristics David & Maynard (2007) have documented the dynamics of the characteristics in Table 2-3 as the project progresses through the sequential phases (start, early, middle, mature, and completion) of the project life cycle.

Table 2-3: Project phases versus characteristic value
(Source: David & Maynard, 2007)

	Start	**Early**	**Middle**	**Mature**	**Completion**
Completion	Low	Medium	High	Very high	Certain
Influence	Very high	High	Medium	Low	Low
Cost/Staff	Low	Medium	High	Medium	Low

David and Maynard (2007) summarise that understanding the trends of these characteristics points out the need for proper prior planning as the time spent planning before the start of the project can never be recaptured. It is thus important to have detailed, well thought-out and well understood plans. Once the project starts, it quickly becomes committed to spending money, with ever decreasing control.

2.7 PROJECT SUCCESS AND FAILURE WITH ESKOM DISTRIBUTION.

The literature review will define the meaning of project success and project failure within the content of the study, and compare other researchers' findings. Researchers and project

managers define success and failure in different ways, and some are specific to those particular organisations. However, there is common ground on which every industry, organisation and business operate. Do a large percentage of projects really fail or do we only hear about the ones that fail? What is failure and what is success? Ninety percent of projects do not meet time/cost/quality targets. In fact, only 9% of large, 16% of medium and 28% of small company projects were completed on time, within budget and delivered measurable business and stakeholder benefits (David & Maynard, 2007).
Let us start by looking at what other researchers say the common causes of project failure are; thus, why projects fail. The researcher will then follow with a literature review of project success. What quantifies project success? Furthermore, the same review will be done on project failure. To close the literature review the researcher will look at the leadership competency.

The concept of *project success* has not been well-defined anywhere in project management literature. *Failure* is also an imprecise and ill-defined term used by practitioners and in the literature without deep meaning (Rae & Eden, 2002). Shenhar and Wideman (2000) state that there does not appear to be any agreed-upon understanding of the concept of *success* in either business or project management literature. Cooke-Davies (2002) also notes that decades of individual and collective efforts by project management researchers since the 1960s have not led to the discovery of a definitive set of factors leading to project success.
In recent years, researchers in project management have become increasingly interested in critical success/failure factors (David & Maynard, 2007).

Previous research results indicate that the relative importance of several of the critical factors change significantly, based on life cycle stages (Pinto & Prescott, 1988). Nevertheless, the success factors are usually listed in either very general terms or very specific terms affecting only that particular project. “Participation in an unsuccessful project can have a positive learning outcome for the participants. It provides the participants with a chance to learn from their mistakes in projects and thus minimises the risk of making similar mistakes in the future” (Ewusi- Mensah, 1995). Thus, a lot of positives can come from failed projects. This should in no way be consolation for project managers, as failed projects can easily derail an organisation from its core business. In fact, no organisation wants to use real money spinning projects as experiential gathering endeavours (David & Maynard, 2007).

Firstly, few people agree on how project success and project failure should be defined, though one should know that not defining the success or failure criteria of a project at its initiation stage can lead to project failure. Eskom Distribution defines project failure as a project not completed on time or within budget, or which does not meet its specified output. This is just a basic explanation. Project failure comprises several other aspects (e.g. unclear scope, poor technical quality, unsatisfied customers, etc.). Project failure may be a common occurrence in any organisation but the way it is defined and quantified depends solely on that organisational output. Secondly, one may define project success as completing all project deliverables on time, within budget and to a level of scope that is acceptable to sponsors and stakeholders. Dvir, Sadeh and Malach-Pines (2006) point out that project managers and project teams are engaged in day-to-day project execution. They are typically not focusing on business aspects. The project manager's attention, rather, is operational, and his mind set is on "getting the job done". Most project managers see their job as successfully completed when they finish the project on time, within budget and to specifications. This "operational mind set" is clearly reflected in the project management literature, which has traditionally used time, budget and quality as the main indicators of project success.

Burke (2006) states: "The integration of time, cost and quality was initially presented as a triangle of balanced requirement – where a change in one parameter could affect the others."

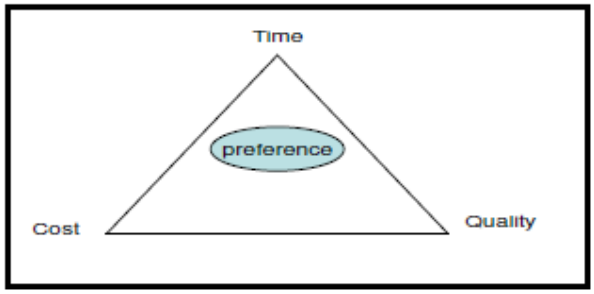

Figure 24: Triangle of Objective
(Source: Burke, 2006)

Freeman and Beale (1992) state that success is measured in subjective and objective ways, and it means different things to different people. Pinto and Mantel (1990) conducted a research study pertaining to the causes of project failure. A set of managerially controllable

factors were identified as associated with project failure. The factors differed according to three contingency variables:

a) "The way in which failure is defined;
b) The type of project being studied; and
c) The stage of the project life cycle at the time assessed."

Cleland and Ireland (2002) suggest that success be viewed from two vantage points the degree to which technical project performance objectives are attained (e.g. time, cost and scope) and the contribution that the project has made to the strategic mission of the firm. Further to this they state that the concept of project success has not been well-defined anywhere in project management literature. From the statements above, one can note that success and failure can be defined in different ways even though there is common ground of understanding. Each organisation will have its own traditional way in which it defines success or failure. Failure is also an imprecise and ill-defined term used by practitioners and in the literature without deep meaning. From the statements above, one can note that success and failure can be defined in different ways even though there is common ground of understanding. Each organisation will have its own traditional way in which it defines success or failure (Rae & Eden, 2002).

2.7.1 COMMON CAUSES OF PROJECT FAILURE

"The perceived causes of project failure will vary depending on whether the project is in the strategic or tactical stage of its life cycle" Pinto and Mantel (1990).

The literature review on the subject matter has revealed that there are different reasons that lead to project failure. According to the Office of Government Commerce
(OGC) in the UK (OGC Best Practices – Common Causes of Project Failure, 2005), there are certain aspects that prevent project success. These include:

a) "Lack of clear links between the project and organisation's key strategic priorities, including agreed measures of success;

b) Lack of effective engagement with stakeholders;

c) Lack of skills and proven approach to project management and risk management;

d) Evaluation of proposal driven by initial price rather than long-term value for money (especially securing delivery of business benefits);

e) Lack of understanding of and contact with the supply industry at senior levels in the industry; and
f) Lack of effective project team integration between clients, the supplier team and the supply chain".

The above listed points are some of the issues common to any business that practises project management. However, the authors of this article have focused on the overall project failure within the industry without proper identification of the common causes that re-occur within projects. For example, it is easy to deduct "lack of effective engagement with stakeholders" as a common cause of failure. One may engage with stakeholders weekly but it is the manner in which the engagement is done, including the correct timing and sharing the right information at the right time at the right level in the organisation that ensures good stakeholder engagement (Rae & Eden, 2002).
If one lists the "lacks" with no further explanation then the article is as good as a repetition of millions of other articles previously published. One needs to understand what quantifies the problem in order to deal with the core issues rather than the symptoms.

According to Professor Yvonne du Plessis of the Department of Human Resource Management at the University of Pretoria, many projects have failed dismally and divulged frustrations caused not by inadequacy in the project methodology, poorly constructed schedules or critical paths analysis, but rather by the people involved in the projects and the manner in which people are working and behaving in projects.
Pinto and Martel (1990) discuss different reasons that lead to project failure compared to the ones discussed by the OCG article in a manner that is much more systematic and structured. There is an acknowledgement that project failure may also be the result of several issues external to the organisation; e.g. a regulatory framework as well as social, political, technological, economic and environmental issues. These external issues cannot be ignored because each country abides by its own laws, which will most probably vary from country to country.
Pinto and Martel (1990) identified three distinct aspects of project performance and used these as benchmarks to assess project success or failure. These aspects are "the implementation process itself, the perceived value of the project and client satisfaction with the delivered project". The conclusion is that "the perceived causes of project failure will vary, depending on which outcome measure is used to assess performance".

Comparing Pinto and Martel's note to the triangle of objectives from Burke (2006) balances the time, cost and quality as variables in the triangle. The aspects from the article are the implementation process (the time it takes to execute), the perceived value (estimated cost) and customer satisfaction (quality). All three are addressed within the old triangle of objectives. The implementation process determines the time it would take to do a project, following a specific process. Changes in the process will then affect the cost and the end user, who is the customer.

Pinto and Martel (1990) also analysed the stages in which project failure might reoccur, meaning that there might be a trend. The project could possibly have had poor planning during its development stage or it might be during its execution stage that it failed. In their analysis the researchers found that their respondents believed that 80% of projects failed in their tactical stage because such projects were closer to completion and 20% of selected projects fail in the strategic stage. In the researcher's opinion this could be driven by the fact that there had been a lot of assumptions made at the early stages. Therefore, people will pick up the mistakes made until it is during the project execution stage. Once the strategic mistake is picked up at the tactical phase it is easy to categorise it as a tactical issue. It is then possible that the tactical phase inherits and implements incorrect assumptions and therefore ends up with strategic issues at the implementation stage. The project phases are shown in sequence, but in practice there may be overlapping between phases. Deliverables from the preceding phase are generally approved before work starts on the next phase. One can see the effort levels required during each stage. Looking at the analyses made in the article one can understand why 80% of projects would fail in their tactical stages as the rate of effort required will increase at this stage (McMillan and Schumacher, 2006).

2.7.2 ENSURING PROJECT SUCCESS

According to De Marco the six steps that ensure project success are:

1. **Assemble the right team:** Behind every successful project is a team of professionals working together towards the same goal.
2. **Use a credible life cycle cost model:** Project managers should consider a cost model that encapsulates industry-specific cost research data and all technical parameters, performance parameters, costs and normalised cost metrics that will assist in accurate cost to complete estimates at any point in a project.

3. **Get the estimate right the first time:** Under- and over-estimating projects could lead to disaster.
4. **Create, document and train the process:** This knowledge management approach is critical to ensure future project success within a sector. Without it, every project starts new, without the wisdom of other projects that are in progress or completed.
5. **Integrate cost estimating, project controls and knowledge management:**
6. These three elements are not individual parts; they build on one another to ensure success at every decision gateway of a project.
7. **Re-assess often:** A solid management methodology requires the project manager to revisit the initial estimates with every significant change, milestone or calendar period along the way.

The above steps may look simple and relevant to any organisation, but putting them into practice may be a challenge depending on each organisation. Eskom is also driven by this method but there are many challenges in ensuring practicality. It is thus concluded that using the six step methodology will not only ensure project success, but it will also help one manage projects more effectively.

Jugdev and Müller (2005) discuss the evolving understanding of project success over the past 40 years as well as the conditions of success, critical success factors and success frameworks. They begin with studying asset valuation, and strategic and operational assets. They then examine project success across the project or product life cycle. A review of the four periods in the project management literature and a discussion on the conditions for project success, project critical success factors and project success frameworks follow.

According to Jugdev and Müller (2005), in the 1970s the literature focused on tools and techniques; i.e. software, work breakdown structure and programme evaluation.
In the 1980s it began to focus on the importance of the “profession” but remained technically oriented, as it covered design-to-cost, life cycle costing, risk management, cost and schedule control, and control systems. In the 1990s the literature started addressing topics such as team building and quality. So, it took more of a human resource approach and dealt with leadership topics. Currently project management literature focuses on competences, stakeholder involvement, performance measures and project management as a career path.

De Wit (1998) states that "good project management can contribute to project success; it is unlikely to be able to prevent failure". Therefore, a distinction between project management success and project success is necessary (Steyn, 2011).

Project management success: Measured against the traditional gauges of performance; i.e. time, cost and quality)

Project success: Measured against overall objective of the project (Steyn, 2011).

The Sydney Opera House is mentioned by De Wit, which took 15 years to build and was 14 times over budget. Yet, it is displayed as an engineering masterpiece. De Wit conceptualises that this initiative was a failure in terms of project management success, but was successful in terms of project success (Steyn, 2011).

The PMBOK describes *project management* under the following nine knowledge areas:

- Project scope management
- Project time management
- Project cost management
- Project quality management
- Project human resources management
- Project communication management
- Project risk management
- Project procurement management
- Project integration.

ISO 10006:2003 provides guidance on quality management in projects and outlines quality management principles and practices that are important and have an impact on the achievement of quality objectives in projects (Steyn, 2011). They are intended to be used during the management of projects to ensure that the organisation is applying the practices contained in the ISO 9000 family of standards. ISO/DIS 21500 provides generic guidance on the concepts and processes of project management that are important for and have impact on the achievement of projects (Distribution Network Asset Creation-IDP Document, 2012).

2.7.3 PROJECT MANAGEMENT STANDARD

ISO 10006:2003 Quality management systems – Guideline for quality management in projects

This international standard provides guidance on quality management in projects. It outlines quality management principles and practices, the implementation of which are important to and have an impact on the achievement of quality objectives in projects. It supplements the guidance given in *ISO 9004*. It is recognised that there are two aspects to the application of quality management in projects: that of the project processes and of the project's product. A failure to meet either of these dual aspects may have significant effects on the project's product; the project's customer and other interested parties, as well as the project organisation. It is necessary to manage project processes within a quality management system in order to achieve project objectives. The project quality management system should be aligned as far as is possible with the quality management system of the originating organisation (Cooke-Davies & Cicmil & Richardson, 2007)

The guidance for quality management of projects forms the basis for quality management systems for the originating and project organisations and is based on eight quality management principles, namely customer focus, leadership, involvement of people, process approach, system approach to management, continual improvement, factual approach to decision-making, and mutually beneficial supplier relationships.

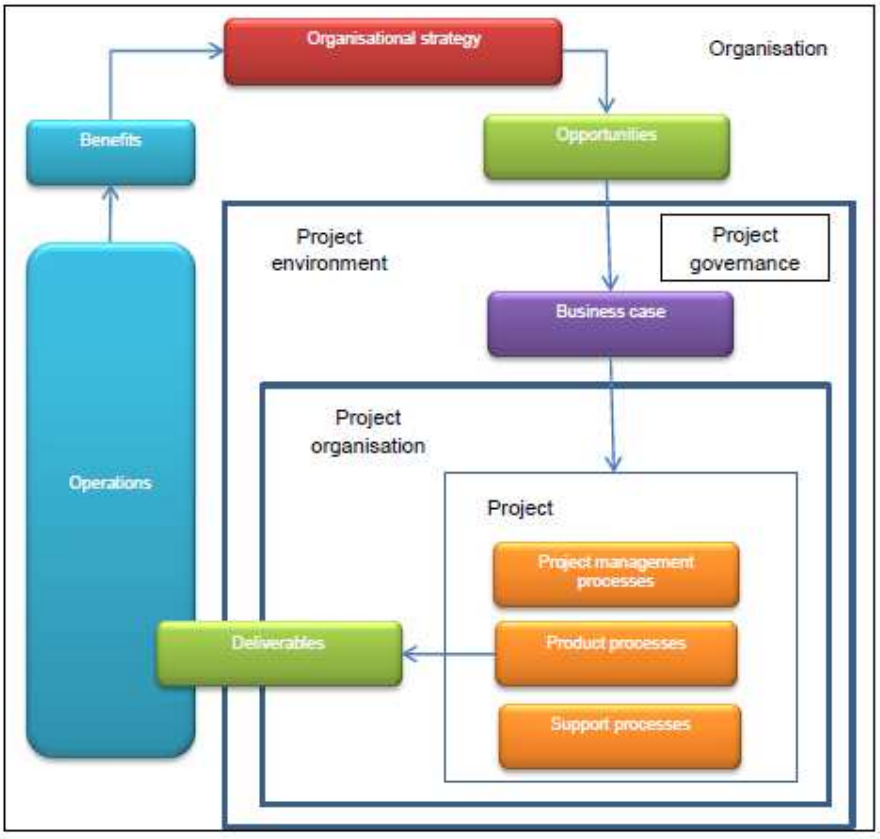

Figure 2-25: Overview of project management concepts and their relationships
(Source: ISO/DIS 21500)

The organisational strategy identifies the opportunities. The opportunities are evaluated and captured in the business case or similar document. Selected opportunities can result in projects that provide deliverables. These deliverables can be used to realise benefits. The benefits can be an input to organisational strategy. According to this standard, projects are usually organised into phases that are determined by governance and control needs. These phases follow a logical sequence, with a start and an end, and use inputs to produce deliverables. To ensure efficient management of the project during the entire project life cycle, a set of activities should be performed in each phase. Project phases divide the project into manageable sections, collectively known as the project life cycle. The project life cycle spans the period from the start of the project to its planned end or its termination. The phases are divided by decision points, which can vary depending on the organisational environment. The decision points facilitate project governance. By the end of the last phase, the project should have provided all the deliverables (McMillan and Schumacher, 2006). To manage a project throughout its life cycle, project management processes should be employed.

2.7.4 PROJECT MANAGEMENT METHODOLOGY

PRINCE2™ is a project management methodology owned and maintained by the United Kingdom (UK) Office of Government Commerce. (Cooke-Davies & Cicmil & Richardson, 2007). Spence and Jolly (2009) gives a basic introduction to project management and PRINCE2™ and states that PRINCE2™ is a project management methodology that outlines 8 processes, 8 components and 3 techniques to successfully carry out a project. (Cooke-Davies & Cicmil & Richardson, 2007) See Figure 2-26 for the PRINCE2™ processes.

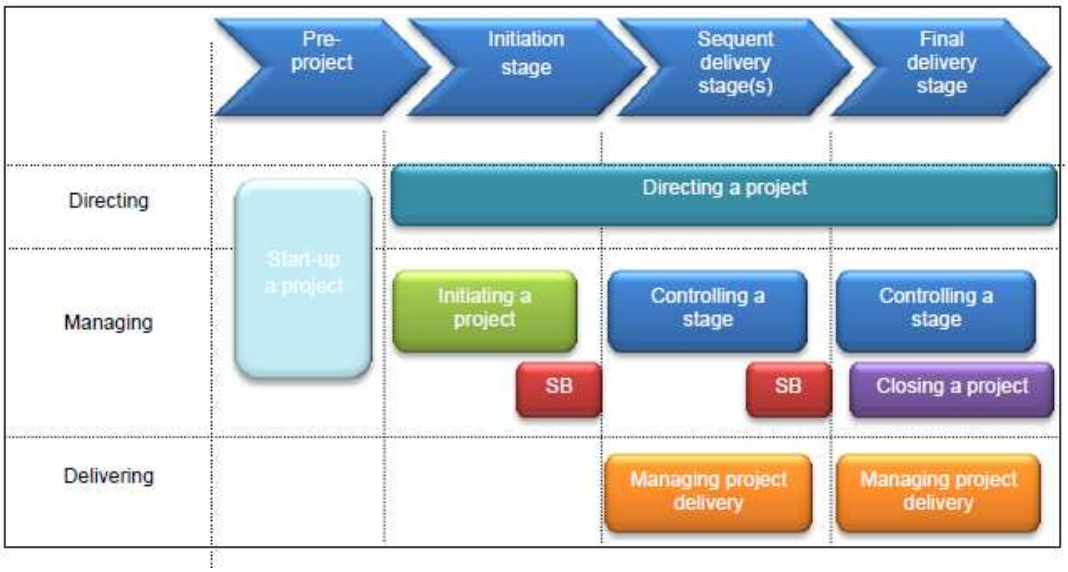

Figure 2-26: PRINCE2™ processes

(Source: United Kingdom Office of Government Commerce)

The starting-up a project process occurs before a project has officially started. It involves identifying capable people who make decisions and appointing a project manager to manage the project on a day-to-day basis. The project manager and executive (the senior management representative who has overall responsibility for the project) together outline reasons for the project and how it is to be carried out. This information is documented in the project brief.

All projects are subjected to repeated approvals to continue by senior management as part of directing a project process. The body representing senior management is called the project board. PRINCE2™ encourages the use of management by exception. While the project board takes overall responsibility and accountability for the success of the project (i.e. governance focus), they entrust the project manager with the day-to-day management of the project (who in turn entrusts the work to be done to the suppliers) within allocated boundaries (i.e. management focus). The project manager keeps the project board informed of the project's progress via regular reporting (Cooke-Davies & Cicmil & Richardson, 2007).

In the initiating a project process the project manager compiles a project initiation document and the next stage plan for approval by the project board before starting and taking control of the first stage. Before commitment of resources, a project is carefully planned to estimate the costs in time and money to meet the project's objectives. Key products are identified, the quality required is determined and stage boundaries are set. In order to control a stage, PRINCE2™ divides a project into management stages to ensure the project remains under control. By default a project is stopped if approval has not been given. The number of stages

depends on project size, complexity and level of risk. Each stage is completed before starting the next and each new stage is planned in the stage preceding it. The stage plans are approved by the project board at stage boundaries to ensure that the project remains within budget and is capable of delivering its objectives (McMillan and Schumacher, 2006)

The managing stage boundaries (SB) process involves preparing for the next stage of the project and reviewing the current stage. It includes the project manager making suggestions to the project board about the likelihood of the project achieving its business objectives and updating any changes in the business case, project plan, risk log and issue log. Stage boundaries with decision points set by the project board means that the project only continues once the project board is satisfied with the proposed next stage plan and that the current stage end has delivered all the required products (De Marco, 2005).

PRINCE2™ projects focus on managing product delivery. Products are physical entities or represent intangible deliverables. Everything produced in PRINCE2™ (even a plan) is called a product and undergoes a common quality checking procedure. Suppliers usually do the work required to deliver products. It is the project manager's responsibility to ensure that the supplier produces the correct products at the right time by approving requests for work to be done. The project manager also receives notification that the finished products have passed their quality reviews (Atkinson, Crawford, & Ward, 2006; Cooke-Davies et al., 2007; Williams, 1999)

Once the project has delivered all its products the project is closed, with final approval of the closure from the project board. Any lessons learned are recorded, resources are released and the post-project review plan is created to evaluate the success of the project's outcome. A controlled close is the last demonstrable project management action (Creswell, 2013).

The analysis phase is where the project life cycle begins. In this phase the high-level project definition is broken down into the more detailed business requirements. The analysis phase is also the part of the project where the overall direction of the project is identified through the creation of the project strategy documents. Gathering requirements is the main concern of the analysis phase. This process consists of a group of repeatable processes that utilises certain techniques to capture, document, communicate, and manage requirements. On completion of the requirements the alternatives for construction are established. These alternatives include

tools and technology to be utilised, the scalability of the solution and the structure of the components to be built (McMillan and Schumacher, 2006).

The design phase is concerned with the many potential solutions, and narrows down the choices to determine the most effective and efficient way to construct the solution. The design phase answers the questions about how to build the best solution. Design becomes more and more important as the project becomes larger, more complex and impacts on more and more people. At the end of the design phase a logical solution is defined. This logical solution is then passed to the construct phase, where the logical solution is turned into a physical solution. The construct phase is the start to construct the solution. During this phase the complete set of design specifications is completed showing how the application should be structured and organised. In the test phase the work is tested to ensure that the solution meets the business requirements and to test to catch errors and defects. The purpose of this phase is to prove that the solution is correct (McMillan and Schumacher, 2006).

The implementation phase refers to the final process of moving the solution from development status to production status. Depending on the project, this process is often called deployment, go-live, roll-out or installation (Cooper & Schindler, 2003).

According to Mochal (2007), the utilisation of a standard set of life cycle processes, techniques and templates results in faster start-up times. Good life cycle processes require an upfront investment of time and effort for analysis and planning. Projects are completed sooner if they are properly planned and the requirements understood correctly in order to design an efficient solution. This results in reducing time, effort and rework required in the construct, test and implement phases (Cooper & Schindler, 2003).

Mochal (2007) says that to be effective, support is required from the entire organisation to use a common set of processes, techniques and tools. However, he warns that tools are only part of the answer as tools support the project life cycle processes, they are not a substitute. Mochal further mentions that a common criticism of a project life cycle approach is that it is cumbersome, paper intensive and it detracts too much focus from the work at hand. Sometimes it is a legitimate concern which is caused by not scaling the project life cycle processes to the size and complexity of the project. Mochal says that some of these fears are natural and logical, while others are emotional and irrational. Although these may be reasons to be hesitant about using formal project life cycle processes, they must be overcome.

Mochal (2007) then describes the guiding principles for the project life cycle process. The general life cycle model must be designed to be applicable to all projects. A life- cycle process must be flexible and scalable, based on the size of the underlying project. Projects must have effective project management processes, as well as project life cycle processes, to be truly successful. A successful project requires a partnership between the project team and the client – the project is at a higher risk of failure without active participation from the client. The project life cycle processes must be generally understood by the project team and the client. Most of the life cycle steps require the involvement of the members of the client and the project team (Cooper & Schindler, 2003).

In order to achieve a project's objectives the project quality management system should be aligned as far as possible with the quality management system of the originating organisation. The management of projects through their life cycles must take into account the eight quality management principles namely customer focus, leadership, involvement of people, process approach, system approach to management, continual improvement, and factual approach to decision-making and mutually beneficial supplier relationships (McMillan and Schumacher, 2006).

2.8 SUMMARY

The context within which projects are performed to achieve the objectives of projects includes the organisational strategy that identifies the opportunities. Opportunities are evaluated and captured in the business cases. Selected opportunities result in projects that provide deliverables. These deliverables are then used to realise benefits. The benefits then provide input to organisational strategy. The project life cycle is shaped by the unique aspects of the organisation, industry or technology employed. The life cycle provides the basic framework for managing the project, regardless of the specific work involved. The processes representing the project life cycle determine significantly how effectively a project is structured. The basic life cycle follows a common generic sequence (i.e. phases). Project phases are divisions within a project where extra control is needed to effectively manage the completion of a major deliverable. The relationships between the phases could be sequential, overlapping or iterative. The specific deliverables and activities that take place in between the start and end of a project will vary with the project. There is no single structure to define the ideal structure for a project. The design and implementation of a project life cycle should thus focus on scalability and robustness, and provide guidance and direction rather than being

rigid to cater for simple as well as complex projects. Different types of projects (e.g. new development, construction and engineering, software development) have different project life cycle patterns (McMillan and Schumacher, 2006).

To effectively manage the project life cycle and to ensure that issues are not overlooked, time and money are not wasted, and that resources are effectively deployed there must be evaluation and approval points between phases that are termed gates. These gates are necessary for management to make major decisions e.g. technical and design reviews, before major procurement decisions and commitments, and to decide to go ahead with the investment or not. There are hard gates and soft gates. Hard gates mean that the project cannot proceed without formal management review and approval (McMillan and Schumacher, 2006). Soft gates mean that there is a degree of option. A phase-end review achieves the combined goal of obtaining authorisation to close the current phase and start the subsequent phase. It is also important to review the project performance once the operations phase has started to review if the benefits have been realised and to document the lessons learned for feedback into other projects (McMillan and Schumacher, 2006).
Project management lessons learnt has consistently shown more time and effort must be spent at the project front-end. Front End Loading (FEL) has the objective to align project objectives with the business need and to develop the most efficient process design and execution plan to achieve the project objectives. Similarly, front-end planning is a process for developing sufficient strategic information with which owners can address risk and decide to commit resources to maximise the chance for a successful project (Cooper & Schindler, 2003).

PRINCE2™ is a project management methodology that outlines 8 processes, 8 components and 3 techniques to successfully carry out a project (Steyn, 2011). The 8 processes are starting up a project, initiating a project, directing a project, controlling a stage, managing stage boundaries, managing product delivery, planning, and closing a project. (Steyn, 2011) TenStep describes the project life cycle as a project management process which consists of the following phases: analysis, design, construct, test and implement (Creswell, 2013). This chapter provided the detailed processes found within Eskom Distribution and practices that are followed during project execution. This is to ensure that readers understand the environment; therefore, laying a good foundation for understanding. It also reviewed various journal articles and books pertaining to project success and failure experienced by other organisations. The existing body of knowledge on project success and failure differs vastly in

terms of the number of factors identified for different organisations. However, there is consensus among the core factors that lead to success or failure; e.g. the nine elements of the PMBOK. If one or more are not managed properly it will lead to project failure. The models developed by various studies will assist in assessing the relevance of these theories within Eskom Distribution, bearing in mind the multi diverse environment. This chapter covered the theories that have been written by other researchers on project life cycle and project success and failure. The next chapter will look at the research methodology.

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

This chapter discusses the research design and methodology used in the study. The main problem researched is restated along with the data collection, measuring tools and limitations to the study. The researcher adopted an exploratory approach to the study by means of the descriptive case study research method with a questionnaire.

3.1.1 KNOWLEDGE CREATION MODE

Two kinds of knowledge creation have been distinguished, labelled Mode 1 and Mode 2(MacLean et al. 2002). Mode 1 is a term from sociology of science which refers to the way knowledge is being produced. Mode 2 is also a term from sociology of science which refers to the way (scientific) knowledge is produced. Mode 2 knowledge is produced in the context of application and in search of solutions to transient global or contemporary problems. The research was conducted according to mode 2 knowledge creation Mode 2 knowledge creation has become increasingly prominent in discussions in the nature and purpose of management research (MacLean et al. 2002). According to Musson (2006): "Mode 2 knowledge (not science) is practised by practitioners (not scientists) and is based self-consciously on knowledge produced in the context of application and in search of solutions to transient global or contemporary problems, as identified periodically by a diversity of stakeholders. It produces and distributes knowledge across disciplines and sites, is characterised by team-work and is subject to the quality of a diversity of stakeholders."

3.2 RESEARCH STATEMENT

The research problem is to analyse the effectiveness of the project management life cycle in Eskom Limpopo Operating Unit. The study seeks to ensure that there is a clear understanding of the project management life cycle within Eskom Distribution in order to recommend ways in which these challenges can be addressed to ensure improvement in organisational performance.

3.3 RESEARCH DESIGN

A research design refers to the logic that links the data to be collected to the initial questions of a study (Yin, 2009). A quantitative research methodology will be followed due to the different nature of the measurements that will be performed. This is a descriptive research that uses data analysis. The mode of reasoning is more inductive than deductive. A comparative evaluation is used as a method to establish if the Distribution Division Project

Life Cycle Model is adequate to successfully deliver Limpopo Operating Unit Projects (Asset Creation document, 2011). Survey research was used to evaluate if the Distribution Division (DX) Project Life Cycle Model (PLCM) is applied effectively.

3.4 COMPARATIVE EVALUATION OF ESKOM DISTRIBUTION DIVISION PLCM WITH CURRENT AND NEXT DISTRIBUTION PROJECT LIFE CYCLE MODELS

The below table 7 illustrate Key practices/elements of current and next practice project life cycle models which is derived to do a comparative evaluation of the DX PLCM with key practices/elements of current and next generation project life cycle models as the method of data analysis and discussion of results (i.e. data interpretation) to establish if the DX PLCM is adequate.

Table 3-1: Key practices/elements of current and next generation project life cycle models
Source: (Somers, 2009)

1. Project Life Cycle Model (PLCM) Principles
PLCM principles include continued business justification, learn from experience, defined roles and responsibilities, manage by phases, manage by exception, focus on products/deliverables, and tailor to suit the project.
2. The building blocks of a project management methodology
The building blocks of a project management methodology is a project life cycle, project management processes, project management plan which is used to plan and control the project's performance, and the project's organisation structure that explains the leadership and the management of the project personnel.
3. Use of a project life cycle
A project life cycle is used to define the period from the start-up of a project to the hand-over of the finished product to those who will operate and maintain it. A life cycle allows the project to be considered as a sequence of phases which provides the structure and approach for progressively delivering the required outputs according to the governance and control needs of the organisation. These phases follow a logical sequence and provide a framework for planning, scheduling, budgeting, manpower and resource allocation and reviews as a project progresses through the project life cycle. Life cycles differ across industries and business sectors.
4. Applicability of a general project life cycle model
The general life cycle model is applicable to all projects. A life cycle process must be flexible

and scalable, based on the size and complexity of the underlying project to build deliverables in similar ways. The project life cycle describes the activities (work) to build the deliverables and is generally unique for each project. The project life cycle shows the major steps that need to be taken to deliver the project from project initiation to project finalisation and it provides a set of templates to do things quickly. The project life cycle is used to develop the project management plan that is used to monitor and control the project work through the project life cycle.

5. Treating projects strategically and integration with programme and project portfolio management

Organisations must treat projects in a more strategic way and seek new guidelines to align their projects with their business strategy to focus on business results. The focus of project management has moved upstream into programme and project portfolio management that requires senior management's attention not just on one project but multiple projects competing for resources, cash flow and contribution to corporate strategic objectives. This in turn requires closer attention to screening or filtering out potential projects that do not make the grade during the course of the portfolio-programme-project life span.

6. Project management processes in the project life cycle

To manage a project throughout its life cycle, project management processes should be employed for the project as a whole, or for individual phases. Projects must have effective project management processes, as well as project life cycle processes, to be truly successful.

7. Contributing disciplines (technical, business or operations) views of the project life cycle

Contributing disciplines (technical, business or operations) to the project life cycle see the life cycle from somewhat different points of view. Responsibility during the project life cycle changes from one individual to another during the course of the project and a smooth transition between phases allows orderly project delivery. A project life cycle has three aspects, namely business, budget and technical. The budget activities and business management activities are combined with the technical aspects to yield the complete project cycle.

8. Decision-making during the project life cycle phases

The project life cycle shows the key decisions within each phase (i.e. decision to initiate the phase, decision to start each process, decision to accept the deliverables to proceed to the next phase). Major reviews of the entire project occur at the end of each phase, resulting in authorisation to proceed with the next phase, cancellation of the project, or repetition of a previous phase. Each phase is completed before starting the next and each new phase is planned in the phase preceding it. The phase plans are

approved by the project board at phase boundaries to ensure that the project remains within budget and is capable of delivering its objectives. The evaluation and approval points between the phases are often termed gates or major milestones. There are hard gates and soft gates. Hard gates mean that the project cannot proceed without formal management review and approval. Managing phase boundaries with decision points means that the project only continues once the project board is satisfied with the proposed next phase plan and that the current phase end has delivered all the required deliverables/products. Soft gates mean that there is a degree of option. A gate may be required before major procurement decisions and commitments are made after initial design but prior to full design/development.
9. Front End Loading (FEL) and front-end planning processes
Front End Loading (FEL) is a process to align project objectives with the business need and to develop the most efficient process design and execution plan to achieve the project objectives. FEL continues until the right project is selected and is not finished until a full design-basis package is completed. Front-end planning is performing the right project, scoping the right 'things' for a good decision basis, setting the stage for successful execution, and documenting the scope of work into an organised basis for design using a Project Definition Rating Index (PDRI). It is a process for developing sufficient strategic information with which owners can address risk and decide to commit resources to maximise the chance for a successful project. PDRI is an index, i.e. a score along a continuum representing the level of scope definition and a risk management tool.
10. Handling of complexity in projects
The traditional project life cycle model is deterministic in nature as it relies on a linear-rational paradigm of decision-making. Next generation PLCMs must allow for dynamics, variability, iterations, uncertainty, and resulting changes of initial conditions and need to adjust the original objectives and project plans accordingly.

3.5 DATA COLLECTION

The data collection methods used includes literature review, a survey and observation. An analysis was conducted via 48 statements posed to the 48 respondents. The 48 statements were organised into three main variables, namely project planning, organisational project practices and project processes. A frequency distribution table is calculated for each statement, then after interpreted. The advantages of this type of data collection are that the researcher has first-hand experience with participants, is familiar to the environment and has access to internal project management documents. The key data collection strategy was to

facilitate group administered questionnaires to ensure that there would be a high response rate. During a group administered questionnaire a sample of respondents is brought together and asked to respond to a structured sequence of questions (Heinz, 2005). The researcher gives the questionnaire to those who are present. If the respondents are unclear about the meaning of a question they can ask for clarification. For very small or a hard-to-reach population, individual or telephonic discussions were used to complete the questionnaire.

3.5.1 INTERVIEWS

An–in-depth interview approach will involve one to one interviews in which individual respondents are questioned at length about issues and experiences (Henn, Weinstein and Foard, 2006). The researcher conducted face to face interviews with participants using structured interview that intends to get views and opinions from the participants

3.5.2 DOCUMENTS

The researcher went through the Eskom projects documents such as the National engineering contracts, project logger and different designs standards in order to have a clear picture of what the project management team has prioritized in terms of clearing the backlog in Limpopo Operating Unit Polokwane Zone.

3.6 POPULATION

The group in a research study is called the population. Yin (2004) defines a population of a research study as the entire group of persons that is of interest to the researcher, and which meets the criteria for inclusion in the study. The population in this study comprised of 170 officials who are directly responsible for projects in Asset creation department within the Limpopo Operating Unit. The population in this study includes the following role players working within Eskom Asset Creation Environment:

- Asset Creation Manager
- Projects Managers, Specialists, Coordinators, Clerk of works and The contractors' general workers (Project Execution)
- Engineering
- Capital Project
- Procurement
- Environmental/Legal
- Land development

LOU Project role-players that are involved in the activities of the DX PLCM are indicated in Figure 32. The role-players marked in red are involved full time in most of the activities of all the phases of the DX PLCM. The role-players marked in blue are involved part-time in some of the activities of the DX PLCM.

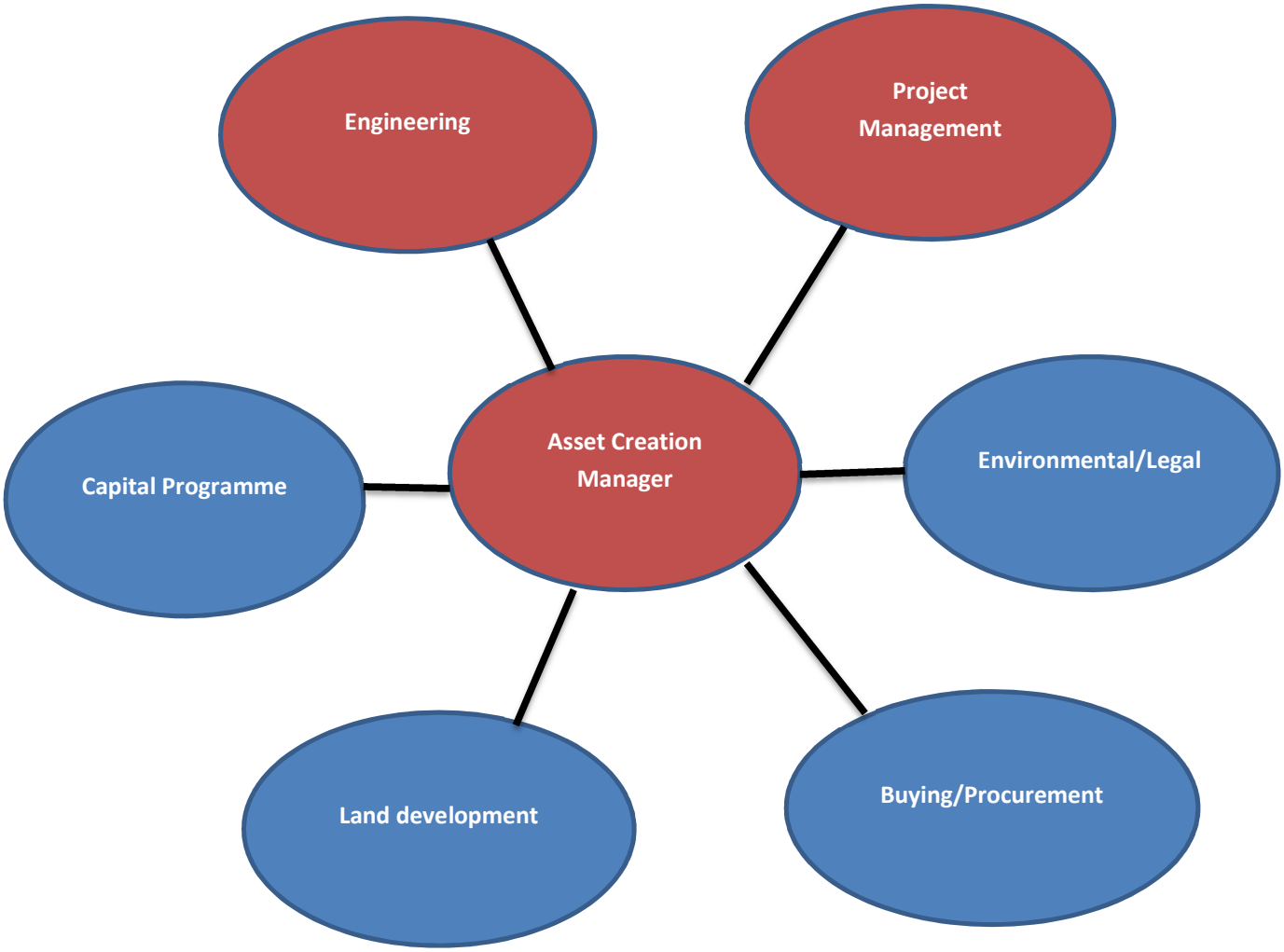

Figure3-27: Eskom Dx LOU PLCM role-players
(Source: Own Source)

The roles of the role-players are as follows:

- **Asset Creation Managers:** Accountable for governance activities and direction/guidance **Project Management:** Responsible for the project management activities
- **Engineering:** Responsible for the technical activities
- **Land Development:** Responsible to facilitate the Land& rights acquisition process
- **Capital Programme:** Responsible for providing financial support (e.g. economic evaluations, payment of invoices, etc.)
- **Buying/Procurement:** Responsible for providing support during the tendering process, placement of orders/contracts and contract management guidance
- **Environmental/Legal:** Responsible for the environmental and licensing approval processes.

3.7 SAMPLE, SAMPLING METHODS AND SAMPLE SIZE

Sampling is the process of selecting units from a population of interest so that by studying the sample the researcher may fairly generalise the results back to the population from which they were chosen. The purpose of sampling is to obtain a manageable part of the population. In order to draw a representative sample from the population to conduct the research, the researcher made use of convenience sampling as it is a relatively quick, inexpensive way of gathering the views of a large number of people.

A total of 48 participants will be selected randomly from both Operating Units. 4 project managers, 6 Project specialist, 16 project execution officials (Project coordinators & clerks of work) and 22 contractors' general workers will be selected. The purposive sampling will be used to purposefully sample the Eskom Limpopo project management officials. On the other hand the random sampling technique will be used to sample general workers. The Purposive selection is based on the project managers' perceived knowledge of strategies of project management life cycle and remedies put in place.

Thus, Project specialists from Asset creation Department are included because of their knowledge and expertise in project management life cycle and experience of executing various major projects. Officials from projects execution are selected because on their knowledge of how the projects activities are done and implemented. Finally, inclusion of the contract workers is important because they are the one doing the actual work.

3.8 MEASURING INSTRUMENT

Due to the nature of this research project, a questionnaire was used as measuring instrument. The questionnaire was designed to address the research questions and supports the problem statement. The data comprise general details and a list of information acquired from the questionnaire concerning region, years working at Eskom and the period in the project environment. The 48 statements were organised into three main variables, namely:

1. Project planning,
2. Organisational project practices and
3. Project processes.

Each category addressed the nine knowledge areas of the Project Management Body of Knowledge (PMBOK). Criteria for Evaluation - For all 48 statements in the questionnaire employees were required to tick what mostly described their beliefs as per the following options:

The researcher analysed the effectiveness of project management life cycle environment using various categories. Firstly, the three sections under Asset Creation Department were identified, which are direct customer projects, Electrification project and Major Projects.

Secondly, the analysis was done based on experience the respondents had within the project management environment.

3.8.1 QUESTIONNAIRE AND QUESTIONS DESIGN

A questionnaire is a list of structured questions aimed at obtaining reliable answers to gain insight on responses to specific research questions to determine what they think/feel about a

particular topic. A list of questions can be asked for specific information as well as judgements; and evaluators can be directed to specific sections, components, features, or segments of a product (Beyer, 2005). Questionnaires are usually paper-and-pencil instruments completed by the respondent. The questions in the survey questionnaire were compiled using the positivistic paradigm which is characterised by the following:

- It is assumed that the question posed will not influence the attitude or thinking of the target population
- The questions may be closed ended
- Questions may be answered independently of the questioner
- Questions may be constructed so that the responses may be determined using electronic or mechanical methods.
- Large samples may be surveyed
- Data may be analysed automatically using standard methods and presented in graphical form.

The survey questionnaire was designed to answer specific questions about the effective application of the DX PLCM and is based on the literature survey and review and the Project Delivery Value Chain Framework and the processes related to the management of Limpopo Operating Unit (LOU) projects (Asset Creation document, 2011). The survey questionnaire consists of three sections: Section A, Section B and Section C designed to gather information about the about the effective application of the Distribution Division Project Life Cycle Model in Limpopo Operating Unit.

3.8.2 ROLE OF RESEARCHER

The role of the researcher was to facilitate the completion of the questionnaires administered to the group or individual and telephonic discussions. This allowed the researcher to clarify any confusion/concerns, and motivated the respondents to complete all the survey questions.

3.9 KEY ASSUMPTIONS

The following assumptions were made that could influence the outcome of the study:

- It is assumed that all of the projects implemented, followed the same project management process/methodology.
- The individuals who completed the survey were honest and accurate.
- The researcher transferred the data correctly to the programs used in the research.

- The three sections are good averages and can be generalised for drawing conclusions and making recommendations.
- All employees are familiar with the methodology of project management.

3.10 ANALYSIS OF RESEARCH OUTCOMES

Data analysis is the statistical design and tests applied to the obtained data to test the various hypotheses (Cooper, 2003). Once data processing has been completed the analysis of this data should follow. The purpose of grouping data is to reduce the number of figures or scores presented in a distribution to enable the reader to grasp the main features of the data and to present the information more effectively (Cooper, 2003). Frequency distribution refers to the need to organise randomly collected data. The analysis of this study was categorised into three sections using frequency distribution. Those categories are further grouped to address the research questions.

To establish if the Distribution Division Project Life Cycle Model (DX PLCM) is effectively applied a survey research methodology is used. One structured questionnaire was designed to answer specific questions about the effective application of the DX PLCM. The survey questionnaire was developed with closed-ended questions and a five point-scale response set with a neutral mid-point (strongly agree, agree, unsure, disagree, strongly disagree) to collect data during group administered questionnaires, face-to-face meetings and telephone discussions to allow for quantitative data analysis.

3.11 DATA COLLECTION PERIOD

1 Month

3.12 RESEARCH LIMITATIONS

The research will interpret that all the functions of Distribution Project Life Cycle Model identified and discussed are applicable to project management. Nevertheless, the study will clarify that for establishing the theoretical framework it has specifically focused on the Distribution Project Life Cycle Model functions that a project manager can adopt during the project execution. Further, it has kept the scope of the selected independent variables up to the extent to which the project manager's and his teams' role is required. The researcher will not be able to get information that Eskom Asset Creation Manager will classify as confidential. Time and the availability of resources i.e. executives to interview and answer questionnaires are regarded as the limiting factors for this research. The findings of this study may not be generalized to other organizations.

3.13 TESTS FOR VALIDITY AND RELIABILITY

According to the Eskom Research & Development Workshop 4 study material tests for validity refer to the extent to which the test results represent the actual situation being investigated, while reliability refers to the accuracy of the results, i.e. the degree to which the results would be repeated should the survey be carried out again. Internal consistency reliability estimation is a single measurement instrument administered to a group of people used on one occasion to estimate reliability. The reliability of the instrument is judged by estimating how well the items that reflect the same construct yield similar results by looking at how consistent the results are for different items for the same construct within the measure.

3.14 SUMMARY

To establish if the Distribution Division Project Life Cycle Model (DX PLCM) is adequate a table of key practices/elements of current and next distribution project life cycle models was compiled. To establish if the DX PLCM is effectively applied a survey research methodology is used. One structured questionnaire (see Annexure A) was designed to answer specific questions about the effectiveness of PLCM in the Distribution Operating Units. The survey questionnaire was developed with closed-ended questions and to collect data during group administered questionnaires, face-to-face meetings and telephone discussions to allow for quantitative data analysis.

CHAPTER 4: RESEARCH FINDINGS

4.1 INTRODUCTION

The previous chapter contained the specific details of how the research was conducted, from the problem statement to the collection of data and the methodology applied at all stages. This chapter covers the results from the data analysis obtained from the respondents, beginning with the population and followed by the results of each dimension. The aim of this chapter is to analyze the data and document the results from the comparative evaluation of the Project Life Cycle Model (PLCM) with key practices/elements of current and next generation project life cycle models as identified during the literature survey and review analyze and present the data collected during the survey on the effective application of the PLCM. The survey was distributed to 48 selected sampled employees in different levels (bargaining unit to management) as discussed in the previous chapter.

4.2 ADEQUACY OF THE PROJECT LIFE CYCLE

In order to establish if the Project Life Cycle Model (PLCM) is effective the PLCM was compared with the key practices/elements of current and next distribution project life cycle models. The project life cycle phases and activities of the PLCM are documented in Annexure A.

4.3 ANALYTICAL TECHNIQUES USED

The research statement addresses three variables of the Eskom Distribution project life cycle model, namely project planning, organisational project practices and project process. The first variable which is project planning focuses on the planning practices being followed to ensure proper project planning from the conception phase to close out. The second variable being organisational project practices focuses on how the organisational project practices are implemented to ensure project success. The last variable which is project processes focuses on project processes being followed within the organisation, e.g. NACVC process. The statements were created to address the research questions. The data analysis is drawn from internal stakeholders who interact with project management.

4.4 DISCUSSION OF THE RESEARCH METHODOLOGY USED

This section sets out results of the study by way of summary statistics and a detailed analysis of the 48 statements posed to the 48 respondents. Results of the analysis are arranged into the three main variables of this study, namely project planning, organisational project practices and project processes.

They are further grouped to address the research questions, which form the core of this research. The grouping is per the nine elements of the body of knowledge, since it is the heart of project management. Frequency distribution tables are therefore grouped as per the statements that are related and responses interpreted from a quantitative perspective in order to extract the essence of responses to each group to draw conclusions.

The questionnaire as per appendices one was sent to a cross-section of employees in an attempt to get a broad base of employees covered. The questionnaire was sent to 48 employees of whom all responded. This gives a hit rate of about 100%.

4.4.1 SUMMARY STATISTICS

The following demographic summary statistics in this study are discussed below:

- Zones in within the Operating Unit
- Duration of service within Eskom
- Duration in a project management environment.

These will assist during the study analysis to clarify whether some comments are Operating Unit (OU)-based or as per duration spent within the organisation.

Operating Unit

The researcher opted to analyse Limpopo Operating unit out of the nine within the Eskom Distribution group, since its project execution performance is poor. The respondents were as follows:

Variable (Zones)

Table 4-1: Frequency Distribution per Zone

(Source: Own Source, 2015)

Value	Absolute Frequency	Relative Frequency	Percentage
Polokwane Zone	11	0.23	23%
Thohoyandou Zone	22	0.46	40%
Groblersdal Zone	8	0.17	17%
Lephalale Zone	7	0.14	14%
Total	48	1.00	100%

As can be seen, 22 responded from the Thohoyandou Zone and 11 employees responded from Polokwane while 8 from Groblersdal and 7 from Lephalale.

Period of Service within Eskom

The researcher decided to have unequal intervals ranging from 0 to 10 years and above with the last one being open ended. These categories were chosen to allow grouping for simple analysis.

Table 4-2: Frequency Distribution per Length of Service within Eskom

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
Variable (Service in Eskom)	0 – 5 years	16	0.33	33%
	6 – 10 years	26	0.54	54%
	Above 10 years	6	0.13	13%
	Total	48	1.00	100%

The 48 respondents were mostly distributed in the combined 0 - 5 year and combined 6 - 10 year categories. In the total of 48, 33% of the respondents fell in the 0 - 5 year category while another 54% fell into the 6 - 10 year category, leaving only 13% for the above 10 years category.

Period within the project management environment

Table 4-3: Frequency Distribution per Length of Years within the PM Environment

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
Variable (Length in PM Environment)	0 – 5 years	19	0.04	40%
	6 – 10 years	27	0.56	56%
	Above 10 years	2	0.04	4%
	Total	48	1.00	100%

Analysis of responses

4.5. VARIABLE 1: PROJECT PLANNING

This section presents results of the data analysis of the 18 statements posed to the 48 respondents in terms of the project planning variable of this study. Frequency distribution tables are presented for each statement. Responses to each statement interpreted with reference to existing literature and a conclusion is drawn.

4.5.1 RESOURCE MANAGEMENT

The two statements addressed under resource management within the planning stages of a project.

A project manager is appointed and core project team members are identified

Table 4-4: Frequency Distribution of Statement 1

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	34	0.71	71%
	Often	14	0.29	29%
	Occasionally	0	0.00	0%
	Seldom	0	0.00	0%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Estimates are refined and resource commitments are analysed

Table 4-5: Frequency Distribution of Statement 8

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	13	0.27	27%
	Often	13	0.27	27%
	Occasionally	14	0.29	29%
	Seldom	8	0.17	17%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Interpretation of resource management statements

Thirty four (34) of the 48 respondents selected ‘always’ for every project where a project manager was appointed and team members identified during the planning stages of the project. Fourteen (14) of the forty eight (48) felt that this was done ‘often’. It is clear from the respondents that the process of resource allocation is done at the planning stage of the project since there are no individuals who have selected the ‘occasionally’, ‘seldom’ and ‘never’ categories. While in question 8 there is a split of 27% each on respondents who selected ‘always’ and ‘often’, 29% selected ‘occasionally’ with 17% responding to ‘seldom’.

4.5.2 SCOPE MANAGEMENT

The next two analyses address scope management within the planning stages of the project. According to Burke (2006), effective scope management is one of the key factors determining project success. Failure to interpret the client’s needs or problems accurately will produce a misleading of the definition.

Project scope and deliverables are defined

Table 4-6: Frequency Distribution of Statement 2

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	38	0.79	79%
	Often	8	0.17	17%
	Occasionally	0	0.00	0%
	Seldom	2	0.04	4%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

A written project objective statement is prepared

Table 4-7: Frequency Distribution of Statement 3

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	26	0.54	54%
	Often	10	0.21	21%
	Occasionally	12	0.25	25%
	Seldom	0	0.00	0%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Interpretation of the scope management statements

In the first statement, 38 of the 48 respondents selected ‘always’ while 8 of the 48 felt that this was done ‘often’ with two responding to ‘seldom’. The majority, which is 79%, believed that the project deliverables were well-defined. In question 3, 54% of the respondents selected ‘always’ while 21% felt that ‘often’ applied to them with 25% of respondents selecting ‘occasionally’.

4.5.3 SCHEDULE MANAGEMENT

The next set of statements address the schedule management within the planning stages. Scheduling is one of the key aspects in project management. Failure to do proper scheduling

leads to project failure, which also can have an effectiveness of the PLCM in the Distribution. Within Section A there are six statements which address scheduling.

The project work breakdown structure is developed

Table 4-8: Frequency Distribution of Statement 4

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	28	0.58	58%
	Often	12	0.25	25%
	Occasionally	8	0.17	17%
	Seldom	0	0.00	0%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Deliverables for each task are defined

Table 4-9: Frequency Distribution of Statement 5

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	26	0.54	54%
	Often	12	0.25	25%
	Occasionally	10	0.21	21%
	Seldom	0	0.00	0%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Key project interface events are identified

Table 4-10: Frequency Distribution of Statement 6

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	19	0.40	40%
	Often	15	0.31	31%
	Occasionally	14	0.29	29%
	Seldom	0	0.00	0%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Preliminary schedule are developed using PERT/CPM network planning

Table 4-11: Frequency Distribution of Statement 7

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	26	0.54	54%
	Often	14	0.30	30%
	Occasionally	6	0.13	13%
	Seldom	2	0.04	4%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Key projects interface events are managed and controlled

Table 4-12: Frequency Distribution of Statement 11

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	6	0.13	12%
	Often	33	0.69	69%
	Occasionally	9	0.19	19%
	Seldom	0	0.00	0%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Baseline plans and schedules are set

Table 4-13: Frequency Distribution of Statement 12

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	25	0.52	52%
	Often	18	0.38	38%
	Occasionally	3	0.06	6%
	Seldom	0	0.00	0%
	Never	2	0.04	4%
	TOTAL	48	1.00	100%

Interpretation of the schedule management statements

In the first statement 58% of the respondents selected ‘always’,

The second statement 54% of the respondents selected ‘always’,

The third statement 40% of the respondents selected ‘always’,

The fourth statement 54% of the respondents selected ‘always’,

The fifth statement 52% of the respondents selected ‘always’

And lastly 69% of the respondents selected ‘often’.

4.5.4 PROJECT MANAGEMENT

The next statements address all three aspects of project management which are scope, time and cost during the planning stages.

Trade-offs between schedule, scope and budget are optimised

Table 4-14: Frequency Distribution of Statement 9

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	10	0.20	20%
	Often	19	0.40	40%
	Occasionally	12	0.25	25%
	Seldom	7	0.15	15%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Interpretation of the overall project management statement

Forty percent (40%) of the respondents believed that this was done often, while 25% believed it was only done occasionally. There was about 20% of the respondents selected ‘always’, while 15% responded to ‘seldom’.

4.5.5 RISK MANAGEMENT

“In the real world most decisions are based on incomplete information with an associated level of uncertainty about the outcome − it is this uncertainty that leads to risk. So risk has always been an intrinsic part of project management” (Burke, 2006).

The statement below addresses risk management within the project planning stage.

Risks are analysed and contingency plans developed

Table 4-15: Frequency Distribution of Statement 10

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	14	0.30	30%
	Often	16	0.33	33%
	Occasionally	15	0.31	31%
	Seldom	1	0.02	2%
	Never	2	0.04	4%
	TOTAL	48	1.00	100%

Interpretation of the risk management statement

Four percent (4%) of the respondents believed that risks were never analysed and plans developed to manage them, while 2% believed that this was seldom done. The rest of the respondents were spread over as 30% on 'always', 33% on 'often' and 31% on 'occasionally'.

4.5.6 PROJECT MONITORING

The next set of statements addresses project monitoring.

Progress and expenditures are reported and intervals defined

Table 4-16: Frequency Distribution of Statement 13

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	24	0.50	50%
	Often	16	0.34	34%
	Occasionally	2	0.04	4%
	Seldom	1	0.02	2%
	Never	5	0.10	10%
	TOTAL	48	1.00	100%

Variances are analysed and their impact documented

Table 4-17: Frequency Distribution of Statement 14

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	14	0.30	30%
	Often	15	0.31	31%
	Occasionally	10	0.21	21%
	Seldom	4	0.08	8%
	Never	5	0.10	10%
	TOTAL	48	1.00	100%

Interpretation of the project monitoring Statement

For the first statement majority, which is 50%, selected ‘always’, while 34% selected ‘often’. The rest of the respondents, namely 4%, 2% and 10%, selected ‘occasionally’, ‘seldom’ and ‘never’ respectively.

For the statement thereafter, 31% of the respondents believed that variances were analysed and their impact documented, while 30% agreed that this was always done.

The remainder of the respondents is 21% on ‘occasionally’, 8% on ‘seldom’ and 10% on ‘never’.

4.5.7 PROJECT DOCUMENTATION

The next statement addresses project documentation.

Necessary project documentation is maintained

Table 4-18: Frequency Distribution of Statement 15

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	13	0.27	27%
	Often	11	0.23	23%
	Occasionally	22	0.46	46%
	Seldom	2	0.04	4%
	Never	0	0.00	4%
	TOTAL	48	1.00	100%

Interpretation of the project documentation statement

Forty six percent (46%) selected 'occasionally', followed by 27% on 'always', 23% on 'often' and 4% on both 'seldom' and 'never'.

4.5.8 PROJECT SCHEDULING

The statement below looks at project reporting.

Project Status is reported to management and customers

Table 4-19: Frequency Distribution of statement 16

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	18	0.38	38%
	Often	18	0.38	38%
	Occasionally	7	0.15	15%
	Seldom	5	0.10	10%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Interpretation of the project reporting statement

There is an equal split in the number of respondents who believe that project status is reported to management and customers of 38%. 15% of the respondents believe that this is done occasionally while 10% selected seldom.

4.5.9 PROJECT PLANNING

The following statement addresses project planning as a whole.

Re-plan systematically and adaptive action is taken

Table 4-20: Frequency Distribution of Statement 17

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	3	0.52	6%
	Often	30	0.63	63%
	Occasionally	9	0.19	19%
	Seldom	1	0.02	2%
	Never	5	0.10	10%
	TOTAL	48	1.00	100%

Interpretation of the project planning statement

Thirty (30) of the 48 respondents indicated that they agreed that a systematic and action is taken adequately, and nine (9) respondents believe it is done occasionally.

The great percentage is on often showing that people are clear on this statement.

4.5.10 Project Review

The last question addresses project review, which is part of proper project implementation.

Periodic project review meetings are conducted

Table 4-21: Frequency Distribution of Statement 18

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	12	0.25	25%
	Often	25	0.52	52%
	Occasionally	0	0.00	0%
	Seldom	11	0.23	23%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Interpretation of the project review statement

Twenty five (25) of the respondents selected ‘often” and twelve selected ‘always’ this is a great percentage who believes that project reviews meetings are conducted. The rest selected ‘seldom’ which is a minimum percentage of the overall respondents.

4.5.11 FINDINGS – PROJECT PLANNING

This concludes the analysis on statements regarding project planning. The statements were grouped during the analysis to get an overall feel of the different aspects, which are deemed important at the project planning stage. The conclusions drawn on each group are:

Resource Management

From this group of statements one can deduct that the project manager is appointed early, and core project team members are identified at the initial stages of the project.

From the negative response to statement no.8 from a majority of respondents and a lack of a clear response, it may be concluded that there is uncertainty as to the process used for estimation and resource allocation.

Scope Management

From both statements on this group, of which the majority of the respondents fell into the ‘always’ category, one can deduct that project scope and deliverables are well defined at the beginning of each project within Eskom.

Schedule Management

From this group of statements one can deduct that a well-documented process to ensure proper scheduling is followed within Eskom Distribution during the project planning stages.

Risk Management

Given the negative response of the majority of respondents to the statements posed on risk management, there is a high level of uncertainty among the respondents. It may be concluded that there is a possibility that the current risk management process being practiced to identify risk and develop a risk plan is not visible to the project stakeholders.

Project Monitoring

The respondents for both statements in this group selected ‘always’ and ‘often’.

Therefore, one can then conclude that the monitoring tools are clear and visible to most stakeholders.

Project Documentation

There is no sufficient difference between respondents who agreed with the statement, those who disagreed and the balance of respondents who were ambivalent. In light of these responses, the researcher cannot draw any firm conclusion as to whether the necessary project documentation is maintained.

Project Reporting

It seems that even if the reporting is done, the stakeholders do not entirely believe that there is a clear process or the process is not well-documented.

Project Management

From this group of statements one can deduct that a well-documented, integrated project management process is followed within Eskom Distribution.

The above elements are discussed randomly in the literature review and are said to be the main elements that affect project success or project failure. These elements need to be well thought through during the project planning phase to ensure success. If by any chance these elements are ignored, the chances of project failure will be increased.

From the analysis above one can deduct that the majority of the elements are properly followed within Eskom even though there is a gap in the project documentation. This means that employees believe that proper project planning is followed within the organisation.

4.6 VARIABLE 2: ORGANISATIONAL PROJECT PROCESS

This section presents results from the data analysis of the 13 statements posed to the 48 respondents in terms of the Eskom project processes variable of this study.

Frequency distribution tables are presented for each statement (statement number indicated). Responses are grouped into four small groups and then interpreted with reference to existing literature thereafter a conclusion is drawn.

4.6.1 ESKOM PROCESSES

The first group that is analysed under the third variable is Eskom processes. Proper processes ensure good organisational practice. If employees are aware of and follow the processes, chances are that good project management will be ensured.

A documented, integrated project management process for all projects is used

Table 4-22: Frequency Distribution of Statement 1

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	17	0.36	36%
	Often	16	0.33	33%
	Occasionally	14	0.29	29%
	Seldom	1	0.02	2%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Each project is planned, scheduled and monitored on an adhoc basis using a relevant system recommended by the project manager

Table 4-23: Frequency Distribution of Statement 2

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	15	0.31	31%
	Often	18	0.38	38%
	Occasionally	10	0.21	21%
	Seldom	3	0.06	6%
	Never	2	0.04	4%
	TOTAL	48	1.00	100%

Only selected high priority projects are formally planned and managed, with an assigned project manager

Table 4-24: Frequency Distribution of Statement 3

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	10	0.21	21%
	Often	21	0.44	44%
	Occasionally	5	0.10	10%
	Seldom	7	0.15	15%
	Never	5	0.10	10%
	TOTAL	48	1.00	100%

All other projects somehow flow through the organisation with little drive from the project coordinator

Table 4-25: Frequency Distribution of Statement 4

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	4	0.08	8%
	Often	17	0.35	35%
	Occasionally	9	0.19	19%
	Seldom	10	0.21	21%
	Never	8	0.17	17%
	TOTAL	48	1.00	100%

Interpretation of the organisational project processes statements

There is consistency among the four statements grouped above, as most respondents have selected ‘often’ in all the questions. Most respondents have still settled for selecting ‘always’ and ‘often’, which are positive responses.

4.6.2 TRAINING

The next group of statements focuses on the training provided within the organisation to ensure project success.

An experienced project manager is assigned to each project

Table 4-26: Frequency Distribution of Statement 5

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	12	0.25	25%
	Often	20	0.42	42%
	Occasionally	10	0.21	21%
	Seldom	6	0.12	12%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Effective project management training is provided to all project contributors

Table 4-27: Frequency Distribution of Statement 8

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	6	0.13	13%
	Often	13	0.27	27%
	Occasionally	11	0.22	22%
	Seldom	12	0.25	25%
	Never	6	0.13	13%
	TOTAL	48	1.00	100%

Career paths in project management are defined

Table 4-28: Frequency Distribution of Statement 9

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	11	0.22	22%
	Often	17	0.35	36%
	Occasionally	17	0.35	36%
	Seldom	3	0.06	6%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Interpretation of the training statements

Forty two percent (42%) of respondents selected 'often' for Question 5. For Question 8, 27% of the respondents selected 'often' with a split in the last question (9) with 35% on 'occasional' and 'often'.

4.6.3 CROSS-FUNCTIONAL

The next group of statements focuses on cross-functional issues within the organisational structure.

Project roles and responsibilities are well-defined and understood by everyone in the organisation

Table 4-29: Frequency Distribution of Statement 7

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	8	0.16	16%
	Often	14	0.30	30%
	Occasionally	21	0.44	44%
	Seldom	5	0.10	10%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Functional managers always double as project managers

Table 4-30: Frequency Distribution of Statement 11

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	10	0.21	21%
	Often	14	0.29	29%
	Occasionally	4	0.08	8%
	Seldom	16	0.34	34%
	Never	4	0.08	8%
	TOTAL	48	1.00	100%

Project managers are selected mainly because of availability

Table 4-31: Frequency Distribution of Statement 12

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	10	0.21	21%
	Often	15	0.31	31%
	Occasionally	11	0.22	22%
	Seldom	6	0.13	13%
	Never	6	0.13	13%
	TOTAL	48	1.00	100%

Interpretation of the cross-functional statement

Question 7 has the largest group of respondents at 44%, which is ‘occasionally’, while question 11 has 34% of the respondents responding to ‘seldom’. The last question in the group produced 31% on ‘often’.

4.6.4 QUALITY

The last two statements in this section address quality of the processes within the organisation.

Continued improvement is made in the project management process and related practices

Table 4-32: Frequency Distribution of Statement 10

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	16	0.33	33%
	Often	20	0.42	42%
	Occasionally	10	0.21	21%
	Seldom	2	0.04	4%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Project planning and control support is provided to project teams

Table 4-43: Frequency Distribution of Statement 13

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	23	0.48	48%
	Often	12	0.25	25%
	Occasionally	13	0.27	27%
	Seldom	0	0.00	0%
	Never	0	0.00	4%
	TOTAL	48	1.00	100%

Interpretation of the quality statement

The first statement in this group has 42% of the respondents answering ‘often’ and 33% answering ‘always’, while the last question has a clear 48% answer to ‘always’.

4.6.5 FINDINGS – PROJECT PROCESSES

This concludes the data analysis of statements pertaining to project processes. The statements were grouped during the analysis to get an overall feel of the different aspects, which are important. The groups were divided into:

Processes

Given the positive response received to these statements, one can deduct that project processes are defined clearly. The challenge may, however, be to the individual capacity to follow the processes.

Training

The respondents have shown that there is a level of training provided within the business for the project management environment. On most projects, there are experienced project managers while there is a level of training provided for project contributors. The career paths are somehow not properly communicated to the employees.

Cross-functional (organisational structure)

Given the negative response from a majority of respondents and the lack of respondents who have agreed with the statements, it may be concluded that project roles and responsibilities are not well-defined and understood by employees within the business. The responses show that there is a clear distinction between functional managers and project managers, as most respondents say there is seldom duplication in these functions.

Quality of the processes

There is a positive response on both statements posed for quality, which clearly states that there is good quality in improving the current processes within the business.

4.6.6 SUMMARY DISCUSSION OF DATA ANAYSIS

The following discussion concludes the three variables discussed above.

Project Planning

- The findings show that within Eskom the project team members are appointed early in the project to ensure proper **resource planning,** though it was also clear that these resources are not analysed for availability and over commitment.

  As the projects are released within certain categories, the teams are allocated by default. There is no proper tool to check if those members are available to execute the work allocated to them. From the literature review one learns that it is important to

allocate one's resources correctly, whether they are project teams (persons) or equipment. According to Burke (2006), resource planning is forecasting the resources required to perform the scope of work within the planned time. This makes it clear that, should the resources be over–committed, then the possibility of them completing their activities on time is minimised.

- According to the respondents, it is also clear that the project scope statement is well-defined at the planning stages and project scope deliverables are also well-defined. One can deduct that **scope management** is well under control during the planning stages of the project. According to Boston University Corporate Education Center, "scope planning is the most important phase in any project because effective scope planning ensures an understanding of the business case".
- Proper **project scheduling** at the planning stage ensures project success.
  From the response one can see that project work breakdown structure is developed; deliverables for each task are defined; the schedules are developed early in the project and there is also a positive response in terms of managing and controlling the key activities during the planning stages. Then, by developing a clear project schedule with the project team, it lies to the project manager to ensure that those activities are completed within the allocated time.
- It is also clear from the findings that there is a gap in **risk management** within the organisation. The response on risk identification and analysis in the conceptual phase or mitigation plans being developed was very poor, which suggests that this is not properly done within the organisation. "The risk management plan needs to be communicated to all the project participants and, where necessary, followed up with appropriate training and practice runs" (Burke, 2009).

Organisational Project Practices

The findings on organisational project practices look at the way in which things are done during project execution and the impact of those practices on the overall organisation performance. For this study, the researcher did not analyse the business performance versus project management success/failure because this would require analysis of the balance sheet of the entire Distribution Division. That scope is beyond the research topic discussed in this document. The points discussed above on organisational project practices have led to the following findings:

- The projects are never completed on or before their original **schedule plan,** which will contribute to poor organisational performance and customer dissatisfaction. From the responses, one can conclude that the delays are normally unacceptable, severe and have a serious impact on the organisational performance.
- The cost estimated at the planning stages of the project is regularly not met, which may be due to poor **cost estimation** or severe time delays causing price increases on material used, interest paid during construction and project overheads. According to the respondents, projects are completed with cost overruns that have a serious impact on the business.
- From the responses, it seems that the **project teams** are not worried about project costs while these overruns reduce profit; thus having a negative result on business performance.
- There is a great level of **teamwork** within the business but employees also believe that this teamwork is normally influenced by the assigned project manager. Employees believe that teamwork can still be improved by providing proper training.
- Most of the time technical objectives are not met, causing client dissatisfaction, which could be a factor contributing to **poor business performance,** while a lack of confidence in project schedules causes unpredictability for customers.

Project Processes

Following are the findings on project processes, training provided and cross functional issues.

- A well-documented, integrated **project management process** (NACVC, ACVC, etc.) is used and could contribute to the positive results obtained at the project planning stages. This process is properly defined; therefore, projects flow through the organisation with little drive from the project leaders in terms of process.
- It is also clear that most of the time an experienced project manager is assigned to each project. Effective **project management training** is provided throughout the business. This may contribute to the processes being followed correctly, for people have clear knowledge of the processes.
- There is no clear differentiation between **functional managers** and **project managers** with the Eskom matrix structure. This organisational structure may lead to poor project management since employees are still reporting to their functional managers while rendering service to the project managers.

The next chapter contains a detailed discussion of these findings and compares them to the research questions which the study seeks to address.

4.7 VARIABLE 3: PROJECT OPERATIONS PRACTICE

This section presents results of the data analysis of the 17 statements posed to the 48 respondents in terms of the Eskom project practices variable of this study. Frequency distribution tables are presented for each statement (statement number indicated).

Responses are then grouped and interpreted with reference to existing literature and a conclusion is drawn.

4.7.1 SCHEDULING

The first grouping looks at the scheduling during project execution.

Projects are completed on or before their original schedule commitment

Table 4-34: Frequency Distribution of Statement 1

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	0	0.00	0%
	Often	3	0.06	6%
	Occasionally	16	0.34	34%
	Seldom	26	0.54	54%
	Never	3	0.06	6%
	TOTAL	48	1.00	100%

Projects are completed within an acceptable amount of delay

Table 4-35: Frequency Distribution of Statement 2

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	0	0.00	0%
	Often	7	0.14	14%
	Occasionally	18	0.38	38%
	Seldom	19	0.40	40%
	Never	4	0.08	8%
	TOTAL	48	1.00	100%

Projects are completed with delays that seriously impact the organisational performance

Table 4-36: Frequency Distribution of Statement 3

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	11	0.23	23%
	Often	17	0.35	35%
	Occasionally	13	0.27	27%
	Seldom	7	0.15	15%
	Never	0	0.00	4%
	TOTAL	48	1.00	100%

The impact of ineffective project management practice is late completion, which reduces economic growth and service Delivery

Table 4-37: Frequency Distribution of Statement 4

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	28	0.58	58%
	Often	18	0.38	38%
	Occasionally	2	0.04	4%
	Seldom	0	0.00	0%
	Never	0	0.00	4%
	TOTAL	48	1.00	100%

Interpretation of the project scheduling statements

Fifty eight percent (58%) of the respondents believed that projects were seldom completed on or before their original schedule commitment, while 40% believed that it was 'seldom' for projects to be completed within an acceptable amount of delay. Thirty five percent (35%) and 23% of respondents selected 'often' and 'always' respectively when asked if they thought the delays on projects affected the business performance.

The last category has 58% respondents believing that late completion of projects impacted the service delivery of the business.

4.7.2 BUDGETING

This group of statements looks at the **budgeting** impacts during project execution.

The impact of cost overruns and under-expenditure always impacts negatively on the business. The statements below have been structured to get the feel on how employees view this impact.

Projects are completed on or under their original budget

Table 4-38: Frequency Distribution of Statement 5

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	0	0.00	0%
	Often	4	0.08	8%
	Occasionally	16	0.33	33%
	Seldom	27	0.57	57%
	Never	1	0.02	2%
	TOTAL	48	1.00	100%

Projects are completed with an acceptable level or budget

Table 4-39: Frequency Distribution of Statement 6

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	0	0.00	0%
	Often	11	0.23	23%
	Occasionally	21	0.44	44%
	Seldom	16	0.33	33%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Projects are completed with cost overruns that seriously impact the organisation

Table 4-40: Frequency Distribution of Statement 7

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	0	0.00	0%
	Often	24	0.50	50%
	Occasionally	21	0.44	44%
	Seldom	3	0.06	6%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

The team does not worry about project cost

Table: 4-41: Frequency Distribution of Statement 8

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	3	0.06	6%
	Often	7	0.15	15%
	Occasionally	12	0.25	25%
	Seldom	12	0.25	25%
	Never	14	0.29	29%
	TOTAL	48	1.00	100%

The impact of ineffective project management practice is cost overruns and reduces profit; thus, it results in poor business performance.

Table 4-42: Frequency Distribution of Statement 9

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	18	0.38	38%
	Often	23	0.48	48%
	Occasionally	2	0.04	4%
	Seldom	5	0.10	10%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Interpretation of the project budgeting statements

Fifty seven percent (57%) of the respondents believed that it was seldom that projects were completed on or under their original budget, while 44% were really not sure of the following question, namely that project were completed with an acceptable level or budget. Fifty percent (50%) of respondents believed that projects were completed with cost overruns that seriously impacted the business.

4.7.3 Teamwork

The next group of questions looks at **teamwork** within the business. From the literature review one can see that different writers dwelt much on the importance of teamwork in ensuring project success and avoiding project failure.

Teamwork on most projects in our organisation is excellent

Table 4-43: Frequency Distribution of Statement 1

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	2	0.04	4%
	Often	23	0.48	48%
	Occasionally	19	0.40	40%
	Seldom	4	0.08	8%
	Never	0	0.00	4%
	TOTAL	48	1.00	100%

Teamwork on most projects in our organisation is good within the technical functions but poor between the technical support services and operations

Table 4-44: Frequency Distribution of Statement 2

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	3	0.06	6%
	Often	14	0.30	30%
	Occasionally	29	0.60	60%
	Seldom	2	0.04	4%
	Never	0	0.00	4%
	TOTAL	48	1.00	100%

Teamwork on most projects in our organisation is influenced by project managers

Table 4-45: Frequency Distribution of Statement 3

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	26	0.55	55%
	Often	14	0.29	29%
	Occasionally	4	0.08	8%
	Seldom	4	0.08	8%
	Never	0	0.00	4%
	TOTAL	48	1.00	100%

Teamwork on most projects in our organisation can be improved with proper training

Table 4-46: Frequency Distribution of Statement 4

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	42	0.88	88%
	Often	4	0.08	8%
	Occasionally	2	0.04	4%
	Seldom	0	0.00	0%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Teamwork on most projects in our organisation is encouraged in all aspects of projects

Table 4-47: Frequency Distribution of Statement 5

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	33	0.69	69%
	Often	4	0.08	8%
	Occasionally	9	0.19	19%
	Seldom	2	0.04	4%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Interpretation of the teamwork statements

The response to the first statement concerning teamwork on most projects was excellent with 48% answering ‘often’ and 40% answering ‘occasionally’, while the respondents reacting to the second statement were not sure because the majority

(60%) selected ‘occasionally’. The statement pertaining to project managers being able to influence teamwork received positive feedback from 55% of the respondents.

The respondents (88%) felt that training would improve teamwork and 69% of them felt that teamwork was encouraged.

4.7.4 IMPACT OF INEFFECTIVE PROJECT MANAGEMENT

The last group of statements in this category looks at the impact of ineffective project management practices, and the role it plays in customers and employees.

Technical objectivity is not met, causing client dissatisfaction

Table 4-48: Frequency Distribution of Statement 1

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	27	0.56	56%
	Often	11	0.23	23%
	Occasionally	8	0.17	17%
	Seldom	2	0.04	4%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Excessive conflicts, working overtime and high stress lead to low morale and high staff turnover

Table 4-49: Frequency Distribution of Statement 2

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	11	0.23	23%
	Often	20	0.42	42%
	Occasionally	13	0.27	27%
	Seldom	4	0.08	8%
	Never	0	0.00	4%
	TOTAL	48	1.00	100%

Lack of confidence in project schedule causing unpredictability for customers and in forecasting financial results

Table 4-50: Frequency Distribution of Statement 3

(Source: Own Source, 2015)

	Value	Absolute Frequency	Relative Frequency	Percentage
RESPONSE	Always	14	0.29	29%
	Often	27	0.56	56%
	Occasionally	5	0.10	10%
	Seldom	2	0.04	4%
	Never	0	0.00	0%
	TOTAL	48	1.00	100%

Interpretation of the statement regarding the impact of ineffective project management practices

The first statement in this group looked at the impact of technical objectivity not being met. Fifty five percent (55%) of the respondents felt that it greatly affected clients and

23% responded that it happened often. The second statement looked at the impact on employees. The respondents believed that it was negative (42% on 'often'). The level of confidence affecting customers and financial results is supported by 56% of the respondents answering 'often'.

4.7.5 FINDINGS – ORGANISATIONAL PROJECT PRACTISES

This concludes the analysis of the statements pertaining to organisational project practices. The statements have been grouped during the analysis to get an overall feel of the different aspects, which are important. The groups are divided into:

Project Schedule

The response from most respondents is clear that there is a challenge within the business in implementing projects on time. Respondents believe that these delays have a serious impact on business performance, while the overall impact is on the service delivery; thus, impacting the economy.

Project Budgeting

Judging from the poor responses from this group of statements addressing budgeting one can deduct that there are serious cost or expenditure challenges. The cost management seems to be an issue that the business is struggling to solve.

Teamwork

The feedback makes it clear that currently there is a challenge in the way teams interact but there is great dependency on the style of the project manager. The respondents feel that with proper training there is great room for improvement in the way in which teams interact.

Impact of ineffective project management practices

One can conclude that the employees understand the impact of ineffective project management practices on the business. From the responses, a deduction can be made that a lack of properly stating the technical needs of the customer causes customer dissatisfaction. While working improperly causes stress and depression among employees. This leads to low morale and a high staff turnover.

4.8 CONCLUSION

While the project life cycle in Eskom (electricity utility) differs somewhat from other industry life cycles (e.g. Sasol BD&I Model), the phases and approval gates are very similar.

A Benefits Realisation Phase which monitors if the benefits, as set out in the business case are being realised during the Operations Phase, needs to be added during the next review of the Distribution Division (DX) Project Life Cycle Model (PLCM) at the end of 2018. Some investigation should be done to establish if there is a requirement to develop more templates.

As Project Definition Readiness Assessment (PDRA) reviews have recently been implemented in Eskom, the requests for these reviews must still be included in the activities of the DX PLCM. As the Eskom Limpopo Operating Unit projects are not complex of nature (i.e. mostly small to medium like-to-like replacement projects), the DX PLCM does not have to cater for complexity.

CHAPTER 5: DISCUSSION OF FINDINGS

5.1 INTRODUCTION

The previous chapter illustrated the survey results and related them back to the research problems defined in Chapter 1. It also analysed each finding per project variable; therefore, drawing a summary of findings for each. This chapter contains an in-depth discussion of the relevant results versus the research questions, the resolution to the research problems, conclusions that can be drawn and the summary of the findings.

5.2 DISCUSSION OF THE RESEARCH QUESTIONS

According to Brink (2006) and Maree (2009) the results from the data analysis require interpretation in order to make sense of the analysed data. The researcher needs to point out the implication of the results, and show the relationships of the findings and how these findings are interpreted by research. The chapter is concluded by determining if the research question has been answered in relation to the findings in the research study and the literature review.

5.2.1 RESEARCH QUESTION 1

What constitutes projects to be executed late?

Firstly, the research question seeks to discover the main contributors to project being executed late. Main contributors can be either be unclear scope of work, time and cost control the key elements in determining project success/failure within Eskom Distribution and constituting to projects being executed late. Scope management is defined by PMBOK as "the processes required ensuring that the project includes all the work required, and only the work required, to complete the project successfully and in expected time. It is primarily concerned with defining and controlling what is or what is not included in the project" (Burke, 2006).

The question regarding scope management is tackled in the first variable, namely project planning, by the following statements, which were part of the survey:

• Project scope and deliverables are defined.

• A written project objective statement is prepared.

It is clear from the responses that a clear scope statement is developed and deliverables clearly defined during the planning stages of the project (refer to Chapter 4 on the findings). Therefore, one can conclude that scope control is one of the main elements that determine project success or failure within Eskom Distribution and it ensures that project get to be done within required time.

Secondly, the research question seeks to find whether time allocated to the project is one of the main determinants of project life cycle model being ineffective within Eskom Distribution. Also based on the literature review in Chapter 2, the researcher discusses the importance of proper project scheduling in ensuring project success. The statements on project scheduling are found in variables 1 and 2 in Chapter 4.

The related statements are:

- The project work breakdown structure is developed.
- Deliverables for each task are defined.
- Key project interface events are identified.
- Preliminary schedules are developed using PERT/CPM network planning.
- Key projects interface events are managed and controlled.
- Baseline plans and schedules are set.
- Projects are completed on or before their original schedule commitment.
- Projects are completed within an acceptable amount of delay.
- Projects are completed with delays that seriously impact the organisational performance.
- The impact of ineffective project management practices is late completion, which reduces economic growth and service delivery.

The first group of statements received good feedback in that during planning stages the project baseline plans are discussed and schedules done accordingly. During project execution scheduling then became a challenge and lagged behind, impacting negatively on the total project outcome. Therefore, one may agree with the research question that time control is one of the main elements that determines project success or failure within Eskom Distribution.

Lastly, the research question seeks to address whether cost is one of the main causes of project success or failure within Eskom Distribution. Based on the literature review in

Chapter two and findings on the previous chapter, one can see that cost plays an important role in project failure or success.

The statements on project budgeting found in variable 2, organisational project practices, show the impact of proper and improper budgeting. The responses are clear that there is still a challenge in cost estimation and meeting cost allocated on projects.

The following statements were posed to employees:

- Projects are completed on or under their original budget.
- Projects are completed with an acceptable level or budget.
- Projects are completed with cost overruns that seriously impact on the organisation.
- The team does not worry about project costs.
- The impacts of ineffective project management practices are cost overruns and reduced profit; it thus results in poor business performance.

In the previous chapter, one could see that responses to these statements were not good. Therefore, the implication is that it affects the business negatively. This leads to the percentage of failed projects increasing; therefore, minimising project success within Eskom Distribution. The result thus is that cost control is one of the main elements that determine project success or failure within Eskom Distribution.

5.2.2 RESEARCH QUESTIONS 2 and 3

What strategies are being implemented within the project management department in order to improve organisational performance and how are the strategies working?

The second research question seeks to determine whether the processes being used within the organisation have an impact on the organisational performance.

The statements included in the third variable are:

- A documented, integrated project management process for all projects is used.
- Each project is planned, scheduled and monitored on an ad hoc basis, using a relevant system recommended by the project manager.
- Only selected high priority projects are formally planned and managed, with an assigned project manager.
- All other projects somehow flow through the organisation with little drive from the project coordinator.

The responses showed that a process is followed within the organisation but there may be a gap in ensuring that the process is understood well and followed by the employees. One can then conclude that documented project processes do contribute to ensure project success within Eskom Distribution.

Teamwork is also identified as a main contributory factor in improving organisational performance. In the discussion of the second variable – organisational project practices – there are statements to address the level of teamwork found within the organisation.

These statements are:

- Teamwork on most projects in our organisation is excellent.
- Teamwork on most projects in our organisation is good within the technical functions but poor among the technical support services and operations.
- Teamwork on most projects in our organisation is influenced by project managers.
- Teamwork on most projects in our organisation can be improved with proper training.
- Teamwork on most projects in our organisation is encouraged in all aspects of the project.

The perceived responses show that the employees appreciate that teamwork affects the organisational performance. Therefore, it needs to be improved through proper training.

It was also clear that the project manager assigned to each project has a great influence on the overall teamwork in that project. One can therefore conclude that teamwork contributes to project success and improves organisational performance.

5.2.3 RESEARCH QUESTION 3

What are the obstacles to have the effective project management life cycle?

The Eskom Distribution Project Life Cycle Model (DX PLCM) is used to define the period from the start-up of all projects to the hand-over of the finished product to those who will operate and maintain it. The DX PLCM allows a project to be considered as a sequence of phases which provides the structure and approach for progressively delivering the required outputs according to the governance and control needs of the organisation. These DX PLCM phases follow a logical sequence and provide a framework for planning, scheduling, budgeting, manpower and resource allocation, and reviewing while a project progresses

through the project life cycle. Whereas the DX PLCM differs somewhat from the life cycles in other industries, the phases and approval gates are very similar.

Systems thinking is used as the approach to discuss (interpret) the data collected during the survey on the effective application of the DX PLCM. Systems theory is regarded as a major breakthrough in understanding the complex world of organisations. System thinking, which is a tool used in systems analysis, is used to view systems from a broad perspective to find the structure, patterns and cycles in systems and to help identify the real causes of issues and how to address them. Aronson (1996) describes system thinking as a process to understand how things influence one another within the whole. Systems thinking focuses on how the thing being studied interacts with the other constitutes of the system (a set of elements that interact to produce behaviour) of which it is part. This means that instead of isolating smaller and smaller parts of the system being studied, system thinking works by expanding its view to take into account larger and larger numbers of interactions as an issue is being studied.

The majority of Limpopo Operating Unit Asset Creation Department projects are not complex of nature (i.e. mostly small to medium like-to-like replacement projects) and therefore does not have to allow for dynamics, variability, iterations, uncertainty, and resulting changes of initial conditions with the need to adjust the original objectives and project plans accordingly. Therefor the current DX PLCM is adequate.

5.3 LIMITATIONS OF THE STUDY

The study was conducted in Eskom Distribution Limpopo Operating Unit which is divided into four zones namely: Polokwane, Lephalale, Thohoyandou and Groblersdal. All the zones are of different ranking within the Eskom business unit size and overall performance of the operating unit. The study ensures that an average can be reached by analysing performance of the Limpopo Asset Creation Department within those five zones. The data for this study were collected randomly between the five above mentioned zones of the Eskom Distribution Limpopo Operating Unit.

Eskom Distribution is a big division within the Eskom group. The results of this research will not give a total picture. This is because each division will conform to the standards that are relevant to its environment. Therefore, each Operating Unit will apply standards that are beneficial to it as long the organisational culture, vision and goals remain the same.

5.4 DELIMITATIONS OF THE STUDY

The study does not attempt to give a step-by-step guideline of things to do to ensure project success or points to follow to avoid project failure. It is an evaluation by means of a questionnaire and research questions that seek to analyse the current challenges within the project management environment and recommend ways to improve.

The next chapter presents the summary, conclusions and recommendations based on these findings.

5.5 CONCLUSION

This concludes the summaries of findings as per research questions from the quantitative analysis of the 48 statements posed to the 48 respondents arranged into the three main variables of this study with sub-categories within each of the main themes. The next Chapter provide recommendation to and detail conclusion on the result

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

"…..success is measured in subjective and objective ways, and it means different things to different people" (Freeman & Beale, 1992).

During the research study, Eskom proposed several changes that would address some of the challenges discovered by this study through the introduction of a project management office and project office framework. This is part of the new strategies Eskom new CEO is implementing to take the organisation to different heights. The research questions sought to discover the extent of project success and failure within Eskom Distribution, and the impact this has on organisational performance.

The approach was to do a survey to answer these aspects through 48 statements divided into three variables after a summary finding on each variable was given. The researcher combined these findings to address the research questions found in Chapter 1.

The study also made the researcher understand that:

- Eskom has a high aspiration towards operational excellence.
- Eskom recognises that its poor current performance is driven by a misalignment between the skills base and process maturity, and that a step change is required.
- Eskom needs a radical shift in its operating systems. Although different options exist, Eskom should pursue a 'lean execution-driven' operating system, combining process compliance with frontline problem solving capabilities.
- A programme management office will coordinate and integrate the process.
- The first objectives of this research were attained in both Chapter 4 and 5 through the questionnaire analysis and its discussion. The research questions were discussed in detail based on the survey analysis and concluded each point that was raised as part of the study.

It can be concluded from the findings that:

- Projects are not completed in time and within cost.
- There are poor cost and time estimation practices in place.
- Project management processes are not structured well.
- There are severe shortages of skills to implement projects correctly.
- Planning is done based on the PMBOK with gaps on other aspects (e.g. risk management).

- There are higher difficulties for implementation due to complex structure.

6.2 OBJECTIVES OF THE STUDY

On Chapter 1 the objectives to be investigated were outlined as follow, to determine the factors influencing its project management life cycle performance. In order to achieve the objectives of the study, there is a need to determine what factors are influencing the performance of the project management life cycle. There is a need to determine the factors that are obstacles to the delivery of projects in time and within the approved budget. To improve the existing framework for maintaining balance in application of all (nine) knowledge areas of Project Management such that it could help project managers by mentioning precise number of minimum essential functions of Human Resource Management explaining an easy and effective manner to exercise them.

The study did meet the objectives by determining factors influencing project management life cycle performance in the Distribution environment through analysis of the way current projects are being managed.

Due to the nature of this research project, a questionnaire was used as measuring instrument. The questionnaire was designed to address the research objective and supports the problem statement. The data comprise general details and a list of information acquired from the questionnaire concerning region, years working at Eskom and the period in the project environment. The 48 statements were organised into three main variables, namely project planning, organisational project practices and project processes. Each category addressed the nine elements of the PMBOK. Criteria for Evaluation

6.3 CONTRIBUTION OF THE STUDY

The following is recommended to Eskom Distribution in order to reach the desired state:

- The establishment of a project management office to ensure a one-stop centre for project information. This will ensure knowledge management by sharing and storing previous information.
- Proper costing tools should be implemented throughout the organisation in order to improve the current costing challenges.
- Structures need to be put in place to promote project team support.
- Detailed execution policies and procedures are to be visible and understood by all employees.

- Project managers need to be trained in a style of management that will ensure harmonised teamwork and great results.
- Proper coaching and mentorship programmes that will ensure project success and transfer of skills should be implemented or initiated.
- Improvements in seemingly unimportant small issues such as project monitoring, skills retention, project reviews, etc. should be considered.
- In order to achieve the 'desired state' aspiration, Eskom will have to implement a set of initiatives geared towards increased customer satisfaction.

The compilation of proper outline schedules will establish more accurate project life cycles for the OU projects. The outline project schedules will be used to determine the milestone dates in the OU and will be more accurate. Milestone dates will be continuously updated after phase gate approvals or if major changes in the outline schedules occur. Governance of TP projects will improve drastically to ensure that TP projects will contribute towards the organisational strategic objectives of optimally maintaining Eskom's generating assets for the duration of its economic life.

6.4 SUMMARY

Eskom strives towards a desired state that will incorporate the abovementioned changes, therefore achieving:

- An organisation that operates along international best project management practice norms;
- An efficient business model, both in terms of service delivery and cost;
- A business model that provides the capacity to deal with current and future industry challenges;
- An organisation that has industry credibility in terms of its capacity to deliver;
- An organisation that is empowered in the right places to benefit the customer and the country;
- An organisation that maximises economies of skills and scale so that frontline staff are enabled to execute projects effectively and efficiently;
- An organisation that can sustain itself going into the future; and
- An organisation that will demonstrate that it anticipates, understands, provides and responds to current and future customer needs.

6.5 CONCLUSION

It is concluded that the research study undertaken was successful. From the comparative evaluation it has been shown that the Distribution Division Project Life Cycle Model (DX PLCM) is in line with current and next Distribution project life cycle models. As Distribution projects are mostly not of a complex nature (i.e. mostly small to medium like-to-like replacements projects), the DX PLCM is adequate for managing Limpopo Operating Unit projects.

The research study has also revealed that the DX PLCM is not applied effectively to successfully deliver DX projects. The researcher therefore has made several suggestions in order to improve the delivery of DX projects. These suggestions will be presented to top and senior management in Eskom LOU DX for consideration and implementation.

Further research on this topic is encouraged to determine if more specific strategies could be developed to improve the project management environment within Eskom Distribution. Such research will also contribute towards analysing the impact the new strategies would have on project success and failure, and ensuring that DX PLCM is effective.

7. REFERENCES

ASSET CREATION LIMPOPO –Standard Implementation Document 2013/14.

Boston University Corporate Education Center. (2008). Best Practices for Project Manager. Available from www.butrain.com [Accessed 15 June 2010].

Burke, R 2006: Project Management: Planning and Control Techniques 5th edition. Cape Town: Burke Publishers.

Cleland, D & Ireland, L 2002: Project Management Strategic Design and Implementation. New York: McGraw Hill Publishers

Cooke-Davies, T., Cicmil, S., Crawford, L., & Richardson, K. (2007). We're not in Kansas anymore, Toto: Mapping the strange landscape of complexity theory and its relationship to Project Management. Project Management Journal, 38(2), 50-61.

Cooke-Davies, T.J 2002: The "real" success factors in projects. International Journal of Project Management, 20:185-190.

Cooper, D.R & Schindler, P.S 2007. Business Research. Available from http://www.crg.com/busresearch/ [Accessed 1 May 2009].

Cooper, D.R. & Schindler, P.S. 2003: Business research methods. International edition. 8th edition. New York: McGraw-Hill.

Crawford, P. & Englan D. 2006: Common Causes of Project Failure, UK Office of Government Commerce. Available www.ogc.gov.uk.

Creswell, J.W 2003: Research design - qualitative, quantitative and mixed method approaches. 2nd edition. UK: Sage Publications Inc.

CRESWELL, J.W. 2013. Research Design. Qualitative, Quantitative and Mixed Methods Approach. New York: Thousand Oaks.

De Marco, A.A. 2005: Executive article - Six steps to project success. Cost Engineering Journal, Vol. 47, 9.

Dick, B. 2006: Action research literature 2004-2006: Themes and trends. Action

Distribution Network Asset Creation-IDP Document, 2012: Limpopo Operating Unit, Polokwane

ESKOM DISTRIBUTION NETWORK ASSET CREATION-IDP Document 2012/13.

Eskom Holdings Limited Annual Report, 2014: Megawatt Park, VOL 13

Fish, E. 2006: 'Managing Project Life: A Project Management Model for Successful Lifestyle Management', Project Management Institute Seminars and Symposium, 28 September to 02 October 1991, Dallas, Texas, USA.

Furlonger, D. 2005: All over the same bar – but some are higher. Financial Mail. Available from http://www.financialmail.co.za [Accessed 20 April 2010].

Goeghegan, L & Dulewicz, V 2008: Do project managers' leadership competencies contribute to project success? Project Management Journal, Vol. 39, No. 4, 58–67 2008 by the Project Management Institute Published online in Wiley Inter-Science.

Institute Published online in Wiley InterScience 2008: Do Project Managers' Leadership Competencies Contribute to Project Success? Project Management Journal, Vol. 39, No. 4, 58–67

Jugdev, K & Müller, R 2005: A Retrospective look at our Evolving Understanding of Project Success. Project Management Journal Vol. 36, No. 4, 19-31, ISSN 8756-9728/03

Leedy, P.D & Ormrod, J.E 2005: Practical research. New Jersey: Pearson-Merill Prentice-Hall.

MAREE, K. 2007. First steps in Research. Pretoria: Van Schaick.

MCMILLAN, J.H and S SCHUMACHER. 2006. Research in education. A conceptual introduction. 5th ed. London: Longman.

Morgan, J.A. 2007: A symphony of power: the Eskom story. South Africa. Chris van Rensburg Publications Pty (Ltd).

Office of Government Commerce (OGC) in the UK. 2005: OGC Best Practices – Common Causes of Project Failure. London. Available from www.ogc.gov.uk [Accessed 23 April 2010].

Parviz, F.R & Ginger, L. 2002: The Advanced Project Management Office a Comprehensive look at Function and Implementation. Florida, USA: St. Lucie Press.

Pinto, J.K & Kharbanda, O.P 1995: Successful Project Manager: Leading your Team to Success. London: International Thomson Publishing.

Pinto, J.K & Prescott, J.E 1988. Variations in Critical Success Factors over the Stages in the Project Life Cycle. Journal of Management, 14(1):5-18.

Project Management Institute Vol. 36, No. 4, 19-31, ISSN 8756-9728/03.

Project Success. Project Management Journal Vol. 36, No. 4, 19-31, ISSN 8756-9728/03

Rae, T & Eden, C 2002: Project Success and Failure in Major Engineering Projects.

Research, 4(4):439-458.

Schwalbe, K., (2004), Information Technology Project Management, 4th Edition, Canada, Thomson Course Technology.

Shenhar, A 2007: Reinventing Project Management: The Diamond Approach to Success Growth and Innovation. USA, Library of Congress Cataloging Publication

Shenhar, A.J & Wideman, M 2000: Optimizing Project Success by matching PM style with project type. Available from www.pmforum.org [Accessed 5 May 2010].

Spence, P. & Jolly, A. 2009: “Time Estimation for Project Management Life Cycle: A Simulation Approach”, IJCSNS International Journal of Computer Science and Network Security, vol.9 no.5, May, pp. 211-215.

ANNEXURE

Annexure A: DX PLCM Phases and Activities
Pre-project phase

01. Identify needs and opportunities

02. Screen projects and consolidate potential project list

03. Record project/investment outline and high-level user requirement (project charter) and identify stakeholders

Concept phase

04. Establish project team for concept phase

05. Identify alternatives

06. Establish scope of conceptual engineering

07. Develop outline project schedule, monitor and control time progress

08. Obtain CRA approval for conceptual engineering

09. Do conceptual engineering of project

10. Establish short list of alternatives

11. Decide whether any environmental authorisations are required or not

12. Review project concept and selection of alternatives

13. Compile the detailed user requirement specification (URS)

14. Compile high level work break down structure

16. Compile order of magnitude estimate

15. Identify long lead time items

17. Evaluate implications on resources

18. Prepare project concept motivation or Definition Release Approval (DRA)

19. Perform concept phase gate review and submit project concept motivation or Definition Release Approval (DRA) for approval

20. Approve project concept motivation or Definition Release Approval (DRA)

Definition phase

21. Confirm project priority

22. Update Business Unit Technical Plan

23. Confirm resources for the definition phase

24. Appoint project team for the definition phase

25. Develop and issue project management plan for the definition phase

26. Issue definition phase responsibility matrix and manage Project Team

27. Facilitate definition kick-off meeting

28. Issue definition phase schedule, monitor and control time progress

29. Monitor and control the definition phase cost as per the definition phase cost management plan

30. Coordinate projects in same area

31. Identify and obtain other legal and statutory authorisations

32. Do basic engineering

33. Identify standard**s and/or compile specifications**

34. Obtain environmental authorisations

35. Perform scope review and freeze scope

36. Compile final work breakdown structure

37. Compile semi-definitive estimate

38. Do project risk analysis and manage project risks for remainder of project

39. Do project motivation

40. Finalise project management plan for the execution phase

41. Perform definition phase gate review and submit project motivation for approval (ERA)

42. Approve Execution Release Approval (ERA)

Execution Phase

43. Issue project management plan for the execution phase

44. Issue detailed project execution schedule and monitor time progress

45. Issue cost control procedure, monitor and control project cost

46. Issue execution phase responsibility matrix and manage Project Team and human resources

47. Facilitate project kick-off meeting

48. Implement variation from plan (VP) and trend procedures

49. Do detailed engineering

50. Issue environmental management plan

51. Authorise detailed design (i.e. design freeze)

52. Issue drawings

53. Compile project technical specifications and works information

54. Compile relevant procurement documentation

55. Confirm the contract strategy

56. Issue enquiries and receive tenders

57. Compile tender report(s) and recommendations

58. Adjudicate tenders, place order(s)/award contract(s)

59. Facilitate construction kick-off meeting

60. Facilitate contract quality assurance meeting

61. Facilitate site/safety/coordination meetings

62. Submit reports to Client and monitor the effectiveness of communications plan

63. Manage and administer contract(s)

64. Review and approve quality control plans (QCPs)

65. Integrate contractor(s) schedule(s) and update detailed project execution schedule

66. Expedite contractor(s) deliveries

67. Coordinate the technical information and acceptance of technical submissions

68. Do inspection at contractor(s) premises (off-site and on-site)

69. Monitor and expedite work performed

70. Do quality control as per approved QCPs

71. Do progress valuations and certification of payment

72. Ensure compliance to the Environmental Management Plan (EMP) and other legal and statutory requirements

73. Do configuration management

74. Do site construction completion inspections

75. Do commissioning and tests

76. Do integrity checks and hand-over

Finalisation phase

77. Verify performance

78. Coordinate defect items completion

79. Finalise configuration management

80. Finalise claims

81. Do financial reconciliation and closure

82. Transfer capital projects into commercial operation

83. Update estimating base and norms

84. Do post project technical and operational review

85. Document and implement lessons learnt

86. Close-out contracts

87. Do inspection prior to defects dates

88. Prepare Finalisation Release Approval (FRA)

89. Perform project finalisation review and submit FRA for approval

90. Approve Finalisation Release Approval (FRA)

91. Close-out project

Note: The activities marked in red are mandatory for all projects. All other activities must be considered for each project.

APPENDICES

8.1 Appendix 1 – Questionnaire

Covering Letter of the Research questionnaire

Dear Respondent

Request to undertake research

I am currently doing a master's degree in Management of Business Administration (MBA) at the University of Limpopo.

I am in the final stage of my research component. This requires that I complete a research dissertation. The topic of my research is The effectiveness of project management life cycle in Eskom Limpopo Operating Unit: An Operating Unit survey. You have been selected to be part of the sample through purposive sampling, which is considered the most applicable sampling method to ensure collection of useful results in this study.

There are three variables, namely project planning, organisational project practices and project processes.

Consequently you are hereby requested to respond to the statements given below to the best of your knowledge about the issues raised. The study adheres to the code of ethics and no responses will be associated with your name. Hence, you are not required to furnish your name in this questionnaire and all your responses/ opinions are anonymous.

This survey should take you a minimum of 20 minutes. I would appreciate it if I get it back by 22 November 2015.

Kind regards.

Gideon Baloyi

Energy & Revenue Loss Manager (Pr. Tech Eng.)

Section A : Project Planning					
	ALWAYS	**OFTEN**	**OCCASIONALLY**	**SELDOM**	**NEVER**
1) A project manager is appointed and core projects team members are Identified.					
2) Project scope and deliverables are defined.					
3) A written project objective statement is prepared.					
4) The project work breakdown structure is developed.					
5) Deliverables for each task is defined.					
6) Key project interface events are identified.					
7) Preliminary schedule are developed using PERT/CPM network planning.					
8) Estimates are refined and resource commitments are analysed.					
9) Trade-offs between schedule, scope and budget are optimised.					

10) Risks are analysed and contingency plans developed.					
11) Key projects interface events are managed and controlled.					
12) Baseline plans and schedules are set.					
13) Progress and expenditures are reported and defined intervals.					
14) Variances are analysed and their impact documented.					
15) Necessary project documentation is always maintained					
16) Project status is reported to management and customers.					
17) Re-plan systematically and adaptive action is taken.					
18) Periodic project review meetings are conducted.					
Section B: Organisational Project processes					

1) A documented, integrated project management process for all projects is used.					
2) Each project is planned, scheduled and monitored on an adhoc basis using relevant system recommended by the project manager.					
3) Only selected high priority projects are formally planned and managed, with an assigned project manager.					
4) All other projects somehow flow through the organisation with little drive from the project coordinator					
5) An experienced project manager is assigned to each project.					
6) There are effective cross functional team work on projects.					
7) Projects roles and responsibilities are well defined and understood by everyone in the organisation.					
8) Effective project management training is provided to all project contributors.					

9) Career paths in project management are defined.					
10) Continues improvement is made in the project management process and related practices.					
11) Functional managers always double as project managers.					
12) Project Managers are selected mainly because of availability.					
13) Project planning and control support is provided to project teams.					
Section C: Project Operations Practice					
a) Projects are completed:					
1) On or before their original schedule commitment.					
2) Within an acceptable amount of delay					
3) With delays that seriously impact the organisational performance.					
4) On or under their original budgets					

5) Within an acceptable level or budget					
6) With cost overruns that seriously impact the organisation					
7) The team does not usually worry about projects costs.					
b) Team work on most projects in our organisation:					
1) Is excellent on most projects.					
2) Is good within the technical functions, but poor between the technical, support services and operational people.					
3) Is influenced by Project Managers.					
4) Can be improved with proper training.					
5) Is encouraged in all aspects of the project.					
c) The impacts of ineffective project management practices are:					
1) Late completion which reduces economic growth and service					

delivery.					
2) Technical objectivity is not met, causing client dissatisfaction.					
3) Cost overruns and reduce profits thus results in business poor performance.					
4) Excessive conflicts, working overtime and high stress lead to low morale and high staff turnover.					
5) Lack of confidence in project schedules, causing unpredictability for customers and in forecasting financial results.					

8.2 Appendix 2 – Questionnaire Results

Operating Unit	Designation	Department	Gender	Age	Yrs Esk	Yrs PM	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5
Limpopo	Project Coordinator	CPD	M	27	2	1.5	A	O	OCC	O	O	OCC	A	OCC	OCC	OCC	O	A	O	O	OCC	OCC	OCC	O	OCC	OCC	S	OCC	OCC	O	OCC	S	A	OCC	A	OCC	A	A	O	OCC	O	O	OCC	A	OCC	OCC	OCC	OCC	S	A	OCC	A	OCC	A
Gauteng	Safety Officer	Projects	M	33	3	3	O	O	O	O	O	OCC	O	OCC	OCC	O	OCC	O	O	OCC	S	OCC	OCC	O	OCC	O	OCC	O	OCC	S	OCC	OCC	O	S	O	A	O	O	O	O	O	O	OCC	O	OCC	OCC	O	OCC	OCC	O	S	O	A	O
Limpopo	Project Manager	CPD	M	38	8	5	A	A	OCC	OCC	A	OCC	OCC	S	S	OCC	O	O	N	N	A	S	N	S	OCC	OCC	O	O	S	OCC	S	S	OCC	A	A	A	O	A	A	OCC	OCC	A	OCC	OCC	S	S	OCC	S	S	OCC	A	A	A	O
Limpopo	Project Controller	CPD	F	25	4.5	2	A	A	O	A	A	A	O	O	O	O	O	O	A	A	A	A	O	O	A	A	A	O	O	OCC	O	O	O	A	O	O	A	A	A	O	A	A	A	O	O	O	O	O	O	O	A	O	O	A
Gauteng	Clerk of Works	CPD	F	31	7	6	A	A	A	A	OCC	O	A	O	O	A	O	OCC	A	A	A	O	OCC	O	O	A	A	O	O	O	OCC	OCC	O	O	OCC	O	A	A	A	A	A	OCC	O	A	O	O	A	OCC	OCC	O	O	OCC	O	A
Gauteng	Project Manager	CPD	M	42	14	10	A	A	A	A	A	O	O	OCC	O	O	O	O	A	O	O	O	O	O	O	O	O	S	O	OCC	OCC	OCC	OCC	O	S	OCC	O	A	A	A	A	A	O	O	OCC	O	O	OCC	OCC	OCC	O	S	OCC	O
Gauteng	Specialist	Projects	M	30	3	2	O	O	OCC	OCC	OCC	OCC	OCC	S	O	S	OCC	A	S	OCC	OCC	OCC	S	S	S	OCC	O	OCC	S	OCC	O	S	S	OCC	OCC	S	OCC	O	O	OCC	OCC	OCC	OCC	OCC	S	O	S	O	S	S	OCC	OCC	S	OCC
Limpopo	Contract Manager	CPD	M	49	10	10	A	A	A	A	A	A	A	A	A	A	A	A	A	A	OCC	A	O	A	A	A	N	N	A	A	A	A	A	OCC	S	N	A	A	A	A	A	A	A	A	A	A	A	A	A	A	OCC	S	N	A
Limpopo	Programme Manager	CPD	M	43	10	8	O	O	A	A	A	A	A	OCC	O	A	O	A	A	OCC	O	A	O	S	A	S	OCC	N	O	OCC	OCC	O	A	A	A	A	A	O	O	A	A	A	A	A	OCC	O	A	OCC	O	A	A	A	A	A
Limpopo	Senior Buyer	Procurement	F	28	5	4	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	O	S	S	A	A	A	A	A	A	S	S	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	S	S	A
Limpopo	Engineer	Engineering	F	31	9	7	O	A	O	O	O	O	O	OCC	OCC	OCC	O	O	O	O	O	O	O	O	O	O	O	OCC	OCC	OCC	OCC	N	OCC	OCC	O	O	OCC	O	A	O	O	O	O	O	OCC	OCC	OCC	OCC	N	OCC	OCC	O	O	OCC
Gauteng	Project Manager	CPD	M	35	8	6	A	A	A	O	O	O	A	OCC	OCC	OCC	OCC	O	O	O	O	O	O	A	A	A	O	S	A	O	O	O	O	O	N	O	A	A	A	A	O	O	O	A	OCC	OCC	OCC	O	O	O	O	N	O	A
Gauteng	Engineer	Engineering	F	27	4	4	O	A	A	A	A	A	A	O	A	O	O	A	O	OCC	OCC	O	O	O	O	O	O	A	O	OCC	O	S	OCC	O	O	OCC	OCC	O	A	A	A	A	A	A	O	A	O	O	S	OCC	O	O	OCC	OCC
Limpopo	Engineer	Engineering	M	35	8	7	A	A	OCC	OCC	OCC	OCC	S	S	S	N	OCC	N	OCC	S	OCC	OCC	OCC	S	OCC	O	A	OCC	OCC	OCC	OCC	N	S	O	S	OCC	OCC	A	A	OCC	OCC	OCC	OCC	S	S	S	N	OCC	N	S	O	S	OCC	OCC
Limpopo	Quantity S	CPD	F	31	2	2	A	A	A	A	A	A	A	O	O	A	O	A	A	S	OCC	A	O	A	O	N	N	N	A	A	A	O	O	O	S	S	O	A	A	A	A	A	A	A	O	O	A	A	O	O	O	S	S	O
Gauteng	Project Coordinator	CPD	M	45	5	4	A	S	OCC	A	OCC	OCC	A	A	O	O	O	A	A	O	OCC	A	O	O	OCC	OCC	S	O	O	OCC	OCC	OCC	O	O	S	N	OCC	A	S	OCC	A	OCC	OCC	A	A	O	O	OCC	OCC	O	O	S	N	OCC
Limpopo	Project Coordinator	CPD	F	25	15	10	A	A	A	A	A	O	O	OCC	O	O	O	A	A	A	O	A	O	O	OCC	A	A	O	O	OCC	O	OCC	OCC	A	S	N	A	A	A	A	A	A	O	O	OCC	O	O	O	OCC	OCC	A	S	N	A
Limpopo	Contract Manager	CPD	F	49	10	11	A	A	A	A	A	A	A	A	A	A	A	A	A	A	OCC	A	O	A	A	A	N	N	A	A	A	A	A	OCC	S	N	A	A	A	A	A	A	A	A	A	A	A	A	A	A	OCC	S	N	A
Limpopo	Programme Manager	CPD	M	38	12	6	O	O	A	A	A	A	A	OCC	O	A	O	A	A	OCC	O	A	O	S	A	S	OCC	N	O	OCC	OCC	O	A	A	A	A	A	O	O	A	A	A	A	A	OCC	O	A	OCC	O	A	A	A	A	A
Gauteng	Senior Buyer	Procurement	F	25	4	4	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	O	S	S	A	A	A	A	A	A	S	S	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	S	S	A
Limpopo	Engineer	Engineering	M	31	7	5	O	A	O	O	O	O	O	OCC	OCC	OCC	O	O	O	O	O	O	O	O	O	O	O	OCC	OCC	OCC	OCC	N	OCC	OCC	O	O	OCC	O	A	O	O	O	O	O	OCC	OCC	OCC	OCC	N	OCC	OCC	O	O	OCC
Limpopo	Project Manager	CPD	F	31	9	6	A	A	A	O	O	O	A	OCC	OCC	OCC	OCC	O	O	O	O	O	O	A	A	A	O	A	N	O	O	O	N	S	OCC	O	A	A	A	A	O	O	O	A	OCC	OCC	OCC	O	O	N	S	OCC	O	A
Gauteng	Engineer	Engineering	M	31	6	6	O	A	A	A	A	A	A	O	A	O	O	A	O	OCC	OCC	O	O	O	O	O	O	N	A	A	A	A	A	O	S	A	O	O	A	A	A	A	A	A	O	A	O	A	A	A	O	S	A	O
Limpopo	Engineer	Engineering	M	39	8	6	A	A	OCC	OCC	OCC	OCC	S	S	S	N	OCC	N	OCC	S	OCC	OCC	OCC	S	OCC	O	A	S	O	N	S	S	N	N	A	N	O	A	A	OCC	OCC	OCC	OCC	S	S	S	N	S	S	N	N	A	N	O
Gauteng	Quantity S	CPD	F	33	6	6	A	A	A	A	A	A	A	O	O	A	O	A	A	S	OCC	A	O	A	O	N	N	O	O	O	O	S	S	S	O	A	A	A	A	A	A	A	A	A	O	O	A	O	S	S	S	O	A	A
Gauteng	Project Coordinator	CPD	M	35	7	6	A	S	OCC	A	OCC	OCC	A	A	O	O	O	A	A	O	OCC	A	O	O	OCC	OCC	S	OCC	S	O	O	A	O	O	A	S	A	A	S	OCC	A	OCC	OCC	A	A	O	O	O	A	O	O	A	S	A
Limpopo	Project Manager	CPD	M	42	12	12	A	A	OCC	OCC	A	OCC	OCC	S	S	OCC	O	O	N	N	A	S	N	S	OCC	OCC	O	OCC	S	S	A	OCC	OCC	S	OCC	O	A	A	A	OCC	OCC	A	OCC	OCC	S	S	OCC	A	OCC	OCC	S	OCC	O	A
Limpopo	Project Controller	CPD	M	25	5	4	A	A	O	A	A	A	O	O	O	O	O	O	A	A	A	A	O	O	A	A	A	S	N	A	O	O	S	OCC	A	O	A	A	A	O	A	A	A	O	O	O	O	O	O	S	OCC	A	O	A
Gauteng	Quantity S	CPD	M	31	4	4	A	A	A	A	OCC	O	A	O	O	A	O	OCC	A	A	A	O	OCC	O	O	A	A	A	N	OCC	OCC	S	A	A	O	OCC	OCC	A	A	A	A	OCC	O	A	O	O	A	OCC	S	A	A	O	OCC	OCC
Gauteng	Project Manager	CPD	M	35	9	8	A	A	A	A	A	O	O	OCC	O	O	O	O	A	O	O	O	O	O	O	O	O	A	O	A	S	OCC	OCC	A	A	O	A	A	A	A	A	A	O	O	OCC	O	O	S	OCC	OCC	A	A	O	A
Limpopo	Project Coordinator	CPD	F	27	6	5	A	O	OCC	O	O	OCC	A	OCC	OCC	OCC	O	A	O	O	OCC	OCC	OCC	O	OCC	OCC	S	A	O	S	A	N	O	A	N	A	OCC	A	O	OCC	O	O	OCC	A	OCC	OCC	OCC	A	N	O	A	N	A	OCC
Limpopo	Safety Officer	Projects	M	35	10	7	O	O	O	O	O	OCC	O	OCC	OCC	O	OCC	O	O	OCC	S	OCC	OCC	O	OCC	A	A	O	OCC	S	OCC	OCC	S	N	A	O	O	O	O	O	O	O	OCC	O	OCC	OCC	O	OCC	OCC	S	N	A	O	O
Limpopo	Project Manager	CPD	M	45	11	8	A	A	OCC	OCC	A	OCC	OCC	S	S	OCC	O	O	N	N	A	S	N	S	A	A	N	N	OCC	O	N	S	N	O	N	O	A	A	A	OCC	OCC	A	OCC	OCC	S	S	OCC	N	S	N	O	N	O	A
Limpopo	Project Controller	CPD	F	25	5	2	A	A	O	A	A	A	O	O	O	O	O	O	A	A	A	A	O	O	A	S	OCC	N	OCC	S	OCC	O	S	S	O	O	A	A	A	O	A	A	A	O	O	O	O	OCC	O	S	S	O	O	A
Limpopo	Contract Manager	CPD	M	49	8	8	A	A	A	A	OCC	A	A	A	A	A	A	A	A	A	OCC	A	O	A	A	O	S	S	OCC	N	OCC	N	S	A	A	OCC	O	A	A	A	A	OCC	A	A	A	A	A	OCC	N	S	A	A	OCC	O
Gauteng	Programme Manager	CPD	M	43	10	8	O	O	A	A	OCC	A	A	A	O	A	O	A	A	OCC	O	A	O	S	O	O	O	OCC	OCC	OCC	OCC	N	OCC	OCC	O	O	OCC	O	O	A	A	OCC	A	A	A	O	A	OCC	N	OCC	OCC	O	O	OCC
Limpopo	Buyer	Procurement	F	28	4	3	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	O	A	N	O	O	O	N	S	OCC	O	A	A	A	A	A	A	A	A	A	A	A	O	O	N	S	OCC	O	A
Limpopo	Engineer	Engineering	F	32	9	7	O	A	O	O	O	O	O	A	OCC	OCC	O	A	O	O	OCC	O	O	O	O	O	O	N	A	A	A	A	A	O	S	A	O	O	A	O	O	O	O	O	A	OCC	OCC	A	A	A	O	S	A	O
Gauteng	Project Manager	CPD	F	38	8	6	A	A	A	O	O	O	A	A	OCC	OCC	OCC	A	O	O	OCC	O	O	A	OCC	O	A	S	O	N	S	S	N	N	A	N	O	A	A	A	O	O	O	A	A	OCC	OCC	S	S	N	N	A	N	O
Limpopo	Engineer	Engineering	F	29	4	4	O	A	A	A	A	A	A	O	A	O	O	A	O	OCC	OCC	O	O	O	O	N	N	O	O	O	O	S	S	S	O	A	A	O	A	A	A	A	A	A	O	A	O	O	S	S	S	O	A	A
Limpopo	Project Manager	CPD	M	30	6	6	A	A	OCC	OCC	A	OCC	OCC	S	S	OCC	O	O	N	N	OCC	S	N	S	OCC	OCC	S	OCC	S	O	O	A	O	O	A	S	A	A	A	OCC	OCC	A	OCC	OCC	S	S	OCC	O	A	O	O	A	S	A
Gauteng	Project Controller	CPD	M	27	5	3	A	A	O	A	A	A	O	O	O	O	O	O	A	A	A	A	O	O	OCC	A	A	OCC	S	S	A	OCC	OCC	S	OCC	O	A	A	A	O	A	A	A	O	O	O	O	A	OCC	OCC	S	OCC	O	A
Gauteng	Clerk of Works	CPD	M	33	8	6	A	A	A	O	O	O	A	A	OCC	OCC	OCC	A	O	O	OCC	O	O	A	A	N	S	A	A	A	A	A	A	A	A	A	A	A	A	A	O	O	O	A	A	OCC	OCC	A	A	A	A	A	A	A
Gauteng	Programme Manager	CPD	F	40	11	8	A	A	A	A	A	O	O	OCC	O	O	O	O	A	O	O	O	O	O	O	O	O	S	OCC	OCC	OCC	OCC	O	S	OCC	O	A	A	A	A	A	A	O	O	OCC	O	O	OCC	OCC	O	S	OCC	O	A
Limpopo	Project Coordinator	CPD	M	32	8	7	O	A	O	O	O	O	O	A	OCC	OCC	O	A	O	O	OCC	O	O	O	O	O	O	OCC	OCC	N	S	A	O	O	OCC	O	A	O	A	O	O	O	O	O	A	OCC	OCC	S	A	O	O	OCC	O	A
Limpopo	Engineer	Engineering	M	33	9	6	A	A	A	O	O	O	A	A	OCC	OCC	OCC	A	O	O	OCC	O	O	A	A	A	O	S	A	O	O	O	N	A	OCC	S	A	A	A	A	O	O	O	A	A	OCC	OCC	O	O	N	A	OCC	S	A
Limpopo	Project Controller	CPD	M	28	7	7	O	A	A	A	A	A	A	O	A	O	O	A	O	OCC	OCC	O	O	O	O	O	O	A	O	A	O	S	OCC	O	O	OCC	OCC	O	A	A	A	A	A	A	O	A	O	O	S	OCC	O	O	OCC	OCC
Limpopo	Engineer	Engineering	F	24	3	3	A	A	OCC	OCC	A	OCC	OCC	S	S	OCC	O	O	N	N	OCC	S	N	S	OCC	OCC	O	O	OCC	OCC	S	S	O	A	A	A	O	A	A	OCC	OCC	A	OCC	OCC	S	S	OCC	S	S	O	A	A	A	O

Revd. Dr. Lutz Ackermann
(Independent Researcher)
Mankweng, Zone A, Stand 506
Tel: +27 72 3487010
e-mail: DRLA4 @ directbox.com

13 Feb 2016

TO WHOM IT MAY CONCERN

This is to confirm, that I, Dr Lutz Ackermann, have read the Research Thesis entitled

"The effectiveness of the project management life cycle
in the Eskom Limpopo Operating Unit"

by Mr **Gideon Baloyi**

(student number 201533157) and that I am satisfied with the quality of work he has produced in terms of structuring the document, in terms of style, grammar and spelling. Suggestions for suitable corrections and improvements have been made to the candidate.

(Rev. Dr. Lutz Ackermann, Mankweng)