

AN INVESTIGATION INTO THE CRITERIA FOR PROJECT SUCCESS WITHIN TRANSNET

By

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Submitted in partial fulfillment of the requirements for the degree of
Masters in Business Administration

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NOVEMBER – 2006

30 NOVEMBER 2006

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ACKNOWLEDGEMENTS

I owe sincere gratitude to the following individuals who enabled this dissertation to be successfully and timeously completed.

- To my daughter, Trinity
- To my mother, and sisters, Gerosha and Kimay, for their support and constant demonstrations of love
- To the happy memory of my father
- To Sivanesan Naidoo – my close friend and confidant - for always making the time
- To my supervisor, Peter Raap, for his professional competence, his many excellent suggestions, his dedication, guidance and sense of quality.

DEDICATION

This dissertation is dedicated to my daughter, Trinity...for her love, patience and support. Without the beauty she brings into my life, I would not have been inspired to come this far.

ABSTRACT

Project Management is the wave of the future. This discipline and its evolution continues to be one of the principal means by which operational and strategic changes are managed in the enterprise. The importance of Project Management for organisational success will expand, rather than wane, in years to come.

Projects, particularly large scale complex ones with multiple stakeholders, are failing at alarming rates despite a wide spectrum of efforts to solve the problem. The lack of meaningful results and outcomes is due, in part, to the fact that organizations tend to operate on a set of unproven assumptions concerning project objectives, business requirements, user expectations, motivations, agendas, schedules, costs and time frames.

The management dilemma is that Transnet has committed R 65 billion to projects in the hope of developing its core businesses to that of world-class standards as a logistics service provider in South Africa. Transnet's capital project division, Protekon, is responsible for managing the projects committed to this R 65bn capital expenditure.

Transnet's perception of Protekon's failure to successfully deliver projects could result in appointments of external consultancies such as Hatch McDougal and Guba (HMG – an engineering consultant firm). Whereas, previously, Protekon was the monopoly service provider of engineering and project management skills within Transnet, Transnet's subdivisions appear to be utilizing outside consultancies more frequently. The reason for procuring engineering and consultancy services external to Transnet, among others, is the perception that Protekon is performing poorly in delivering successful projects. The

outsourcing of work, fuelled by the negative perception of Protekon's performance, directly impacts on the profitability of Protekon in the short to medium term.

The objective of this dissertation was firstly to investigate the effect of Protekon's involvement in Transnet's project success; and secondly, to recommend strategies to improve the rate of project success, that could be applied within Transnet and Protekon.

The method of research was to issue questionnaires to the entire population of project leaders at Protekon. The questionnaires were designed around the simplified five-point Likert scale using closed questions. Questionnaires were used to gauge the perceptions on the current project environment within Transnet.

This dissertation recommends strategies to bridge the gap and address those shortcomings pertinent to Transnet's success in the project management discipline. It also identifies Protekon's position and contribution in enhancing this success.

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1.0 CHAPTER 1 – INTRODUCTION AND OVERVIEW OF THE STUDY

1.1 INTRODUCTION

In a competitive business climate, an organization's ability to efficiently align resources and business activities with strategic objectives can mean the difference between succeeding and just surviving. To achieve strategic alignment, organizations are increasingly managing their activities and processes as projects. In essence, they are projectizing their businesses, to monitor performance more closely and make better business decisions about their overall work portfolio. By planning and tracking projects with clarity and precision, organizations can respond with greater agility to the demands of a fast-changing business environment.

Whether delivering products or services, all organizations need to meet project deadlines, budgets and stakeholder expectations. To maintain customer satisfaction and meet customer expectations, no room exists for project errors or delays.

To stay competitive, companies are increasingly implementing initiatives to improve their project delivery by continually reducing cycle times, minimizing costs and controlling quality. These initiatives require skilled people, standardized processes and superior technology unified and driven by effective project management.

This chapter describes the motivation and context of the study and introduces the reader to the project environment with Transnet. This chapter further briefly outlines the framework for the study and the objectives of the research.

1.2 THE HISTORY OF PROJECT MANAGEMENT

The history of project management is often associated with the construction of the massive Egyptian Pyramids and the Great Wall of China. From the early 1900s, businesses found that to succeed in the face of rapidly changing technology and fierce competitive markets, they had to embrace the project management concept and management-by-projects, as these offered real solutions.

Project management continued to grow and develop into a multi-disciplined profession with its distinctive tools and techniques. Project management associations in America and Britain were the first to use project results to reinforce project management concepts and refine distinctive tools and techniques to aid in the management of projects. (Morris 1998).

The Project Management Institute issued a Guide to the Project Management Body of Knowledge, which is a global standard framework for managing projects. According to a Guide to the Project Management Body of Knowledge (PMBOK Guide, 2004:35) "...a project is a temporary endeavour undertaken to create a unique product, service or result."

In the 1990s fierce competition from the Far East encouraged leaner and meaner, flatter and more flexible organization structures, together with a more efficient systems approach. Large companies found that by using a management -by-projects approach, they could assign their work to many small project teams, which were able to quickly

respond to innovation, new ideas and market competition and keep the spirit of the small entrepreneurial company alive even in large corporations.

1.3 BACKGROUND OF THE STUDY

Transnet's vision is to become a world-class logistics service provider in South Africa. To do this, Transnet aims to improve the capacity within the ports, and to upgrade and develop facilities to meet the growing demands of the economy, whilst contributing to lowering the costs of doing business in South Africa. Transnet has always operated as a parastatal in the past. Its objectives have been job creation, business sustainability and continuity. Transnet is currently undergoing an organization wide restructuring process with the view to streamlining its various core businesses to maximize wealth and profitability.

Transnet's client's benchmark its services to an international standard. Transnet has invested billions of Rands in the past to achieving its vision and meeting client expectations. Poor investment choices in the past have brought ports to a state where they have brilliant infrastructure, but limited growth opportunity and operating assets to support development. Transnet needs to shift paradigms, so that investments are managed through projects that will align with business goals, thereby realizing the business vision, CEO of Transnet Group, Maria Ramos [Protekon News, 2005].

The management dilemma is that Transnet has committed R 65 billion to projects in the hope of developing its core businesses to that of world-class standards as a logistics service provider in South Africa. Transnet's capital project division, Protekon, is by and large responsible for managing the projects committed to this R 65bn capital

expenditure.

However, Transnet's perception of Protekon's project management abilities is very poor. This lack of confidence and a perception of project failure often retards the project selection and award, the commitment of funds and by extension Transnet's commitment of delivery to its customers.

Protekon, with its team of project managers and engineers, often takes responsibility for unsuccessful projects. However, Protekon understands that their project related responsibility rests only in the planning and implementation phases of the project. The assumption is that the client has assessed the feasibility of the project, analyzed its outcomes in relation to business requirements and has committed the necessary resources for implementation. These assumed responsibilities however, are seldom undertaken, resulting in project delays, budgets being cut midway through the project, project losses, lost opportunity, wasted time and money, disillusioned project teams and unspent capital.

1.4 PROBLEM STATEMENT

The research problem is that the true reasons for project failure within Transnet are not known and the criteria for project success are not firmly established.

Currently, the number of unsuccessful projects within Transnet is very high. Although investor confidence is low, the requirement for business growth and development in a competitive environment forces the capital investment. If the current project failure rate

continues, Transnet is unlikely to achieve its goal of becoming a world-class logistics service provider in South Africa, within reasonable timeframes, to remain competitive.

Whereas previously Protekon was the monopoly service provider of engineering and project management skills within Transnet, Transnet's sub-divisions appear to be utilizing outside consultancies more frequently. The reasons for procuring engineering and consultancy services external to Transnet, among others, is the perception that Protekon is performing poorly in delivering successful projects. This perception directly impacts the profitability of Protekon, as a business division, in the short to medium term.

1.5 MOTIVATION FOR THE STUDY

The main objective of the research is to establish the criteria that will contribute to project success within Transnet.

The sub-objectives of the study are:

- To determine the process of establishing projects
- To differentiate between perceived failure and real failure in projects
- To compare the project management concept within Transnet with that accepted by the Project Management Institute (PMI) of South Africa to identify gaps and inconsistencies in the project management approach and to identify paradigm, cultural and skills gaps within Transnet that inhibit project success
- To ascertain the alignment between business goals and projects goals within Transnet

- To establish the business benefits of utilizing Protekon's skills and expertise in the management of Transnet's projects

1.6 VALUE OF THE STUDY - RESEARCH OBJECTIVES

The potential value from this study will be:

- To evolve a strategy for the amalgamation of Transnet's conventional approach to project management to the modern concepts of project management defined by the Project Management Institute through the PMBOK (2004)
- To encourage project owners to use an exhaustive project selection process in making investment choices
- To encourage an understanding of the project requirements and outcomes at the initiation phase of the project, with clearly defined deliverables, thus getting upfront buy in and commitment from the project owners
- To align business goals with project goals for defined outcomes
- To change the perception of Protekon within Transnet thus increasing Protekon's usage by Transnet's sub divisions
- To enhance the probability for project success

There is evidence to suggest that the process of establishing projects within Transnet differs considerably from those dictated by the Project Management Institute. Transnet may not be employing the correct project selection methods; making informed capital budgeting decisions or pursuing and measuring project success in a consistent manner. There are obvious gaps in Transnet's concept of project management. These gaps need to be investigated and researched further.

1.7 IMPORTANCE OF TOPIC

For Transnet to realize its vision of becoming a world class logistics service provider, it will need to strategically align the outcomes, of the projects it chooses to invest in, with its business vision.

In the past, Transnet's projects have often been terminated mid course due to a lack of commitment to the capital investment decision. Project termination results in wasted time, money and lost opportunity.

The challenge is to encourage project owners to embrace the PMI methodologies and processes in their business. Adoption of these principals will ensure that the projects selected will have clearly defined outcomes that align with the business growth strategy, a predetermined, committed, order of magnitude budget (-50% to + 100%) according to PMBOK (2005), commitment and buy in from the user client and a project team and project owner that should remain constant for the duration of the project.

A sound business case, that applies a full range of project selection methods in selecting a project, is essential to project success. Involving the customers and other stakeholders during project initiation generally improves the probability of shared ownership, deliverable acceptance and customer and other stakeholder satisfaction. Acceptance is critical to project success. It identifies the project's purpose, identifies objectives and authorizes the start of the project, (Cookerman, 2005).

Processes or shortcomings of establishing projects within Transnet

The Project Management Institute defines Project Management as

“The process that is used to initiate, plan, execute, monitor, control and close out projects by applying skills, knowledge and project management tools and techniques to fulfill the project requirements” , (PMBOK Guide, 2004:8).

Project Management duties occur from the foetal stages of a project and encompass such things as feasibility studies, stakeholder analysis, cost and time deliverables, design life and many other forecasting and actuarial functions. There exist multitudes of grey areas in the project management concept within Transnet that only become apparent at project termination.

There exists no clear framework for the implementation of a structured approach to project management according to the PMBOK Guide (2004). It is, therefore, necessary to understand the shortcomings of the Transnet project management process and to evolve a strategy for the amalgamation of the conventional Transnet concept of project management with the modern business functions of project management more closely associated with the PMI approach.

Interpretation of failure

Heldman (2004) describes the following project endings: addition, starvation, integration, and extinction. However, the principal reason for termination of a project earlier in its life cycle is when the project results no longer have a strategic fit with the enterprise's future.

In practice, however, a project that achieves the planned outcomes within the allocated time, scope, quality and budget constraints could still be perceived as a 'failed project'. There is generally much ambiguity associated with what the project entails, measures of success and the stakeholders involved. Projects often become the victims of perceived failure if the project boundaries, constraints, deliverables, measure for success and communication methods are not clearly defined at the onset.

Enhancing project success

The Project Management Institute emphasizes the importance of planning in project success. Planning is important, but proper planning alone cannot ensure project success.

An article on *Identifying Business Needs for Success* Cookerman (Jan/ Feb 2005) states that simply identifying one's business need at any point in time is not enough to ensure the success and sustainability of operations, services and benefits.

Public and private sectors have attempted to improve project management through various techniques. The reality is that any business has limited borrowing resources that should be allocated to the best investment alternatives. Management must, therefore, carefully decide whether a project is economically acceptable. To take this decision, a sound procedure to evaluate, compare and select projects is needed. This procedure is called *capital budgeting*.

1.8 LIMITATIONS AND DELIMITATIONS OF THE STUDY

Some limitations that may influence the outcome of this study are:

- Respondents may find it difficult to give honest feedback even though their anonymity is guaranteed.
- The buy-in that is indirectly obtained via the questionnaire submission could influence the statistical analysis in terms of positive skewness.
- Respondents may feel that negative responses reflect on their abilities in managing projects and not on factors beyond their control.

Delimitations that will confine the boundary of the research will be:

- The research will only be conducted within Protekon in Durban. Other Protekon offices will not be approached.
- The research will only be applied to projects under R 300 million which are currently handled by Protekon.

1.9 RESEARCH METHODOLOGY

This research will be conducted by issuing questionnaires to the entire population of fifty project leaders at Protekon. The questionnaires will be designed around the simplified five-point Likert scale using closed questions (Cooper & Schindler, 2001). The type of research to be undertaken can be classified as quantitative in nature.

Primary data will be collected using a survey questionnaire. A focus group interview will be conducted with four senior managers, in order to finalize the design and content of the questionnaire. These four employees will be excluded from the census.

The self-administered, closed-response questionnaire had been informed by the literature review and designed around the core research objectives. The questionnaire was used to gain insight into the reasons for project termination.

A questionnaire was prepared to guide the collection of the correct data in a structured and logical format. The questions were structured to gauge an understanding of the current issues in successful management of projects.

The questionnaire was then divided into various sections that would focus on fundamentals for project success. Questionnaires were designed to target knowledgeable, experienced and suitably qualified individuals who were engaged in managing projects within Transnet at the time.

Questionnaires were used to gauge the typical understanding of project owners with respect to:

- How capital budgeting decisions were made.
- The motive for the capital expenditure (typically with equipment, is the decision stemming from a need for refurbishment, replacement or expanding capacity?).
- Alignment between the business vision and the operational requirements.
- The requirements for project success.
- The common reasons for project failure.
- Typical rate of project progress once commitment was made from clients.

- Reasons for delays if any.
- Success in meeting capital commitments within the financial year.

Responses were analyzed by the researcher and included the use of descriptive statistics such as means, frequencies and standard deviation. Responses were compared to ascertain whether the results obtained were significant and did not happen by chance.

1.10 CONCLUSION

The objective of this dissertation was firstly to investigate the effect of Protekon's involvement in Transnet's project success; and secondly, to recommend strategies to improve the rate of project success, that could be applied within Transnet and Protekon.

The general approach to the study, the importance of the topic and the objectives and benefits of the research have been expressed. The following chapters will expand these concepts and eventually draw a conclusion on the study objective.

2.0 CHAPTER 2 - THE PMBOK APPROACH TO PROJECT MANAGEMENT

2.1 INTRODUCTION

This chapter expands on the industry standard for project management. This standard is developed by the Project Management Institute, which is an international project management body, and is defined in the PMBOK (2004).

The research conducted is based on the PMBOK framework for project management practices. Existing project management practices are benchmarked to the PMI industry standard. A critique on the PMBOK standard is discussed later in the chapter.

The chapter will further establish how projects are defined, selected and evaluated in an organisation.

2.2 AN INTRODUCTION TO THE PMBOK GUIDE TO PROJECT MANAGEMENT

A Guide to the Project Management Body of Knowledge (PMBOK Guide) is a project management standard developed by the nonprofit Project Management Institute (PMI). The PMBOK Guide is widely accepted to be the standard in project management. It is a collection of processes and knowledge areas generally accepted as best practice within the project management discipline.

The PMBOK is an internationally recognized standard that provides the fundamentals of project management that are applicable to a wide range of projects, including construction, software, engineering and automotive.

PMBOK recognizes five basic process groups and nine knowledge areas typical of almost all projects. The basic concepts are applicable to projects, programmes and operations. The five basic process groups are:

1. Initiating;
2. Planning;
3. Executing;
4. Controlling and monitoring; and,
5. Closing.

Processes overlap and interact throughout a project or phase. Processes are described in terms of inputs (documents, plans and designs), tools and techniques (mechanisms applied to inputs) and outputs (documents and products).

The nine knowledge areas are:

1. Project Integration Management;
2. Project Scope Management;
3. Project Time Management;
4. Project Cost Management;
5. Project Quality Management;
6. Project Human Resource Management;
7. Project Communications Management;
8. Project Risk Management; and
9. Project Procurement Management.

2.3 CRITICISMS OF THE PMBOK APPROACH TO PROJECT MANAGEMENT

The PMBOK is accepted as the industry standard for project management. The main thrust of the critique comes from the fact that the PMBOK places the most focus on the

planning of the work and not enough attention is given to construction. Schools of thought differ on this aspect and it can be noted that if the work is carried out to plan, then the emphasis should be on the planning phase as this phase will form the basis for a successful execution as long as the plan allows for a high level of detailing.

A further, related, criticism is that the PMBOK Guide shows a bias towards the managerial aspects of projects, indicated by the planning, monitoring and controlling functions, with very little emphasis being placed on the actual execution of the work. There is no articulated theory of proper execution according to Devaux (1999).

None of the criticisms indicate that the PMBOK cannot be used as an established benchmark for the purposes indicated in this study, nor would it be impractical to adopt the PMBOK approach in Transnet's project environment.

2.4 IDENTIFYING THE BUSINESS NEED

Simply identifying the business need at any point in time is not enough to ensure the success and sustainability of operations, services and benefits. Most organizations understand the need to define outcomes and focus on results – and that measuring performance, managing risks and serving their customers with accountability and value are necessary ingredients for successful outcomes. However, projects, particularly large scale complex ones with multiple stakeholders, are still failing at alarming rates despite a wide spectrum of efforts to solve the problem according to Martin Cookerman (2005).

Businesses have attempted to improve project management through various techniques and have made efforts at enhancing service delivery, but even with the best intentions, they remain frustrated according to Laufer (1997). The lack of meaningful results and outcomes is due in part to the fact that organizations tend to operate on a set of unproven assumptions concerning project objectives, business requirements, user expectations, motivations, agendas, schedules, costs and time frames. Such speculations are interpreted as facts in a business model.

As stakeholder objectives, strategies and priorities change and evolve, unaligned interests must be appropriately synchronized. Management must communicate and provide the delivery team with strategic direction to match the changing needs of the business and its stakeholders. To achieve desired outcomes, business cases should be developed with a true understanding of success factors, implementation factors and methods for realizing and harvesting benefits. From the outset, business cases must be aligned with reality and should incorporate procedures for ongoing alignment and, most importantly, focus on benefit realization factors rather than merely focusing on project results. Focusing on the core factors required to satisfy benefits (needs)- not just bringing the project in on time and within budget – increases the chances of success.

2.5 IDENTIFYING THE PROJECT REQUIREMENT

A *project* is defined as a temporary endeavour undertaken to create a unique product service or result PMBOK Guide (2004).

The first process in determining if a project is warranted is to perform a *needs analysis*. Needs arise as a result of market demand, business need, customer requests, technological advance, legal requirement or a social need (Cookerman, 2005).

Once the organization has determined the need and defined the project, a feasibility study usually follows, particularly with large projects. A *feasibility study* is used to determine if firstly a project is viable, and secondly, the project's likelihood to succeed (Devaux, 1999).

Involving the customers and other stakeholders during project initiation generally improves the probability of shared ownership, deliverable acceptance and customer and other stakeholder satisfaction. Acceptance is critical to project success. It identifies the project's purpose, identifies objectives and authorizes the start of the project.

2.6 REQUIREMENTS OF THE BUSINESS CASE

“A business case is a decision support and planning tool that projects the likely financial results and other business consequences of an action” (Solution Matrix, 2002).

Essentially, a business case is a form of gap analysis. It describes an organisations, current status versus the desired status and how the organisation can achieve its goals. A business case helps decision makers understand the structure and content that make the proposed investment compelling and lucrative. The business case is designed to systematically define the case, develop cost and benefit data, analyse results, allocate financial value to costs and benefits and determine business impacts that cannot be

weighed in monetary terms. The business case assists decision makers to predict the results of a business decision, in terms that are clear, concrete and credible. It is essentially the fundamental feasibility study in initiating a project.

A good business case shows expected cash flow consequences of the action, over time, and also includes the methods and rationale that were used for quantifying benefits and costs. The latter are important because every business case in a complex environment requires assumptions, arbitrary judgements, and the development of new data. The case is built from information that goes beyond existing budgets and business plans. Two people working independently can evaluate the same proposed scenario, use correct financial arithmetic and still produce quite different business case results.

The organising backbone of the case is a timeline extending across months or years. This framework suggests an approach to reduce costs, increase gains, and accelerate gains. The case also describes the overall impact of a proposal in terms of: discounted cash flow, payback period, and internal rate of return.

Essential building blocks of the business case appear in five general categories (Morris and Hough, 2003):

- a. Introduction and overview;
- b. Assumptions and methods;
- c. Business impacts;
- d. Sensitivity and risk analysis; and
- e. Conclusions and recommendations.

This list represents a very natural order for presenting the elements of reasoning, evidence and analysis.

2.7 CAPITAL BUDGETING

Capital budgeting refers to actions relating to planning and financing of long-term projects. It involves an investment concept – a company must pay out funds now in the hopes of some future return. Typical capital budgeting decisions include:

- a. Expansion decisions;
- b. Equipment selection decisions;
- c. Lease or buy decisions; and
- d. Cost reduction decisions. (Gitman, 2000)

Financial management is largely concerned with financing, dividend and investment decisions of the firm with some overall goal in mind. The objective is to maximise the market value of the firm to its shareholders. (Gitman, 2000)

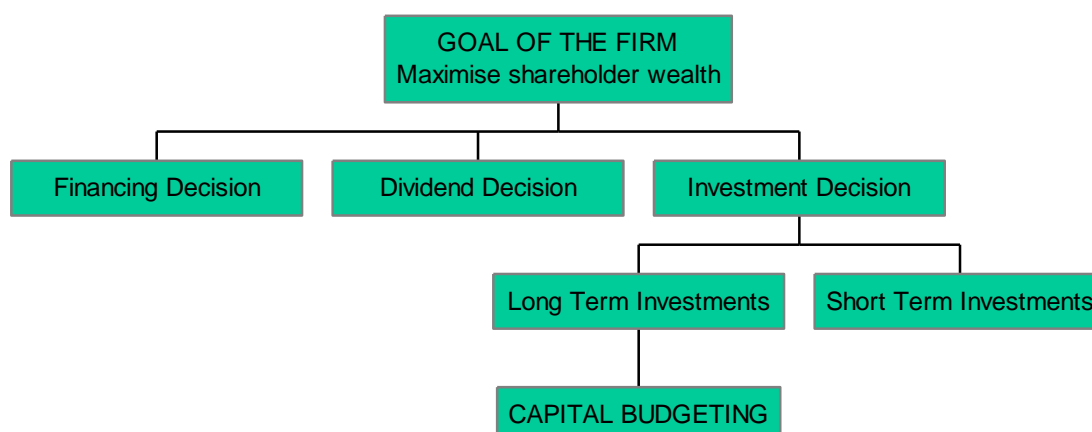


Figure 1. Capital Budgeting Overview [Source: Gitman (2000: page 88)]

Figure 1 shows that importance of capital budgeting in maximising shareholder wealth.

There are two broad categories of capital budgeting decisions (Gitman, 2000). Screening decisions answer the question of whether or not the proposed project meets or exceeds some given standard of acceptance. Preference decisions refer to ranking the acceptable alternative projects in order of desirability.

Capital budgeting is a multi faceted activity. There are several sequential stages in the process. For typical investment proposals of a large corporation, the distinctive stages in the capital budgeting process are depicted in the form of a highly simplified flow chart in figure 2 below.

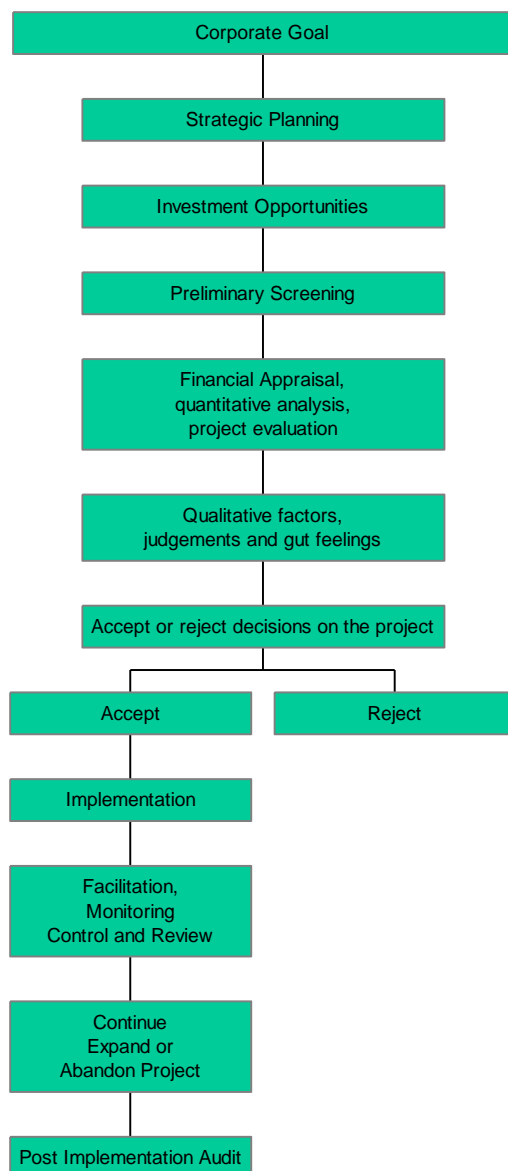


Figure 2. The Capital Budgeting Process [Source: Gitman (2000: pg.89)]

The basic difficulty in evaluating long-lived projects is that money has a time value. A rand received now is worth more than a rand received at some future date. In evaluating cash flows received in the future, we need to discount them back to the present so that a comparable measuring rod for present cash outlays and future cash returns is used.

Future cash flows can be discounted in a number of ways including:

- a. Present and future value tables;

- b. Electronic calculators;
- c. Equation methods; and
- d. Spreadsheet programmes.

Capital budgeting methods discussed further on include:

- a. Net present value (NPV);
- b. Internal rate of return (IRR);
- c. Payback method; and
- d. Simple rate of return.

In using these models, a new term is introduced, “cost of capital”. The cost of capital can be defined as overall cost to an organisation of obtaining investment funds including the cost of both debt (borrowing) sources and equity (selling stock) sources- according to Solution Matrix (2002).

Classification of investment projects

Investment projects can be classified into three categories on the basis of how they influence the investment decision process: independent projects, mutually exclusive projects and contingent projects (Morris and Hough, 2003).

An *independent* project is one where the acceptance or rejection of the project does not preclude other projects from consideration or affect the likelihood of their selection.

Two or more projects that cannot be pursued simultaneously are called *mutually exclusive* projects – the acceptance of one prevents the acceptance of an alternative proposal.

A *contingent* project is one where the acceptance or rejection of the project is dependent on the decision to accept or reject one or more other projects. Contingent projects may be complementary or substitutes (Devaux, 1999).

2.8 PROJECT SELECTION AND EVALUATION TECHNIQUES

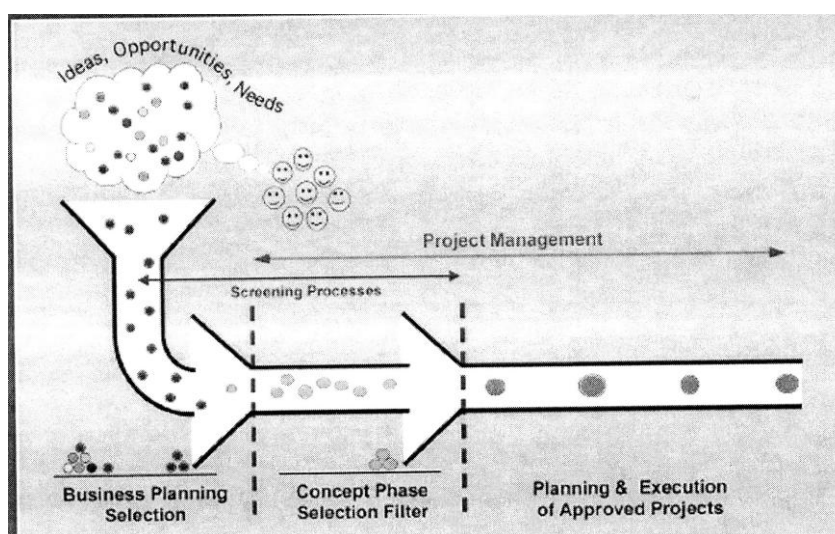


Figure 3: Project Screening Flow Diagram [Source: Devaux (1999: page 276)]

The project selection process is developed to make an enlightened commitment for the future of the business. The execution of a project ties up company resources, and as an opportunity cost, may preclude the company from pursuing another (more profitable) project. Hence, a project selection process (as shown in figure 3 above) is crucial to select and rank projects that are most beneficial to the company.

Selection criteria and methodologies will vary depending on the company, the people serving on the selection committee, the criteria used and the project. Project selection criteria identify how projects are selected and prioritized.

The criteria and methodologies could be purely financial, purely marketing and sometimes even based on public perception or political perception. For the purposes of this dissertation, the selection methods usually focus on measuring the tangible benefits of the project or on the measurable benefits of one project against another. Decision models examine different criteria used in making decisions regarding project selection while calculation methods provide a way to calculate the value of the project, which is then used in project selection decision-making (Burke, 2004).

Burke (2004) suggests that there are basically two project selection methods that may be used. The first is constrained optimization, which uses mathematical models to analyze and compare projects for suitability. The second and more commonly applied method is the benefits measurements method. This method employs the techniques of net present value, internal rate of return and payback period to analyze and select projects. In addition, the following are important considerations in project selection.

The two categories of selection methods are: (Burke, 2004):

i. Constrained Optimisation Methods

These are mathematical models that use linear, dynamic, integer, non-linear or multi objective programming in the form of algorithms. In essence, they use a specific set of steps to solve a particular problem. This approach is generally very involved and requires an engineering, statistical or mathematical background. It is used on projects of enormous complexity.

The vast majority of project selection techniques will use the benefits measurement methods to make project selection decisions.

ii. Benefit Measurement Methods

This is the more analytic and comparative approach to project selection. It includes cost – benefit analyses, scoring models, benefit contribution methods that include various cash flow techniques, and economic models. These will be discussed and proposed for Transnet’s processes since they are more user-friendly and appropriate to the environment.

a. Cost – benefit Analysis

This method compares the financial benefits of performing the project to the costs of implementing the project. A sound business choice would be where the costs to implement the project or produce the product of the project are less than the financial benefits. The limits for the margin of difference are set according to company preference (Devaux, 1999).

The costs to be considered will include costs to produce the product or service, the costs to take the product to market, and ongoing operational support costs.

b. Scoring Models

Scoring models are generally used to choose between projects. The project selection committee decides on the criteria that will be used on the scoring model – for example, profit potential, marketability and production time. Each of these criteria

is assigned a weight depending on its importance to the organization. The project with the highest weight overall is the project that is selected (Burke, 2004).

c. Cash Flow Analysis Techniques

Benefit Cost Ratio

The benefit cost ratio (BCR), defined as the ratio of discounted benefits to the discounted costs at the same point in time, is a profitability index based on discounted benefits per unit of discounted costs of a project, according to Bruner in the Cambridge University Press (2005). It is sometimes referred to as the savings-to-investment ratio when the benefits are derived from the reduction of undesirable effects. Its use also requires the choice of a planning horizon. Since some savings may be interpreted as a negative cost to be deducted from the denominator or as a positive benefit to be added to the numerator of the ratio, BCR is not an absolute numerical measure. However, if the ratio of the present value of benefit to the present value of cost exceeds 1, then the project is profitable irrespective of different interpretations of such benefits or costs (Bruner, 2005).

Payback Period

This financial metric answers the question: “when does the action pay for itself?” that is, “When do the cumulative inflows equal the cumulative outflows?” Payback period is a measure of time. Other things being equal, the investment with the shorter payback is the better option. Payback is sometimes viewed as a measure of risk: the longer the payback, the higher the risk.

Payback period is calculated as follows, (Gitman, 2000):

$$\text{Payback period} = \frac{\text{Investment}}{\text{Net annual cash inflow}}$$

This is usually shown in decimal years. The shorter is the payback period, the more attractive is the project.

Net Present Value (NPV)

The NPV represents total cash flow across the analysis period, adjusted to reflect the time value of money, according to the Bruner in an article in the Cambridge University Press (2005). Other things being equal, the action or investment with the larger NPV is the better option. NPV uses the present value concept, the idea being that money now is worth more than the same amount in the future. Money now could be invested now and gain return between now and the future time. Furthermore, future money may be less certain, and it cannot be invested until inflation has taken some of its value. The NPV method involves a three-step process as follows:

- i. Diagram cash inflows and outflows;
- ii. Find present value of cash flows; and
- iii. Sum the present values.

If NPV is greater than or equal to 0, then the project is acceptable. The greater the NPV the more desirable is the project.

Internal Rate of Return (IRR)

IRR (like NPV) is a financial metric that reflects the time value of money. This is according to the Bruner (2005). The IRR view of the cash flow stream is essentially

an investment view: money will be paid out and compared to returns. The IRR is calculated using a two-step process as follows:

i. Calculate the appropriate factor =
$$\frac{\text{Investment}}{\text{Net annual cash inflow}}$$

ii. The return is located in the present value annuity table at the intersection of the factor and the life of the project.

The answer is an interest rate. The higher the interest rate, the more robust is the investment and the better the returns compare to the costs.

The project selection process is developed to make an enlightened commitment for the future of the business. The execution of a project ties up company resources, and as an opportunity cost, may preclude the company from pursuing another (more profitable) project. Hence,, a project selection process is crucial to select and rank projects that are most beneficial to the company.

A number of surveys have shown that, in practice, the internal rate of return (IRR) method is more popular than the net present value (NPV) approach. The reason may be that the IRR is straightforward while it still uses cash flows and recognises the time value of money, just like NPV.

The main problem with the IRR method is that it often gives unrealistic rates of return. Suppose the cut off rate is 11% and the IRR is calculated at 40%, the calculated IRR is a false indication of a highly positive result and often confuses management. An IRR of 40% assumes that a business has the opportunity to reinvest future cash flows at 40%.

If past experience and the economy indicate that 40% is an unrealistic rate for future reinvestments, an IRR of 40% is suspect – it is too good to be true. So, unless the calculated IRR is a reasonable rate for reinvestment of future cash flows, it should not be used as a yardstick to accept or reject a project.

Another problem with the IRR method is that it may give different rates of return. Suppose there are two discount rates (two IRRs) that make the present value equal to the initial investment – which rate should be used for comparison with the cut off rate? This simply indicates that, despite its popularity in the business world, the IRR method entails more problems than a practitioner may expect (Gitman, 2000).

When comparing two projects, the use of the NPV and IRR methods may give different results. A project selected according to the NPV may be rejected if the IRR method is used.

Suppose there are two alternative projects, X and Y. The initial investment in each project is R 2 500. Project X will provide annual cash flows of R 500 for the next ten years. Project Y has annual cash flows of R 100, R 200, R 300...R 1000 in the same period. Using the trial and error method, the IRR of project X is 17% and the IRR of project Y is around 13%. If one considers the IRR, project X should be preferred because its IRR is 4% more than the IRR of project Y. However, if the NPV method is used, the decision will change depending on the discount rate used. For instance, at a 5% discount rate, project Y has a higher NPV than project X. However, at a discount rate of 8%, project X is preferred because of a higher NPV.

This numerical example illustrates an important distinction: the use of the IRR always leads to the selection of the same project, whereas project selection using the NPV method depends on the discount rate chosen.

- *Project size and life*

There are reasons why the Net Present Value (NPV) and Internal Rate of Return (IRR) are sometimes in conflict: the size and life of project being analysed are the most common ones. According to Burke (2004), a 10-year project with an initial investment of R 100 000 can hardly be compared to a small 3-year project costing R10 000. The large project could be thought of as ten small projects. So, when the IRR and NPV methods are used to compare big, long-term projects with small, short-term projects, selection results may differ.

- *Different cash flows*

Furthermore, even two projects of the same length may have different patterns of cash flow, (Burke, 2004). The cash flow of one project may continuously increase over time, while the cash flows of the other project may increase, decrease, stop, or become negative. These two projects have completely different forms of cash flow, and if the discount rate is changed when using the NPV approach, the result will probably be different orders of ranking. For example, at 10% the NPV of project A may be higher than that of project B. As soon as one changes the discount rate to 15%, Project B is more attractive.

- *When are the NPV and IRR reliable?*

In general, one can rely on the NPV and IRR methods if the two conditions are met. First, if projects are compared using the NPV, a discount rate that fairly reflects the

risk of each project should be chosen. There is no problem if two projects are discounted at two different rates because one project is riskier than the other. The result of the NPV is as reliable as the discount rate that is chosen. If the discount rate is unrealistic, the decision to accept or reject the project is baseless and unreliable. Second, if the IRR method is used, the project must not be accepted only because the IRR is very high. The management decision should be based on whether such an IRR is possible to maintain. This is based on past records and existing and future businesses to determine whether an opportunity to reinvest cash flows at such a high IRR really exists. If the firm is convinced that the IRR is acceptable, then the project is acceptable. Otherwise, the project must be re-evaluated by the NPV method using a more realistic discount rate, (Gitman, 2000).

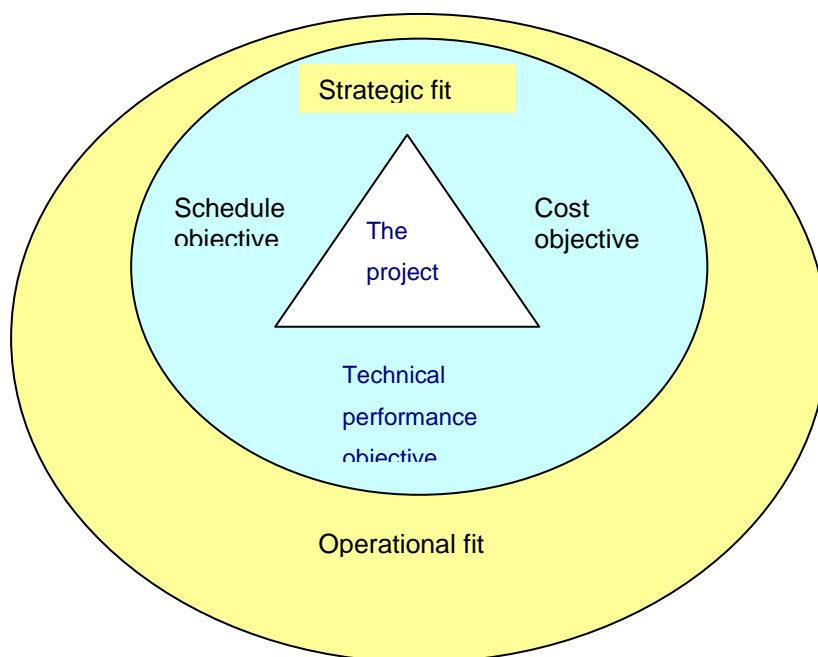


Figure 4. Interrelationship of project objectives and organisational fit [Source: Cleland and Ireland (2002: page 26)]

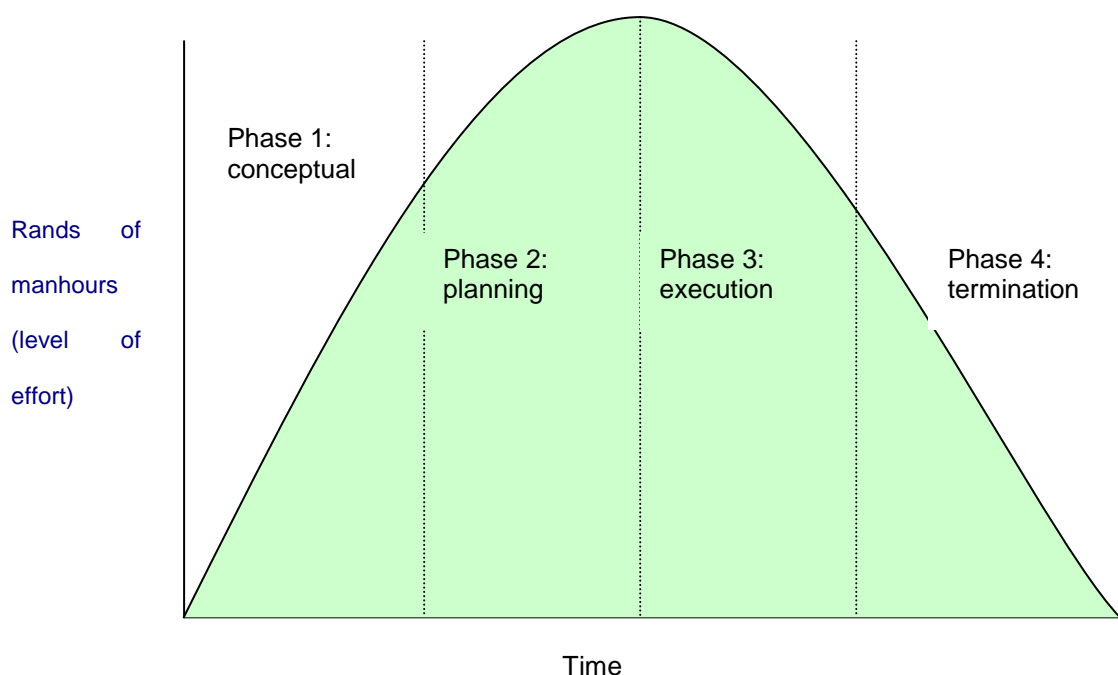
The project selection process is critical in defining the project outcomes and aligning the project deliverables with the business requirements. There must be a synergistic relationship where project deliverables are aligned with operational fit and strategic fit of the organisation (figure 4). In order to successfully complete the business case, a feasibility study is completed by the client. This feasibility study marks the initiation phase of the project with a defined outcome – an approved project charter.

2.9 THE PROJECT MANAGEMENT TEAM

Once the project requirements are firmly established and the initiation phase complete, the management of the project brings together a set of tools and techniques – performed by the project team- to describe, organise and monitor the work of project activities. According to *PMBOK Guide (2004)* “Project management is the application of knowledge, skills, tools and techniques to project activities to meet project requirements.”

The project manager is the person who assumes responsibility for the success of the project. The project charter identifies the project manager and describes the authority the project manager has in carrying out the project. The project manager’s primary responsibilities are project planning and then executing and managing the work of the project. They are responsible for setting the standards and policies for the projects they work on. It is the project manager’s responsibility to establish and communicate the project procedures to the project team and stakeholders. They will resource the project and allocate responsibilities to team project team members.

THE PROJECT LIFE CYCLE



<ul style="list-style-type: none"> • Identify need 	<ul style="list-style-type: none"> • Implement schedule 	<ul style="list-style-type: none"> • Procure materials 	<ul style="list-style-type: none"> • Train functional personnel
<ul style="list-style-type: none"> • Establish feasibility 	<ul style="list-style-type: none"> • Conduct studies and analyses 	<ul style="list-style-type: none"> • Build and test tooling 	<ul style="list-style-type: none"> • Transfer materials
<ul style="list-style-type: none"> • Identify alternatives 	<ul style="list-style-type: none"> • Design system 	<ul style="list-style-type: none"> • Develop support requirements 	<ul style="list-style-type: none"> • Transfer responsibility
<ul style="list-style-type: none"> • Prepare proposal 	<ul style="list-style-type: none"> • Build and test prototypes 	<ul style="list-style-type: none"> • Produce system 	<ul style="list-style-type: none"> • Release resources
<ul style="list-style-type: none"> • Develop basic budget and schedule 	<ul style="list-style-type: none"> • Analyse results 	<ul style="list-style-type: none"> • Verify performance 	<ul style="list-style-type: none"> • Reassign project team members
<ul style="list-style-type: none"> • Identify project team 	<ul style="list-style-type: none"> • Obtain approval for production 	<ul style="list-style-type: none"> • Modify as required 	

Figure 5. Tasks accomplished by project phase [source: DI Cleland and L R Ireland (2002: page 50)]

Project management is a continuing process. The processes are iterative and will be revisited several times throughout the project life cycle, as the project is refined. New demands are constantly placed on the project team and have to be co-ordinated by the project manager through a process of planning, organising, motivating, directing and

controlling. Managing a large project is so complex that it is difficult to comprehend all the actions that have to be taken to successfully plan and execute the project. It is necessary to divide the project into parts in order to grasp the full significance of each part and just where that part fits in the scheme of the project, (Cleland and Ireland, 2002).

As the project progresses through its life cycle, the project exhibits ever-changing levels of cost, time and performance. The need for resources and various kinds of expertise will similarly fluctuate, as will virtually everything else.

2.10 MEASURING PROJECT SUCCESS

In order to measure the success of any project, the goals, requirements and deliverables must be clearly defined at the onset. Project *goals* should follow the SMART rule:

S	Specific	The project goals should be stated in clear, concise and understandable terms and should be documented in the project charter. Projects exist to bring about a unique, specific product or service that has not existed before.
M	Measurable	The deliverables of the project should be measurable against verifiable outcomes or results.
A	Accurate	The verification and measurement of requirements and deliverables are used to determine accuracy and also to ascertain if the project is on track according to the project plan.
R	Realistic and	Projects are unique and produce tangible products or

	tangible	services. The triple constraints (time, cost, scope) of any project help to define realistic goals and realistic requirements based on the limitations the constraints place on the project.
T	Time bound	Projects are preformed in specific time frames, with a definite beginning and definite end date.

Table 1: SMART Principle, Held man (2004)

Project *requirements* are not the same as goals and objectives. Requirements are specifications of the goals or deliverables. If a project delivers on specification and the necessary prerequisites that make up the product or service, then the project is successful.

Deliverables are measurable outcomes, measurable results, or specific items that must be produced to consider the project or project phase completed. Deliverables, like goals, must be specific and verifiable.

Hence,, identifying whether or not a project is successful can be easily accomplished if these parameters are clearly defined at the onset of the project, (Cleland and Ireland, 2004).

2.11 CONCLUSION

This chapter established the framework for application of the project management principles according to the PMBOK (2004). The following chapter will establish the project management concept within Transnet and how it relates and interlinks with the PMBOK approach.

3.0 CHAPTER 3 - THE PROJECT MANAGEMENT PHILOSOPHY WITHIN TRANSNET

3.1 INTRODUCTION

This chapter will briefly introduce the business climate in which Transnet operates. It will establish the global importance of Transnet as a logistics service provider and the growth and expansion forecasts for the future.

This chapter further introduces the port of Durban as the mega hub port and hence, justifies the geographical context of this study.

Also discussed in the concept of project management within Transnet, which is based on the E5 General Conditions of Contracts and how this differs in principle from the PMBOK approach to project management.

3.2 AN INTRODUCTION TO TRANSNET

Transnet is a state-owned company consisting of five core sub divisions. Transnet comprises of South African Port Operations, National Ports Authority, Spoornet, Petronet, Transwerk and Protekon. The South African Port Operations and National Ports Authority divisions control and manage the ports in South Africa.

South African Port Operations (SAPO) operates the ports. National Ports Authority (NPA) is the landowner and provides infrastructure to SAPO. Spoornet operates the railways and transports cargo from the ports to their various hinterland destinations.

Petronet provides the piping infrastructure for the conveyance of petrochemicals. Transwerk is Transnet's in-house maintenance division.

Protekon, a subsidiary of the Transnet Group, is a multi-disciplinary company, which provides logistics and transportation solutions throughout Southern Africa. With offices in most major centres around South Africa, as well as an international office, Protekon is well positioned to provide turnkey Port, Railway and Intermodal solutions for the major divisions of Transnet and other clients.

Protekon's ability to design, manage and construct projects economically is one of its key strengths in its competitive market. Adding value to the customer with the company's intimate knowledge of the local environment and over forty years experience, enables Protekon to offer a comprehensive service. Protekon employs professional and technical staff country wide to offer an extensive consultancy service, which includes architecture, quantity surveying, project management, as well as civil, electrical, mechanical, signal and structural engineering.

3.3 TRANSNET'S STRATEGIC INTENT

Transnet's Board Chairman, Bongji Khumalo had said [Natal Mercury, 15 July 2005], "Transnet has been tasked to help make our economy more competitive, inter alia, by reducing the cost of doing business in South Africa." He suggested that becoming more competitive could be achieved by increasing Spoornet's freight capacity by 30% over the next five years and by eliminating bottlenecks and inefficiencies at our ports.

CEO of Transnet Group, Maria Ramos [Protekon News, 2005], put it in global perspective by saying that the R65bn infrastructure plan approved by Cabinet was essential to strengthen Transnet's position to provide its client's with a seamless inter modal freight transport service.

Hence,, Transnet's aim is to improve the capacity within the ports, and to upgrade and develop facilities to meet the growing demands of the economy, whilst contributing to lowering the costs of doing business in South Africa.

3.4 THE PORT IN CONTEXT

The port of Durban employs over 5400 people and approximately 30 000 people are directly dependent upon the port and its activities.

According to South African Port Operations newsletter (January 2005), the port already handles over 4000 commercial vessels annually, that translates to 31,4 million tons of cargo worth more than R50 billion.

The 21 terminals in the Port of Durban service 57 berths. Coal, paper, sugar, citrus, grain, liquid bulk, dry bulk, and granite terminals are privately operated, whilst the passenger, container, Ro-Ro, breakbulk, and timber terminals are run by South African Port Operations.

International

Since the April 1994 elections South Africa had been competing in the global markets again. The country joined the United Nations General Assembly, the Commonwealth

and the International Maritime Organization. The new political situation and lifting of trade embargoes has resulted in increased activities through the Port of Durban.

Governor of the Reserve Bank, Tito Mboweni, has said in the Mercury (06 February 2006), "South Africa needs to increase exports to Asia to take advantage of the economic boom in China, but the deteriorating rail infrastructure and delays at major ports locally are threatening the supply chain". He emphasised that something needed to be done to improve the situation within the ports to meet Chinese demand for commodities. In the past, Europe had been South Africa's biggest trading partner, but the anticipated growth rate for Europe was only 1,7% compared to the 14% anticipated for China.

According to South African Port Operations newsletter (January 2005), the port, ranked as the 9th largest container port in the world, was Africa's busiest and largest general goods harbour and expected to maintain its dominance into the next century. Since the lifting of sanctions, the trade from Western Europe, which was South Africa's trading partner, had decreased and the trade from the Far East increased. Almost 40% of Durban's 880 000 TEU's (Twenty foot equivalent units) throughput per year was generated by the Far East.

It has been predicted that many of the new emerging markets are in the Indian Ocean and Pacific Rim. Great economic co-operation is anticipated among the 30 countries, which border the Rim. The core group of countries identified in this emerging alliance is South Africa, India, Australia, Singapore, Oman, Kenya and Mauritius.

Durban, being the largest and busiest port in Africa, is strategically located to become one of the world's mega hub ports for the East African seaboard, in the next millennium. By being a hub port, the harbour will play a vital role in handling goods, especially containers, from Western Europe, USA and South America to Australia, Asia and the Far East.

Southern African Development Community (SADC)

South Africa's well-developed transport system is economically vital for the Southern Africa region and could be seen as the springboard into Africa. The majority of cargo flowing to and from the SADC countries goes through the Port of Durban, since the other ports in the East African Seaboard has serious infrastructure limitations.

South Africa

According to South African Port Operations Newsletter (February 2006), the port of Durban is a general-cargo port, handling 20% of South Africa's total port traffic. Fifty percent of South Africa's breakbulk cargo and 63% of all containerized cargo flows through the Port of Durban. Of the seven commercial ports on the South African coastline (Durban, East London, Port Elizabeth, Richards Bay, Mossel Bay, Cape Town and Saldanha), Durban earned 65% of all the revenue earned by all the ports. Durban has the advantage of being a very flexible and versatile port with facilities to handle a wide spectrum of cargo. Good rail and road links to the highly industrialised Gauteng region has given the port a further advantage over the other ports in South Africa. This advantage allows for quicker turn around times for ships, road and rail transport and reduces the costs for handling goods.

The Greater Durban Area

The city of Durban with its related infrastructure has developed around the Bay and maintains the second largest economic area in the country after the Pretoria, Witwatersrand, Vereeniging complex in Gauteng.

With the economic multiplier effect, input - output analysis for the South African economy for 2006 shows that a R1 increase in output in rail freight transport adds R1.73 to GDP (Gross Domestic Product); for road freight transport, the figure is R1.55. Of the total traffic distributed to and from the port of Durban, on average, 70% is per road and 30% by rail.

3.5 THE PORT INTO THE NEXT MILLENIUM

Vision of Government

The minister of trade and industry, Mr Alec Irwin, has announced on the 19 March 2004 that the governments' long-term vision is to build Durban into a significant hub port – and the largest export orientated Industrial City in the Southern Hemisphere. Durban and Singapore are envisaged to be the hub ports in the future for ocean liners servicing Africa, South East Asia and Latin America.

Mr Irwin also mentioned that South Africa needed a big port in Durban to contain the big new generation container ships that can take up to 6000 containers on one ship. The Southern Industrial basin would be developed into a world-class production plant that could feed the port with export commodities.

Any expansion in Durban would have to be planned carefully. There needed to be a very close working relationship between transport facilities and industry and the development of the port had to be done in partnership with the private sector.

Transport Infrastructure

South Africa is faced with a challenge to improve the quality and cost efficiency of systems and operations within the freight industry. In the export-focused context of GEAR (Growth, Employment and Redistribution Strategy), and in the recognition that South Africa's future economic growth rests on our ability to compete in the global economy, the efficiency of South African freight transport becomes a matter of national concern.

3.6 TRANSNET'S PROJECT MANAGEMENT PHILOSOPHY

Transnet has committed R 65 billion to projects in the hope of developing its core businesses to that of world-class standards as a logistics service provider in South Africa. Transnet's capital project division, Protekon is responsible for managing the projects committed to this R 65bn capital expenditure.

Past experience in the project management field reflected that clients (Transnet's various sub divisions) invested large sums of money in projects without clearly identifying the need for the investment or clearly defining the project outcomes. This failure to clearly define front end requirements resulted in either:

- Difficulty in committing funds to projects;
- Delays in the project because of a lack of client buy-in;

- Projects being cancelled with wasted resources;
- The project outcome did not address the business requirement;
- The capital commitment was either not spent or not effectively managed;
- Lack of user involvement;
- Long or unrealistic timescales;
- Poorly defined project requirements;
- Lack of a formal change control system;
- Scope creep; and
- Lack of appropriate skills and expertise in managing projects.

In the recent past, Transnet had recorded an alarming number of unsuccessful projects. Project update reports [July 2006] reflect that at least 65% of projects within Transnet have failed to meet the time and cost constraints. Factoring in the opportunity cost, loss in potential revenue, loss in market share and resulting delays in business growth and economic profitability, rendered project delays as significantly expensive to Transnet's business. Transnet is, therefore, hesitant to invest in new projects geared towards growth and development of the business. If this continues, Transnet is unlikely to achieve its goal of becoming world-class logistics service provider in South Africa.

Projects are established within Transnet for any of the following reasons:

- A government regulatory requirement;
- A need to satisfy public safety concerns;
- An operational efficiency improvement;
- Environmental improvement, or public relations opportunity; and
- New business, or economic opportunity.

The reasons for project failure within Transnet could likely be as a result of:

- The conventional methods of project management within Transnet are failing in the modern business environment;
- The conventional appointment of a project manager in the Transnet system only happens at the tender award stage and is born out of a contract. This is in direct conflict with the PMI approach where the project manager is appointed at the initiation stage of a project and his duties encompass items such as feasibility studies, stakeholder analysis, cost and time deliverables, design life predicting as well as forecasting and actuarial functions. These grey areas only become apparent during the project execution or termination stages; and
- The lack of commitment from users could be as a result of the upward mobility of high profile positions within Transnet, a gap in training and expertise or that the Transnet rate of transformation is not yet on par with that of the private business sector.

3.7 TRANSNET'S DEFINITION OF PROJECT MANAGER

The conventional title of Project Manager according to the Transnet E5 Conditions of Contract and the New Engineering Contract only happens at the tender award stage and is born out of the contract.

Transnet's E5 document is designed to cover the legal requirements of every contract within a project. The E5 has multi disciplinary application to all engineering and architectural type projects within Transnet.

The E5 General Conditions of Contract (1996, page 79-80) list the duties and functions of the project manager, defined within the Transnet environment only. In essence, the role of the project manager here is confined to the overall budgetary and contractual (legal and financial) superintendence and control over the contract and the project as a whole. The scope, quality and time controls are very clearly excluded from the functions of the project manager and included in the functions of the technical officer or engineer.

3.8 PMI DEFINITION OF THE PROJECT MANAGER

The Project Management Institute defines Project Management as

“The process that is used to initiate, plan, execute, monitor, control and close out projects by applying skills, knowledge and project management tools and techniques to fulfill the project requirements” (Project Management Institute, 2004)

Project Management duties should occur from the foetal stages of a project and encompass such things as feasibility studies, stakeholder analysis, cost and time deliverables, design life and many other forecasting and actuarial functions. There existed multitudes of grey areas in the project management concept within Transnet. This lack of clarification was the most obvious shortcoming in the process of establishing projects within Transnet.

No clear framework existed for the implementation of a structured approach to project management according to the Project Management Body of Knowledge (PMBOK) (Project Management Institute, 2004). It was, therefore, necessary to understand the shortcomings of this process and to evolve a strategy for the amalgamation of the

conventional Transnet concept of project management with the modern business functions of project management more closely associated with the PMI approach.

The challenge within Transnet would be to develop a generic business case template to be applied to all Transnet projects. A structured template will force project owners to methodically and systematically work through the feasibility stage of the project. This will ensure that the projects selected will be more likely to achieve outcomes that meet business requirements.

3.9 CONCLUSION

In summary, Transnet's project management philosophy differs from the PMI approach to project management. Transnet has grown and evolved from the old SARH (South African Railways and Harbours), a social upliftment company and is now refocusing its business initiatives in a competitive international market.

While Transnet invests large amounts of capital in projects geared towards its growth and development, there appear to be definite gaps in the investment decisions taken when selecting projects. Hence,, the weak financial justification for the expenditure precludes Transnet from rapidly progressing towards its vision of becoming a world-class logistics service provider.

The following chapter introduces the approach to the study and the overall method of research that was employed.

4.0 CHAPTER 4 - RESEARCH METHODOLOGY

4.1 INTRODUCTION

The chapter that follows will define the management question and the basis for the research. It will reiterate the objectives of the study; the format of the research tools employed and establishes a basis for the validity and reliability of the study. The research method used is in keeping with the methodology proposed by Cooper and Schindler (2001).

4.2 MANAGEMENT DILEMMA

The research problem is that the true reasons for project failure within Transnet are not known and the criteria for project success are not firmly established.

Transnet's perception of Protekon's failure to successfully deliver projects could result in appointment of external consultancies such as Hatch McDougal and Guba (HMG – an engineering consultant firm).

4.3 MANAGEMENT QUESTION

Whereas previously Protekon was the monopoly service provider of engineering and project management skills within Transnet, Transnet's sub divisions appear to be utilizing outside consultancies more frequently. The reason for procuring engineering and consultancy services external to Transnet, among others, is the perception that Protekon is performing poorly in delivering successful projects. This directly impacts the profitability of Protekon in the short to medium term.

Protekon with its team of project managers and engineers often takes responsibility for unsuccessful projects within Transnet. However, Protekon's project related responsibility rests only in the planning and implementation phases of the project. The assumption is that the client has assessed the feasibility of the project, analyzed its outcomes in relation to business requirements and has committed the necessary resources for implementation. This, however is seldom done, resulting in project delays, budgets being cut midway through the project, project losses, lost opportunity, wasted time and money, disillusioned project teams and unspent capital.

The management question, therefore, is to establish Protekon's role in project delivery within Transnet, the parameters of success in measuring projects, and from this to identify Protekon's contribution to either project failure or project success.

Management should then use this information to change paradigms and perceptions within Transnet's management with respect to Protekon's roles, responsibilities and talent. Changing people's paradigms will also directly impact on Protekon's forecasted workload and bottom-line.

4.4 RELEVANCE OF THE STUDY

The study was conducted on a census population of Protekon's employees. Protekon operates on a de-centralised philosophy. Protekon's various regional offices focus support on the various regions within Transnet. Hence, it can be confidently assumed that a research study applied to the regional offices in Durban would be similar to that

applied to the regional offices in Cape Town or Johannesburg. Hence,, since operating philosophy in the different regions is identical, it can be safely assumed that a study conducted in Durban would reveal very similar results to a study applied in any other region.

4.5 RESEARCH QUESTION AND OBJECTIVES OF THE STUDY

Past experience in the project management field reflects that clients (Transnet's various sub divisions) invest large sums of money in projects without clearly identifying the need for the investment or clearly defining the project outcomes. Poor project selection and investment decisions often result in:

- Difficulty in committing funds to projects;
- Delays in the project because of a lack of client buy-in;
- Projects being cancelled with wasted resources;
- The project outcome does not address the business requirement;
- The capital commitment is either not spent or not effectively managed;
- Lack of user involvement;
- Long or unrealistic timescales;
- Poorly defined project requirements;
- Lack of a formal change control system;
- Poor change control procedures and scope creep;
- Lack of appropriate skills and expertise in managing projects; and
- The gap in the Transnet way of managing projects and the defined project management concept from the Project Management Institute.

According to Cooper and Schindler (2001) the role of the research question is to:

- Guide the direction of the study;
- Identify facts that are relevant and those that are not;
- Suggest which form of research design is likely to be most appropriate; and
- Provide a framework for organising the conclusions.

In this research, the research question had been selected as:

Research question: Protekon contributes to project failure within Transnet.

Independent variable: Protekon

Dependent variable: project failure within Transnet

The main objective of the research is to establish the criteria contributing to project success within Transnet, and how instrumental Protekon is (if at all) in this success.

The sub-objectives of the study were:

- To determine the process of establishing projects within Transnet;
- To compare the project management concept within Transnet with that accepted by the Project Management Institute (PMI) of South Africa to identify gaps and inconsistencies in the project management approach and to identify paradigm, cultural and skills gaps within Transnet that inhibit project success;
- To ascertain the alignment between business goals and projects goals within Transnet;
- To differentiate between perceived failure and real failure in projects; and
- To identify Protekon's capabilities in project management.

4.6 RESEARCH DESIGN

The method of research was to issue questionnaires to the entire population of project leaders at Protekon in the form of a census. The questionnaires were designed around the simplified five-point Likert scale using closed questions. Questionnaires were used to gauge the perceptions on the general reasons for project terminations.

4.7 QUESTIONNAIRE DESIGN

The type of research that was undertaken could be classified as quantitative in nature. Primary data was collected using a survey questionnaire. A focus group interview was conducted with four senior managers, in order to finalise the design and content of the questionnaire. Those four employees were excluded from the census.

The self-administered, closed-response questionnaire was designed around the core research objectives. The questionnaire was used to gain insight into the reasons for project termination.

A Likert-type scale was selected for the questionnaire; with a simplified five-point scale ranging from strongly disagree to strongly agree. This scale was useful in measuring the perceived reasons for performance, as well as to compare and analyze results.

A questionnaire was prepared to guide the collection of the correct data in a structured and logical format. The questions were structured to gauge an understanding of the current issues in successful management of projects.

4.8 DATA COLLECTION

A census of all fifty-project leaders was conducted. Questionnaires were administered to the entire population of project managers, technical experts and project leaders. These were used to gauge the typical understanding of project owners with respect to:

- How capital budgeting decisions were made;
- The motive for the capital expenditure (typically with equipment, was the decision stemming from a need for refurbishment, replacement or expanding capacity);
- Alignment between the business vision and the operational requirements;
- The requirements for project success;
- The common reasons for project failure;
- Typical rate of project progress once commitment was made from clients;
- Reasons for delays if any; and
- Success in meeting capital commitments within the financial year.

A subject information letter was distributed to employees to create awareness. The researcher physically distributed hard copies of the questionnaires to employees. The questionnaires were available in English only as all employees had tertiary qualifications and were fully conversant in the English language. On completion, the questionnaires were dropped into a dedicated box that was later collected by the researcher for consolidation. The researcher ensured that the process was conducted in an ethical and morally sensitive manner and that participants were not coerced into submitting questionnaires.

4.9 DATA ANALYSIS

Data analysis was done by the researcher and included the use of descriptive statistics such as means, frequencies and standard deviation. Responses were compared to ascertain whether the results obtained were significant and did not happen by chance. The appropriate analysis was done to ascertain if there was a relationship between the type of client, discipline of engineering and number of years of experience of the project manager. The strength of relationship between these variables was also investigated.

4.10 VALIDITY AND RELIABILITY

To ensure validity and reliability of the research, a pilot test of the questionnaire was conducted with four senior management employees who had critically assessed the questionnaire in terms of face validity. This test group was excluded from the research. The relevant role-players had confirmed the information collected from the various sources as accurate. The results were tested also with the practical staff, and they were confident that the information was realistic.

Of the fifty questionnaires that were circulated, a response rate of forty-four employees was required to ensure validity of the study. Forty-four responses were received and analyzed. Hence,, the study was valid. Tests for validity and missing data revealed that every question had a valid response and no respondent had left a question unanswered.

The questionnaire was divided into various sections that focused on fundamentals for project success. Questionnaires were designed to target knowledgeable, experienced and suitably qualified individuals who are currently engaged in managing projects within Transnet. Hence,, the information that was evaluated was reliable since it was extracted from a reliable source of knowledgeable respondents.

4.11 LIMITATIONS AND DELIMITATIONS

Some limitations that may have influenced the outcome of this study were:

- Respondents may have found it difficult to give honest feedback even though their anonymity was guaranteed;
- The buy-in that was indirectly obtained via the questionnaire submission could have influenced the statistical analysis in terms of positive skewness; and
- Respondents may have felt that negative responses reflected on their abilities in managing projects and not on factors beyond their control.

Delimitations that confined the boundary of the research were:

- The research was only conducted within Protekon in Durban. Other Protekon offices were not approached; and
- The research was only applied to projects under R 300 million which is currently handled by Protekon.

4.12 ANALYSIS OF RESEARCH RESULTS

Forty-four research questionnaires were collected in total. The responses were collated on an excel spreadsheet. Responses were coded to assist in the analysis process.

Strongly disagree responses were coded as 1, disagree were coded 2, neither agree nor disagree were coded 3, agree as 4 and strongly agree responses were coded as a 5.

The spreadsheet was then tested for validity. Basic inferential statistics were applied to the results. As the approach followed was that of a census, there was no requirement for significance tests such as chi square tests. The mean, median, mode, variance and standard deviation computations were applied to the results. These were tabulated and graphically represented where necessary.

4.13 RELATING RESEARCH RESULTS BACK TO OBJECTIVES AND RESEARCH QUESTION

The frequency distributions were represented using bar charts. Bar charts were chosen since they were the most easily understood graphical representation of data. The frequency distributions on each question in the questionnaire were grouped according to the research objectives that they applied to. These research objectives were then analyzed and interpreted to determine the validity of the chosen research question.

4.14 RELATING RESEARCH QUESTION BACK TO MANAGEMENT DILEMMA

The potential value from this study will be:

- To force project owners to consult user clients on the business needs before formalizing projects;
- To encourage an understanding of the project requirements and outcomes;
- To get buy in and commitment from the project owners when the project is initiated;

- To align business goals with project goals for defined outcomes;
- To change the perception of Protekon within Transnet thus increasing Protekon's usage by Transnet's sub divisions; and
- To enhance probability for project success.

4.15 CONCLUSION

Hence,, the research method employed ensured reliability and validity of the process.

The following chapter will present the responses and interpret the results.

The final chapter will recommend strategies to address shortcomings in the projects management processes and to generally improve Transnet's business practices.

5.0 CHAPTER 5 - PRESENTATION AND INTERPRETATION OF RESULTS

5.1 INTRODUCTION

The chapter that follows presents and analyzes the data collected from respondents. The data is then interpreted with relation to the sub-objectives. The sub-objectives are then evaluated with respect to how they relate back to the research question.

5.2 DATA COLLECTION AND PREPARATION

According to Cooper and Schindler (2001), statistical studies attempt to capture a population's characteristics by making inferences from sample characteristics. In this research, a census of the population was taken; hence,, there was no need to imply inferences from the sample data.

The questionnaires were submitted to the entire population of engineers, project leaders, project managers, architects and quantity surveyors who work in project teams on a daily basis and were familiar with the subject matter data. A subject information letter was issued with the questionnaires to inform respondents of their role in the study, the content and requirement of the study and the issue of confidentiality.

Following and intensive literature review and study of the environment and its influences, questionnaires (Appendix 2) were prepared using the five point Likert scale suggested by Cooper and Schindler (2001). Respondents were asked to complete questionnaires and deposit them into a collection box in a central location for the

purpose of anonymity and confidentiality. Responses were collected from this central location and the data was collated.

The research approach was that of a census and the research methods could be applied without the use of highly involved statistical analysis software. Data was entered onto an excel spreadsheet and responses were coded for the ease of statistical analysis. The coded formatting of data that was applied used assigned values on a scale of 1 to 5 to responses of 'strongly disagree' through to 'strongly agree'.

Tests for validity and missing data revealed that every question had a valid response and no respondent had left a question unanswered. The following tests were applied to the data, as suggested by Cooper and Schindler (2001): minimum, maximum, range, mode, median, mean, homogeneity and heterogeneity, skewness, kurtosis, variance and standard deviation.

Frequency distributions were calculated for each question. All relevant questions on the questionnaire were related to sub-objectives of the study. Frequency distributions for these questions were then consolidated per sub-objective. Towards the end of this chapter, frequency distributions were analyzed and discussed. Sub-objectives were analyzed and discussed. The research question of the study was then analyzed and discussed in relation to the identified sub-objectives.

5.3 RELIABILITY OF DATA

The research conducted was applied to a census of the population and not a sample, hence,, the reliability tests such as ANOVA recommended by Cooper and Schindler (2001) for use on randomly selected samples, was not applicable.

As this was a census of the entire population, all questions were answered and means and frequency distributions appear consistent, it can be assumed that the data collected is relevant to the research and reliable.

Cooper and Schindler (2001) mention the following types of errors that may be applicable to the data collected.

- Error of leniency is apparent when there is a conglomeration of responses either on the left (negative leniency), the right (positive leniency) or the centre (central tendency) of the questionnaires. Error of leniency was not an obvious concern in the responses received.
- The demographic representation of the respondents indicated that there could be a halo effect type of error in responses. This effect would be explained by respondents with more experience being more comfortable with the current business processes and being more resistant to change. The type of client being serviced did not appear to have any obvious effect on the data although it is apparent that NPA is the most common client among respondents. Data presented was not specific in any way to the discipline of engineering to which respondents belonged.

5.4 INTERPRETATION OF RESULTS

The various questions on the questionnaire were categorized with respect to applicability to the sub-objectives. The frequency distribution was computed for each question. An analysis of the respective questions is discussed below. This analysis will lend itself to either verifying or disputing the sub-objectives supporting the research question. The coding on the frequency distributions is related to the questionnaire analysis as follows:

Response rated 1 = strongly disagree

Response rated 2 = disagree

Response rated 3 = neither agree nor disagree

Response rated 4 = agree

Response rated 5 = strongly agree

Sub-objective 1

To establish Transnet's efficacy in the process of establishing projects

Response to Question 15

Project managers are appointed at the concept stage of the project.

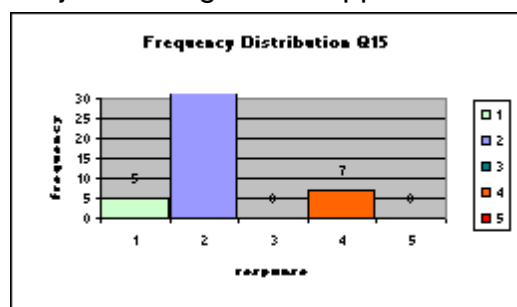


Figure 6: Graph showing analysis of response to question 15

mean	2,2
median	2
mode	2

Analysis

The most frequent response to this question was 'disagree'. Thirty-two of the forty-four respondents noted from their past experience that project managers are not appointed at the concept stage of the project.

This delay in appointing a project manager poses a problem at the very onset of the project as the project manager is not fully conversant with the history or requirements of the project, he/ she may not have bought into the project dynamics and his/her overall influence on the outcomes of the project is thus limited. The PMI advocates that the project manager be appointed at the conceptual stage of a project. He/she is the strategist that formulates the management approach. The project charter is developed during the concept stage, and the project manager becomes the custodian of this charter for the life of the project. Hence,, his/her acceptance and buy in from the onset of the project is crucial to project success.

The appointment of the project manger at the concept stage of the project is the responsibility of the client (project owner). A failure to timeously make this appointment could inhibit project success.

Response to Question 16

The Project Manager is involved in the project selection process.

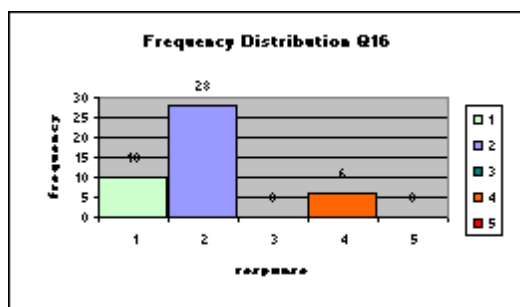


Figure 7: Graph showing analysis of response to question 16

mean	2
median	2
mode	2

Analysis

The most frequent response to this question was 'disagree'. Twenty eight of the forty four respondents noted from their past experience that project managers are not involved in the project selection process.

According to Cleland and Ireland (2002: page 212), ideally, an organization will select projects that align with the strategic goals and that build on current capability. Each project that is selected and implemented should be a building block that promotes the organization's purpose and that positions the organization for an improved future capability. Any project not aligned with the strategic goals may detract from the organizations purpose and delay its growth.

As suggested by Burke (2004: page 56), the selection of the right project for future investment is a crucial decision for the long-term survival of a company. The selection of the wrong project may well precipitate project failure leading to company liquidation.

The execution of a project will tie up company resources and, as an opportunity cost, the selection of one project may preclude a company from pursuing another (more profitable) project. Therefore, a process is required to select and rank projects on the basis of beneficial change to a company. Typically, the methods to be employed are:

1. Constrained Optimization (mathematical models)
2. Benefits Measurement (these include calculations of the net present value, internal rate of return and cost benefit analysis)

Use of appropriate project selection models will enable an organization to compare various project options and establish a direction for change.

PMI recommends involvement of the project manager during the project selection process. His/her buy-in and commitment is invaluable in establishing the business case for the project, developing the project charter, clearly defining tangible project objectives and deliverables and, hence,, initiating the project. Project success will be defined by delivering on these tangible objectives that are clearly defined at project initiation.

Response to Question 28

Project failure can, in part, be attributed to the failure to adequately identify, document and track project requirements.

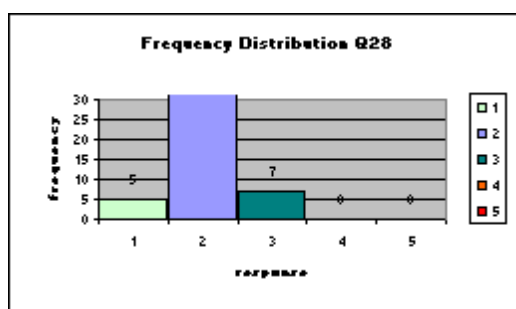


Figure 8: Graph showing analysis of response to question 28

mean	2
median	2
mode	2

Analysis

The most frequent response to this question was 'disagree'. Thirty-two of the forty-four respondents noted from their past experience that this was not an issue contributing to project failure within Transnet.

The implication is that project requirements are adequately identified, documented and tracked. It is pertinent to note that the responsibility for this function rests with Protekon. Hence,, the inference is that Protekon is performing adequately in this aspect.

Analysis of Sub-objective 1

Analysis of responses to questions related to sub-objective 1 implies that Transnet is not realizing the true benefit of the project selection process. Failure to appoint a project manager during the conceptual phase of the project contributes to project failure related to this aspect.

It should be noted that where Protekon is concerned, it is performing to satisfaction with respect to identifying, documenting and tracking project requirements. Hence,, if these requirements are correctly established with Protekon's (project manager's) involvement from the conceptual stage, it is likely that project outcomes will be delivered to requirement.

Sub-objective 2

To compare the project management concept within Transnet with that accepted by the Project Management Institute (PMI) of South Africa to identify gaps and inconsistencies in the project management approach and to identify paradigm, cultural and skills gaps within Transnet that inhibit project success

Response to Question 11

The Transnet concept of project management is clearly defined and understood.

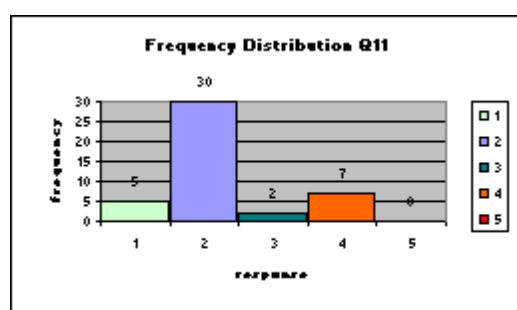


Figure 9: Graph showing analysis of response to question 11

mean	2.3
median	2
mode	2

Analysis

The most frequent response to this question was 'disagree'. Thirty of the forty-four respondents believe that the Transnet concept of project management is not clearly defined and understood.

Transnet defines the conventional title of Project Manager according to the E5 – General Conditions of Contract. This responsibility is only assigned at the tender award stage and is born out of a contract.

The PMI approach includes processes such as feasibility studies, stakeholder analysis and other forecasting and actuarial functions. There exists a multitude of grey areas within Transnet and one of them is a clear definition and function of a project manager. There exists no clear framework for the implementation of a structured approach to Project Management.

The project management processes common to most projects associated with each other by their performance for an integrated purpose. The purpose is to initiate, plan, execute, monitor and control and close a project. Each of these processes has clearly defined outputs that contribute to successful project delivery.

According to the PMBOK (2004), project management is the application of knowledge, skills, tools and techniques to project activities to meet project requirements.

Managing a project includes:

- Identifying requirements;
- Establishing clear and achievable objectives;
- Balancing the competing demands for quality, scope, time and cost;
- Adapting the specifications, plans and approach to the different concerns and expectations of the various stakeholders.

Effective project management requires that the project manager and his team understand and use knowledge and skills from at least five areas of expertise:

- The PMBOK;
- Application area knowledge, standards, and regulations;
- Understanding the project environment;

- General management knowledge and skills; and
- Interpersonal skills.

Response to Question 13

There is a general reluctance to embrace leading edge technology, alternative business solutions and contemporary project management practices.

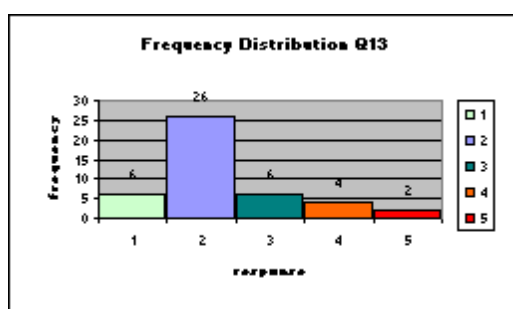


Figure 10: Graph showing analysis of response to question 13

mean	2.3
median	2
mode	2

Analysis

The most frequent response to this question was 'disagree'. Twenty-six of the forty-four respondents believe that Transnet is receptive to change and constantly evolving and improving to achieve its vision of becoming a world-class organization. This company no longer employs archaic project management principles.

Transnet has recently attempted major shifts in its management philosophies through re-engineering and restructuring its organization. It has restructured its organizational design to focus more on core operations by eliminating unrelated operations, improving organizational processes, downsizing and flattening hierarchies. Continuous improvement of services and organizational processes by adapting concepts of

flexibility, rapid responses, improved human resource practices, service development strategies, improved supplier and customer relations and management methods will strongly position Transnet to succeed in its winning strategy.

Response to Question 15

Project managers are appointed at the concept stage of the project.

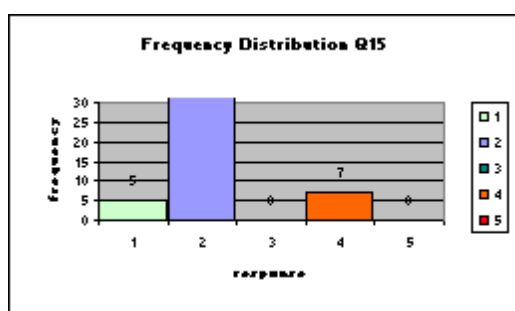


Figure12: Graph showing analysis of response to question 15

mean	2.2
median	2
mode	2

Analysis

The most frequent response to this question was 'disagree'. Thirty-two of the forty-four respondents agree that Project Managers are not appointed at the concept stage of the project.

The implication here is that Project Managers do not buy into the project concept; cannot technically evaluate the legitimacy of the project objectives and oversee the project selection process and the defining of the deliverables.

Response to Question 16

The project manager is involved in the project selection process.

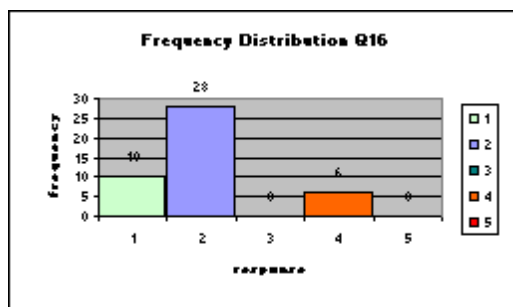


Figure 13: Graph showing analysis of response to question 16

mean	2
median	2
mode	2

Analysis

The most frequent response to this question was 'disagree'. Twenty-eight of the forty-four respondents confirm that the project manager is not appointed in the project selection process.

The PMBOK advocates that it is good practice to appoint the project manager as early on in the project as is possible. The project charter is the output of the project initiation phase. The project manager should be involved in the development of the charter, the selection of the project and the defining and detailing of project requirements. Early appointment of the Project Manager reduces the delays at the start of the project-planning phase.

Response to Question 19

The principles of project management are applied uniformly irrespective of the size of the project.

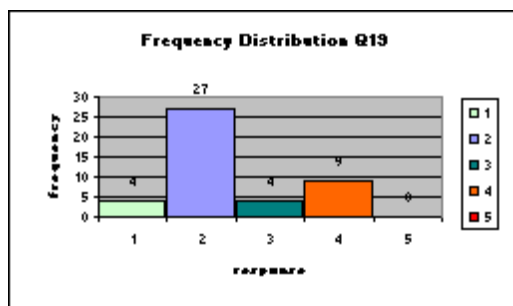


Figure 14: Graph showing analysis of response to question 19

mean	2.4
median	2
mode	2

Analysis

The most frequent response to this question was 'disagree'. Twenty-seven of the forty-four respondents believe that the principles of project management are not applied uniformly on all projects.

What is often the case with smaller projects is that they have fewer deliverables, smaller project teams and shorter horizons in which to meet deliverables. The administrative functions in managing projects are generally very time-consuming. Although the life cycle of the project is generic and applicable to projects of all sizes, the phases often overlap and only the most blatant deliverables of each phase are defined and produced in the scope of the project. This short sighted, however convenient, approach to project management only becomes apparent at termination or mediation stages typically due to the lack of proper protocol, no clear documenting and tracking of project records, undefined deliverables and lack of clear communication.

Response to Question 24

The time, cost, quality and scope constraints are usually managed as planned.

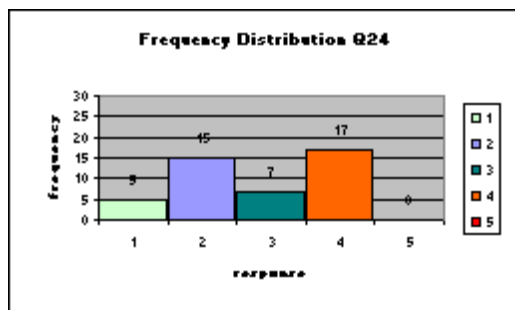


Figure 15: Graph showing analysis of response to question 24

mean	2.8
median	3
mode	4

Analysis

Although the most frequent response to this question was 'agree' by seventeen of the forty-four respondents, fifteen respondents disagreed that project constraints are managed as planned.

The respondents that agreed with the question have most likely based their perception on Protekon's ability to manage projects. In this respect, Protekon's Project Managers are suitably skilled and adept in their functions. However, analysis has shown that projects are not always delivered as planned and, hence, respondents that disagreed with this question have a valid reason for doing so. This response is closely related to the lack of a formal change control system and will be discussed further under the next question. This question is also related to the perception of failure and the measures of project success – both of which will be discussed further on.

Response to Question 30

No formal change control system

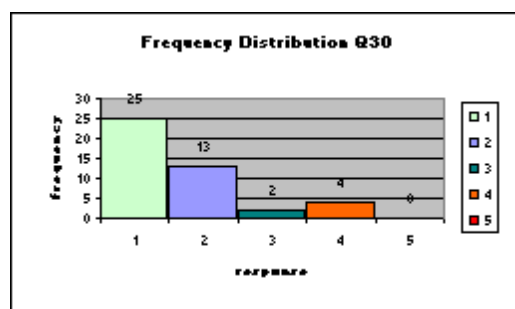


Figure 16: Graph showing analysis of response to question 30

mean	1.7
median	1
mode	1

Analysis

The most frequent response to this question was ‘strongly disagree’. A staggering twenty-five of the forty-four respondents believe that Protekon does not adopt a formal change control system.

Inadequate change control is an obvious shortcoming in Protekon’s method of managing projects. The lack of a meaningful change control system lends itself to scope creep. Hence, projects overrun on their time and cost constraints to accommodate client requests for change in scope. Formally, tracking and monitoring the change control process is a clearly defined responsibility of a project manager. Paying poor attention to change control is a common occurrence in Protekon’s history of managing projects. Hence, it is very necessary to adopt a formal change control mechanism that will alleviate many of the “project failure perceptions” in Protekon’s project management.

Response to Question 34

Poor plans and planning processes

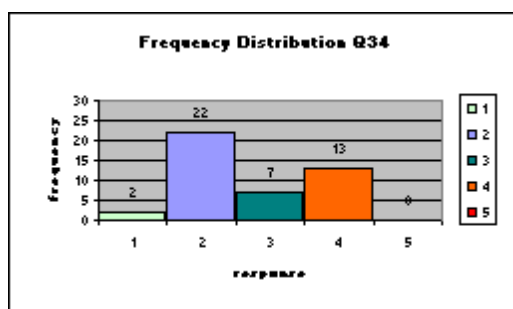


Figure 17: Graph showing analysis of response to question 34

mean	2.7
median	2
mode	2

Analysis

The most frequent response to this question was 'disagree'. Twenty-two of the forty-four respondents believe that poor plans and planning processes is not a problem in their environment.

The inference is that Protekon successfully manages the planning stage of the project. Success during the planning stage of a project is an obvious strength within Protekon as its staff complement is chiefly technical and designs and documentation produced during this stage of the project is done so by highly qualified, competent and experienced individuals. The project team is well selected and managed which contributes to successful deliverables in the planning stage of the project life cycle.

Response to Question 36

Inadequate or misused methods, processes and procedures

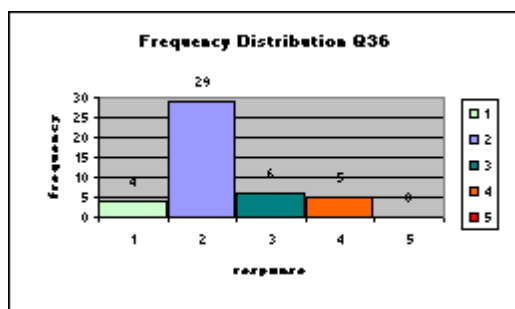


Figure 18: Graph showing analysis of response to question 36

mean	2.3
median	2
mode	2

Analysis

The most frequent response to this question was 'disagree'. Twenty-nine of the forty-four respondents believe that project failure could not be attributed to the inadequate or misused methods, processes and procedures in the Protekon environment.

The belief is that Protekon is consistent in the methods and processes that it employs in managing projects. Since Protekon ISO (International Standards Organisation) compliant, regular audits regulate the consistency and suitability of processes and procedures followed on projects.

Analysis of Sub-objective 2

In summary, the Project Management concept, while understood and applied well by Protekon, is not clearly defined by Transnet. Hence, there are a fair amount of grey areas with respect to project management and the project manager's roles and responsibilities.

The processes, procedures and implementation for proper project management are defined to world-class standards by the PMI. Transnet has a definite shortcoming in its approach to project management. This would be overcome by application of broad based project management principles dictated by PMBOK.

In the recent past, Transnet has developed a non-resistant culture to change. This focus on restructuring and re-engineering of its business processes will hold the organization in good stead to adapt and adopt industry standards in project management.

There appears to be no gaps with respect to Protekon's use of project management procedures and processes. Protekon has adopted the principles of project management and apply them well, mostly on larger projects. However, the obvious gap is if Protekon is trained and knowledgeable of the PMI way of managing projects, why has it not shared this knowledge with its client Transnet? A reason could be that Transnet is a very large organization, hence, its rate of change is very slow.

Protekon seems to be failing in aspects of project management such as adopting formal change control processes. Adopting formal change control will impact in a change in mindset within Transnet and will formalize the project scope and monitor and control any changes.

Sub-objective 3

To ascertain the alignment between business goals and projects goals within Transnet

Question 1

Projects are selected in line with business goals

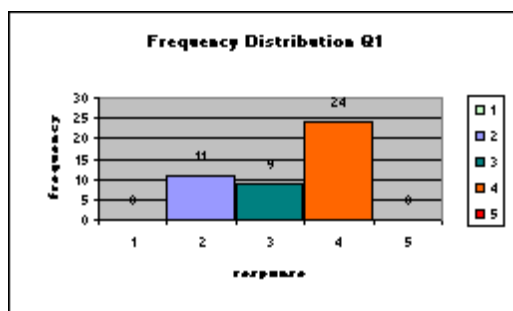


Figure 19: Graph showing analysis of response to question 1

mean	3.3
median	4
mode	4

Analysis

The most frequent response to this question was 'agree'. Twenty-four of the forty-four respondents believe that the projects are selected in line with business goals.

Although based largely on perception of respondents, the result is an indication that Transnet's business goals are clearly defined and that projects are selected in line with these business goals. The result also implies that the screening process for capital expenditure is stringent and project selection is a priority in any investment decision.

Response to Question 2

Project outcomes are generally aligned with business goals.

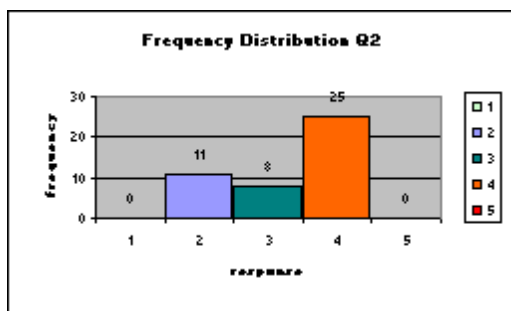


Figure 20: Graph showing analysis of response to question 2

mean 3.3
 median 4
 mode 4

Analysis

The most frequent response to this question was 'agree'. Twenty-five of the forty-four respondents agree that project outcomes are generally aligned with business goals.

By inference, project outcomes are generally achieved as planned and hence, are aligned with Transnet's business goals.

Response to Question 3

Project results satisfy the business requirements in the short to medium term (1 to 5 years)

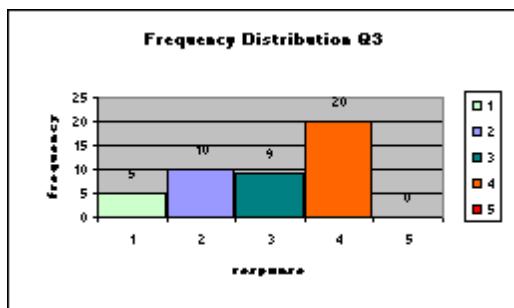


Figure 21: Graph showing analysis of response to question 3

mean 3
 median 3
 mode 4

Analysis

The most frequent response to this question was 'agree'. Twenty of the forty-four respondents believe that project results satisfy business requirements in the short to medium term.

Short to medium term business requirements are generally related to optimizing business operations. Hence, projects that are selected in line with logistics and operations decisions generally achieve planned outcomes.

Response to Question 4

Project results satisfy the business requirements in the long term (beyond 5 years).

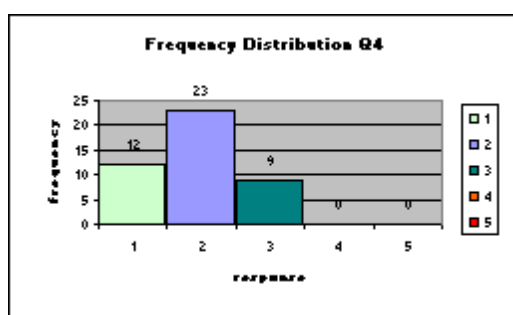


Figure 22: Graph showing analysis of response to question 4

mean	1.9
median	2
mode	2

Analysis

The most frequent response to this question was 'disagree'. Twenty-three of the forty-four respondents believe that project results do not satisfy business requirements in the long term.

Long-term business decisions are generally geared towards growth and development of the business. While projects fulfilling short-term business decisions are identified through an immediate business need, long-term decisions are based on aligning projects to suit the business vision. For Transnet to be a successful business entity, even projects that are selected to meet short-term demands should support the long-term business requirements. Very large capital investment decisions are taken for medium to long term project commitments. The project selection process here should be very stringent and based on an exhaustive business case.

Response to Question 5

Project outcomes are clearly defined by the client

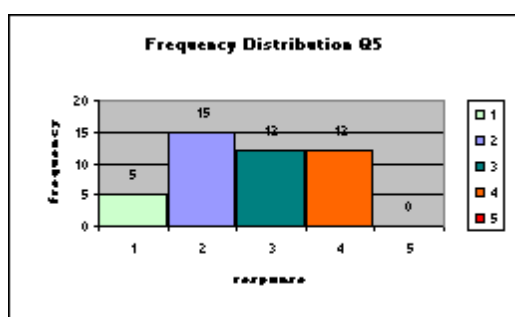


Figure 23: Graph showing analysis of response to question 5

mean	2.7
median	3
mode	2

Analysis

The most frequent response to this question was 'disagree'. Fifteen of the forty-four respondents disagreed while twelve respondents agreed that outcomes are clearly defined and twelve respondents were undecided.

While respondents previously agreed that project outcomes are generally met and aligned with short-term business requirements, the responses here seem to indicate that the project outcomes themselves are not clearly defined by the client.

Poorly defined project outcomes could indicate that while the client is able to identify operational requirements and select projects to fulfill these requirements, the total array of deliverables on such projects may not be defined. Ill defined project outcomes leaves room for interpretation (and possibly manipulation) by the project manager and his team, and could also mean that the full benefit of the project and the capital expenditure invested in delivering that project cannot be achieved. Hence, resources are wasted because project deliverables are not clearly defined.

Projects by their very nature have the ability to improve and transform the business remarkably. Every project initiative should be started with this goal in mind and with the focus being business growth and development. Projects that are selected to meet short-term operational demands, while they may deliver to expectation, are not effective in the business sense.

Response to Question 17

Project results have a strategic fit in the design and execution of future products and services.

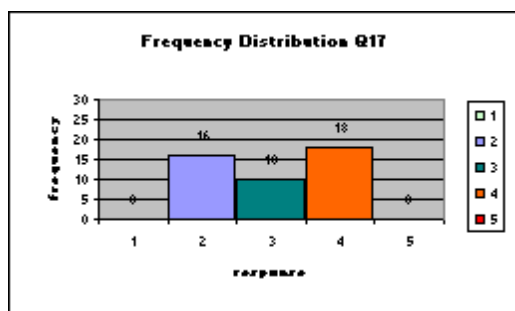


Figure 24: Graph showing analysis of response to question 17

mean	3
median	3
mode	4

Analysis

The most frequent response to this question was 'agree'. Eighteen of the forty-four respondents agreed while sixteen of the respondents disagreed that project results have a strategic fit in the design and execution of future products and services. The kurtosis on this response is flat. Hence, the response is not conclusive.

Those respondents in agreement with this question could possibly have considered only the operational needs of the business. This could also be true in projects that are phased to deliver certain outcomes in defined periods.

Respondents who disagreed may have considered that projects are not long term focused and, hence, future operational improvements are limited by the short-term focus.

Response to Question 18

Projects are selected in line with business growth and expansion strategies.

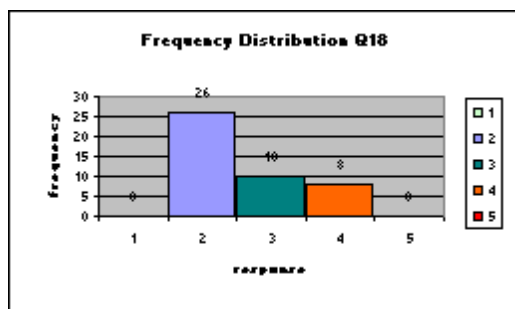


Figure 25: Graph showing analysis of response to question 18

mean	3.4
median	4
mode	4

Analysis

The most frequent response to this question was 'disagree'. Twenty-six of the forty-four respondents believe that projects are selected in line with business growth and expansion strategies.

This response emphasizes the short-term focus of both project selection decisions and the benefits derived from project deliverables. Project decisions that do not support growth and expansion strategies are actually stifling the development of the business. Hence, Transnet is unlikely to achieve its vision of becoming a world-class logistics service provider if it does not change its focus in project investments.

Response to Question 20

The project usually satisfies the business operational requirements

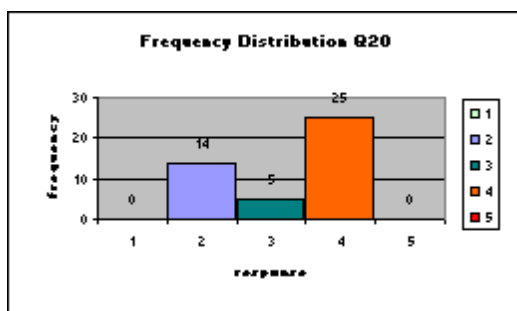


Figure 26: Graph showing analysis of response to question 20

mean	3.3
median	4
mode	4

Analysis

The most frequent response to this question was 'agree'. Twenty-five of the forty-four respondents believe that the project usually satisfies the business operational requirements.

It has already been established that projects are generally initiated to satisfy operational demands in the short term. This response in agreement re-iterates that fact.

Response to Question 23

Projects always deliver the business value it promises

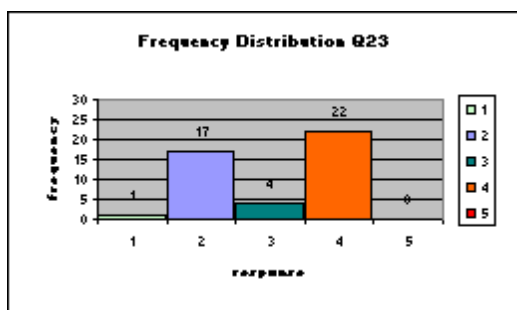


Figure 27: Graph showing analysis of response to question 23

mean	3
median	3.5
mode	4

Analysis

The most frequent response to this question was 'agree'. Twenty-two of the forty-four respondents believe that projects always deliver the business value it promises.

Success in this arena would be a direct result of the efficiency, professional, competence and performance of the project team. Project deliverables are met and fulfill operational requirements. This result in no way refers to the delays that could be caused in operations by the project implementation process. The opportunity costs have not been considered here. However, it would be pertinent to note that a fire fighting maintenance strategy that is managed through project implementation does not make good business sense. Fire fighting is an expensive, fool-hardy business management approach that would retard the growth and development of the business and encourages short-term focus, unprecedented delays and operational inefficiencies.

Response to Question 35

Project failure can be attributed to misalignment between the project team and the business it serves

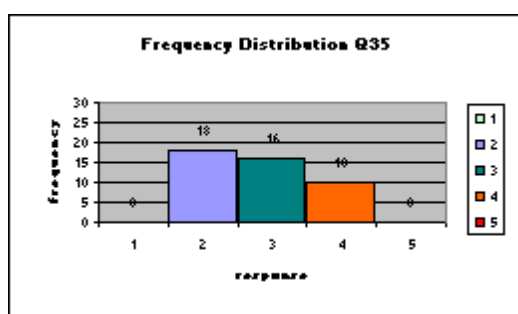


Figure 28: Graph showing analysis of response to question 35

mean	2.8
median	3
mode	2

Analysis

The most frequent response to this question was 'disagree'. Eighteen of the forty-four respondents believe that the project team is aligned with the business it serves and this is not a cause for project failure.

Protekon is a division of Transnet. Protekon's only client is Transnet. After decades of experience in engineering and project management within Transnet, Protekon is well versed with Transnet's business, its client, its environment and its operations. Protekon also understands the limitations and delimitations of the Transnet environment.

Protekon is also able to advise the client on the context of its project selections, defined deliverables and operational requirements based on its knowledge and experience and the portfolio of projects that is underway at any point in time. Hence, the project team is well aligned with the business it serves.

Analysis of Sub-objective 3

Project selection of the right project for future investment is a crucial decision for the long-term survival of the company. The selection of the wrong project may well precipitate project failure. Project selection provides the framework for evaluating and ranking prospective projects using numeric methods. It is usually applied during the project feasibility phase.

There are two distinct methods of project evaluation. The Constrained Optimization method uses mathematical models to evaluate project feasibility while the Benefits Measurement method uses payback period, net present value (NPV) and internal rate of return (IRR). Non-numeric methods consider items such as market share, client retention and environmental issues.

Hence, by applying appropriate project selection techniques in a comprehensive business case, projects are more likely to be successful. Application of project selection techniques will force focus on project goals being aligned with business goals and, hence, support the overall growth and development strategy of Transnet.

Sub-objective 4

To differentiate between perceived failure and real failure in projects

Response to Question 6

The client determines project success by measuring project outcomes.

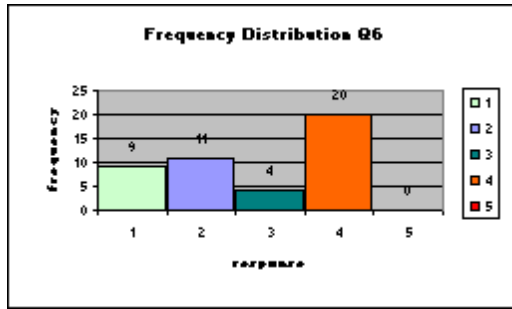


Figure 29: Graph showing analysis of response to question 6

mean	2.8
median	3
mode	4

Analysis

The most frequent response to this question was 'agree'. Twenty of the forty-four respondents agree that the client determines project success by measuring project outcomes.

By definition, this implies that the client determines whether or not a project is successful by checking that all of the deliverables that were promised by the project were delivered at the end of the project.

The PMI measures project success by ensuring that the scope, time quality and cost constraints that were defined at the onset of the project, were adhered to. The project deliverables are generally only associated with one of these dynamics i.e. the scope of the project. Hence, the measure of project success is inherently flawed. If the client does not use the correct measure, his/her perception of success may differ somewhat from reality.

Response to Question 10

Project owners are equipped with the skills to analyse business requirements when defining project outcomes.

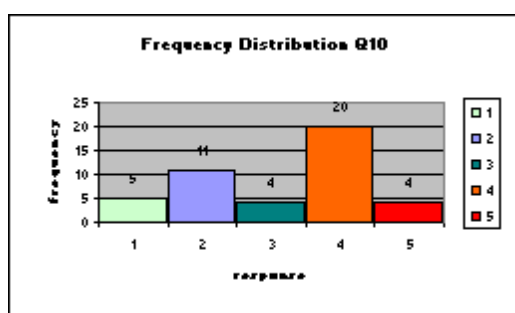


Figure 30: Graph showing analysis of response to question 10

mean	3.2
median	4
mode	4

Analysis

The most frequent response to this question was 'agree'. Twenty of the forty-four respondents believe that project owners are equipped with the skills to analyze business requirements when defining project outcomes.

It is essential that project outcomes be aligned with business requirements both in the long and short term. Project owners should be the custodians championing this alignment within the organization before the project is selected.

Response to Question 21

Project deliverables are generally produced on time and within budget.

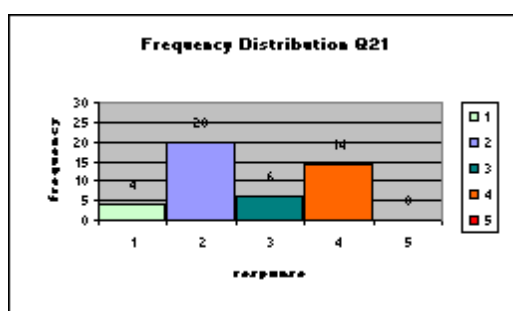


Figure 31: Graph showing analysis of response to question 21

mean	2.7
median	2
mode	2

Analysis

The most frequent response to this question was 'disagree'. Twenty of the forty-four respondents believe that Project deliverables are not generally produced on time and within budget.

This is a direct reflection on Protekon's performance in its project management role. It has been previously identified that the lack of a meaningful change control system contributes to the time and cost overruns on the project as scope is allowed to creep indefinitely.

Protekon should definitely focus more attention on this aspect of project management and benchmark their efforts to the PMI prescribed process for controlling and managing scope change. This is a chief contributing factor to project failure and it is essential that this process be properly managed.

Response to Question 22

The business owners usually believe that the project was successful.

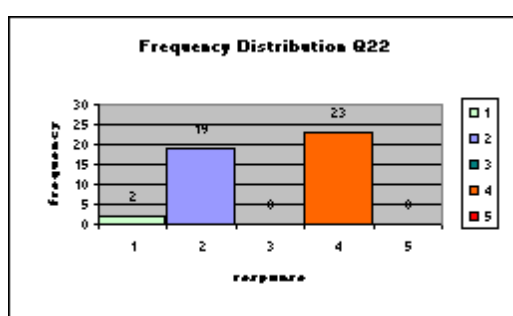


Figure 32: Graph showing analysis of response to question 22

mean	3
median	4
mode	4

Analysis

The most frequent response to this question was 'agree'. Twenty-three of the forty-four respondents agreed while nineteen of the respondents disagreed that business owners usually believe that the project was successful.

It has been established previously where business owners measure project success on the delivery of predefined project outcomes. Hence, this definition of project success stems merely from successfully delivery of outcomes and not necessarily on the successful management of project constraints.

Response to Question 25

Projects ultimately provide satisfactory return on investment to the customer

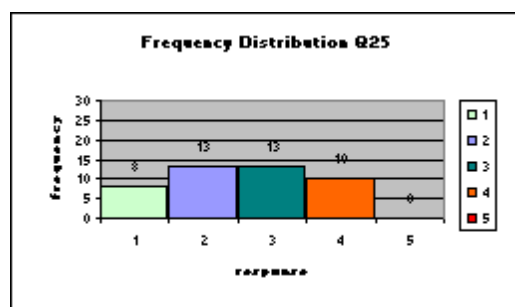


Figure 33: Graph showing analysis of response to question 25

mean	2.6
median	3
mode	2

Analysis

The most frequent response to this question was tied between ‘disagree and neither agree nor disagree’. Thirteen of the forty-four respondents disagreed, thirteen were undecided and ten respondents agreed that projects ultimately provide satisfactory return on investment to the customer. The kurtosis on this response was virtually flat, hence, the result is not truly conclusive.

As previously established and by virtue of the fact that project selection is not based on the application of proper project evaluation techniques (including a return on investment analysis), but merely on the short-term operational demands of the business, it would not be expected that projects would provide a satisfactory return on investment to the customer.

Analysis of Sub-objective 4

Typically, projects fail when they do not deliver on the schedule, budget, scope and quality constraints. A key factor to consider is that there is no one overriding factor to determine project failure or success. Some of the most important reasons for failure are lack of user involvement, long or unrealistic timescales, poorly defined project outcomes, scope creep and lack of a meaningful change control system.

Finally, there should be ongoing communication to stakeholders and other interested parties to build an appropriate level of expectation on a project with well-defined boundaries. The project must deliver within boundaries and meet or exceed expectations that were set.

The perception of ambiguity is caused primarily by the different corporate cultures and degrees of maturity regarding project management and general management practices found in organisations. To avoid the trap that definitional ambiguity sets, measures of success should be clearly defined in the project plan and in all correspondence that announces the launch and progress of the project as it proceeds.

Sub-objective 5

To identify Protekon's capabilities in project management

Response to Question 8

Protekon has the necessary capabilities to fulfill the technical requirements of the project.

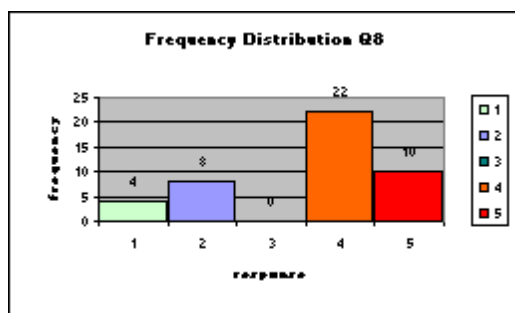


Figure 34: Graph showing analysis of response to question 8

mean	3.6
median	4
mode	4

Analysis

The most frequent response to this question was 'agree'. Twenty-two of the forty-four respondents agreed that Protekon has the necessary capabilities to fulfill the technical requirements of the project

Protekon comprises a staff complement of technically professional people. These include engineers, project managers, quantity surveyors, architects draughts people and supporting functions. Protekon's project managers are all certified as Professional Project Managers.

Together with the Transnet environment specific knowledge of technical experts within Protekon, the qualifications, the knowledge the skills and the depth of experience positions Protekon well to serve the client in a professional and competent manner.

Response to Question 9

Protekon has the project management knowledge to successfully complete projects

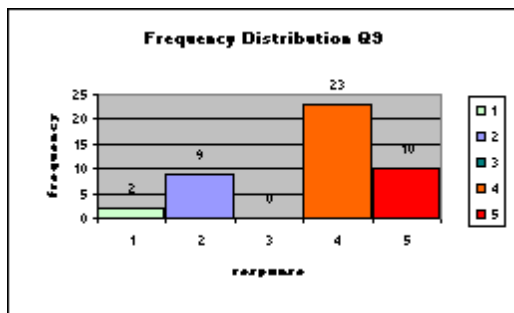


Figure 35: Graph showing analysis of response to question 9

mean 3.7
 median 4
 mode 4

Analysis

The most frequent response to this question was ‘agree’. Twenty-three of the forty-four respondents agreed that Protekon has the project management knowledge to successfully complete projects.

Response to Question 31

Project failure can be attributed to inadequately trained or inexperienced project managers

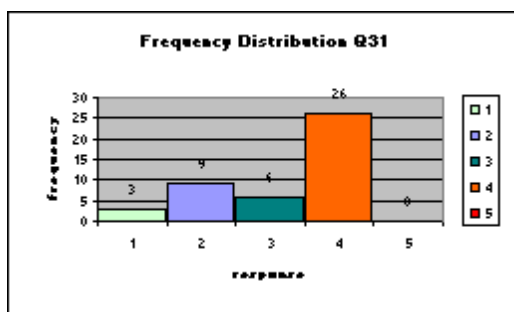


Figure 36: Graph showing analysis of response to question 31

mean 3.3
 median 4
 mode 4

Analysis

The most frequent response to this question was 'agree'. Twenty-six of the forty-four respondents agreed that project failure could be attributed to inadequately trained or inexperienced project managers.

This response indicates that the respondents believe that while project managers are trained and generally competent in the functions, inadequate training or inexperience on the part of the project manager could definitely contribute to project failure.

Training alone cannot equip a project manager with the complete requirement for his/her role. A project manager needs general management skills, experience in the various disciplines of his/her technical project team, application area knowledge and environmental awareness. Together with these, a project manager spends 80% of his time communicating with the project team and client, hence, he/she must be a good communicator.

Analysis of Sub-objective 5

Hence, responses indicate that Protekon has the necessary project management capabilities to successfully fulfill its role within Transnet. Protekon brings skills, talent and a breadth of experience to Transnet's projects.

How the client perceives the project has a lot to do with how he/she perceives the project manager. Research, according to PM Solutions (2006), shows that when a project fails, it is rarely because the Gantt chart was not done. Generally, project failure results from politics, personality and interpersonal skills.

The project manager must possess a combination of skills including an ability to ask penetrating questions, detect unstated assumptions and resolve interpersonal conflicts as well as more systematic management skills. PMs should put a primary focus on people skills including leadership, delegation, conflict resolution and negotiation.

In large, Protekon has evolved over the years in line with these requirements. Project managers are well equipped with the experience, the knowledge and the skills to succeed. However, there seems to be the underlying need to please the client at any cost. This desire to appease leaves Protekon's Project Managers at a disadvantage as they digress from their core focus, roles and responsibilities with the fundamental objective being project success, to the mistaken perception that pleasing the client 'at whatever cost' builds relationships and secures future business. This perception, in reality, has the opposite effect. Failure to effectively apply the project management principles at all times contributes to project failure and project failure does not secure future project developments from clients.

Relationship between Sub-objectives and Research question

To recap, the sub-objectives were related to questions on the questionnaire and analyzed independently. These sub-objectives all support the research question in some manner. This relationship between the research question and the sub-objectives will now be examined further.

5.5 Analysis of Research Question

Research question: Protekon contributes to project failure within Transnet.

Sub-objective 1 looked at Transnet's efficacy in establishing projects. The conclusion was that Transnet is not realizing the true benefit of the project selection process. Failure to appoint a project manager as early on in the project, and preferably during the conceptual phase of the project, contributes to project failure.

Responses to questionnaires revealed that Protekon appears to be performing to satisfaction with respect to identifying, documenting and tracking project requirements. Hence, if these requirements are correctly established with Protekon's (project manager's) involvement from the conceptual stage, it is likely that project outcomes will be delivered to requirement.

The second sub-objective compared the project management concept within Transnet with that advocated by the Project Management Institute in South Africa.

The conclusion here was that the Project Management concept, while understood and applied to a satisfactory degree within Protekon, is not clearly defined by Transnet. Hence, there are a fair number of grey areas with respect to project management and the project manager's roles and responsibilities within Transnet.

The 3rd sub-objective ascertained the alignment between business goals and project goals within Transnet.

Project selection of the right project for future investment is a crucial decision for the long-term survival of the company. The selection of the wrong project may well precipitate project failure.

Hence,, by applying appropriate project selection techniques in a comprehensive business case, Transnet projects are more likely to be successful. This application will force focus on project goals being aligned with business goals and, hence, support the overall growth and development strategy of Transnet.

The fourth sub-objective focused on the concept of perceived failure and real failure on projects.

The entire perception that Protekon is contributing to project failure could be attributed to the perception of ambiguity which is caused primarily by the different corporate cultures and degrees of maturity regarding project management and general management practices within these organisations. To avoid the trap that definitional ambiguity sets, measures of success should be clearly defined in the project plan and in all correspondence that announces the launch and progress of the project as it proceeds.

The 5th sub-objective was designed to assess Protekon's capabilities in project management.

Responses indicated that Protekon has the necessary project management capabilities to successfully fulfill its role within Transnet. Protekon brings skills, talent and a breadth of experience to Transnet's projects.

5.6 CONCLUSION

In summary, the research question is disproved. There is general consensus that Protekon enhances project success within Transnet.

The analysis of the sub-objectives and discussion thereafter indicates that while there are definite shortcomings in Transnet's project management philosophy, Protekon has embraced the industry benchmark for project management (advocated by PMI) and is performing well.

Transnet's perception of project failure could be perpetuated by an ill-informed knowledge of the project management concepts and a lack for tangible pre-defined measures for success.

The following chapter will recommend strategies to overcome shortcomings in project delivery to Transnet and will thereby conclude the study.

6.0 CHAPTER 6 – RECOMMENDATIONS AND CONCLUSION

6.1 INTRODUCTION

Following from the analysis of the sub-objectives and the research question of this dissertation, the following recommendations are put forward with the view to address the gaps in the project management approach by Protekon and Transnet.

This chapter will summarize research findings and will propose recommendations to bridge the gap in Transnet's project management approach.

6.2 SELLING PROJECT MANAGEMENT

Project management is an essential element of business solutions. There is a vital need to raise the level of awareness of the potential for using project management in senior managers, those individuals charged with the responsibility to guide the organization in the most efficient and effective manner. Raising the level of awareness, or "selling project management to senior managers," is vital to maintain the organization's competitive edge. Without a competitive edge, organizations will shrink in the marketplace and their capability to develop new products and services to meet emerging needs will decline.

In order to sell project management to Transnet's management, Protekon needs to convince senior management that its project management services can add value to the organization. A crisis will energize senior managers to act and to use project management when it is viewed as the solution to the problem. A crisis is usually dictated by some action and the implementation of project management may be

identified as the solution. A crisis also has the challenge of immediate action; hence, Protekon could capitalize on the opportunity to effectively manage the crisis by applying professional technical and project management expertise, while delivering results on time and within budget.

To sell project management, there must be perceived value by the project manager. There must be some compelling reason for the senior manager to become the champion and support the change. The value must be to the organization and it must outweigh considerations such as economic, political and stakeholder objection, and personal interests. The change must also advance the organization on the competitive scale to improve its position in relation to competitors.

In selling project management, one must show the benefits of project management to the organization and the differences between what is currently done compared to the future. Senior managers are looking for value added solutions in project management and not the features, characteristics or process. Anyone selling project management or project management services must focus on the value to the organization. This value must be quantified and show the advantages or benefits of changing to project management practices.

Hence, Protekon must invest in valuable marketing to get client buy in and appreciation of its worth. The study has revealed that Protekon does possess the technical and project management skills and capabilities to succeed. Transnet may be more enthusiastic about investing 65 billion rand in capital investment, if they are convinced that Protekon will provide project solutions that will effectively add business value.

6.3 COMPETENCE

How the client perceives the project's outcome has a lot to do with his/her perception of the project manager.

There are two types of project authority. *De jure* project authority refers to the legal or rightful power to command or act in the management of a project. *De facto* authority is that influence brought to the management of a project by reason of a particular person's knowledge, expertise, interpersonal or personal effectiveness, (Burke, 2004).

Part of the ability to influence is the competence to work effectively with project team members, functional managers, general managers and project stakeholders. Interpersonal skills provide power to the project manager in influencing the many professionals and managers with whom the project manager works. Developing and maintaining a successful track record that gets people to work with the project manager, are in themselves, a form of power in influencing. The ability to influence is directly related to how others perceive one's expertise.

The ability to exercise *de facto* authority is dependent on the competency of the individual. This competency is essentially a combination of the knowledge, skills and attitudes that an individual possesses.

6.4 THE PROJECT MANAGEMENT MATURITY MODEL

An industry benchmark for project management excellence is measured through the Project Management Maturity Model as per the PMBOK Guide (2004).

Project Management maturity is the progressive development in the project management approach, methodology, strategy and decision-making process. The appropriate level of maturity will vary for each organization with specific goals, strategies, resources capabilities, scope and needs.

The proper level of maturity to which an organization should strive is determined during a detailed assessment conducted by a professional project management consulting team. An organization has achieved full project management maturity when it has met the requirements and standards for effectiveness defined by the Project Management Maturity Model. At this stage, the organization is capable of demonstrating improvements such as on-time project delivery, cost reductions, organizational efficiency and profitability according to PMBOK (2004).

Protekon appears to be on level two of a five level maturity scale. This rating implies that there is generally structured processes and standards in project management. If it intends to optimize its project management processes, Protekon will need to evolve and improve to industry standards. A template for the Project Management Maturity Model is attached as appendix 1.

6.5 THE ORGANISATIONAL STRUCTURE

Up to the mid 1950s projects tended to be run by companies using the traditional functional hierarchical organisation structure, where the project work would be passed from department to department. But as projects became more complex, meeting

budgets became more important, delivering the project on time was more crucial and working with many disciplines became common practice – so out of necessity '*project focused*' organisation structures started to develop.

As the project responsibility shifted from the functional managers to the project managers, so the functional departments were increasingly seen as a pool of company resources that could be used on any project. This new organisation structure where the project lines of authority and responsibility overlaid functional lines of authority and responsibility became known as the *matrix organisation structure*. This structure enabled companies to work on many projects at the same time; share resources, address scope overlap and underlap, and most importantly have one person communicate with the client. Matrix organisation structures have become synonymous with project management.

In creating a successful project management environment, Transnet must adopt a matrix organisational structure. Being on level 2 of the Project Management Maturity model, Protekon should evolve to a projectized structure if this can be accommodated in its current environment.

6.6 CULTURE

According to anthropologist Taylor (1958), culture is a set of refined behaviours that people have and strive toward in their society. In business, the term is used to describe the synergistic set of shared ideas and beliefs associated with a way of life in an organisation. In the corporate setting, the value orientation and leadership examples set

by senior managers greatly influence employee behaviour. The culture of the enterprise and the culture of a project within that enterprise are mutually interdependent.

We are living in a knowledge economy. Three interconnected features characterize the knowledge economy: people, change and projects. Change initiatives are always projects, projects almost always create change, and “change agents” are people. Organisations rely on projects and project management for competitive success. Project management relies on people. Thus, people are the key to success in our knowledge economy.

Aligning organisational, project and individual performance helps to strengthen the project management culture, facilitates continuous planning and review, and provides tools for business systems.

People are the power in a successful organisation. They run the projects, they initiate change, and they create and fulfil the vision. They should be acknowledged, appreciated and empowered. By investing in its people, an organisation can build inspired teams and provide them with a work environment where their intrinsic motivation can flower.

Project managers must design and facilitate a culture that brings out the best in the project stakeholders, to the benefit of the project. In promoting a culture, they must design and implement an ongoing disciplines approach in planning, organisation and control of the project management system so that team members have a model to use in managing the project. Project Managers must create a learning culture so that project team members are solution oriented and allowed to experiment without fear of reprisal if

mistakes are made. Project Managers must acknowledge, reward and give attention to members when deserving. The project manager will encourage open communication in the project's culture by providing timely feedback to the project team. He/she must provide oversight and guidance throughout the project. He/she must lead and direct the project team to a successful ending.

6.7 PROJECT DECISION ANALYSIS

Capital budgeting is investment decision-making as to whether a project is worth undertaking. Capital budgeting is basically concerned with the justification of capital expenditures.

Current expenditures are short-term and are completely written off in the same year that expenses occur. Capital expenditures are long-term and are amortized over a period of years as required by the South African Receiver of Revenue (SARS).

Virtually every business is faced with capital-budgeting decisions at some point or another. Bruner in his article on Capital Budgeting (2006) suggests the following general guidelines to orient the decision maker in investment decision situations:

1. To focus on cash flows, not profits. One wants to get as close as possible to the economic reality of the project. Accounting profits contain many kinds of economic fiction. Flows of cash, on the other hand, are economic facts;
2. Focus on *incremental* cash flows. The point of the whole analytical exercise is to judge whether the firm will be better off or worse off if it undertakes the project. Thus, one wants to focus on the changes in cash flows effected by the project. The

analysis may require some careful thought: a project decision identified as a simple go/no-go question may hide a subtle substitution or choice among alternatives. For instance, a proposal to invest in an automated machine should trigger many questions: Will the machine expand capacity (and thus permit us to exploit demand beyond our current limits)? Will the machine reduce costs (at the current level of demand) and thus permit us to operate more efficiently than before we had the machine? Will the machine create other benefits (e.g., higher quality, more operational flexibility)? The key economic question asked of project proposals should be, “How will things change (i.e. be better or worse) if we undertake the project?”;

3. Account for time. Time is money. We prefer to receive cash sooner rather than later. Use Net Present Value (NPV) as the technique to summarize the quantitative attractiveness of the project. Quite simply, NPV can be interpreted as the amount by which the market value of the firm’s equity will change as a result of undertaking the project; and
4. Account for risk. Not all projects present the same level of risk. One wants to be compensated with a higher return for taking more risk. The way to control for variations in risk from project to project is to use a discount rate to value a flow of cash that is consistent with the risk of that flow.

These 4 precepts summarize a great amount of economic theory that has stood the test of time. Organizations using these precepts make better investment decisions than organizations that do not use these precepts.

The following project evaluation techniques should be employed when projects are selected – Gitman (2000).

1. Carefully estimate expected future cash flows;
2. Select a discount rate consistent with the risk of those future cash flows;
3. Compute a “base-case” NPV;
4. Identify risks and uncertainties. Run a sensitivity analysis;
5. Identify qualitative issues such as flexibility, quality, know-how and learning; and
6. Select a project.

The basic steps to Capital Budgeting are:

1. Estimate the cash flows;
2. Assess the riskiness of the cash flows;
3. Determine the appropriate discount rate;
4. Find the PV of the expected cash flows; and
5. Accept the project if $PV \text{ of inflows} > \text{costs}$. $\text{Internal Rate of Return (IRR)} > \text{Hurdle Rate}$ and/or $\text{payback} < \text{policy}$.

Hence,, by applying appropriate project selection techniques in a comprehensive business case, as introduced earlier, projects are likely to be more successful. This process will force focus on project goals being aligned with business goals and, hence, supporting the overall growth and development strategy of Transnet.

6.8 WHY PROJECTS FAIL

Typically, projects fail when they do not deliver on the schedule, budget, scope and quality constraints. A key factor to consider is that there is no one overriding factor to determine project failure or success. Some of the most important reasons for failure are listed below:

Lack of User Involvement

Without user involvement, nobody in the business feels committed to a system, and can even be opposed to it. If a project is to be a success, senior management and users need to be involved from the start and continually throughout the development of the project. Senior management must continuously support the project to make it clear to the staff that the project is priority.

Long or Unrealistic Time Scales

Long timescales for a project generally lead to a system being delivered for products and services no longer in use by an organization. The key recommendation is that project timescales should be short. Short time scales could be created by phasing or separating larger projects so that they become more manageable.

Many managers are aware of the need for fast delivery, leading the problem of unrealistic timescales. These time scales are set without considering the volume of work that needs to be completed to ensure delivery. As a result, these systems are either delivered late or only have a fraction of the facilities that were required. The recommendation here is to review all project plans to see if they are realistic.

Poorly Defined Project Outcomes

Many projects have high level, vague and generally poorly defined requirements. Poorly defined outcomes leads to developers, having little or no input from the users, building what they believe is required, without having any real knowledge of the business.

Inevitably, when the system is delivered, business users are dissatisfied with the project results. Users must know what they require and must be able to match project deliverables with business requirements. In order to match deliverables with requirements successfully, users need skills and training.

Scope Creep

Scope is the overall view of what the system will deliver. Scope creep is the growth in the scale of a system during the life of the project. Since all the functionality of the revised system has to be delivered at one time, project timescales are negatively impacted. Scope creep is a management issue closely related to change control. Management must be realistic about project deliverables and time scales. Changes to the project must be closely controlled and monitored.

Lack of a Meaningful Change Control System

Change is continuous in business. It is not practical to expect no change in requirements while a system is being built. However, uncontrolled changes play havoc with a system under development and have caused many project failures in the past. This result emphasises the advantages of shorter timescales and a phased approach to project management.

6.9 DEFINING SUCCESS AND FAILURE

In the realm of project management, a project that satisfies all the criteria of success may still carry the stigma of failure because of people's perceptions. Project failure is measured across a spectrum. On one hand, there are clear failures such as:

- No value for money delivered;
- The wrong thing was delivered;
- The delivery was so late as to render the product useless;
- The product quality was so poor as to make the product useless; and
- The project cost much more than was planned making the product financially not viable.

Each of these clear failures can be seen along a spectrum moving from complete failure to complete success. To avoid the perception of failure, it's not enough to succeed – but it's a start. Defining the boundaries of the project well, could alleviate the perception of failure, through the following:

- When the project starts and ends;
- Prescribing the budget;
- Clearly defining goals and deliverables;
- Identifying stakeholders and what benefits they expect;
- Defining what level of quality is required and how quality will be measured
- The change control process must be well defined and executed.

Finally, there should be ongoing communication to stakeholders and other interested parties to build an appropriate level of expectation on a project with well-defined

boundaries. The project must deliver within boundaries and meet or exceed expectations that were set.

The perception of ambiguity is caused primarily by the different corporate cultures and degrees of maturity regarding project management and general management practices found in organisations. To avoid the trap that definitional ambiguity sets, measures of success should be clearly defined in the project plan and in all correspondence that announces the launch and progress of the project as it proceeds.

6.10 ROLES AND RESPONSIBILITIES OF THE PROJECT MANAGER

As suggested by PMBOK Guide (2004), the role of the project manager encompasses many activities including:

- Planning and Defining Scope;
- Activity Planning and Sequencing;
- Resource Planning;
- Developing Schedules;
- Time Estimating;
- Cost Estimating;
- Developing a Budget;
- Controlling Quality;
- Managing Risks and Issues;
- Creating Charts and Schedules;
- Risk Analysis;
- Benefits Realisation;

- Documentation;
- Team Leadership;
- Strategic Influencing; and
- Customer Liaison.

Running a successful project requires a high degree of stakeholder management. A stakeholder is anyone who has an interest in the project or will be affected by its deliverables or output. It is important to understand the values and issues that stakeholders have in order to address them and keep everyone on board for the duration of the project. This is effected through:

Setting Goals and Objectives

Involve stakeholders in creating a set of realistic goals and objectives. Stakeholders are not always keen to participate but engaging them at this early stage of the project will help ensure success. Stakeholders are most likely to be actively engaged by a set of goals and objectives aimed at improving business performance and thereby take an interest in the project.

Agreeing Deliverables

All projects need a clear set of deliverables aimed at achieving the project goals and objectives. These deliverables should be communicated clearly to the stakeholders and efforts made to ensure that there is a clear understanding regarding the quality and composition of each deliverable. In order to achieve success, prototypes and samples can be prepared to avoid misunderstandings or disappointment later.

Communicating Information

Once the project is running there are two groups of people who need to be kept informed of progress, the project team and the stakeholders. The most effective way of communicating progress is via regular progress reports. The reports form a useful record of the project and can be e-mailed to all relevant parties and/or placed in a central repository to which everyone has access.

According to Cleland and Ireland (2002), a project manager must have the following skills to succeed:

- Leadership - inspiring others to create a vision and strive to achieve the goals;
- Good communication - ability to provide valuable information related to the project status in a timely and effective manner;
- Conflict resolution skills - assisting in resolution of any project conflicts so that the project team members all feel part of the process and want to remain involved in the project;
- Negotiation skills - maintaining relationships with people who are involved in the project;
- Team building - assists the team members in understanding their roles and responsibilities on the project and work collaboratively;
- Listening skills - using good listening skills to truly hear and try to understand what others on the project are trying to say; and
- Relationship management - capable of working with all levels within the organization by building relationships with them.

Morris and Hough (2003) assist in identifying other skills project managers need to be effective. These include:

- Ability to influence without having authority;
- To hope for the best but prepare for the worst;
- To manage, motivate and organize people;
- Possess core competencies in project related fields and business management;
- Persuasion techniques - influencing without direct authority and obtaining win-win situations;
- Generosity - share the glory, share knowledge, and don't blame others;
- Vision - understanding what needs to be done and how to get it done;
- Flexibility - capable of changing to fit the situation for the good of the project;
- Humour - seeing humour in events, laughing and going on; and
- No Sweat - appearing like a duck on the surface but paddling like crazy under the water.

"The project manager is the catalyst, the initiator who lifts the entire project and puts it into motion" according to Heldman (2002: page 30). He also stated "energy and attitude gives the project manager power." Leadership is crucial for a project manager who must motivate people who are on the project teams and in functional departments.

6.11 AREAS FOR FURTHER RESEARCH

The research conducted proved to be both valid and reliable. Responses received were consistent and reputable. The research achieved the objectives that it set out to achieve, to a conclusive end. Areas for further research would be to identify the actual

and ideal state, with respect to the Project Management Maturity Model, for Transnet to truly succeed in the discipline of project management.

6.12 CONCLUSION

The objective of this dissertation was firstly to investigate the effect of Protekon's involvement in Transnet's project success; and, secondly, to recommend strategies to improve the rate of project success, that could be applied within Transnet and Protekon.

The biggest project management problems facing organisations today are inconsistent approaches to managing projects (in 24% of organisations), difficulty in allocating resources (20%) and poor project selection (17%). Very low on the list of problems is the issue of projects always late or over budget (7%). These conclusions are among the results of a survey of 74 project management practitioners by the Centre for Business Practices, the research arm of the consulting and training organisation, PM Solutions (2006).

Throughout the changes impacting modern organisations, one constant has remained: Resistance to change in organisations most often comes from individuals who fear that change may bring losses to the organisation and to themselves. Change usually creates winners and losers; although enlightened management can deal with the change in a manner that reduces the losses. Successful organisations that have undergone significant changes have gradually come to recognise that successful change comes only with the commitment and co-operation of individuals in all working levels of the enterprise.

Knowing of pending change, and having no management philosophy with which to deal with that change, can be terrifying. Muddling through will be an invitation to failure. But an organised team of resources managed through a project management systems approach shows considerable promise as a way to cope with, and in the process influence, the effects of a change.

In summary, Transnet has the fundamental dynamics and expertise (available through Protekon) to achieve its goal of becoming a world-class service provider. The criteria for project success has been outlined and is tangible and within reach to Transnet. By embracing a culture of change and adopting new approaches to project selection and management, Transnet has the potential for enormous return on investment and through this, ultimate success in this arena.

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8.0 APPENDIX

8.1 Appendix 1: Project Management Maturity Model

8.2 Appendix 2: Research Questionnaire

SUBJECT INFORMATION LETTER FOR PARTICIPANTS

Dear Participant

I am currently studying towards a Masters degree in Business Administration. For the purposes of my study, I intend to carry out research into the factors contributing to project failure within Protekon. The investigation requires the completion of a questionnaire by interested employees. Kindly note that by responding to the questionnaire, you would not only be making a valuable contribution to this research, but also provide invaluable insight into the deterrents to project success within Transnet.

It would therefore be appreciated if you would complete the attached questionnaire. Your individual responses are of importance to this research so therefore please do not consult with colleagues. The completion this questionnaire should not take more than 10 minutes.

You are assured of the confidentiality of your responses. Responses may be anonymous and your name is not required on the questionnaire. Your participation is voluntary and you may withdraw at any time without giving any reasons. Kindly deposit your completed questionnaire into the special box placed in the Projects reception foyer by no later than 23rd June 2006.

Thank you for your co-operation and the time that you have set aside for this research.

Yours faithfully

Renee Pillay

Research Supervisor: Mr Peter Raap

Associate Director: Department of Marketing

Faculty of Commerce: DIT

031- 308 5389 (T)

I the undersigned agree to participate in this research

Respondent signature

SAMPLE QUESTIONNAIRE

Instructions: Please use the five-point scale (shown below) to respond to the questions. Fill in a cross in the box with the number that corresponds with your view.

Example using the 5 Point Likert Scale

		Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
		1	2	3	4	5
Eg 1	Project outcomes generally meet the client's business requirements		x			
Eg 2	Project success is entirely within Protekon's control					x

Section 1 - Strategic Alignment

1	Projects are selected in line with business goals					
2	Project outcomes are generally aligned with business goals					
3	Project results satisfy the business requirements in the short to medium term (1 to 5 years)					
4	Project results satisfy the business requirements in the long term (beyond 5 years)					
5	Project outcomes are clearly defined by the client					
6	The client determines project success by measuring project outcomes					

Section 2 - Culture, Skills and Capabilities

1	There is continuous surveillance from the project owner through the life of the project					
2	Protekon has the necessary capabilities to fulfil the technical requirements of the project					
3	Protekon has the project management knowledge to successfully complete projects					
4	Project owners are equipped with the skills to analyse business requirements when defining project outcomes					
5	The Transnet concept of project management is clearly defined and understood					
6	There is a general lack of leadership (from the project owner) to take decisions and solve problems in a timely manner					
7	There is a general reluctance to embrace leading edge technology, alternative business solutions and contemporary project management practices					
8	Cultural and ethical differences are a recurring problem on projects					

Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
1	2	3	4	5

Section 3 - Project Selection

1	Project managers are appointed at the concept stage of the project					
2	The project manager is involved in the project selection process					
3	Project results have a strategic fit in the design and execution of future products and services					
4	Projects are selected in line with business growth and expansion strategies					
5	The principles of project management are applied uniformly irrespective of the size of the project					

Section 4 - Project Outcomes

1	The project usually satisfies the business operational requirements					
2	Project deliverables are generally produced on time and within budget					
3	The business owners usually believe that the project was successful					
4	Projects always deliver the business value it promises					
5	The time, cost, quality and scope constraints are usually managed as planned					
6	Projects ultimately provide satisfactory return on investment to the customer					

Section 5 - Reasons for failure

1	Lack of user involvement					
2	Long or unrealistic timescales					
3	Failure to adequately identify, document and track requirements					
4	Scope creep					
5	No formal change control system					
6	Inadequately trained or inexperienced project managers					
7	Poor leadership at any and all levels					
8	Cultural misalignment within Transnet					
9	Poor plans and planning processes					
10	Misalignment between the project team and the business it serves					
11	Inadequate or misused methods, processes and procedures					
12	Inadequate communication in process tracking and reporting					

For the purpose of statistical analysis of responses received, kindly provide the following information:

		0-6	7-12	13-18	18-24	24 +
a.	Number of years of industry specific experience					

		Mech	Elec	Civil	Building Services	Other
b.	Discipline of engineering					

		NPA	SAPO	Spoornet	Petronet	Other
c.	Your principal client					

Project Management Maturity Model

Levels of Project Management Maturity	Level 1	Level 2	Level 3	Level 4	Level 5
	Initial Process	Structured Process and Standards	Organizational Standards and Institutionalized Process	Managed Process	Optimized Process
Project Integration Management	No established practices, standards, or Project Office. Work performed in ad hoc fashion.	Basic, documented processes for project planning and reporting. Management only involved on high-visibility projects.	Project integration efforts institutionalized with procedures and standards. Project Office beginning to integrate project data.	Processes/standards utilized by all projects and integrated with other corporate processes/systems. Decisions based on performance metrics.	Project integration improvement procedures utilized. Lessons learned regularly examined and used to improve documented processes.
Project Scope Management	General statement of business requirements. Little/no scope management or documentation. Management aware of key milestones only.	Basic scope management process in place. Scope management techniques regularly applied on larger, more visible projects.	Full project management process documented and utilized by most projects. Stakeholders actively participating in scope decisions.	Project management processes used on all projects. Projects managed and evaluated in light of other projects.	Effectiveness and efficiency metrics drive project scope decisions by appropriate levels of management. Focus on high utilization of value.
Project Time Management	No established planning or scheduling standards. Lack of documentation makes it difficult to achieve repeatable project success.	Basic processes exist but not required for planning and scheduling. Standard scheduling approaches utilized for large, visible projects.	Time management processes documented and utilized by most projects. Organization wide integration includes inter-project dependencies.	Time management utilizes historical data to forecast future performance. Management decisions based on efficiency and effectiveness metrics.	Improvement procedures utilized for time management processes. Lessons learned are examined and used to improve documented processes.
Project Cost Management	No established practices or standards. Cost process documentation is ad hoc and individual project teams follow informal practices.	Processes exist for cost estimating, reporting, and performance measurement. Cost management processes are used for large, visible projects.	Cost processes are organizational standard and utilized by most projects. Costs are fully integrated into project office resource library.	Cost planning and tracking integrated with Project Office, financial, and human resources systems. Standards tied to corporate processes.	Lessons learned improve documented processes. Management actively uses efficiency and effectiveness metrics for decision-making.
Project Quality Management	No established project quality practices or standards. Management is considering how they should define "quality."	Basic organizational project quality policy has been adopted. Management encourages quality policy application on large, visible projects.	Quality process is well documented and an organizational standard. Management involved in quality oversight for most projects.	All projects required to use quality planning standard processes. The Project Office coordinates quality standards and assurance.	The quality process includes guidelines for feeding improvements back into the process. Metrics are key to product quality decisions.
Project Human Resource Management	No repeatable process applied to planning and staffing projects. Project teams are ad hoc. Human resource time and cost is not measured.	Repeatable process in place that defines how to plan and manage the human resources. Resource tracking for highly visible projects only.	Most projects follow established resource management process. Professional development program establishes project management career path.	Resource forecasts used for project planning and prioritization. Project team performance measured and integrated with career development.	Process engages teams to document project lessons learned. Improvements are incorporated into human resources management process.
Project Communications Management	There is an ad hoc communications process in place whereby projects are expected to provide informal status to management.	Basic process is established. Large, highly visible projects follow the process and provide progress reporting for triple constraints.	Active involvement by management for project performance reviews. Most projects are executing a formal project communications plan.	Communications management plan is required for all projects. Communications plans are integrated into corporate communications structure.	An improvement process is in place to continuously improve project communications management. Lessons learned are captured and incorporated.
Project Risk Management	No established practices or standards in place. Documentation is minimal and results are not shared. Risk response is reactive.	Processes are documented and utilized for large projects. Management consistently involved with risks on large, visible projects.	Risk management processes are utilized for most projects. Metrics are used to support risk decisions at the project and the program levels.	Management is actively engaged in organization-wide risk management. Risk systems are fully integrated with time, cost, and resource systems.	Improvement processes are utilized to ensure projects are continually measured and managed against value-based performance metrics.
Project Procurement/ Vendor Management	No project procurement process in place. Methods are ad hoc. Contracts managed at a final delivery level.	Basic process documented for procurement of goods and services. Procurement process mostly utilized by large or highly visible projects.	Process an organizational standard and used by most projects. Project team and purchasing department integrated in the procurement process.	Make/buy decisions are made with an organizational perspective. Vendor is integrated into the organization's project management mechanisms.	Procurement process reviewed periodically. On-going process improvements focus on procurement efficiency and effective metrics.