ASSESSING THE EFFECTIVENESS OF PROJECT MANAGEMENT PRACTICES IN THE SOUTH AFRICAN COMMUNICATIONS INDUSTRY

BY

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Submitted in fulfilment of the requirements for the degree of Masters in Business Administration at the Port Elizabeth Technikon

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January 2002
15 January 2002

To Whom It May Concern

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This work is of strategic importance.

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______________

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Opinions expressed and conclusions arrived at, are those of the researcher and are not necessarily attributed to the Centre of Science development.
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- My Heavenly Father for the ability to persevere and complete my research.

Michael Smith
Port Elizabeth
January 2002
DEDICATION

This dissertation is dedicated to my wife, Vanessa and daughters Danielle and Stacey-Lee, for their continued support (and patience) during my academic studies.
ABSTRACT

In many organisations, project management is no longer a separately identified function, but is entrenched in the overall management of the business. The typical project management environment has become multi-project. Most of the project decisions require consideration of schedule, resource and cost concerns on other project work, necessitating the review and evaluation of multi-project data. Resource management is at least as important as schedule (time) management. Functional managers, supporting multiple projects with shared and limited resources, need to know the demands on their resources and the impact of new project loads and changing priorities. This means that the effectiveness of project management is not only influenced by the function itself, but it permeates throughout the entire organisation, for which the overriding goal is to survive and prosper in a competitive environment.

The research problem of this study is to assess how effective project management practices in the South African communications’ industry are, by using Telkom SA as the selected target group. The research method employed was to first identify the best practices of project management, by focusing on generally accepted standards and practices, that is those which are particularly effective in helping an organisation to achieve its objectives. The Project Management Body of Knowledge (PMBOK®) which is considered to be the international standard for project management, was used as the framework for identifying the best practices. The identified best practices were used as an assessment tool to determine to what extent these practices are applied in Telkom SA.
A number of completed projects in Telkom SA were also analysed to determine which factors influence the success or failure of projects. The research findings identified various opportunities for improvement. These findings, in particular, related to the level of commitment of project stakeholders, the controlling of project changes, the analysing of resource utilisation and the managing of risks proactively.

Competing effectively in a challenging and demanding marketplace requires more than just technology and resources. It also requires the ability to manage projects in today’s complex, fast-changing organisations, its people, processes and operating systems which all work together in a collaborative, integrated fashion. Therefore, to survive and prosper in the challenging business environment of the 21st century, the ability to effectively manage projects will play a decisive role in separating winning companies from losers.

The assessment tool developed as part of this research to evaluate the effectiveness of project management practices can also be utilised or adapted by other organisations and industries to determine their project management maturity.
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CHAPTER 1: INTRODUCTION AND OVERVIEW OF THE STUDY

1.1 INTRODUCTION

An overview of the study is presented in this chapter which deals with the following issues:

- Main problem to be researched together with its related sub-problems.
- Demarcation of the research, in terms of organisation, geographic, management level and project management practices.
- Definition of selected concepts.
- Assumptions.
- Significance of the research.

1.2 MAIN PROBLEM

According to Mullaly (1998:1) “doing more with less is a deciding factor within business today”. Organisations are compelled to adapt quickly to new environments and to be able to recognise and respond quickly to new business opportunities. Demands are thus being made on organisations to manage more activities with fewer resources and less staff. The future of business, therefore, relies on competitiveness and adaptability. The increase in the demand to compete more effectively in a global (international) marketplace has also resulted in organisations, more than ever, striving to redefine their business practices in order to increase quality, productivity and customer satisfaction (The changing role of project management in IS/IT organisations, 1999:2). Every level of operation should also be re-evaluated based on its ability to meet business goals and objectives. As a result, organisations are becoming project-driven; that
is, they are budgeting, planning and gauging business success through the
success of its projects and processes that drive their business.

The traditional command and control structures are rapidly disappearing and in
their place are task forces, self-directed work teams and various forms of
project-driven organisations (Wysocki, Beck & Crane, 2000:5). Project
management has thus become the new general management approach through
which organisations respond to change and also to facilitate the development
and exploitation of markets ahead of their competitors (Steyn, 1998:2). The
project-based approach integrates and co-ordinates strategic and operational
dimensions to achieve business success. The increase in demand for services
and the scarcity of resources experienced in the communications industry has
drastically influenced the way business is done (doing more with less) and has
also changed the nature of its projects. The focus has changed from mere
project management to managing by projects, where many of the ongoing
operations of the organisation are treated as projects (Project management:
Tools and techniques, 2000:8). The result is that modern projects are
characterised by:

- Technical complexity (technological advances)
- Skills diversity
- Intensive market research (owing to the uncertainty within the dynamic
  business environment)
- Market analysis (to get ahead of competition)

The aforementioned factors identified, leads to the following problem that will be
addressed by this research:
How effective are current project management practices in the South African communications industry?

1.3 SUB-PROBLEMS

The following risks are usually encountered when managing projects in the dynamic (ever-changing) business environment projects (Project management: Tools and techniques, 2000:3):

- Schedule (time) delays,
- Cost overruns, and
- Performance (quality) deficiencies.

To evaluate the effectiveness of current project management practices, the following sub-problems apply to this study:

(i) What best practices does the literature reveal which enhances the effectiveness of project management?

(ii) To what extent are these best practices applied in the communications industry?

1.4 DEMARCATION OF RESEARCH

Demarcating the research serves the purpose of making the research topic manageable from a research point of view. The omission of certain topics does not imply that there is no need to research them.

1.4.1 ORGANISATION

For the purpose of this study, the empirical component of the research will be focused on, Telkom SA Limited, hereafter referred to as Telkom. Telkom will
thus be used as the target group to assess the effectiveness of project
management practices in the South African communications industry.

1.4.2 GEOGRAPHIC DEMARCATION

The empirical component of this study will be limited to the Southern region of
Telkom which includes the province of the Eastern Cape, as defined by the
political borders of the nine provinces. The Southern region as demarcated by
Telkom, however, also includes a portion of the Western Cape political region,
that is, the area from Plettenberg Bay to Mossel Bay (Southern Cape). The
afore-mentioned area will thus be considered as part of the study area for the
empirical component.

1.4.3 MANAGEMENT LEVEL

The study will be limited to junior management and middle management which
are directly involved with the managing of projects.

1.4.4 PROJECT MANAGEMENT PRACTICES

This research will be limited to examining the project management practices,
that is, the generally accepted practices which will enhance the management of
projects.

1.5 DEFINITION OF SELECTED CONCEPTS

The concepts in the title and main problem of this study will be defined in this
section.
1.5.1 PROJECT

Randolph and Posner (1998:9) make the statement that “every one is a manager of projects!” without defining what a project is. To put projects into perspective, a definition is needed, that is, a common starting point (Wysocki et al., 2000:65). All too often people call any work they do a project. To clarify this issue, Duncan (1996:4) states that organisations perform work which generally involves either operations or projects, although the two may overlap. Operations and projects share many attributes, for example, they are:

- performed by people.
- constrained by limited resources.
- planned, executed and controlled by management.

Operations and projects differ mainly in that operations are ongoing and repetitive, whereas projects are temporary and unique. Duncan (1996:4) defines a project as “a temporary endeavour undertaken to create a unique product or service”. Temporary in this context means that every project has a definite beginning and a definite end (when the project objectives have been achieved). Unique product or service in this context suggests that a project involves doing something new that has not been done before which is, therefore, unique.

Maylor (1996:3) expands on the definition by stating that a project is a non-repetitive activity with the following characteristics:

- It is goal oriented – it is being pursued with a particular end or goal in mind.
- It has a particular set of constraints – usually centered around time and resources.
- The output of the project is measurable.
Something has been changed through the project being carried out (making it unique).
Reiss (1992:11) adds the *human* (resource) element to the definition by suggesting that a project is “a human activity that achieves a clear objective against a time scale” with the following characteristics:

- One clear objective
- A fixed time scale (end date)
- A team of people (projects are human endeavours)
- No practice or rehearsal (a project is unique)
- Change (the end product of the project will be something new and different)

Verma (1995:17) emphasises the conditions under which a project should be managed. He views a project as a vehicle through which change can be created and successfully managed, using appropriate human skills and the generally accepted project management practices.

*For the purposes of this research, a project will be defined as a temporary endeavour undertaken to create a unique product or service.*

### 1.5.2 PROJECT MANAGEMENT

Duncan (1996:6) defines project management as “the application of knowledge, skills, tools and techniques to project activities in order to meet or exceed stakeholder needs and expectations”. Meeting or exceeding stakeholder (client or customer) needs and expectations more often than not involves balancing competing demands among:

- Scope (project objectives), time, cost and quality
- Stakeholders with differing needs and expectations
- Identified requirements (needs) and unidentified requirements (expectations)
Van der Waldt and Knipe (1998:59) are of the opinion that project management is “a set of principles, methods, tools and techniques for the effective management of objective-oriented work in the context of a specific and unique organisational environment”. Verma (1995:17-18) states that project management is the “art of directing and co-ordinating human and material requirements throughout the life of a project to achieve project objectives within specified constraints”. All projects are also characterised by objectives, constraints, interfaces and interactions. Managing project interfaces is a major component of project management. There are three main types of project interfaces:

- People interfaces managing personal interfaces (human behaviour)
- Organisational interfaces relate to the flow of information and communication between different components of the project organisation
- Systems interfaces are non-people interfaces such as project hardware, software and facilities

For the purposes of this research, project management will be defined as the application of knowledge, skills, tools and techniques to project activities in order to meet or exceed stakeholder needs and expectations.

1.5.3 EFFECTIVENESS

Effectiveness is defined as being “a measure of the quality of attainment in meeting objectives; to be distinguished from efficiency which is measured by the volume of output achieved for the input used” (Wideman, 2001b:1).
1.5.4 BEST PRACTICES

Wideman (1999:2) defines a practice as “a way of doing things”. A best practice is defined as “a strategy, approach, method, tool or technique that is particularly effective in helping an organisation achieve its objectives for managing a project” (Best practices in project management: Private and public sectors internationally, 2001:1).

1.6 ASSUMPTIONS

It is assumed that there are certain universal (generally accepted) project management practices which will enhance the effectiveness of managing projects. It is also assumed that these universal project management practices are independent of the type of organisation and operate in the same way irrespective of the type of organisation.

1.7 SIGNIFICANCE OF THE RESEARCH

The challenging environment, in which organisations operate, has changed the focus from mere project management to managing by projects, where many of the ongoing operations are treated as projects (Project management: Tools and Techniques, 2000:8). The results of this research will provide the following opportunities:

- Benchmarking current project management practices against sound best practices;
- Identifying the strengths of current practices, that could provide a competitive advantage;
- Identifying areas that may need development in order to enhance the effectiveness of project management; and
- Getting a return on intellectual capital based on the research findings.
1.8 RESEARCH METHODOLOGY

In order to resolve the main problem and associated sub-problems of this research, the following methodology will be adopted:

1.8.1 A conceptual framework will be compiled after an examination of the different project-management theories that are relevant to modern project-driven organisations. This will be conducted as follows:

- A critical review of existing project management practices and other relevant theories as found in the literature.
- Specific best practices for project management will be identified by means of a literature survey which focuses on generally accepted practices and processes.

1.8.2 An assessment tool (questionnaire) will be developed based on the best practices identified which will facilitate the process of evaluating project management practices in the South African communications industry.

1.8.3 The assessment tool will be used to evaluate the effectiveness of project management practices in Telkom. This process will include:

- The planning of the empirical study with regard to the survey method, population to be surveyed, the compilation of the assessment tool (questionnaire) and its distribution.
- The assessment tool (questionnaire) will be based on the best practices for project management as determined in paragraph 1.8.2.
- A description of the technique that will be used in processing the data collected.
- The interpretation of the data collected by conducting a comparative analysis of the research results and the best practices identified in paragraph 1.8.2.
1.8.4 Conclusions will be drawn, from which recommendations will be made that may lead to improving the effectiveness of project management.

1.9 DISSERTATION STRUCTURE

The research has provisionally been planned to include the following chapters:

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1.10 SUMMARY

An overview of the study has been outlined which will be used as the framework for the purposes of the research. The main problem, with its associated sub-problems, identified for the research will thus be focused on in the chapters that follow.
2.1 INTRODUCTION

In order to expand on the significance of this research it is necessary to clarify the role of project management in organisations. The questions that need to be addressed to place the role of project management in perspective are:

- What is the significance of project management?
- What is the value of project management?
- What is the future of project management?

The answers to these questions are explored in this chapter.

2.2 SIGNIFICANCE OF PROJECT MANAGEMENT

According to Navarre and Schaan (1999:19) the long-term survival of any organisation is to a certain extent dependent on management’s ability to develop and implement corporate strategies in harmony with its ever-changing environments. Furthermore, it is stated that the strategic alignment between an organisation and its environment is usually effected through projects such as investments, new products, internal re-organisation, etcetera. The escalating resource constraints faced by organisations require the implementation of project management methods that will maximise the proportion of successful projects. Navarre and Schaan (1999:20-21) lists three reasons that explain why, in an increasingly competitive and volatile environment, projects are of growing strategic importance to the survival of any organisation. These include:
(i) The timing and successful implementation of projects can greatly enhance an organisation’s competitive situation. For example, the reduction of the time required to bring a new product to the market can contribute to the erection to prevent barriers to entry for competitors. This in the end, determines the overall profitability of the project. Time and, in particular, speed of execution are increasingly considered a strategic factor that needs to be managed as any other resource.

(ii) Projects consume an organisation’s resources such as cash flow, people and equipment. Projects only produce a return on investment when successfully implemented, therefore, the goal of any project management system is to transfer projects into stable operations that will eventually generate liquidity. That means, to realise profitability, the capital invested needs to be recovered first.

(iii) Projects normally involve significant changes to the infrastructure (and culture) of an organisation. Projects often require the destabilisation of the existing order when they necessitate the re-engineering and restructuring of the internal workings of the organisation. Projects are thus a source of deviation that create tension and provoke the need for change.

The need for project-based management is generally derived from one or several key business drivers, that is, those elements of the business so fundamental, that they often determine a business’ level of competitiveness and success (Achieving project success through best practices, 2000:1). The business drivers identified are:

- Reduced product development time
- Extended product range
- Increased use of multi-functional teams and partnerships
- Creation of global service centers from cross-functional teams
- Increased importance of controlling individual activity
- Multi-national approach to development
- Standardisation of information technology
Rapid restructuring of industry sectors through acquisition and joint-ventures

Restricted government spending

Management of external resources and contractors

Ease of access to information and knowledge

Tharnhain (1994:6) sees modern project management as a fully-integrated part of its host organisation that works across functional lines, business units and geographic regions. Artemis Management Systems (The changing role of project management in IS/IT organisations, 1999:1) cites that today's businesses do not rely on one strategic project, but several parallel initiatives that must combine to meet business objectives. This statement is substantiated on the following grounds:

- With decentralised and global work forces, projects must coordinate the efforts of multiple cross-functional teams operating in different environments and geographic locations.

- Project information needs to be shared and presented to an increasing number of stakeholders, including senior management, clients, suppliers, partners and controlling bodies, whose impact can threaten or strengthen the project outcomes.

- In a dynamic environment traditional business models do not succeed, whereas project-based organisations thrive. With faster response to market demand, better utilisation of resources and improved project control and performance, project-based organisations have the ability to maximise their investments in core business projects and leverage evolving technology.

From the benefits that have been identified, it is evident that project management is of particular importance to modern organisations, especially if the demand to do more with less is considered to provide a competitive edge.
2.3 VALUE OF PROJECT MANAGEMENT

According to Meredith and Mantel (1989:6), actual experience with project management indicates that the majority of the organisations using it experience better control and better customer relations. Other advantages include lower costs, higher quality and reliability, higher profit margins, a sharper orientation towards results, improved interdepartmental co-ordination and higher employee morale. Other benefits identified by Kerzner (1994:7) are:

- improved efficiency and increased profitability through better utilisation of limited resources; and
- enhanced planning, estimating and cost control leading to a more consistent achievement of milestones and objectives.

The Project Management Institute (Project management: A proven process for success, 2000:6) further confirms that project management helps organisations meet their customers' needs by standardising routine tasks and reducing the number of tasks that could potentially be forgotten. Project management thus ensures that available resources are used in the most effective and efficient manner. Project management also provides senior executives with insight into what is happening and where things are going within their organisation. The application of project management principles enables senior executives to:

- establish measures of success.
- enable customer focus and alignment.
- quantify value commensurate with cost.
- optimise the use of organisational resources.
- incorporate quality principles.
- put strategic plans into practice.
- ensure fast time-to-market (for example new products or services).

According to the Project Management Institute (Project management: A proven process for success, 2000:6) project management has gained popularity because of significant changes in the workplace. Some of these changes include:

- Downsizing (fewer people to do more tasks)
- Projects and services have grown larger and more complex
- Fierce global competition
- Easier access to information through vast communications networks
- More sophisticated customers demanding higher quality goods and services
- Exponential technological growth
- Multinational organisations seeking to establish uniform practices for managing projects

According to Pennypacker (2000:1), “implementing project management adds significant value to organisations”. This conclusion is based on the results of a survey of more than 100 senior-level project management practitioners across various organisations and industries. More than 94 percent of the respondents stated that implementing project management added value to their organisations. Organisations cited significant improvements in financial measures, customer measures, project/process measures and learning and growth measures. Organisations of all sizes and in all industries reported improvement. The companies surveyed noted average improvements in the order of 50 percent in project execution, 54 percent in financial performance, 36 percent in customer satisfaction and 30 percent in employee satisfaction.
Based on these results as well as the benefits identified by the respective authors, it can be concluded that those organisations that do not implement project management will be at a competitive disadvantage to those who do.

2.4 THE FUTURE OF PROJECT MANAGEMENT

Levine (1994:59) expresses the opinion that the project environment has always been a challenge, but never so much as at the current time. Reasons cited are:

- Today’s flatter organisations have to work with leaner resources and shrinking costs.
- The team approach, typical of project management operations, is spreading to all types of organisations and to all kinds of work.
- Philosophies of total quality management, concurrent engineering, partnering and self-directed teams are eroding traditional bureaucratic modes in favour of a more ad hoc style of leadership.
- Conditions are changing, from position power to knowledge power, from managing by procedure to getting the job done and from hierarchical control to individual empowerment.
- The emphasis is on shorter time cycles, quicker response to problems and changes, teamwork and shared responsibility.

According to Levine (1994:60) more organisations are adopting project-management practices, bringing these special methods to enterprises that were previously considered to be outside of the project domain. It is speculated that in many organisations, project management will no longer be a separately identified function, but will be embedded in the overall management of the business. Also, the emphasis is considered to be shifting from a single project focus to managing the efforts on multiple projects. The typical project
management environment will, therefore, be multiple-project which means that most of the project decisions will require consideration of schedule, resource and cost concerns on other project work, necessitating the review and evaluation of multiple-project data. Consequently functional managers, supporting multiple projects with shared and limited resources, will need to know the demands on their resources and the impact of new project loads and changing priorities.

Kwak and Ibbs (1999:3) reiterate that many organisations are projectising their operations and processes to plan, manage and complete their projects successfully. The compelling reason for such projectising is the growing pressure on managers to integrate, plan and control time-intensive and one-of-a-kind endeavours. According to Ibbs (1998:1), project management tools and practices appeal to companies in many industries and application areas because they offer real help in meeting today’s time-to-market in a highly competitive business environment.

2.5 SUMMARY

The role of project management in modern organisations has been explained in this section by focusing on the significance and value of project management as well as its future role in business. From the literature surveyed, It is evident that project management fulfils an important role in the operations of modern organisations.
CHAPTER 3: THEORIES OF PROJECT MANAGEMENT

3.1 INTRODUCTION

With the role of project management in organisations being clarified, it is important to discover what theories (in general) exist to investigate the first sub-problem of this research, of which the aim is to establish the best practices of project management. A literature search is conducted to discover what theories and general practices of project management exist. The issues to be explored are the:

- Project management environment
- Principles of project management
- Project management practices and processes

3.2 PROJECT MANAGEMENT ENVIRONMENT

According to Kerzner (1998:4) there are always “class or prestige gaps” between the various levels of management. There are also functional gaps between the different working units of the organisation. A combination of the management gaps and functional gaps illustrates that companies are made up of small operational islands (based on the boundaries of the function and its hierarchical level in the organisation). The result is that these operational islands refuse to communicate with each other for the fear that giving up information may strengthen their opponents (other divisions in the organisation). Project management is considered to be a management technique that is used to bridge these gaps between the operational islands, therefore, getting all the stakeholders (role-players) to communicate cross-functionally (across the
superficially imposed *borders* of the organisation) and focus on common goals and objectives.

Cook (1999:1) confirms the view that project management cuts across this vertical structure (bureaucracies), placing authority and accountability for project results in the hands of a project manager. The basic purpose for initiating a project is thus to accomplish some goals (Meredith & Mantel, 1989:5). The reason for organising the task as a project is to focus the responsibility and authority for the attainment of the goals on an individual or small group.

### 3.2.1 PROJECT STAKEHOLDERS

Duncan (1996:15) defines project stakeholders as “individuals and organisations who are actively involved in the project, or whose interests may be positively or negatively affected as a result of project execution or successful project completion”. To ensure a successful project, the stakeholders (role-players) must be identified, to determine what their needs and expectations are. The key stakeholders (with their roles) of every project are indicated in Table 3.1 below.

**Table 3.1: Key stakeholders**

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project manager</td>
<td>Individual responsible for managing the project</td>
</tr>
<tr>
<td>Customer</td>
<td>Individual who will use the product delivered by the project</td>
</tr>
<tr>
<td>Performing organisation</td>
<td>Enterprise whose employees are most directly involved in doing the work of the project</td>
</tr>
<tr>
<td>Sponsor</td>
<td>Individual or group within the performing organisation that provides the final resources, in cash or in kind, for the project</td>
</tr>
</tbody>
</table>

*Source: Duncan (1996:15)*
Managing stakeholder expectations may be challenging because stakeholders often have very different objectives that may come into conflict. Duncan (1996:17) mentions that, in general, differences between or among stakeholders should be resolved in favour of the customer. This does, however, not mean that the needs and expectations of other stakeholders can be disregarded. This dilemma is one of the major challenges of project management.

3.2.2 PARAMETERS OF PROJECT MANAGEMENT

Verma (1995:19) proclaims that project management is a dynamic process. The result is that the project management processes require the management of four core (critical) elements, that is, scope (requirements or specifications), quality, time and cost. These critical elements represent the client or customer’s project objectives and emphasise what needs to be achieved as well as what the constraints are, thereby establishing the parameters of the project. Throughout the life-cycle of a project, trade-offs need to be made between the project goals to preserve some balance between them (Meredith & Mantel, 1989:94). Rosenau (1998:15) refers to the trade-off principle as being the “triple constraint which defines the performance specifications (scope and quality), time schedule and money of projects”. According to Rosenau’s explanation of the triple constraint, two of the critical elements, that is, scope and quality have been grouped together. According to Van der Waldt and Knipe (1998:59) these elements interact constantly and a balance must be established and maintained between them. If time and cost receive priority, then quality will be neglected and vice versa.
Verma (1995:19) states that managing the trade-offs (between scope, quality, time and cost) is the key to successful project management. It means getting the job done and achieving a satisfactory outcome on time and at reasonable cost. In addition to the critical elements (scope, quality, time and cost), there are four interface elements (also known as the four interactive or facilitative management functions) which according to Verma (1995:19) include the management of:

- communications (or information).
- contract procurement.
- human resources.
- risk.

These facilitative functions provide the means for accomplishing project objectives and emphasise how objectives will be achieved. In a typical project environment, project managers must analyse and manage all the knowledge areas of the project management process. This typically involves trade-offs within the first four areas or critical elements (scope, quality, time and cost) plus effective management and integration of the second set of four facilitative functions (management of communications, contract procurement, human resources and risk).

3.2.3 PROJECT LIFE-CYCLE

Most projects go through similar stages on the path from origin to completion (Meredith & Mantel, 1989:7). Verma (1995:17) also states that projects have a distinct life-cycle, starting with an idea and progressing through planning and development of the concept, execution and eventual transfer to the client, or customer, or project owner. This sequence is collectively known as the project
life-cycle. Each project phase is marked by completion of one or more deliverables (outcomes or results). The number and names of these phases are determined by the control needs of the organisation and may further be broken down into stages, depending on the area of project application (Verma, 1995:17). A generic project life-cycle consists of the four phases identified in Table 3.2 below.

### Table 3.2: Project life-cycle phases

<table>
<thead>
<tr>
<th>Project Phase</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Concept</td>
<td>Project concept (business need or requirement) is developed and project goals and objectives are formulated.</td>
</tr>
<tr>
<td>2. Development</td>
<td>Detailed planning to achieve the project goals and objectives.</td>
</tr>
<tr>
<td>3. Execution</td>
<td>Implementation of the project plan and the monitoring and controlling of all the required tasks (activities).</td>
</tr>
<tr>
<td>4. Finishing</td>
<td>At completion of the project, its success needs to be measured and, thereafter, terminated.</td>
</tr>
</tbody>
</table>

*Source: Verma (1995:17)*

These phases may be called by different names in different environments and even overlap, depending upon the nature and size of the project and its industrial or business environment (Verma, 1995:17).

### 3.3 PRINCIPLES OF PROJECT MANAGEMENT

Wideman (2000:7-10) proposes the following “first principles of project management”:

#### 3.3.1 COMMITMENT PRINCIPLE

A commitment between the provider of resources (project sponsor) and the project delivery team must exist before a viable project exists. The project
delivery team is responsible for developing appropriate strategies, plans and controls for applying the necessary skills and actions to convert those resources into the required deliverables or product. Both parties should possess relevant skills, experience, dedication, commitment, tenacity and authority to ensure the project's success.

3.3.2 SUCCESS PRINCIPLE

The measure of project success, in terms of both process and product, must be defined at the beginning of the project as a basis for project management decision-making and post-project evaluation. The goal of project management is to be successful and, therefore, project success needs to be defined in terms of:

- acceptability of the project's deliverables, for example, scope, quality, relevance and effectiveness; and
- internal processes, for example time, cost and efficiency.

Without agreement on the success criteria, it will not be possible to measure the project's ultimate success (Wideman, 2000:8).

3.3.3 TRADE-OFF PRINCIPLE

The core variables of the project management process, namely: product scope, quality grade, time-to-produce and total cost-at-completion must all be mutually consistent and attainable. Theses core variables are measures of internal project management efficiency. If these variables prove not to be mutually consistent and achievable, the commitment is neither equitable nor are key success criteria likely to be met (Wideman, 2000:9).
3.3.4 STRATEGY PRINCIPLE

A strategy must be in place which first encompasses planning and then doing, in a focused set of sequential and progressive phases. All project work should be planned first and then done. This plan-do sequential process forms the basis of every project life-cycle and can be expanded to suit the control requirements of every type of project in every area of project management application. The project life cycle determines:

- when the project starts,
- the control gates (checkpoints) through which it must progress, and
- when the project is finished.

3.3.5 THE CONTROL PRINCIPLE

Policies and procedures that are effective and efficient must be in place for the conduct and control of the project commitment. This principle is seen as an extension of the strategy principle, where what is going to be done and when are determined. The characteristics of good policies and procedures include clear roles and responsibilities, delegation of authority and processes for managing changes in the product scope and/or scope of work (Wideman, 2000:9).

3.3.6 SINGLE-POINT RESPONSIBILITY PRINCIPLE

A single channel of communication must exist between the project sponsor and the project team leader for all decisions affecting the product scope. While free and transparent communication is vital for coordination of project activities, this principle is necessary for effective and efficient administration of the project commitment.
3.3.7 CULTURAL ENVIRONMENT PRINCIPLE

Management must provide an informed and supportive cultural environment to ensure that the project delivery team is able to work to the limits of its capacity. The ability of a project delivery team to produce results both effectively and efficiently is highly dependent upon the cultural environment. This cultural environment includes both internal and external project relations and values (Wideman, 2000:10).

3.4 PROJECT MANAGEMENT PRACTICES AND PROCESSES

The practices and processes identified for project management will be discussed briefly in this section. A more detailed discussion of these practices and processes will be continued in Chapter 4 in order to identify the best practices of project management.

3.4.1 ESTABLISHED PRACTICES

(Wideman, 1998:7) states that the “Project Management Body of Knowledge (PMBOK) published by the Project Management Institute (PMI) represents the knowledge and practice that is generally accepted and unique or nearly unique to the field of project management”. The PMBOK identifies nine project management knowledge areas which describe knowledge and practice in terms of its specific processes (Duncan, 1996:6). Brief descriptions of the nine processes are reflected in Table 3.3.
Table 3.3: Overview of Project Management Knowledge Areas

<table>
<thead>
<tr>
<th>Knowledge Area</th>
<th>Includes the processes to ensure that the:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Integration Management</td>
<td>various elements of the project are properly co-ordinated. It involves making trade-offs among competing objectives and alternatives in order to meet or exceed stakeholder needs and expectations.</td>
</tr>
<tr>
<td>Project Scope Management</td>
<td>project includes all the work required and only the work required to complete the project successfully.</td>
</tr>
<tr>
<td>Project Time Management</td>
<td>project is completed in time.</td>
</tr>
<tr>
<td>Project Cost Management</td>
<td>project is completed within the approved budget.</td>
</tr>
<tr>
<td>Project Quality Management</td>
<td>project will satisfy the needs for which it was undertaken. It includes all the activities of the overall management function that determines the quality policies, objectives and responsibilities, and implements them by means such as quality planning, quality assurance and quality control.</td>
</tr>
<tr>
<td>Project Human Resource Management</td>
<td>use of the people involved with the project is effective.</td>
</tr>
<tr>
<td>Project Communications Management</td>
<td>project information is generated timely and appropriately, collected and disseminated, stored and ultimately, disposed of.</td>
</tr>
<tr>
<td>Project Risk Management</td>
<td>risks are identified, analysed and responded to.</td>
</tr>
<tr>
<td>Project Procurement Management</td>
<td>goods and services from outside the performing organisation are acquired.</td>
</tr>
</tbody>
</table>

*Source: Duncan, 1996:151-153*

### 3.4.2 PROJECT MANAGEMENT PROCESSES

Project management is considered to be an integrative effort which implies that an action, or failure to take action, in one area will usually affect other areas (Duncan, 1996:19). These interactions often require trade-offs among project objectives, signifying that only sacrificing performance in another may enhance
performance in one area. Successful project management, therefore, requires actively managing these interactions as well as its related processes. According to Duncan (1996:28) project management processes can be organised into five groups of one or more processes (Duncan, 1996:28). The process groups are identified in Table 3.4.

Table 3.4: Project management process groups

<table>
<thead>
<tr>
<th>Process groups</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiating</td>
<td>Recognising that a project or phase should begin and committing to do so.</td>
</tr>
<tr>
<td>Planning</td>
<td>Devising and maintaining a workable scheme to accomplish the business need that the project was undertaken to address.</td>
</tr>
<tr>
<td>Executing</td>
<td>Co-ordinating people and other resources to carry out the plan.</td>
</tr>
<tr>
<td>Controlling</td>
<td>Ensuring that project objectives are met by monitoring and measuring progress and taking corrective action when necessary.</td>
</tr>
<tr>
<td>Closing</td>
<td>Formalising acceptance of the project or phase and bringing it to an orderly end.</td>
</tr>
</tbody>
</table>

*Source: Duncan (1996:28)*

Some additional characteristics of the project processes are:

- Process groups are linked by the results they produce; the result or outcome of one becomes an input to another.
- Process groups are not discrete, one-time events; they are overlapping activities which occur at varying levels throughout each phase of the project.
- The process group interactions also cross phases such that closing one phase provides an input to initiating the next which means that in actual projects there will be many overlaps.

Figure 3.1 illustrates the interactions between the respective project processes.
Duncan (1996:29) clarifies the process interactions further by stating that within each process group, the individual processes are linked by their inputs and outputs. Each process can thus be described in terms of its:

- Inputs - documents or documentable items that will be acted upon.
- Tools and techniques - mechanisms applied to the inputs to create the outputs.
- Outputs - documents or documentable items that are a result of the process.

### 3.5 SUMMARY

The theories identified in respect of the project management environment, practices and processes, have revealed factors that could be considered to be the foundation for project management standards. It is already evident that there are certain key (universal) project management practices which will be feasible to explore in order to identify the best practices of project management.
CHAPTER 4: IDENTIFYING THE BEST PRACTICES FOR PROJECT MANAGEMENT

4.1 INTRODUCTION

The principles and practices identified in Chapter 3 are explored in greater detail in Chapter 4 in order to identify the best practices of project management. The first sub-problem of this research is finalised in this chapter by identifying the best practices that enhance the effectiveness of project management.

4.2 FACTORS INFLUENCING THE EFFECTIVENESS OF PROJECT MANAGEMENT

Tharnhain (1994:6) states that managing projects within pre-established performance parameters requires realistic projections of resource requirements, including time, money, people and facilities. It also requires an understanding of the work, the people, the technologies, the market and the business processes used to integrate the project. Furthermore, it requires decision-oriented information systems with appropriate checks and balances and a system that is responsive enough to cope with the inevitable changes and contingencies. The project management system is considered to consist of three integrated sub-systems:

- Process of project management decisions
- Tools and methods of project management
- People of the project organisation
According to Artemis Management Systems (The changing role of project management in IS/It organisations, 1999:2-3) the factors that influence the effectiveness of project management are commonly referred to as the “three Axes of Continuous Improvement” which are culture, organisation and technical.

(a) *Culture Axis* refers to the influences that shape the way people within the organisation think and behave. These are manifest through common behavior patterns and management styles, shared values and vision, attitudes and motivation. Key objectives of this component are to:

- breakdown functional barriers and power groups, eliminate information retention, encourage open communication and visibility
- overcome fatalism, sceptical attitudes, lack of rigor
- create shared vision and objectives across functional teams
- ensure the involvement and buy-in of operational staff

(b) *Organisation Axis* includes all the elements that combine to make up the project management process: the methodologies, definitions and standards that determine the project organisation with the associated roles and responsibilities of the project stakeholders and team members, as well as the procedures and decision making processes. Key objectives of this component are to:

- clarify project and functional roles and responsibilities, especially in matrix organisations
- provide visibility of resources: What skills are required? Is there capacity to take on a new project? Are there really overloads?
- ensure the decision-makers have the information and tools to measure the impact of the decisions that are made
- establish a consistent vocabulary and management reporting process that provides an appropriate level of visibility and improves decision-making
Technical Axis refers to the concepts and methods of time, resource and cost management together with the associated project data and information processing systems. Key objectives of this component are to:

- promote the concepts of project management throughout the organisation
- ensure consistent and timely progress reporting
- guarantee the accuracy of information and report data
- anticipate and exploit evolving information technology
- acknowledge and apply the discipline imposed by information systems

While every organisation is unique and every project represents a special case, the ultimate management of the project organisation involves complex variables that are related to the people, the organisation and its environment (The changing role of project management in IS/It organisations, 1999:1).

4.3 GENERALLY ACCEPTED PROJECT MANAGEMENT PRACTICES

According to Duncan (1996:3) the Project Management Body of Knowledge (PMBOK) is “an inclusive term that describes the collective (accumulated) knowledge within the profession of project management”. The full PMBOK includes knowledge of proven traditional practices that are widely applied, as well as knowledge of innovative and advanced practices which have seen more limited use. The primary purpose of the PMBOK is to identify and describe the project management practices that are generally accepted. Generally accepted means that the knowledge and practices described are
applicable to most projects most of the time and that there is widespread consensus about their value and usefulness.

The nine knowledge areas covered by the PMBOK will be discussed in more detail below.

4.3.1 PROJECT INTEGRATION MANAGEMENT

Duncan (1996:39) defines project Integration management as “the processes required to ensure that the various elements of the project are properly coordinated”. It involves making trade-offs among competing objectives and alternatives in order to meet or exceed stakeholder needs and expectations.

The following major processes apply:

- *Project Plan Development* - taking the results of other planning processes and putting them into a consistent, coherent document.
- *Project Plan Execution* - carrying out the project plan by performing the activities included therein.
- *Overall Change Control* - coordinating changes across the entire project.

Integration applies to a number of other areas as well. For example, the integration of:

- Work of the project with the ongoing operations of the performing organisation.
- Product scope and project scope.
- Deliverables from different functional specialties (such as civil, electrical and mechanical drawings for an engineering design project).
4.3.2 PROJECT SCOPE MANAGEMENT

Duncan (1996:47) defines project scope management as “the processes required to ensure that the project includes all the work required and only the work required, to complete the project successfully”. It is mainly concerned with defining and controlling what is or is not included in the project. The major project scope management processes are:

- **Initiation** - committing the organisation to begin the next phase of the project.
- **Scope Planning** - developing a written scope statement as the basis for future project decisions.
- **Scope Definition** - subdividing the major project deliverables into smaller, more manageable components.
- **Scope Verification** - formalising acceptance of the project scope.
- **Scope Change Control** - controlling changes to project scope.

In the project context, the term *scope* may refer to:

- Product scope - the features and functions that are to be included in a product or service, or
- Project scope - the work that must be done in order to deliver a product with the specified features and functions.

Completion of the *product* scope is measured against the requirements (specifications) while completion of the *project* scope is measured against the plan. Both types of scope management must be well integrated to ensure that the work of the project will result in delivery of the specified product.
4.3.3 PROJECT TIME MANAGEMENT

Duncan (1996:59) defines project time management as “the processes required to ensure timely completion of the project” which consists of:

- **Activity Definition** - identifying the specific activities that must be performed to produce the various project deliverables.
- **Activity Sequencing** - identifying and documenting interactivity dependencies.
- **Activity Duration Estimating** - estimating the number of work periods which will be needed to complete individual activities.
- **Schedule Development** - analysing activity sequences, activity duration and resource requirements to create the project schedule.
- **Schedule Control** - controlling changes to the project schedule.

An important consideration is to ensure that the work to be done is described accurately and understood by those who must do the work.

4.3.4 PROJECT COST MANAGEMENT

Duncan (1996:73) defines project cost management as “the processes required to ensure that the project is completed within the approved budget” which include the following major processes:

- **Resource Planning** - determining what resources (people, equipment and materials) and what quantities of each should be used to perform project activities.
- **Cost Estimating** - developing an approximation (estimate) of the costs of the resources needed to complete project activities.
- **Cost Budgeting** - allocating the overall cost estimate to individual work items.
- Cost Control - controlling changes to the project budget.

Predicting and analysing the prospective financial performance of the project product is usually done outside the project. In other projects (for example, construction), cost management also includes the analysing of the financial performance of the project. When such predictions and analysis are included, project cost management will include additional processes and techniques such as return on investment, discounted cash flow and payback analysis.

4.3.5 PROJECT QUALITY MANAGEMENT

Duncan (1996:83) defines project quality management as “the processes required to ensure that the project will satisfy the needs for which it was undertaken”. It includes all activities of the overall management function that determine the quality policy, objectives and responsibilities and implements them by means such as quality planning, quality control, quality assurance and quality improvement within the quality system. Project quality management processes consist of:

- **Quality Planning** - identifying which quality standards are relevant to the project and determining how to satisfy them.
- **Quality Assurance** - evaluating overall project performance on a regular basis to provide confidence that the project will satisfy the relevant quality standards.
- **Quality Control** - monitoring specific project results to determine if they comply with relevant quality standards and identifying ways to eliminate causes of unsatisfactory performance.
Project quality management must address both the management of the project and the product of the project. Failure to meet quality requirements in either dimension can have serious negative consequences for any or all of the project stakeholders. A critical aspect of quality management in the project context is the necessity to turn implied needs into stated needs through project scope management.

4.3.6 PROJECT HUMAN RESOURCE MANAGEMENT

Duncan (1996:93) defines project human resource management as “the processes required to make the most effective use of the people involved with the project”. It includes all the project stakeholders, that is, sponsors, customers and individual contributors. The major processes are:

- **Organisational Planning** - identifying, documenting and assigning project roles, responsibilities and reporting relationships.
- **Staff Acquisition** - getting the human resources needed assigned to and working on the project.
- **Team Development** - developing individual and group skills to enhance project performance.

4.3.7 PROJECT COMMUNICATIONS MANAGEMENT

Duncan (1996:103) defines project communications management as “the processes required to ensure timely and appropriate generation, collection, dissemination, storage and ultimate disposition of project information”. It provides the critical links among people, ideas and information that are necessary for success. The major processes are:
Communications Planning - determining the information and communications needs of the stakeholders - who needs what information, when will they need it and how will it be given to them.

Information Distribution - making needed information available to project stakeholders in a timely manner.

Performance Reporting - collecting and disseminating performance information which includes status reporting, progress measurement and forecasting.

Administrative Closure - generating, gathering and disseminating information to formalise phase or project completion.

4.3.8 PROJECT RISK MANAGEMENT

Duncan (1996:111) defines project risk management as “the processes concerned with identifying, analysing and responding to project risk”. The major processes are:

- Risk Identification - determining which risks are likely to affect the project and documenting the characteristics of each.
- Risk Quantification - evaluating risks and risk interactions to assess the range of possible project outcomes.
- Risk Response Development - defining enhancement steps for opportunities and responses to threats.
- Risk Response Control - responding to changes in risk over the course of the project.

4.3.9 PROJECT PROCUREMENT MANAGEMENT

Duncan (1996:123 describes project procurement management as “the processes required to acquire goods and services from outside the performing organisation”. The major processes are:
- Procurement Planning - determining what to procure and when.
- Solicitation Planning - documenting product requirements and identifying potential sources.
- Solicitation - obtaining quotations, bids, offers, or proposals as appropriate.
- Source Selection - choosing from among potential sellers.
- Contract Administration - managing the relationship with the seller.
- Contract Close-out - completing and settling the contract, including resolution of any open items.

As the aforementioned knowledge areas, prescribed by the PMBOK, are considered to be the generally accepted practices of project management, it will be used as a framework to identify the deemed best practices of project management. In searching for best practices of project management, these nine knowledge areas will thus be used as the focal points.

4.4 PROJECT MANAGEMENT PROCESSES

The project management processes common to most projects in most application areas as stated by Duncan (1996:30), are illustrated in Table 4.1. According to Duncan (1996:34), the processes identified and the interactions illustrated meet the test of general acceptance, that is, they apply to most projects most of the time.
Table 4.1: Project management processes

<table>
<thead>
<tr>
<th>Knowledge Area</th>
<th>Process Groups</th>
<th>Initiating</th>
<th>Planning</th>
<th>Executing</th>
<th>Controlling</th>
<th>Closing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration Management</td>
<td>✓</td>
<td>✓ Project Plan Development</td>
<td>✓ Project Plan Execution</td>
<td>✓ Integrated Change Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scope Management</td>
<td>✓ Initiation</td>
<td>✓ Scope Planning</td>
<td>✓ Scope Definition</td>
<td>✓ Scope Verification</td>
<td>✓ Scope Change Control</td>
<td></td>
</tr>
<tr>
<td>Time Management</td>
<td>✓ Activity Definition</td>
<td>✓ Activity Sequencing</td>
<td>✓ Activity Duration estimating</td>
<td>✓ Schedule Development</td>
<td>✓ Schedule Control</td>
<td></td>
</tr>
<tr>
<td>Quality Management</td>
<td>✓ Quality Planning</td>
<td>✓ Quality Assurance</td>
<td>✓ Quality Control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human Resource Management</td>
<td>✓ Organisational Planning</td>
<td>✓ Staff Acquisition</td>
<td>✓ Team Development</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communications Management</td>
<td>✓ Communications Planning</td>
<td>✓ Information Distribution</td>
<td>✓ Performance Reporting</td>
<td>✓ Risk Monitoring and Control</td>
<td>✓ Administrative Closure</td>
<td></td>
</tr>
<tr>
<td>Procurement Management</td>
<td>✓ Procurement Planning</td>
<td>✓ Solicitation Planning</td>
<td>✓ Solicitation</td>
<td>✓ Source Selection</td>
<td>✓ Contract Administration</td>
<td>✓ Contract Closing</td>
</tr>
</tbody>
</table>

Source: Duncan (1996:30)

4.4.1 IMPORTANCE OF PLANNING

Bigelow (2001:1) claims that planning is the most important yet most undervalued element of project management. Planning is perceived as being the map that sets the direction for a project. Planning is critical to the project management process because it forms the basis for the project scope, schedule, resources, quality, risk and integration. Planning requires that the
project team collectively consider all that is necessary to complete a project effectively. Planning (or the lack thereof) is often the crux of many project failures.

Although it is recognised that planning is something that must be done, a feeling of anxiousness is normally experienced if it takes too long, or gets too detailed. More often than not, time is not taken to understand and develop the necessary requirements and assess the risk which could be a costly mistake for any project manager. Bigelow (2001:2) asks the question “Why don't we do more planning?” Some of the answers provided (across all industries) are:

- It takes too much time.
- The existing culture does not see the value.
- The plan will change anyway.
- The customer does not know what they want.
- The role-players do not want to commit and be held accountable.

Bigelow (2001:2) states that “the bottom line is that we need to be thorough and effective as we construct a comprehensive plan for managing our projects”. Duncan (1996:56) reiterates that planning is of major importance to a project because the project involves doing something that has not been done before. The relationships among the project planning processes are shown in Figure 4.1.
Figure 4.1: Overview of planning process

Source: Duncan (1996:56)

4.4.2 PLANNING PROCESSES

As is illustrated in Figure 4.1, certain planning processes are considered to be core processes. These core (primary) planning processes are considered to have clear dependencies that require them to be performed in essentially the same order on most projects (Duncan, 1996:56). For example, activities must be defined before they can be scheduled or costed. These core (primary) planning processes include:

- Scope Planning - developing a written scope statement as the basis for future project decisions.
- Scope Definition - subdividing the major project deliverables (outputs) into smaller, more manageable components.
- Activity Definition - identifying the specific activities that must be performed to produce the various project deliverables.
- Activity Sequencing - identifying and documenting interactivity dependencies.
- Activity Duration Estimating - estimating the number of work periods which will be needed to complete individual activities.
- Schedule Development - analysing activity sequences, activity duration and resource requirements to create the project schedule.
- Resource Planning - determining what resources (people, equipment and materials) and what quantities of each should be used to perform project activities.
- Cost Estimating - developing an approximation (estimate) of the costs of the resources needed to complete project activities.
- Cost Budgeting - allocating the overall cost estimate to individual work items.
- Project Plan Development - taking the results of other planning processes and putting them into a consistent, coherent document.

The remaining planning processes are seen as supporting processes. Interactions among the supporting (secondary) planning processes are more dependent on the nature of the project. For example, on some projects there may be little or no identifiable risk until after most of the planning has been done and the team recognises that the cost and schedule targets are extremely aggressive and thus involve considerable risk. Although these supporting processes are performed intermittently and as needed during project planning, they are not considered to be optional. The supporting processes include:
- Quality Planning - identifying which quality standards are relevant to the project and determining how to satisfy them.
- Organisational Planning - identifying, documenting and assigning project roles, responsibilities and reporting relationships.
- Staff Acquisition - getting the human resources needed assigned to and working on the project.
- Communications Planning - determining the information and communications needs of the stakeholders - who needs what information, when will they need it and how will it be given to them.
- Risk Identification - determining which risks are likely to affect the project and documenting the characteristics of each.
- Risk Quantification - evaluating risks and risk interactions to assess the range of possible project outcomes.
- Risk Response Development - defining enhancement steps for opportunities and responses to threats.
- Procurement Planning - determining what to procure and when.
- Solicitation Planning - documenting product requirements and identifying potential sources.

Wideman (2001a:3-4) states that the planning phases of a project can generally best be accomplished by a progressive flow of information and work, through the project management process, in the sequence described in the Table 4.2.
Table 4.2: Planning phases of the project

<table>
<thead>
<tr>
<th>You need to know…</th>
<th>Which identifies the:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) First and foremost, what is it that is to be delivered?</td>
<td>project’s scope.</td>
</tr>
<tr>
<td>(ii) To what standards are these products or services going to be delivered?</td>
<td>quality of the products.</td>
</tr>
<tr>
<td>(iii) How long is the project estimated to take and in what sequence will the necessary work be done?</td>
<td>time involved.</td>
</tr>
<tr>
<td>(iv) What is the estimated funding required for the project?</td>
<td>cost involved.</td>
</tr>
<tr>
<td>(v) What is the level of confidence for successfully completing all the work?</td>
<td>associated risk (and opportunities).</td>
</tr>
<tr>
<td>(vi) What is the quality of human performance required to achieve these results?</td>
<td>quality of the process.</td>
</tr>
<tr>
<td>(vii) What skills are needed to do the work?</td>
<td>human resources required.</td>
</tr>
<tr>
<td>(viii) What resources must be outsourced (contracted for) or what corporate commitments must be obtained (procured internally)?</td>
<td>contract/procurement arrangements.</td>
</tr>
<tr>
<td>(ix) How can all of this be melded into an effective and efficient whole?</td>
<td>information/communications.</td>
</tr>
</tbody>
</table>

Source: Wideman (2001:3)

Wideman (2001a:4) also classes the functions as either being (a) *hard* (core) functions, or (b) *soft* (supportive). The first four functions in Table 4.2 (scope, quality of product/service, time and cost) are considered to be the traditional, relatively clearly-defined components of project management. These four functions should be defined as far as possible prior to commencement of the production phases of the project in order to provide a basis for project control. The documentation for these four functions are said to be *hard*, that
is, the scope and quality by requirements and specifications, time by schedules and charts and cost by budgets, reports and analyses.

The last five functions in Table 4.2 (risk, quality of process, human resources, contract/procurement and information) require personal interaction and are said to be the soft components of project management. These functions tend to be dependent upon the social sciences and make a great deal of use of management theory. Quality is particularly important because it has a pivotal function. It bridges the transition between the hard and soft components since it has two parts, the hard part of product quality and the soft part of the quality of human performance. It is the latter which, in fact, determines the quality of the product. The cost and timeliness of all these various activities required to produce the end products to the required quality will together and in large measure, determine the project's success.

*The importance of planning a project is evident based on the information discussed in this section. As highlighted in this section certain planning functions are considered to be primary (core), whereas other functions are deemed to be secondary (supportive). For the purpose of this research, the assumption can be made at this stage that the effectiveness of planning will influence the success of a project. This assumption will be investigated in more detail in the next section when the factors that influence the success or failure of projects, are identified.*
4.5 FACTORS AFFECTING THE SUCCESS AND FAILURE OF PROJECTS

The factors that influence the success and/or failure of projects will be investigated in this section. The focus of the discussion will be around project success and/or failure factors identified by a number of authors. At the end of the discussion the collective factors will be summarised in order to identify the common factors (and practices) that could be considered to be the best practices.

4.5.1 HARRISON AND CRAWFORD’S SUCCESS AND FAILURE INDICATORS

The reasons for the success or failure of projects are many and varied (Harrison, 1992:6). The question arises as to what constitutes the success or failure of a project. Normally, if a project does not meet its time, cost and performance objectives, it would appear to have been a failure, but this is not necessarily so. It is the perceived success or failure that is of importance which is influenced by the needs or requirements of the project stakeholders. Provided a project achieves a satisfactory level of performance (technical requirements), in retrospect, the stakeholders involved may consider it a success, despite exceeding cost and time targets. The criteria for project success or failure is thus determined whether all the stakeholders are satisfied with the final outcome of the project.
Harrison (1992:8) and Crawford (2001:6) identified specific factors that affect
the success and failure of projects. Table 4.3 draws a comparison between
the success and failure indicators presented by (a) Harrison (1992:8) and (b)
Crawford (2001:6), respectively.

Table 4.3: Project success and failure indicators

<table>
<thead>
<tr>
<th>(a) Project success indicators</th>
<th>(b) Project failure indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal commitment of project team</td>
<td>Muddled business objectives</td>
</tr>
<tr>
<td>Accurate initial cost estimates</td>
<td>Insufficient documentation</td>
</tr>
<tr>
<td>Adequate project team capability</td>
<td>Extreme complexity</td>
</tr>
<tr>
<td>Adequate minimal start-up difficulties</td>
<td>Project disorganisation</td>
</tr>
<tr>
<td>Adequate planning and control techniques</td>
<td>Inadequate project planning</td>
</tr>
<tr>
<td>Task (versus social) orientation</td>
<td>Faulty task management</td>
</tr>
<tr>
<td>Absence of bureaucracy</td>
<td>Poor reporting and communications</td>
</tr>
<tr>
<td>On-site project manager</td>
<td>Abrupt scheduling changes</td>
</tr>
<tr>
<td>Clearly established success criteria</td>
<td>No client objectives or project objectives</td>
</tr>
<tr>
<td>Adequate funding to completion</td>
<td></td>
</tr>
</tbody>
</table>

Sources: (a) Harrison (1992:8) and (b) Crawford (2001:6)

By contrasting the success and failure indicators in Table 4.3, the
significance of planning a project is accentuated by the importance
given to those factors that are considered to be essential for success,
for example, establishing the success criteria (and objectives),
estimating cost and assessing project team capability.

4.5.2 BING’S PRINCIPLES OF SUCCESSFUL PROJECTS

Bing (1994:38) states that “project management is used in so many diverse
circumstances, that extracting principles that apply to all is not simple".
Nevertheless, Bing (1994:38-9) recommends the following principles, or basic rules, of project management:

(a) **There must be a project as defined in the PMBOK and not just a task or an ongoing activity.**

Project management is a tool for effective and efficient management of projects. It is not necessarily a useful or appropriate for ongoing production or for something such as making a phone call.

(b) **There must be a single leader (project manager), who is experienced and willing to take the responsibility for the work.**

A principle that evolved in the development of project management is that if a job needs to get done, it must be assigned to one person who can be hold accountable for the results. The experience required of the project manager is related both to the business or technology of the project and in the management of projects.

(c) **There must be an informed and supportive management that delegates appropriate authority to the project manager.**

As mentioned before, the project manager is the person responsible for the project. If a person is given the responsibility and accountability for something, that person must also be given the authority to carry out the assignment.

(d) **There must be a dedicated team of qualified people to do the work of the project.**

Team members must be specifically identified for the project from the perspective of personal responsibility. This is opposed to the work being assigned to a larger group of unidentified people. The team members should be qualified, although a project is should not be precluded from being the training ground for new employees. In these cases, the newcomers must learn under the guidance of qualified supervisors.
(e) The project goal must be clearly defined along with the priorities of the shareholders.

Project management is a goal-oriented management system and the first order of business is to define the goal, the purpose of the project. Once this goal is set, the stakeholders should indicate the relative importance for the three basic objectives of all projects, such as to have a short schedule, to have low cost, or to have the highest quality. Because these three objectives are inherently in conflict, initial goals are usually compromises to obtain a practical or optimum overall objective. However, the project manager needs to know the priorities as a guide for future decisions and trade-offs. Thus, if time is most important and the schedule is slipping, it may be necessary to spend extra money to keep to this goal.

(f) There must be an integrated plan that outlines the action required in order to reach the goal.

Once the project goal is defined, the project manager must establish the plan of action required to reach the goal (a map to show how to get there). The plan must take into account all the factors that affect the project and all the people who are involved. All of the factors must be considered and conflicts must be resolved, or the original plan is bound to fail when the inevitable problems surface.

(g) There must be a schedule establishing the time goals of the project.

A basic part of the integrated plan is a schedule of all the activities reflecting how long each activity will take and the interrelationship they have with one another. For example, the foundation must be poured before the equipment can be set. There are many types of schedules and the type chosen by the project manager should be the one most appropriate for the conditions of the project.

(h) There must be a budget of costs and/or resources required for the project.

In order to control the cost of a project there must be an estimate of the total project cost as well as a cost breakdown for each activity. These
costs may be in rands, in labour, in materials, or in equipment, all of which can be translated into costs. As the project progresses, the project manager can assess actual costs versus the estimated costs so that deviations can be acted upon quickly.

The sequence of the list of principles is not intended to indicate the relative importance of the individual principles. However, they do fall into the normal sequence of activities in the concept and planning phases of projects and thus can be viewed as building blocks, one on another, in establishing the foundation for successful projects. Failure of one can jeopardise all that follow. According to Bing (1994:39), this list of principles was developed over a period of years from critical reviews and audits of a number of projects. Most project failures, that is, projects that do not attain their goals, were traced to non-adherence to one or more of these principles.

4.5.3 WIEGERS’ “SECRETS OF PROJECT MANAGEMENT SUCCESS”

Wiegers (2001:1-3) shares what is referred to as “secrets of project management success”. The factors identified for the planning and execution of projects are:

(a) Define project success criteria.
   At the beginning of the project, it needs to be ensured that the stakeholders share a common understanding of how it will be determined whether the project is successful.

(b) Identify project drivers, constraints and degrees of freedom.
   Every project needs to balance its functionality, staffing, budget, schedule and quality objectives.
(c) **Negotiate commitments.**
Negotiate with project stakeholders about what is realistically achievable.

(d) **Write a plan.**
It is often believed that the time spent writing a plan could be better spent doing the work. However, the difficult part is not writing the plan. The difficult part is actually doing the planning - thinking, negotiating, balancing, talking, asking and listening. The time spent analysing what it will take to solve the problem will reduce the number of surprises later in the project.

(e) **Decompose tasks to inch-pebble granularity.**
Inch-pebbles are miniature milestones. Breaking large tasks into multiple small tasks helps to estimate tasks more accurately and permits more accurate status tracking.

(f) **Develop planning work sheets for common large tasks.**
If common tasks are undertaken frequently, activity checklists and planning worksheets need to be developed for these tasks. These checklists and worksheets will help identify and estimate the effort associated with such large tasks.

(g) **Manage project risks.**
If risks are not identified and controlled, risks will control the project. During planning of the project some time should be spent on identifying possible risk factors, evaluating their potential threat and deciding how the risks can be mitigated or prevented.

(h) **Build training time into the schedule.**
Determine how much time team members need to spend on training in order to build capacity.

(i) **Record estimates.**
When preparing estimates for project work, how the estimates were calculated should be documented. Understanding the assumptions and approaches used to create an estimate will make it easier to defend
and adjust when necessary and it will help to improve the estimation process.

(j) Use estimation tools (computer software).
Many commercial tools are available to help estimate entire projects. With such large databases of actual project experience, these tools can provide a spectrum of possible schedule and staff allocation options.

(k) Track project status openly and honestly.
Create a climate in which team members feel safe reporting project status accurately. Use project status information to take corrective actions when necessary and to celebrate when appropriate.

4.5.4 ARCHIBALD’S KEY CONCEPTS FOR PROJECT MANAGEMENT

Archibald (2001:9-15) identifies the following three key concepts for project management:

(a) Integrated project portfolio management
In order to achieve the full benefits of modern project management the organisation must have a documented picture of its overall project management process. This integrated approach should:

- Describe how the organisation's project portfolios are related to the organisation's strategies.
- Identify the basic types or categories of projects that exist or are planned.
- Define the project life-cycle for each project category.
- Define, for each project category, the corporate guidelines for project risk analysis and planning and control, with provision for appropriate adaptation for specific situations.
- Specify the documents and related levels of approval authority for initiating and authorising new projects and major changes to authorised projects.
- Identify the key roles and define their responsibilities and authority as related to project and functional management.
- Specify the procedures for escalating the inevitable conflicts (for scarce resources, priorities between projects and others) to the appropriate level for their prompt resolution.

This process should be documented with supporting descriptions, together with appropriate references to pertinent corporate policies, procedures and forms. When this is done properly the result is integrated project management.

(b) Key integrative roles

All the integrative roles need to be clearly defined, understood and assigned to qualified people. The role of the project manager is a central one, as he/she integrates the efforts of all persons and organisations contributing to the project, primarily working through the various functional project leaders. The project manager plans and directs the execution of the project to meet the time, cost and performance objectives.

(c) Application of integrative project planning and control systems

The second key concept of the project management discipline requires that each project be planned and controlled on an integrated basis by:

- including (involving) all the contributing functional areas or organisations.
- working through all of the project life-cycle phases (conception, definition, design, development, operation and post-completion).
- including all the elements of information (schedule, cost and technical) important to the project, together with cost and schedule variance reports.
- using currently available project management software systems.

Most organisations are faced with the need to plan and execute many projects simultaneously using common resource pools, creating the need to use one common project planning and control information system for all projects. Effective application of computer-supported project planning and control systems requires using one integrated system for each and every project within the organisation to:

- Define and control the project's objectives and scope.
- Evaluate and proactively manage individual project risks together with the aggregate project portfolio risks.
- Define and control the specification, quality, configuration and quantity of intermediate and final products (or deliverables) of the project.
- Systematically define and control the work to be carried out using the work breakdown structure (WBS) approach.
- Estimate the labour, material and others costs associated with the project's deliverable products and related work elements and each summary element in the WBS.
- Plan and control the sequence and timing of the project deliverables and related work elements using a top level project master schedule plus an appropriate hierarchy of schedules.
- Authorise and control the expenditure of funds and work hours required to execute the project.
- Provide the information regarding actual progress and expenditures as well as forecasts in the future, required by project stakeholders on a timely and reasonably accurate basis.
- Continually evaluate progress, predict and mitigate problems with quality, cost, schedule and risk.
- Report to management and customers on the current status and future outlook for project quality, cost and schedule completion, including post-completion reports.

### 4.5.5 GREER’S KEY PRINCIPLES OF PROJECT SUCCESS

Greer (2001a:1-3) identifies a number of key principles of project success:

(a) *Project managers must focus on three dimensions of project success.*

   Project success means completing all project deliverables on time, within budget and to a level of quality that is acceptable to sponsors and stakeholders.

(b) *Planning is everything and is ongoing.*

   The single most important activity that project managers engage in is planning. Detailed, systematic, team-involved plans are the foundation for project success.

(c) *Project managers must feel and transmit to their team members a sense of urgency.*

   Because projects are finite endeavours with limited time, money and other resources available, they must be kept moving toward completion. Regular status checks, meetings and reminders are essential.

(d) *Successful projects use a time-tested, proven project life-cycle.*

   Professional standards and best practices need to be built into project plans which will support quality and help to minimise rework.
(e) All project deliverables and all project activities must be visualised and communicated in vivid detail.
   The project manager and project team must create a tangible picture of the finished deliverables in the minds of everyone involved so that all effort is focused in the same direction.

(f) Deliverables must evolve gradually, in successive approximations.
   Incremental reviews and approvals are required to maintain a controlled evolution.

(g) Projects require clear approvals and sign-off by sponsors.
   Formal sign-off by sponsors and other key stakeholders, of the project deliverables should be included in the process.

(h) Project success is correlated with thorough analyses of the need for project deliverables.
   There is a greater likelihood of project success when a project produces the deliverables that are designed to meet a thoroughly documented need.

(i) Project managers must fight for time to do things right.
   Projects must have available enough time to do it right the first time, to minimise rework during the execution phase.

(j) Project sponsors and stakeholders must be active participants, not passive customers.
   Most project sponsors and stakeholders demand the authority to approve project deliverables. With this authority comes the responsibility to be an active participant in the project by helping to define deliverables, to complete reviews and to help the project manager's in gaining access to resources and essential documentation.

(k) Project managers should acquire the best people they can and then do whatever it takes to keep the garbage out of their way.
   By acquiring the best people, the most skilled, the most experienced, the best qualified, the project manager can compensate for too little time or money, or other project constraints.
Top management must actively set priorities.

It is not uncommon for project team members to be expected to play active roles on many project teams at the same time. It is possible that resources are stretched to their limits and there are simply too many projects to be completed. To overcome this challenge, most organisations have established a project office comprised of top managers from all departments to prioritise projects and project requests. The project office reviews the organisation's overall mission and strategies, establishes criteria for project selection and funding, monitors resource workloads and determines which projects are of high enough priority to be approved.

Greer (2001b: 4-5) also identified a number of key actions for project managers. The key actions identified for planning are:

- Describe project scope (statement of project scope, scope management plan and work breakdown structure).
- Define and sequence project activities (list of all activities that will be performed on the project).
- Estimate duration of activities and resources required (time required for each activity and assumptions related to each estimate and statement of resource requirements).
- Develop a project schedule (with supporting details, such as resource usage over time, cash flow projections and order/delivery schedules).
- Estimate costs for completing each activity (with supporting detail, including assumptions and constraints).
- Build a budget and spending plan.
- Create a formal quality plan (including definitions quality checklists).
- Create a formal project communications plan (including distribution structure, description of information to be disseminated and schedules listing when information will be produced).
- Organise and acquire staff (role and responsibility assignments, staffing plan, organisational chart, project staff and project team directory).
- Identify risks and plan to respond (a document describing potential risks, including their sources, symptoms and ways to address them).
- Plan for and acquire outside resources, where necessary (procurement management plan describing how contractors will be obtained).
- Organise the project plan (a comprehensive project plan that pulls together all the outputs of the preceding project planning activities).
- Close out the project planning phase (a project plan that has been approved, in writing, by the sponsor).
- Revisit the project plan and re-plan if needed (to effectively achieve results as planned).

4.6 SUMMARY OF BEST PRACTICES

Taking the practices and standards identified, as well as the other generally accepted practices, discussed in this chapter, it will be noticed that there are a number of commonalities that are shared by the respective authors. The collective standards identified in the literature survey which can be considered to be the best practices of project management are summarised in Table 4.4.
### Table 4.4: Summary of project management *best practices*

<table>
<thead>
<tr>
<th><strong>PLANNING THE PROJECT</strong></th>
<th></th>
</tr>
</thead>
</table>
| **Scope Management**    | The *criteria (measure) for project success* (time, cost and deliverables) must be determined and agreed upon with all stakeholders at the beginning of the project.  
The *scope (requirements) of the project* must be clearly defined by dividing the major project deliverables into smaller, more manageable.  
The *project requirements (scope), constraints and specific schedule elements/dates (milestones)* must be clearly identified and communicated to all stakeholders.  
The *scope of the project* needs to be verified and formally accepted by key role-players. |
| **Time Management**      | An integrated *project schedule (plan)* must be created which identifies activity sequences, activity duration and resource requirements.  
The specific *activities (work to be done)* to produce the project deliverables (outcomes), have to be identified clearly and documented. |
| **Cost Management**      | *Costs* for the project have to be calculated by developing an estimate of the costs for the resources needed to complete project activities.  
*Resources* have to be planned, by determining what resources (people, equipment and materials) and what quantities of each are needed to perform project activities. |
| **Quality Management**   | *Quality* standards for the project deliverables (outputs) must be identified. |
| **Human Resource Management** | A single person (*project manager/leader*) must accept overall responsibility for the project.  
All team and stakeholder *roles and responsibilities* have to be clearly delineated and communicated.  
*Skilled people* must be used for all project roles.  
*Resources* need to be analysed for both over- and under- utilisation.  
All the stakeholders must be committed to the goals of the project.  
The *roles and responsibilities of project role-players* have to be clearly identified and documented. |
Table 4.4: Summary of project management *best practices* (continued)

<table>
<thead>
<tr>
<th>Communications Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>A <em>communications’ plan</em> must be developed which identifies the information and communications needs of the role-players.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Risks</em> have to be identified and responses developed proactively.</td>
</tr>
<tr>
<td>Early warning signs of problems (<em>risks</em>) in the project must be responded to timeously.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Procurement Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>If <em>contractors/suppliers</em> are used for the project, the procurement of such goods and services need to be planned for.</td>
</tr>
</tbody>
</table>

**EXECUTING THE PROJECT**

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The <em>time schedule, budget and quality of the deliverables</em> have to be monitored closely throughout the project’s life-cycle.</td>
</tr>
<tr>
<td><em>Changes</em> to the project scope, or budget, or schedule (time), must be controlled by documenting and communicating such changes.</td>
</tr>
<tr>
<td><em>Project status (progress) reports</em> must be distributed timeously and disseminated to all role-players.</td>
</tr>
</tbody>
</table>

**GENERIC STANDARDS**

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A <em>common methodology</em> must exist for developing project plans.</td>
</tr>
<tr>
<td>Established <em>project processes</em> must be documented.</td>
</tr>
<tr>
<td><em>Templates</em> (guides) must be developed for the project processes.</td>
</tr>
<tr>
<td><em>Training</em> needs to be provided to build adequate project team capability.</td>
</tr>
<tr>
<td>The use of project management <em>software</em> will facilitate planning and controlling.</td>
</tr>
<tr>
<td>A <em>formal project management office</em> will enhance managing of projects in a multiple-project environment.</td>
</tr>
</tbody>
</table>

### 4.7 SUMMARY

The objective of this chapter was to address the first sub-problem of this research, by identifying the deemed *best practices* that enhance the effectiveness of project management. This was achieved by identifying, (a)
the factors that influence the effectiveness of project management, (b) generally accepted project management practices, (c) project management processes, and (d) factors affecting the success and/or failure of projects. A summary of the deemed *best practices* based on the literature research was provided which will be used for the design of the research questionnaire to be discussed in the Chapter 5.
5.1 INTRODUCTION

A number of standard practices from the various authors were identified in Chapter 4, which could be considered to be the best practices of project management. These standards will thus be used for the development of an assessment tool to evaluate the effectiveness of project management practices in Telkom (the second sub-problem). Particulars of the empirical component of the research are clarified in this chapter.

5.2 SURVEY METHOD

A survey questionnaire was selected as measuring instrument for this research, the reasons for which will be described in more detail below. Welman and Kruger (1999:147) state that survey questionnaires may be used to obtain the following types of information from respondents:

- Biographical particulars
- Typical behaviour
- Opinions, beliefs and convictions
- Attitudes

In order to conduct a postal or mail survey, firstly, the questions for the respondents need to be assembled in a structured questionnaire. Secondly, the questionnaires are posted to the respondents with the request to complete the questionnaires and return by mail or other method.
5.2.1 ADVANTAGES AND DISADVANTAGES OF POSTAL SURVEYS

The advantages and disadvantages of postal surveys according to Welman and Kruger (1999:151-152) are:

- Cost and ease of application - the most important advantage of postal surveys is that it is the least expensive of all survey methods.
- Anonymity - of all survey methods the postal survey provides the greatest possibility of anonymity, that is, it is not necessary to provide name or identification.
- Control over responding - the researcher has the least control over the conditions under which postal questionnaires are completed, for example, respondents may choose not to answer some of the questions.
- Response rate - the researcher’s lack of control over the completion of the questionnaires, could also result in a poor response rate (the percentage of questionnaires returned). Postal surveys tend to have the lowest response rate of all survey methods.

Welman and Kruger (1999:153) suggest alternative ways of distribution to improve the response rate of postal surveys, such as, delivering the questionnaires in person; posting and collecting it personally (at the postal service); or delivering and collecting the questionnaires personally. An alternative method of distribution was, however, used for this research, namely via electronic mail. The reasons for selecting electronic mail are:

- An improved response rate, as electronic mail is considered to be the preferred way of formal communication in most modern organisations.
- The entire research population has access to electronic mail.
- An envisaged improvement in control over the response rate justifies the use of electronic mail, although the anonymity of postal surveys will be compromised.
The use of electronic mail provides the opportunity to develop an *on-line* (computer-based) questionnaire that is *user-friendly* and less time-consuming for respondents to complete.

### 5.3 DEVELOPMENT AND CONSTRUCTION OF THE QUESTIONNAIRE

Welman and Kruger (1999:171-179) present a number of techniques and hints for developing and constructing questionnaires. The considerations offered are briefly:

- Choose judiciously between open-ended and closed-ended (multiple-choice variety) questions.
- Take the respondents literacy level into consideration.
- Be careful not to offend.
- Strive for conciseness (briefness) yet no ambiguity (having one meaning only).
- Maintain neutrality.
- Use a justified sequence.
- Be sure the question is appreciable to all respondents.

For the purposes of this survey questionnaire, closed-ended questions were used, more specifically multiple-choice variety questions with a combination of (a) two alternatives (yes/no), as well as (b) structured questions that provides for selecting a response from five alternatives.

The research populations selected for the research are considered to be experienced *project managers/co-ordinators*, whom are accustomed with project management terminology. The questions were formulated using words and concepts with which the respondents are familiar. For some questions, technical
terms (jargon) had to be used, to enhance the objectivity of the expected responses. However, where such technical terms were used in the questions, the terminology was explained in more common (clear) language, using parentheses.

5.3.1 CONSTRUCTION OF THE RESEARCH QUESTIONNAIRE

The research questionnaire was divided into the following parts:

Part 1: *Personal details of the respondent:* - such as job title or position, geographic location and contact details.

Part 2: *Project Management Standards and Processes:* - questions relating to general project standards and practices in the specific organisation, based on the *best practices* identified in Chapter 4.

Part 3: *Planning and Executing projects:* - questions concerning general methods/procedures applied during the planning and execution of projects in the specific organisation, again based on the *best practices* identified in Chapter 4.

Part 4: *Project Retrospection:* - assessing the effectiveness of a recently completed project with which the respondent was involved.

The questions included in Parts 2 and 3 provide the opportunity to assess the standard practices in the organisation, measured against the identified best practices. The questions in Part 4 will be used to (a) identify whether the completed projects could be considered to be a success or failure; and (b) also identify the factors that contributed to the success or failure of the specific projects. Although some criteria for the execution of projects have also been included in the questionnaire for comparative results, it must be mentioned that
the major focus in the research questionnaire is on the planning criteria for projects. This will facilitate the testing of the hypothesis that planning is crucial to the success of a project.

5.3.2 PILOT STUDY FOR THE QUESTIONNAIRE

Welman and Kruger (1999:146) strongly recommend that a survey questionnaire be tested on a small group of individuals who are representative of the same population for which it is intended. The purpose of such a pilot study is:

- To detect possible flaws in the measurement procedures (such as ambiguous instructions and inadequate time limits);
- To identify unclear or ambiguously formulated items; and
- To allow the researcher to identify non-verbal behaviour which possibly may be a sign of discomfort or embarrassment about the content or wording of the questions.

Three project managers of Telkom, as well as Dr J.J. Pieterse, the promoter of this study evaluated the survey questionnaire. A few minor changes were made to some questions, after which it was concluded that the questionnaire was understandable.

5.4 POPULATION TO BE SURVEYED

The questionnaires were sent to senior project managers, project managers and project co-ordinators/administrators in the Southern region (from Port Elizabeth, East London and George) of Telkom. The population selected for the survey, are representative of different project-driven divisions within Telkom which include:

- Technology and Network Services (Engineering)
- Information Technology
- Sales and Marketing

These divisions utilise project management methodology as part of their normal operations, hence the reason for selecting them as the survey population for project-driven organisations, for which this research is intended.

5.5 COMPLETION OF THE QUESTIONNAIRES

As this was a restricted research population, the response time was limited to two weeks from the date of receipt of the questionnaires. The completed questionnaires were returned via electronic mail to the researcher in Port Elizabeth. The responses to the questionnaires were recorded by the researcher, using an electronic spreadsheet, Microsoft Excel, to facilitate the statistical analysis.

5.6 SUMMARY

The survey method used for the research, as well as the procedure used for the development and construction of the questionnaire, was described in this chapter. Chapter 6 will examine the research results. The questionnaire compiled for the research is included in Annexure A.
CHAPTER 6: ANALYSIS OF THE RESEARCH RESULTS

6.1 INTRODUCTION

The results of the research conducted are examined in this chapter, focusing on the second sub-problem of this research, of which the aim is to determine what project management practices are currently applied in the South African communications industry. The research results are presented by focusing on the following three areas which correspond to the way in which the research questionnaire was constructed:

- Project management standards and processes
- Planning and executing projects
- Project retrospection of a completed project

6.2 THE RESPONSE RATE

The computer-based questionnaire was mailed electronically to 28 project managers/co-ordinators of Telkom in the Eastern Cape (Southern region), of which 21 responded. A response rate of 75 percent was thus achieved.

6.3 ANALYSIS OF THE RESULTS

A statistical comparison will be done for the different projects, to determine:

- Whether the general project management standards and practices of the organisation are on par with the best practices identified?
- How effective general project planning and execution methods and procedures are?
How successful the completed project was, in order to do a comparative analysis of the factors that could have affected the success or failure of the projects?

The questions and responses to each question are presented as a percentage of the total respondents. Figures and graphs have been used to facilitate the presentation of the research results.

6.3.1 PROJECT MANAGEMENT STANDARDS AND PRACTICES

A summary of the results for the general project standards and practices, measured against the best practices, are reflected in Figure 6.1.

**Figure 6.1: Summary of results for project management standards and practices**

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes (%)</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does a common methodology exist for developing project plans?</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Are established project processes documented?</td>
<td>95%</td>
<td>5%</td>
</tr>
<tr>
<td>Do templates (guides) exist for the various project processes?</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Are you involved with multiple projects at one specific time?</td>
<td>86%</td>
<td>14%</td>
</tr>
<tr>
<td>Are projects staffed from a common/shared pool of resources?</td>
<td>86%</td>
<td>14%</td>
</tr>
<tr>
<td>Is training (formal and/or on-the-job) provided to build adequate project team capability?</td>
<td>71%</td>
<td>19%</td>
</tr>
<tr>
<td>Are you currently using project management software?</td>
<td>86%</td>
<td>14%</td>
</tr>
<tr>
<td>Does a formal project management office exist?</td>
<td>90%</td>
<td>0%</td>
</tr>
</tbody>
</table>
From the research results illustrated in Figure 6.1, the following presumptions can be made relating to those results that are of statistical significance:

- The standards and processes in the organisation are well-established, in relation to:
  (i) project-planning methodologies;
  (ii) processes documented; and
  (iii) the availability of templates.

- The majority of the respondents (86 percent) are involved with multiple projects at one specific time.

- The same percentage respondents’ (86 percent), projects are staffed from a shared pool of resources.

- Adequate training (formal and/or on the job) is provided according to 71 percent of the respondents.

- Project software is used by 86 percent of the respondents.

- A formal project management office is available to 90 percent of the respondents.

6.3.2 PLANNING AND EXECUTING PROJECTS

A summary of the results for the general methods/procedures applied during the planning of projects, measured against the best practices, are reflected in Figure 6.2.
Figure 6.2: Summary of results for planning projects

- The criteria for project success are agreed upon with all stakeholders at the beginning of the project.
  - Always: 47.6%
  - Often: 42.9%
  - Seldom: 9.5%

- The scope of the project is clearly defined (work breakdown structure).
  - Always: 66.7%
  - Often: 33.3%

- The scope of the project is verified and formally accepted by key role-players.
  - Always: 52.4%
  - Often: 47.6%

- The specific activities are clearly identified and documented.
  - Always: 52.4%
  - Often: 38.1%
  - Seldom: 4.3%

- An integrated project schedule (plan) is created.
  - Always: 71.4%
  - Often: 28.6%

- The roles and responsibilities of project role-players are clearly identified and documented.
  - Always: 57.1%
  - Often: 28.6%
  - Seldom: 4.3%

- A communications' plan is compiled, which identifies the information and communications needs of the role-players.
  - Always: 38.1%
  - Often: 38.1%
  - Seldom: 19.0%

- Risks are identified and responses developed proactively (during planning).
  - Always: 9.5%
  - Often: 42.9%
  - Seldom: 47.6%

- Quality standards for the project deliverables (outputs) are identified.
  - Always: 47.6%
  - Often: 38.1%
  - Seldom: 9.5%

- Resources are planned by determining what resources and what quantities of each are needed.
  - Always: 57.1%
  - Often: 28.6%
  - Seldom: 9.5%

- Costs for the project are calculated by developing an estimate of the costs for project activities.
  - Always: 81.0%
  - Often: 19.0%

- The scope of the project is clearly defined (work breakdown structure).
From the research results illustrated in Figure 6.2, the following suppositions can be made relating to those results that are applicable to the planning of projects:

- Only 9.5 percent of the respondents indicated that the criteria for project success are determined *seldom* at the beginning of a project. The remaining respondents (90.5 percent) were in the affirmative that it is done *always* or *frequently.*

- The scope of projects is *always* or *frequently* clearly defined and formally accepted, according to all the respondents.

- The majority of the respondents also experience that the following practices are applied *always* or *frequently*:
  1. Clearly-defined project activities;
  2. Integrated project plans;
  3. Clearly-defined roles and responsibilities of stakeholders; and
  4. A communications plan exists.

- However, for the identification of risks and proactively developing responses to the risks, 48 percent of the respondents said that it is *seldom* done.

- For the determining of quality standards, planning of resources and calculating the costs, the majority of the respondents perceived these actions to be performed *always* or *frequently.*

A summary of the results for the general methods/procedures applied during the execution of projects, measured against the best practices, are reflected in Figure 6.3.
From the research results illustrated in Figure 6.3, the following supposition can be made relating to those results that are applicable to the execution of projects:

- The majority of the respondents experience that:
  (i) Changes to the scope, budget and time schedule, are controlled;
  (ii) Overall project performance is evaluated on a regular basis;
  (iii) Projects are kept under control; and
  (iv) Information is distributed in a timely manner.

6.3.3 PROJECT RETROSPECTION OF COMPLETED PROJECTS

A summary of the results for the retrospections on completed projects is reflected in Figure 6.4.
Figure 6.4: Summary of research results for project retrospection

- Did the project take longer than planned? 67% YES, 33% NO
- Did the final cost of the project exceed the initial budget? 29% YES, 71% NO
- Did the final deliverables of the project satisfy the needs or requirements of all stakeholders? 81% YES, 19% NO
- Were the project requirements and constraints clearly identified and communicated to all stakeholders? 95% YES, 5% NO
- Were all the stakeholders committed to the goals of the project? 71% YES, 29% NO
- Were all team and stakeholder roles and responsibilities clearly delineated and communicated? 90% YES, 10% NO
- Were skilled people assigned to all project roles? 86% YES, 14% NO
- Was a project manager/leader assigned to accept overall responsibility for the project? 90% YES, 10% NO
- Was the scope of the project changed at any stage during the execution phase? 71% YES, 29% NO
- Were the time schedule, budget and quality of the deliverables monitored closely throughout the project’s life cycle? 81% YES, 19% NO
- Were project status (progress) reports circulated timeously and disseminated to all role-players? 76% YES, 24% NO
- Were resources analysed for both over- and under-utilisation? 62% YES, 38% NO
- Were early warning signs of problems that occurred in the project, responded to timeously? 86% YES, 14% NO
- Were any contractors/suppliers used for the project? 67% YES, 33% NO
- Could any project delays be attributed specifically to the contractors/suppliers? 48% YES, 24% NO
The main question to be answered is as to whether the completed projects reviewed by the respondents could be considered to be a success or failure, and then to identify the factors that contributed to the success or failure of the specific project. The following questions were used as the fixed variables to determine the success or failure of the projects reviewed by the respondents:

(i) Did the project take longer than planned?
   - Of the 21 projects reviewed, 67 percent took longer than planned.

(ii) Did the final cost of the project exceed the initial budget?
   - The costs of 29 percent of the projects reviewed, exceeded the original budget.

(iii) Did the final deliverables (outcomes) of the project satisfy the needs or requirements of all stakeholders?
   - The deliverables of 19 percent of the projects did not satisfy the requirements of all the stakeholders.

These three fixed variables will be considered to be the generic project goals (time, cost or performance) that will determine whether the projects can be classified as either being a success, or a failure. The three project goals (time, cost or performance) will first be analysed as separate fixed variables and, thereafter, in combination where the results will be of statistical significance. The results of the projects will then be analysed further to identify possible factors (causes) that could have contributed to the failure or success of the project. A comparative analysis of the results that are of statistical significance will be conducted to determine if there is any correlation between the factors that contributed to the success or failure of the projects.
(a) Using *time as a fixed variable*, the following suppositions can be made by analysing the statistics:

Of the 21 projects reviewed, 67 percent (14 projects) took longer than planned. For the 14 projects that exceeded its original time schedule:

- The original *budget* was also exceeded by 43 percent of these projects (6).
- The final *deliverables* of 3 of these projects (21 percent) also did not satisfy the requirements of all the stakeholders.
- The *stakeholders* of only 43 percent of the projects were considered to be committed to the goals of the project.
- As much as 93 percent of these projects’ *scope* was changed during the execution of the project.
- The *resources* of only 50 percent of the projects were analysed for both over and under utilisation.
- *Contractors/suppliers* were used for the project 64 percent of these projects (9), of which the delays experienced on eight of these projects, could be attributed to the contractors/suppliers.

For the other 7 projects (33 percent) that were completed within the original time schedule, the following observations could be made:

- All 7 projects (100 percent) were also completed within the constraints of the original *budget*;
- The final *deliverables* of 6 of these projects (86 percent) also satisfied the requirements of all the stakeholders;
- The *stakeholders* of all 7 projects (100%) were considered to be committed to the goals of the project;
- Only 2 (29 percent) of these projects’ *scope* was changed during the execution of the project;
- *Resources* were analysed for both over and under utilisation in 86 percent of the projects (6); and
- Interestingly, 5 of these projects (71 percent) also used contractors/suppliers for the project, of which only 2 of the 5 projects’ where delays were experienced (not affecting the whole project) could be attributed to the contractors/suppliers.

A comparative analysis of the factors that resulted in the success or failure of the projects are summarised in Table 6.1.

**Table 6.1: Comparative analysis of time as a fixed variable**

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Failed projects (14 of 21 projects)</th>
<th>Successful projects (7 of 21 projects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUDGET EXCEEDED</td>
<td>43%</td>
<td>0%</td>
</tr>
<tr>
<td>REQUIREMENTS SATISFIED</td>
<td>21%</td>
<td>86%</td>
</tr>
<tr>
<td>STAKEHOLDERS COMMITTED</td>
<td>43%</td>
<td>100%</td>
</tr>
<tr>
<td>SCOPE CHANGED</td>
<td>93%</td>
<td>29%</td>
</tr>
<tr>
<td>RESOURCES ANALYSED</td>
<td>50%</td>
<td>86%</td>
</tr>
<tr>
<td>CONTRACTORS USED</td>
<td>64%</td>
<td>71%</td>
</tr>
<tr>
<td>CONTRACTOR DELAYS</td>
<td>89% (of 64%)</td>
<td>40% (of 71%)</td>
</tr>
</tbody>
</table>

For the 14 projects that took longer than planned, other interesting observations can be made:

- When referring to the *general methods and procedures for planning projects*, 8 (57 percent) of the 14 respondents whose projects exceeded the original time schedule, stated that *risks* are seldom identified proactively during the planning of the project.

- When referring to the *general standards and processes in the organisation*, only 9 (64 percent) of the 14 respondents, whose projects exceeded the original time schedule, were of the opinion that *training* is provided to build project team capability.
Comparing this information with the 7 projects that were completed within the original time schedule:

- For the general methods and procedures for planning projects, 5 (72 percent) of the 7 respondents whose projects were completed within the original time schedule, stated that risks are constantly or frequently identified proactively during the planning of the project.
- For the general standards and processes in the organisation, 6 (86 percent of the 7 respondents, whose projects exceeded the original time schedule, were of the opinion that training is provided to build project team capability.

Table 6.2 provides a comparative analysis of these two factors of the general standards and procedures in the organisation.

**Table 6.2: Comparative analysis of general standards and processes (for time)**

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Failed projects (14 of 21 projects)</th>
<th>Successful projects (7 of 21 projects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RISKS IDENTIFIED PROACTIVELY</td>
<td>57%</td>
<td>72%</td>
</tr>
<tr>
<td>TRAINING IS PROVIDED</td>
<td>64%</td>
<td>86%</td>
</tr>
</tbody>
</table>

From the aforementioned observations, it can be presumed that the success or failure of projects in relation to its time goal, is directly or indirectly influenced by the:

- commitment of project stakeholders to the goals of the project;
- extent to which the scope of the project is changed, or allowed to change;
- manner in which the resources allocated to the project are monitored for over- or under-utilisation, that is, the way in which the resources are managed;
- use of contractors/suppliers for the supply of goods and services, although it should be acknowledged that contractors/suppliers should also be treated as stakeholders of the project;
amount of effort put into identifying potential risks during planning and proactively developing responses to minimise its potential impact on the project; and
extent to which training is provided for project team members in order to build capacity.

(b) Using cost as a fixed variable, the following suppositions can be made by analysing the statistics:

Of the 21 projects reviewed, 29 percent (6 projects) exceeded its original budget. For the 6 projects that exceeded its original budget:

- All these projects (100 percent) also exceeded the original time schedule.
- One of these projects (17 percent) also did not satisfy the requirements of all the stakeholders.
- The stakeholders of only 3 of these projects (50 percent) were considered to be committed to the goals of the project.
- The scope of 5 of these projects (83 percent) was changed during the execution of the project.
- The resources of only 3 of these projects (50 percent) were analysed for both over- and under-utilisation.

For the other 15 projects (71 percent) that were completed within the original budget, the following observations can be made:

- Only 8 of these projects (53% percent) exceeded the original time schedule.
- Twelve of these projects (80% percent) also satisfied the requirements of all the stakeholders.
- The stakeholders of 12 of these projects (80 percent) were considered to be committed to the goals of the project.
- The scope of 10 of these projects (67 percent) was changed during the execution of the project.
The resources of 10 of these projects (67 percent) were analysed for both over and under utilisation.

A comparative analysis of the factors that resulted in the success or failure of the projects are summarised in Table 6.3.

**Table 6.3: Comparative analysis of cost as a fixed variable**

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Failed projects (6 of 21 projects)</th>
<th>Successful projects (15 of 21 projects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIME EXCEEDED</td>
<td>43%</td>
<td>53%</td>
</tr>
<tr>
<td>REQUIREMENTS SATISFIED</td>
<td>17%</td>
<td>80%</td>
</tr>
<tr>
<td>STAKEHOLDERS COMMITTED</td>
<td>50%</td>
<td>80%</td>
</tr>
<tr>
<td>SCOPE CHANGED</td>
<td>83%</td>
<td>67%</td>
</tr>
<tr>
<td>RESOURCES ANALYSED</td>
<td>50%</td>
<td>67%</td>
</tr>
</tbody>
</table>

There are other noteworthy observations for the 6 projects that exceeded the original budget. Referring to the general methods and procedures for planning projects, 2 (33%) of the 6 respondents (at random) whose projects exceeded the original budget, stated that:

- Risks are seldom identified (and responded to) proactively during the planning of the project.
- Changes to the scope, budget, or time schedule are not often (seldom) controlled.
- During execution, project performance is evaluated seldom.
- Projects are seldom kept under control during the execution of the project, by balancing its scope, cost, time and quality.
Comparing this information with the 15 projects that were completed within the original budget, more observations could be made. For the general methods and procedures for planning projects:

- Seven (46 percent) of the 15 respondents whose projects were completed within the original budget stated that risks are constantly or frequently identified proactively during the planning of the project.
- All 15 respondents (100 percent) stated that changes to the scope, budget, or time schedule are constantly or frequently controlled.
- All 15 respondents (100 percent) stated that project performance is evaluated constantly or frequently during execution.
- Thirteen of the fifteen respondents (87 percent) stated that projects are kept under control constantly or frequently during the execution of the project by balancing its scope, cost, time and quality.

Table 6.4 provides a comparative analysis of these factors of the general standards and procedures in the organisation.

Table 6.4: Comparative analysis of general standards and processes (for cost)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Failed projects (6 of 21 projects)</th>
<th>Successful projects (15 of 21 projects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RISKS IDENTIFIED PROACTIVELY</td>
<td>33%</td>
<td>46%</td>
</tr>
<tr>
<td>CHANGES ARE CONTROLLED</td>
<td>33%</td>
<td>100%</td>
</tr>
<tr>
<td>PERFORMANCE EVALUATED</td>
<td>33%</td>
<td>100%</td>
</tr>
<tr>
<td>KEPT UNDER CONTROL</td>
<td>33%</td>
<td>87%</td>
</tr>
</tbody>
</table>
From the aforementioned observations, it can be deduced that the success or failure of projects in relation to its cost goal is directly or indirectly influenced by the:

- commitment of project stakeholders to the goals of the project;
- extent to which the scope of the project is changed, or allowed to change;
- manner in which the resources allocated to the project is monitored for over- or under utilisation, that is, the way in which the resources are managed;
- use of contractors/suppliers for the supply of goods and services, although it should be acknowledged that contractors/suppliers should also be treated as stakeholders of the project;
- amount of effort put into identifying potential risks during planning and proactively developing responses to minimise its potential impact on the project;
- frequency of evaluating the overall performance of the project; and
- extent to which the project is kept under control, by balancing its scope, cost, time and quality with stakeholder expectations.

Similarities that can be identified at this stage between the project success and failure factors to achieve the time and cost goals are the:

- Commitment of stakeholders.
- Degree to which the scope of the project is changed.
- Utilisation of resources on the project, that is the way in which the resources are managed for over- or under-utilisation.
- Identifying potential risks and proactively developing responses to minimise its potential impact on the project.
(b) Using the final deliverables (outcomes) of the projects as a fixed variable, the following suppositions can be made by analysing the statistics:

Of the 21 projects reviewed, 4 projects (19 percent) did not satisfy the needs or requirements of all the stakeholders. Of the 4 projects whose final deliverables (outcomes) did not satisfy requirements:

- Three of these projects (75 percent) also exceeded its planned time schedule.
- Only one of these projects (25 percent), however, also exceeded its original budget.
- The stakeholders of 2 of these projects (50 percent) were considered to be committed to the goals of the project.
- Three (75 percent) of these projects’ scope was changed during the execution of the project.
- The resources of only two of these projects (50 percent) were analysed for both over- and under-utilisation.

For the other 17 projects whose final deliverables (outcomes) did satisfy requirements, the following observations can be made:

- Eleven of these projects (65 percent) exceeded its planned time schedule.
- Only 5 of these projects (29%), however, exceeded its original budget.
- The stakeholders of 13 of these projects (76 percent) were considered to be committed to the goals of the project.
- Twelve (71 percent) of these projects’ scope was changed during the execution of the project.
- The resources of 11 of these projects (65 percent) were analysed for both over and under utilisation.
A comparative analysis of the factors that resulted in the success or failure of the projects are summarised in Table 6.5.

Table 6.5: Comparative analysis of project requirements as a fixed variable

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Failed projects (6 of 21 projects)</th>
<th>Successful projects (15 of 21 projects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIME EXCEEDED</td>
<td>75%</td>
<td>65%</td>
</tr>
<tr>
<td>BUDGET EXCEEDED</td>
<td>25%</td>
<td>29%</td>
</tr>
<tr>
<td>STAKEHOLDERS COMMITTED</td>
<td>50%</td>
<td>76%</td>
</tr>
<tr>
<td>SCOPE CHANGED</td>
<td>75%</td>
<td>71%</td>
</tr>
<tr>
<td>RESOURCES ANALYSED</td>
<td>50%</td>
<td>65%</td>
</tr>
</tbody>
</table>

A further analysis of the results for the four projects whose deliverables (outcomes) did not meet requirements by comparing it to the general methods and procedures for planning projects, is considered not to be of statistical significance.

*From the aforementioned observations, it can be deduced that the success or failure of projects in relation to its performance goal (final deliverables), is directly or indirectly influenced by the:*

- commitment of project stakeholders to the goals of the project;
- extent to which the scope of the project is changed, or allowed to change; and
- manner in which the resources allocated to the project is monitored for over- or under utilisation, that is, the way in which the resources are managed.
Again a number of similarities can be identified at this stage between the project success and failure factors to achieve the time, cost and performance goals:

- Commitment of stakeholders.
- Degree to which the scope of the project is changed.
- Utilisation of resources on the project, that is the way in which the resources are managed for over- or under-utilisation.

(c) Using a combination of time as well as cost as a fixed variable the following suppositions can be made by analysing the statistics:

In order to confirm the relationships that were identified for the project success and failure factors, specifically for the time and cost goals, these two success criteria have been used as fixed variables in this section. Of the 21 projects reviewed, 29 percent (6 projects) exceeded its original time schedule and budget. Of the 6 projects that exceeded its original time schedule and budget:

- The stakeholders of only 3 of these projects (50 percent) were considered to be committed to the goals of the project.
- The scope of 5 of these projects (83 percent) was changed during the execution of the project.
- The resources of only 3 of these projects (50 percent) were analysed for both over and under utilisation.
- Three of these projects (50 percent) used contractors/suppliers for the project, of which the schedule delays experienced on 2 of these projects, could be attributed to the contractors/suppliers according to the relevant respondents.
- For 2 of these projects (33 percent), skilled people were not assigned to project roles.
- One out of the project’s final deliverables (outcomes) also did not satisfy the requirements of all stakeholders.
For 7 other projects that were completed within original time schedule and budget, the following observations can be made:

- The stakeholders of all 7 of these projects (100 percent) were considered to be committed to the goals of the project.
- The scope of only 2 these projects (29 percent) was changed during the execution of the project.
- The resources of 5 of these projects (71 percent) were analysed for both over and under utilisation.
- Five of these projects (71 percent) used contractors/suppliers for the project, of which 2 of these projects experienced schedule delays (not on entire project) that could be attributed to the contractors/suppliers.
- For all 7 of these projects (100 percent), skilled people were assigned to project roles.
- Six (86 percent) of the project’s final deliverables (outcomes) satisfied the requirements of all stakeholders.

A comparative analysis of the factors that resulted in the success or failure of the projects are summarised in Table 6.6.

**Table 6.6: Comparative analysis of time and cost as a fixed variable**

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Failed projects (6 of 21 projects)</th>
<th>Successful projects (7 of 21 projects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stakeholders committed</td>
<td>50%</td>
<td>100%</td>
</tr>
<tr>
<td>Scope changed</td>
<td>83%</td>
<td>29%</td>
</tr>
<tr>
<td>Resources analysed</td>
<td>50%</td>
<td>71%</td>
</tr>
<tr>
<td>Contractors used</td>
<td>75%</td>
<td>86%</td>
</tr>
<tr>
<td>Skilled people used</td>
<td>33%</td>
<td>100%</td>
</tr>
<tr>
<td>Requirements satisfied</td>
<td>17%</td>
<td>86%</td>
</tr>
</tbody>
</table>
There were other notable observations for the 6 projects that exceeded its original time schedule and budget. Referring to the general methods and procedures for planning projects, 2 of the 6 respondents (at random) whose projects exceeded the original time schedule and budget, stated that:

- **Risks** are seldom identified (and responded to) proactively during the planning of the project.
- **Changes to the scope, budget, or time schedule** are not often (seldom) controlled.
- During execution, *project performance* is evaluated seldom.
- Projects are seldom or never kept under control during the execution of the project, by balancing its scope, cost, time and quality.

Comparing this information with the 7 projects that were completed within the original time schedule and budget, the following observations can be made:

- Five (71 percent) of the 7 respondents stated that *risks* are constantly or frequently identified proactively during the planning of the project.
- All 7 respondents (100 percent) stated that *changes to the scope, budget, or time schedule* are constantly or frequently controlled.
- All 7 respondents (100 percent) stated that *project performance* is evaluated constantly or frequently during execution.
- Six of the seven respondents (86 percent) stated that projects are kept under control constantly or frequently during the execution of the project by balancing its scope, cost, time and quality.

Table 6.7 provides a comparative analysis of these factors of the general standards and procedures in the organisation.
Table 6.7: Comparative analysis of general standards and processes (for time and cost)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Failed projects (6 of 21 projects)</th>
<th>Successful projects (7 of 21 projects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RISKS IDENTIFIED PROACTIVELY</td>
<td>33%</td>
<td>71%</td>
</tr>
<tr>
<td>CHANGES ARE CONTROLLED</td>
<td>33%</td>
<td>100%</td>
</tr>
<tr>
<td>PERFORMANCE EVALUATED</td>
<td>33%</td>
<td>100%</td>
</tr>
<tr>
<td>KEPT UNDER CONTROL</td>
<td>33%</td>
<td>86%</td>
</tr>
</tbody>
</table>

From the aforementioned interpretations, it can be confirmed that the success or failure of projects in relation to its time and cost goals is directly or indirectly influenced by the:

- commitment of project stakeholders to the goals of the project;
- extent to which the scope of the project is changed, or allowed to change;
- manner in which the resources allocated to the project are monitored for over- or under utilisation, that is the way in which the resources are managed;
- use of contractors/suppliers for the supply of goods and services, although this criterion was only tested for its influence on and not cost;
- level of skilled people used on the projects which can be interrelated with the extent to which training is provided to project team members;
- amount of effort put into identifying potential risks during planning and proactively developing responses to minimise its potential impact on the project;
- frequency of evaluating the overall performance of the project; and
- extent to which the project is kept under control, by balancing its scope, cost, time and quality with stakeholder expectations.
6.4 SUMMARY

From the analysis of the research results, it can be concluded that a correlation exists between a number of project success and failure factors that have been identified. The findings of the results will be discussed in further detail in Chapter 7 when the conclusions and recommendations are presented for deliberation.
CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7.1 INTRODUCTION

The main problem for this research posed the question *How effective are current project management practices in the South African communications industry?*

The associated sub-problems identified were:

(i) What best practices does the literature reveal which enhances the effectiveness of project management?

(ii) To what extent are these best practices applied in the communications’ industry?

Sub-problem (i) was dealt with in Chapter 4 where the best practices for project management were identified. Sub-problem (ii) was attended to in Chapter 6 where the project management practices in Telkom were analysed to determine what practices are currently applied.

A summary of the research findings is provided in this chapter, together with some recommendations based on the findings.

7.2 SUMMARY OF THE EMPIRICAL FINDINGS

The results of the survey were presented in Chapter 6. The aim of this section is to summarise the empirical findings and to provide concluding remarks about the findings. The results of statistical significance will be summarised in a similar structure as for Chapter 6, where the results were presented for the three focus areas:
- Project management standards and processes
- Planning and executing projects
- Project retrospection of a completed project

7.2.1 PROJECT MANAGEMENT STANDARDS AND PROCESSES

It is clear from the research results that the standards and processes in the organisation are well-established, in relation to its project planning methodologies, processes being documented, and the availability of templates. The results also show that the majority of the respondents (86 percent) are involved with *multiple projects* at one specific time. Considering that the formal jobs of all the respondents are to manage projects, it could be assumed (rightfully or wrongly) that most, if not all of them should be involved with more than one project at a specific time. Depending on the size and extent of the *multiple projects*, this could either be seen as being the optimal utilisation of the available project managers, or it could be perceived that some of them are overloaded. If the latter is the case, then it could be to the detriment of the projects, as it will mean that the project manager will be forced to share time and effort between two or more projects.

The respondents, whose projects are staffed from a *shared pool of resources* (86 percent), match up with the same percentage of respondents who are involved with multiple projects. The question arises as to whether there is a relationship between the two factors (*multiple projects* and shared resources). There should be a natural relationship between these two factors if the assumption is made that managing multiple projects require *multiple resources* which means that by default, resources have to be shared amongst the projects.
Alternatively, it could be a condition of limited resources, that is commonly experienced in most project environments.

*Training* (formal and/or on the job) is essential to build capacity (and capability) in the project environment. Although 71 percent of the respondents felt that enough training is provided, it could be argued that it is not enough, because it could mean a potential loss of 39 percent in capability. If the training is extended to all, this potential loss in capability, could be turned around as an opportunity to increase the capability and thus reducing the load on the project managers (86 percent) involved with multiple projects.

A surprising response was obtained for the use of *project software*, where 14 percent of the respondents said that they do not use any software. Although this is low percentage, the use of a project management software tool increases the effectiveness and efficiency of the project team, specifically when planning and controlling projects. If software is not used, it could imply that more time and effort would be required from the project team, to plan and control projects *manually*. The question that remains to be answered is as to why 14 percent of the respondents do not use any software tools for managing their projects. Some possible answers could be that:

- Respondents do not see the value of the software.
- Respondents do not how to use the software (lack of training).
- Software is not made available owing to budget constraints.

A *project management office* provides the opportunity to prioritise projects and monitor the utilisation of resources across a number of projects. According to 90
percent of the respondents, a formal project management office is used. This high percentage again correlates well with the respondents who are involved with managing multiple projects, for which a central project office is essential.

7.2.2 PLANNING AND EXECUTING PROJECTS

The results for the general methods/procedures applied during the planning and execution of projects compare favourably with the best practices. However, an opportunity for improvement was identified for the identification of risks. Almost half of the respondents said that risks are seldom identified proactively during the planning phase of the projects. In most cases, risks impact negatively on the time and cost goals of a project. It is, therefore, advisable that preventive and/or contingent actions for potential risks are developed proactively (during planning) in order to reduce the probability and seriousness of the risks.

7.2.3 PROJECT RETROSPECTION OF COMPLETED PROJECTS

The three project goals of time, cost and performance were used as the fixed variables to determine the success or failure of a project. The comparative results for the projects that were considered to be a success or a failure, based on the fixed variables, provided some significant results.

The time goal was the one on which the projects reviewed performed the worst. Of the 21 projects reviewed, 14 projects (67 percent) took longer than planned. Comparing the results of the failed projects with those for the successful projects (in relation to the time goal), a number of correlations were identified between
the success and failure factors. The factors that directly influenced the success or failure of the projects are the:

- Commitment of stakeholders to the goals of the project.
- Changes to the scope of the project which could be seen as being an obvious one because when the requirements of the project are changed, it would necessarily mean that more time will be needed to complete the project.
- Analysis of resources for over- and under utilisation.
- Use of contractors/suppliers strongly influenced the projects’ time schedule for those who exceeded their time goal. However, for the projects that were completed within the original time schedule, most of them (71 percent) also used contractors/suppliers.

Furthermore, comparing these projects’ results with the general standards and processes in the organisation (as per the specific respondents), the lack of adequate risk-planning and also possible shortage of training for project team members could also have had an indirect influence.

When analysing the results for the cost goal, of which 29 percent of the projects did not achieve, similar dynamics as for the time goal are recognised, that is the commitment of stakeholders, changes to the scope of the project and analysis of resources. However, comparing these projects’ results with the general standards and processes in the organisation (as per the specific respondents), some other factors come into play. Although the lack of risk management is also a possible indirect influence, the other influences are the:

- Extent to which changes to the project scope, budget, or time schedule are controlled.
- Degree to which overall project performance is evaluated.
- Effort applied in keeping the project under control, by balancing its scope, cost and time.

Focusing on the results for the *performance goal* (satisfying project requirements) similarities also exist with the success factors that were identified for the other goals (time and cost). The similarities identified are the commitment of stakeholders, changes to the scope of the project and analysis of resources.

When the project goals of *time and cost* are used as combined fixed variables, the results of the combined success factors agree with the results that were identified for time and cost as separate criteria. The success factors that are confirmed are the commitment of stakeholders, changes to the scope of the project and analysis of resources. Another factor also comes into consideration when the results of the time and cost goals are combined and that is the level of skilled people assigned to the project.

The indirect influences of the *general standards and processes* are also confirmed as being, managing risks, control over changes to the project, evaluating project performance and keeping the project under control.

### 7.3 RECOMMENDATIONS

Based on the research findings, the following recommendations are presented for consideration:
7.3.1 RECOMMENDATION 1: GET COMMITMENT OF STAKEHOLDERS

As with any business initiative, the commitment of its stakeholders is of imperative importance for success. After all, it is the stakeholders, the people who will contribute to or are affected by the project, whose efforts influence the outcomes of a project. The successful completion of a project thus require commitment to the project scope, quality, time and cost between the organisation’s management and its client or sponsor.

The question that arises is as to how the commitment of stakeholders can be assured. It could be seen as being the responsibility of the project manager to attain the willing commitment of people to assigned tasks in order to achieve the coordination and collaboration of different work groups. However, to enable the project manager to accept this responsibility he or she needs to have the support from top management (project sponsor) and also have the authority to drive the project through to the end.

7.3.2 RECOMMENDATION 2: CONTROL CHANGES TO THE PROJECT

The three-dimensional goals of a project (time, cost and performance) are interrelated which means that a change in any of the goals (for example, extending the time schedule of a project) will necessarily affect the other goals (for example, more costs for resources). It has been estimated that it costs about ten times as much to implement a change in each succeeding phase of a project. Hence, during execution, changes (and consequent delays) will cost ten
or more times as much to implement, compared to making the same changes during the planning phase.

Evaluation (control) points should be included in the project at regular intervals which will provide the opportunity to exercise control over the state and timing of the project. The project manager can thereby ensure that the project is progressing in a manner consistent with its objectives, or the project can be modified with minimum upset if the objectives (scope) have changed. Continued monitoring, reporting and forecasting must take place during project implementation and the forecasts compared to the project plan. Deviations must immediately receive attention, in order to assess the impact on any of the three-dimensional goals (time, cost and performance).

7.3.3 RECOMMENDATION 3: ANALYSE RESOURCE UTILISATION

It is acceded that managing multiple projects in a project-driven organisation by default requires resources to be shared amongst a number of projects. The optimal utilisation of resources, therefore, becomes of cardinal importance when a condition of limited resources is experienced. The efforts of all contributors to the project must be integrated. Projects consist of many diverse tasks that require the different levels of expertise and resources. These tasks are assigned to various people and organisations, usually from both within and outside the organisation. The most effective project management is achieved when all such contributors collaborate and work together as a well-trained team, under the integrative leadership of the project manager.
One of the best ways of getting people started and organised is to have them review their part of the work (work package) and to set about coordinating it with each of the other parts. In this way a comprehensive and detailed plan can be built up by a team of people who each understand their participation and responsibility and are committed to the success of the project.

7.3.4 RECOMMENDATION 4: MANAGE RISKS PROACTIVELY

Projects are uncertain business, by the very nature of its goal to create a unique product or service. Uncertainty, however, can lead to both risk and opportunities. Consequently, a very important part of a project manager's job is management of risk. The aim is to move potential uncertainties away from risk (that is, adverse time and cost implications) and towards opportunity (that will enhance the project and make it more successful). To do this, potential risks must first be identified and preferably grouped in some way, analysed and then appropriate defensive responses initiated such as preventive actions to reduce the probability of the risk. Alternatively, contingency plans need to be developed as a precaution.

Risk management calls for proactive steps to be taken during the planning of the project to mitigate the possibility of a less favourable outcome, by reducing the project risk wherever this can be achieved cost effectively.
7.4 SUMMARY

Although a number of factors have been identified that influence the success or failure of projects, some of these factors are specifically related to the planning of projects, whereas others are related to the execution of projects. It can thus not be conclusively confirmed that the success of projects is strongly influenced by its planning, although some of the findings do suggest this.

Further research is required into the factors identified that influence the success or failure of projects. The factors that require further research are:

- The extent to which the commitment of stakeholders in projects is crucial.
- The extent to which uncontrolled changes to the project scope influence the failure on projects in relation to its time and cost goals.
- The affect utilisation of resources has on the success or failure of projects.
- The impact of risks on the success or failure of projects.

Although the empirical component of this research was limited to Telkom it will be very interesting to see whether there are similarities in the project management practices applied in other project-driven organisations.
REFERENCES


ASSESSMENT TOOL FOR PROJECT-DRIVEN ORGANISATIONS

The questionnaire consists of the following parts:

- **Part 1:** Personal details of the respondent: - your own details in the spaces provided.

- **Part 2:** Project Management Standards and Processes: - questions relating to general project standards and practices in your own organisation/division.

- **Part 3:** Planning and Executing projects: - questions concerning general methods/procedures applied during the planning and execution of projects in your own organisation/division.

- **Part 4:** Project Retrospection: - taking a recently completed project with which you were involved and assessing its effectiveness by answering the questions provided.

**Instructions:** Please respond by clicking on the text fields [ ] and type the required information; or click on the appropriate check box [ ] to answer the relevant questions (only one answer per question, please). Please also answer all the questions to enhance the objectivity of the research. Responses in the survey will remain confidential.

1. **PERSONAL DETAILS OF THE RESPONDENT**

<table>
<thead>
<tr>
<th>Field</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td></td>
</tr>
<tr>
<td>Job title/Position</td>
<td></td>
</tr>
<tr>
<td>Company</td>
<td>Telkom SA Ltd.</td>
</tr>
<tr>
<td>Division</td>
<td></td>
</tr>
<tr>
<td>Region</td>
<td>Southern</td>
</tr>
<tr>
<td>Geographic location</td>
<td></td>
</tr>
<tr>
<td>Telephone number</td>
<td></td>
</tr>
</tbody>
</table>
## 2. PROJECT MANAGEMENT STANDARDS AND PROCESSES

1. Does a **common methodology** exist for developing project plans?  
   - Yes  
   - No

2. Are established **project processes** documented?  
   - Yes  
   - No

3. Do **templates** (guides) exist for the various project processes?  
   - Yes  
   - No

4. Are you involved with **multiple projects** at one specific time?  
   - Yes  
   - No

5. Are projects staffed from a common/shared pool of **resources**?  
   - Yes  
   - No

6. Is training (formal and/or on-the-job) provided to build adequate project team capability?  
   - Yes  
   - No

7. Are you currently using project management **software**?  
   - Yes  
   - No

8. Does a **formal project management office** exist?  
   - Yes  
   - No
3. PLANNING AND EXECUTING PROJECTS (IN GENERAL)

1. The criteria (measure) for project success (time, cost and deliverables) are determined and agreed upon with all stakeholders (role-players), at the beginning of the project.

   □ Do not know □ Never (not at all) □ Seldom (not often) □ Frequently (often) □ Constantly (always)

2. The scope (requirements) of the project is clearly defined by dividing the major project deliverables (outputs) into smaller, more manageable components (work breakdown structure).

   □ Do not know □ Never (not at all) □ Seldom (not often) □ Frequently (often) □ Constantly (always)

3. The scope of the project is verified and formally accepted by key role-players.

   □ Do not know □ Never (not at all) □ Seldom (not often) □ Frequently (often) □ Constantly (always)

4. The specific activities (work to be done) to produce the project deliverables (outcomes), are clearly identified and documented.

   □ Do not know □ Never (not at all) □ Seldom (not often) □ Frequently (often) □ Constantly (always)

5. An integrated project schedule (plan) is created which identifies activity sequences, activity duration and resource requirements.

   □ Do not know □ Never (not at all) □ Seldom (not often) □ Frequently (often) □ Constantly (always)

6. The roles and responsibilities of project role-players are clearly identified and documented.

   □ Do not know □ Never (not at all) □ Seldom (not often) □ Frequently (often) □ Constantly (always)

7. A communications’ plan is compiled which identifies the information and communications needs of the role-players.

   □ Do not know □ Never (not at all) □ Seldom (not often) □ Frequently (often) □ Constantly (always)

Continued on next page
8. **Risks** are identified and responses developed proactively (during planning).

   - Do not know
   - Never
   - Seldom
   - Frequently
   - Constantly

9. **Quality** standards for the project deliverables (outputs) are identified.

   - Do not know
   - Never
   - Seldom
   - Frequently
   - Constantly

10. **Resources** are planned by determining what resources (people, equipment, materials, etc.) and what quantities of each are needed to perform project activities.

    - Do not know
    - Never
    - Seldom
    - Frequently
    - Constantly

11. **Costs** for the project are calculated by developing an estimate of the costs for the resources needed to complete project activities.

    - Do not know
    - Never
    - Seldom
    - Frequently
    - Constantly

12. **Changes** to the project **scope**, or **budget**, or **schedule** (time), are controlled by documenting and communicating such changes.

    - Do not know
    - Never
    - Seldom
    - Frequently
    - Constantly

13. During execution, overall **project performance** is evaluated on a regular basis to provide confidence that the project will satisfy the requirements.

    - Do not know
    - Never
    - Seldom
    - Frequently
    - Constantly

14. During execution, projects are kept under **control**, by balancing its scope, cost, time and quality with stakeholder expectations.

    - Do not know
    - Never
    - Seldom
    - Frequently
    - Constantly

15. **Information** is distributed by making required information available to project role-players in a timely manner.

    - Do not know
    - Never
    - Seldom
    - Frequently
    - Constantly
4. PROJECT RETROSPECTION (for a specific completed project)

General information about a specific completed project

<table>
<thead>
<tr>
<th>Project period:</th>
<th>months</th>
<th>Completion date:</th>
</tr>
</thead>
</table>

Your key responsibility in the project:

- Project Manager/Leader
- Senior Project Manager
- Project Co-ordinator
- Project Administrator
- Other (please specify)

Type of project

- Information Technology
- Construction
- Engineering
- Manufacturing
- Other (please specify)

<table>
<thead>
<tr>
<th>Brief description of the project</th>
</tr>
</thead>
</table>

ASSESSING THE EFFECTIVENESS OF THE COMPLETED PROJECT

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Did the project take longer than planned?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Did the final cost of the project exceed the initial (original) budget?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>3. Did the final deliverables (outcomes) of the project satisfy the needs or requirements of all stakeholders (role-players)?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4. Were the project requirements (scope), constraints and specific schedule elements/dates (milestones) clearly identified and communicated to all stakeholders?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>5. Were all the stakeholders committed to the goals of the project?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Continued on next page
6. Were all team and stakeholder roles and responsibilities clearly delineated and communicated?  
   - Yes ☐ No ☐

7. Were skilled people assigned to all project roles?  
   - Yes ☐ No ☐

8. Was a project manager/leader assigned to accept overall responsibility for the project?  
   - Yes ☐ No ☐

9. Was the scope of the project changed at any stage during the execution phase?  
   - Yes ☐ No ☐

10. Were the time schedule, budget and quality of the deliverables monitored closely throughout the project’s life-cycle?  
    - Yes ☐ No ☐

11. Were project status (progress) reports circulated timeously and disseminated to all role-players?  
    - Yes ☐ No ☐

12. Were resources analysed for both over and under utilisation?  
    - Yes ☐ No ☐

13. Were early warning signs of problems that occurred in the project, responded to timeously?  
    - Yes ☐ No ☐

14. Were any contractors/suppliers used for the project?  
    - Yes ☐ No ☐

15. If contractors/suppliers were used, could any project delays be attributed specifically to the contractors/suppliers?  
    - Yes ☐ No ☐

**THANK YOU FOR YOUR TIME AND SUPPORT**

Please return the completed questionnaire to SmithM1@Telkom.co.za.

**NOTE:** Please save the completed questionnaire (file) to a local drive on your computer before you E-mail it.