

**ROOT CAUSE ANALYSIS OF MAJOR CAPITAL PROJECTS
FAILURE
AT
TRANSNET FREIGHT RAIL**

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1.1 Introduction

Project management has become a way to manage organizations and implement their strategic goals. It has developed into a discipline as important in itself as other functions such as operations, information technology, or finance (Kenny, 2003), and its critical processes and core competencies are constantly studied and reviewed by practitioners as well as academics (Crawford, Simpson, & Koll, 1999). All this fairly new focus notwithstanding, many projects are deemed unsuccessful as numerous studies show. Too many times, projects go over budgets, beyond their planned schedule, or deliver products that are not satisfying their customers.

Elbeik & Thomas (1998) identified ten factors that managers in organizations see as critical for the success of a project.

- Clearly defined projects objectives
- Good planning and control methods
- Good management support
- Enough time and resources
- Commitment by all
- High user involvement
- Good communications
- Appropriate project organization structure and culture
- Being able to stop a project.

The factors listed above are placed in order of priority as shown. The reasoning was that without clear objectives, one couldn't be sure that a project has succeeded because one cannot measure the extent to which it has achieved its intended results. Similarly, if the progress of a project is not planned and controlled, it is unlikely to be achieved within the budget and time constraints. If the necessary quality of outcomes is not achieved, the outcomes will not be of much use and the project will have failed. One might be thinking that if the factors of success are well known, why do projects still fail?

Project failure continues to be a concern even though standards and procedures have been in place for years to counteract the issue. Many reasons for the high rate of project management failure have been purported in the research literature (Bauer, 2006; Hammoud, 2008 & Kerzner, 2002). This study analyzes the problem of high failure rate of major capital projects within Transnet Freight Rail. In addition to reviewing research literature that addresses projects failure concepts, critical success factors, project management principles, strategic alignment, skills and capabilities of project managers and how these factors might relate to major capital projects failure, the study will examine possible problems at the organizational and functional level that might be contributing to the high failure rate of major capital projects within TFR.

1.2 Background information

Transnet Freight Rail (formally known as Spoornet), the largest operating division of Transnet LTD, is responsible for the transportation of rail freight along the approximately 20 500 route kilometre rail network, of which about 1 500 kilometres comprises heavy haul lines for export coal and export iron ore. The rail network connects the ports to the hinterland of South Africa as well as the rail networks of the sub-Saharan region. Rail freight services are provided to customers in the mining, manufacturing, agriculture, and forestry, automotive and inter-modal sectors of the economy as well as overborder trade with six bordering African countries. Excluding the suburban commuter networks, South Africa's entire residual public rail infrastructure is owned by Freight Rail. TFR's core activities of rail operations, infrastructure ownership and maintenance enable the business to contribute to Transnet's goals of a focused freight transport company, with the long-term objective of delivering integrated, efficient, safe, reliable and cost-effective freight services to promote economic growth in South Africa. Freight Rail aims to increase its market share, improve its productivity and profitability and provide appropriate capacity to customers. Capital expansion is a key contributor to the growth strategy of Transnet Freight Rail. In this regard, TFR has initiated a number of capital projects in recent years. With continued expansion envisaged in 2011/2012, capital expenditure continues to be a single significant part of the business operations. To fulfill its mandate of lowering the logistics costs of doing business in South Africa and to develop its core business to that of world class standards as the rail freight logistics service provider, TFR has committed R52.5 billion over the next five years to capital projects. The thrust of this investment programme covers improvements in operational efficiencies through the upgrade of its rolling stock and infrastructure, new technologies, replacement programmes, improving safety standards and compliance with legal statutes. The objective of the capital investment plan is to support the growth strategy and to sustain existing capacity within the affordability limits of the company. The capital requirements reflect the strategic direction and objectives of TFR. Freight Rail is positioned to support the transport needs of certain growing sectors contributing to the economy (primarily mining and manufacturing).

Transnet Freight Rail's capital projects are categorized into three main classes, viz:

Project Class	Classification	No of projects (2010/11)	Estimated Total Cost (ETC)
MEGA Projects	More than R100m	16	R5.8b
MAJOR Projects	More than R5m but less than R100m	137	R4.8b
MINOR Projects	Less than R5m	45	R0.5b
TOTAL		198	R11.1b

Table 1.2-1: Project categories within TFR

The focus of this research is on major capital projects (projects with an Estimated Total Cost of more than R5m but less than R100m). Contrary to the mega projects which are executed by Transnet Capital Projects (an outsourced specialist project management and engineering firm), major capital projects are managed and executed in-house with high incidences of failure. Past experiences reflected that Transnet Freight Rail invested large sums of money in projects without clearly identifying the need for the investment or clearly defining the project outcomes. According to the project update report (July, 2009), in the past five years, 55% of major projects at TFR failed and this failure could partly be attributed to:

- Inconsistent application of the Transnet Project Lifecycle Plan.
- Delays in projects execution because of a lack of senior management support and commitment;
- Projects being cancelled mid-way resulting in irregular and fruitless or wasteful expenditures;
- The project outcomes not fully addressing the business requirements, possibly because of misalignment between project objectives and organizational goals
- Failure to undertake pre-feasibility (FEL-1) and feasibility (FEL-2) studies on major projects which is the normal practice followed by the Project Life Cycle Plan
- Poorly defined project requirements
- Scope creeps
- Lack of appropriate skills and expertise in managing projects.

As mentioned above, TFR has made significant capital investments in infrastructure and rolling stock over the past five years to increase capacity and sustain the business, following more than two decades of underinvestment. This envisaged programme of intense capital investment for the five-year planning period has been reprioritised in accordance with current business needs, economic prospects and growth expectations for key corridors.

1.3 Problem in context

Transnet Freight Rail has invested billions of rands in the past into achieving its vision and meeting client expectations. Poor investment choices in the past have brought its rolling stock and infrastructure to a state of collapse with limited growth opportunity and operating assets to support development. TFR needs to shift paradigms, so that investments are managed through projects that will be aligned with its business goals, thereby realizing the business vision. The management dilemma is that TFR has committed a five year plan of R 52.5 billion to projects with the hope of developing its core businesses to that of world-class standards as a logistics service provider in South Africa. Rail is a capital-intensive business, capital investments are large and incremental by nature, and investment can only be recouped over a protracted period of time. This implies that capital expenditure is a big and enduring part of the company's business plan. The true reasons for major projects failure within TFR are not known and the criteria for project success are not firmly established. Currently, the number of unsuccessful major projects within TFR is very high and the requirements for business growth and development in a competitive environment forces TFR to invest in capital

projects. For TFR 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, TFR capital projects have been terminated mid course due to lack of commitment to the capital investment decisions. Project termination results in wasted time, resources and lost opportunity. The reasons for projects failure within Transnet Freight could likely be as a result of:

- The conventional methods of project management within Transnet Freight Rail are failing in the modern business environment and the grey areas only become apparent during the project execution or project terminal stages.
- The lack of commitment and support from senior management. Unlike the mega projects, major capital project are perceived as not critical to the success of the organization. Although major capital projects might represent a small fraction of the total capital budget in relation to the size of the company the aggregate value of all major projects seem enormous.
- The lack skilled project managers and expertise in project management
- Silo mentality – lack of multi-disciplinary team involvement in execution of major projects and traditional hierarchical structures.
- Possible misalignment between project objectives and business objectives.
- Project cost overruns compared to the initial budget: a) Business case estimates are poor not only because pre-feasibility studies are not performed, but because they are not budgeted for; b) Finance has limited involvement and no “mandatory” involvement in business case development, therefore controls against “gaming” do not exist. There are instances of business cases approved by Investment Committee despite finance findings of insufficient substantiation of base data and assumptions; c) Poor project management in terms of progress reporting because operative project progress is not linked to project costs within finance environment; d) There are no defined criteria for reviewing and revising projects should assumptions change.
- Project schedules delayed due to process delays: a) Processes and functional interfaces are not defined and hence not streamlined.
- Capability gaps: a) The link between the Capital Investment Programme and long-term strategy is not clear; b) Lack of investment in the past has eroded organisational capability; c) Post Implementation reviews are not being performed; d) The organisation has not yet fully evolved and implemented planned interventions to develop capabilities.

1.4 Problem review

A number of themes have been identified from the background information and the problem in context and these are:

1.4.1 Project management approach

Although management indicated that the Transnet Project Lifecycle has been adopted in Transnet Freight Rail, full implementation and consistent application thereof was not always evident. The conventional methods of project management within Transnet Freight Rail are failing in the modern business environment and that might point to the lack of proper project management approach. The fact that there is no clear framework or structured approach to project management in TFR makes it necessary to understand the shortcomings of this process and evolve a strategy for the amalgamation of the conventional TFR concept of project management with the modern project-based approach to project management.

1.4.2 Top management support and commitment

The lack of support and commitment from senior management is a sure way to disaster. With the amount of capital envisaged to be spent on major capital projects in the next financial year alone amounting to 43% of the total annual capital budget, it is unthinkable to note that top management would not support or even commit to make sure the success of the major projects and that might point to problems at organizational or functional level. The researcher assumes that all major capital projects are approved in line with delegated authority which means that top management must have a some kind of a measure of success capital projects. It is imperative to review the process used for establishing projects within TFR.

1.4.3 Project management skills, competencies and expertise

It is a known fact that project management skills are a scarce resource. The problem of skilled and experienced project managers in TFR runs deeper than mere failure of recruitment and selection policies at TFR. The competition for skilled project managers with Transnet Capital Projects poses a major threat to retaining skilled, experienced and qualified project managers. The need to develop the skills necessary for effectively managing successful projects could be an important issue facing TFR.

1.4.4 Project cultures, structures and processes

Limited involvement or no mandatory involvement of other functions especially finance in the business case development results in project cost overruns. The lack of multi disciplinary team involvement in execution of major projects and traditional hierarchical structures curtail functional interface resulting in project schedule delays which might be contributing to major capital projects failure within TFR.

1.4.5 Alignment between business objectives and project objectives

There are no clear links between capital investment programme and long term strategy of the company, hence the possible misalignment between the project objectives and

the business objectives is suspected. Years of neglect in infrastructure maintenance and rolling stock upgrade might have eroded TFR's ability to meaningfully invest in capital projects, and that might have eroded its capability which might need to be developed.

1.5 Problem statement

In the past five years, 55% of major projects at TFR failed and the true reasons for failure are not known. Management feel that the current number of unsuccessful major projects within TFR is very high. The requirements for business growth, profitability and competitive advantage compel TFR to invest in capital projects. If the current failure rate for major capital projects continues, TFR is unlikely to fulfil its mandate of lowering the logistics costs of doing business and achieving its goal of becoming the world-class logistics provider in South Africa.

1.6 Research objectives

The primary objective of this research is to do a theoretical and empirical study to identify the root causes of major capital projects failure within Transnet Freight Rail. In order to realize the primary objective, the following secondary objectives must be met:

- To compare the conventional TFR project management approach with the modern business approach to identify gaps and inconsistencies in the project management approach.
- To ascertain if there is alignment between business goals and project goals within TFR.
- To review skills and competencies, structures, cultures, and processes used in establishing and managing major capital projects, to make recommendations on how these could increase major capital project success within TFR.

1.7 Delineation of the study

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

- Despite the confidentiality and anonymity of the research instrument, responses may be biased due to participants feeling they must respond in a socially acceptable manner.
- Respondents may feel that negative responses reflect on their abilities in managing projects and not on factors beyond their control.

Delimitations that confine the boundary of the research are:

As the extent of this study needs to be constrained to ensure manageability, the focus of this research is only on major capital projects (projects that have an Estimated Total Cost (ETC) of more than R5m but less than R100m) because contrary to the mega projects which are executed by Transnet Capital Projects (an outsourced specialist project management and engineering firm), major capital projects are managed and

executed in-house within TFR with the high incidences of failure. Therefore, the results of this study cannot be generalized across all projects undertaken by TFR.

To further ensure manageability of the study, certain issues like project governance, procurement, environmental and technical were not part of the study; although they contribute to projects failure were not part of the study.

1.8 Importance of the study

Capital programmes are critical to the future success of the organisation. For Transnet Freight Rail to realize its vision of becoming a world class logistics service provider, it needs to strategically align the outcomes of the projects it chooses to invest in with its business vision. In the past, TFR's major capital projects have often been terminated mid course due to a lack of commitment to the capital investment decision. Project termination resulted in wasted time, money and lost opportunity. In TFR, 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 TFR project management process and to evolve a strategy for the amalgamation of the conventional TFR concept of project management with the modern business approach to project management more closely associated with the PMBOK approach.

1.9 Assumptions

In this study, which sought to analyze the root causes of major capital projects failure at TFR, the researcher assumed that the results of the study would only apply to major capital projects at TFR i.e. no generalization of the results can be made to the entire capital investment programme at TFR. The researcher also assumed that the respondents would complete the survey questionnaires openly and honestly.

1.10 Conclusion

The objective of this study is to analyze the root causes of major capital projects failure within Transnet Freight Rail. The background to the study, the problem in context, problem review, problem statement, research objectives, delineation of the study and the importance of the study have been expressed. The following chapters will expand these concepts and eventually draw a conclusion on the study objective.

2 Problem analysis/ Theoretical concepts

2.1 Introduction

This chapter explores the problem further with theoretical concepts. The focus of this study is to analyze the root causes of major capital projects within TFR and it is therefore appropriate to begin with a thorough account of the theoretical aspects of project management as a management approach. The concept of project management will be theoretically researched in this chapter to have a better understanding of the importance of project failure or success and the themes identified in chapter two will be further explored.

2.2 Project management

2.2.1 Definition of a project

The project management body of knowledge (PMBOK) (2000:4) defines a project as "A temporary endeavour undertaken to create a unique product or service (outcome or result). Temporary means that every project has a definite beginning and a definite end. Unique means that the product or service is different in some distinguishing way from all similar products or services." Table 2.1 below indicates some of the special features of a project.

Start and finish	A project has a clear start and finish
Life Cycle	A project has a beginning and an end, with a number of distinct phases in between
Schedule and timeline	Projects are often time limited. This means they must finish by a certain date
Budget	Projects have a clear budget, often broken down to a budget per work package
Non-repetitive	Activities are essentially unique and non-repetitive
Resources	Resources may be sourced from different functional departments and need to be co-ordinated.
Single point of responsibility	The project manager or project leader is responsible for the whole project
Teams	Project teams are formed to complete the project

Table 2-1: Some of the special features of the project: Adopted from Burke (2007:16)

Organisations perform work to achieve a set of objectives. Work generally involves either projects or operations, although the two sometimes overlap. Projects and operations share some characteristics. For example, they are (PMBOK 2004:5):

- performed by people.
- constrained by limited resources.

- planned, executed and controlled.

Operations and projects differ primarily in that operations are ongoing and repetitive while projects are temporary and unique.

2.2.2 Project management concepts

PMBOK (2004:8) defines project management as "the application of knowledge, skills, tools and techniques to project activities to meet project requirements and satisfy stakeholder expectations". In other words, the project manager must do whatever is required to make the project successful.

The definition clearly identifies that the purpose of the project is to meet the stakeholders' needs and expectations. It is therefore important for the project manager to determine who the stakeholders are and analyse their needs and expectations to define, at the outset, the project's scope of work and objectives.

The concept of project success is rather difficult to define. As defined by the *Oxford Dictionary* (1998), success is "the accomplishment of an aim; a favourable outcome." But what can be said of project success? Without venturing onto risky terrain, we can say that there is no consensus as to what constitutes "project success" or "project failure." Pinto & Slevin (1988) suggested that few concepts in project management have been addressed in the literature on a regular basis without the investigators being able to reach a consensus on definitions. Wells (1998) goes as far as to complain about how little attention has been paid to defining success, except what could be said in the most general terms, "Arriving at a definition of project success would appear to represent an enormous challenge to investigators". The basic tenet of project management is that the project is constantly involved in the triple constraint, i.e. cost, schedule and quality.

Figure 2-1 indicates the trade-off between these three parameters.

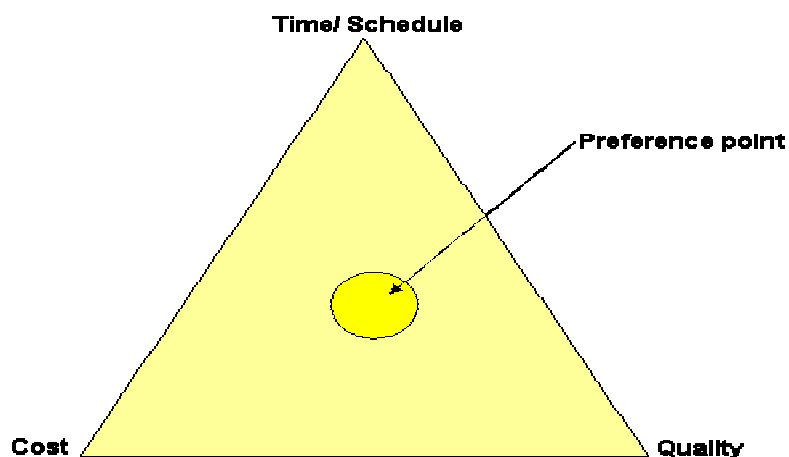


Figure 2-1: Triple constraint i.e. cost, schedule and quality triangle

It can be easily derived from the triple constraint triangle that if too much emphasis is placed on the cost side of the triangle, less focus and normally not enough, focus will be

placed on schedule and quality. The same is applicable to the schedule and quality sides. The position taken by the researcher in this instance is that successful projects should be executed within a time constraint, within a pre-agreed budget and according to the stakeholders' expectations to meet the organisation's strategic objectives (Shenhar, 2007).

2.2.3 Project Life Cycles

PMBOK (2003: 11) contends that due to the nature and uniqueness of projects, projects will always have a degree of uncertainty which is defined in project management as the risk component associated with a project. Projects are inherently complicated with all the various stakeholders and integration required to fulfil the stakeholder's objectives. To ease the project's complicity projects are divided into project phases. Collectively the project phases are known as the project life-cycle, according to Knipe, A., Van Der Waldt, G., Van Niekerk, D. & Nell, K. (2002). Depending on which industry a project is implemented, the phases of the project will vary. These four phases which, according to Burke, (2007:45) form the structure of the project life-cycle, are:

- 1) Concept and Initiation phase
- 2) Design and Development phase
- 3) Implementation or Construction phase
- 4) Commissioning and Handover phase

One can therefore conclude that each project is broken down into project phases called the project life-cycle. This project life-cycle is imposed upon a project sequence to make it easier to manage the project's sequence. The breaking down of the project life-cycle into project phases is an artificial device used to gain control of the sequence of achieving the objectives of the project.

2.2.4 Determination of success or failure of a project

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

S	Specific	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • The deliverables of the project should be measurable against verifiable outcomes or results.
A	Accurate	<ul style="list-style-type: none"> • The verification and measurement of requirements and deliverables are used to determine accuracy and to ascertain if the project is on track according to the project plan.
R	Realistic	<ul style="list-style-type: none"> • Projects are unique and produce tangible products or 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	<ul style="list-style-type: none"> Projects are preformed in specific time frames, with a definite beginning and definite end date.

Table 2-2: SMART Principle, Heldman (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 prerequisites that make up the product or service, then the project is deemed 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 & Ireland, 2004).

Although process defines the road map to achieving project success, success provides the vision for the process (Bredillet, 2008). Success is the ultimate goal of every project and a function of skilful leadership that creates knowledge (Zand, 2010). However, over the past 2 decades, project management practitioners have succeeded in differentiating between traditional project management success (traditional approach) and project success (adaptive approach) for the purpose of linking projects to ongoing operations.

The traditional definition of project success, also called project management success, holds that a project is a success if the project meets the technical performance specifications and satisfies all project stakeholders (Hughes et al., 2004; Thomas & Fernández, 2008); if the project objectives are accomplished (Mescon et al., 1985); if all of the stakeholders are satisfied with the results (Dvir, 2005; Hedeman et al., 2005); if a project is on target (scope), on time (schedule), and within budget (cost); and if the customer is satisfied (Gido and Clements, 2006; Kerzner, 2006; Phillips, 2004; 2009; PMBOK, 2004; Scott-Young and Samson, 2008). The point of departure is that project success is no longer viewed as just completing the project on time and within a budget; rather, it also means ensuring that the product ultimately satisfies the end user (Milosevic & Srivannaboon, 2006; Shenhar et al., 2007). According to Khang & Moe (2008), as well as Yu; Flett & Bowers (2005), overall project success is measured against the realization of the customer's objectives and goals, as well as the satisfaction of the end users and key stakeholders. Khang and Moe further argued that the modern approach to project success links the traditional project purpose to the final product and long-term goals. Dvir (2005); Gelbard & Carmeli (2009), emphasized that a productive working relationship, a focus on the overall project goal, and consistency of the approach in managing the project from the initiation to the closeout phase are key to success. Consistency in this perspective applies to the incorporation of standardized tools and technology, proven project methodology into the management of project within the project life cycle. The new multidimensional model for assessing and planning project success beyond the triple constraints (Shenhar & Dvir, 2007) was used to

capture the success variables. The unique features of this model are that (a) it takes into consideration the strategic management as well as the tactical aspects of project performance in the short and long term, (b) reflects the overall expectations of various stakeholders, 3) ties project and product together, (c) aligns the project activities integrated within the entire life cycle phases with the customer expectations, and (d) yields success stories in academic research and corporations. Shenhar et al. (2001) asserted that defining and assessing project success is a strategic management concept that should help to align projects efforts with the short- and long-term goals of the performing organization. They argued that the new success criteria involve four dimensions developed from two data sets of 127 projects (see Table 2.3).

Success dimensions	Measures
Project efficiency	<ul style="list-style-type: none"> ❖ Meeting schedule goal ❖ Meeting budget goal
Impact on the customer	<ul style="list-style-type: none"> ❖ Meeting functional performance ❖ Meeting technical performance ❖ Fulfilling customers' needs ❖ Solving customers' problem ❖ The customer is using the product ❖ Customer satisfaction
Preparing for the future	<ul style="list-style-type: none"> ❖ Creating a new market ❖ Creating a new product line ❖ Developing a new technology
Business success	<ul style="list-style-type: none"> ❖ Commercial success ❖ Creating a large market share

Table 2-3: Success Dimensions (Shenhar et al., 2007)

As Perkins (2007) asserted, projects fail because the stakeholders choose to ignore the basic tenets of project success that they already know. Perkins argued that projects fail because of the lack of dedicated resources, cultural conflicts, and the lack of clear deliverables and a contingency plan, as well as unnecessary complexity in the system.

2.3 Project management approach

The value of a formal and structured approach to project management is becoming increasingly recognised as the discipline develops and more organisations begin to reap the benefits of proactive project-based management. One of the most widely reported results of research on the practicing of project management in formerly functionally only structured organisations, is that an informal approach to project management is a sure path to disaster (Nicholas, 1990; Kezsbom & Edward, 2001; Mantel *et al.*, 2001; Frigenti & Comminos, 2002). Mantel *et al.*, (2001:35) are even of the opinion that the more complex an organisation's projects are, the more formal the approach or style of project management should be. Guidelines and standards used to define best practice project management e.g. PMI's Project Management Body of Knowledge (PMBOK) is available

to organizations wishing to develop or improve in-house project management processes. The PMBOK (2004) states that because projects are unique undertakings, they involve a certain degree of uncertainty. Organizations performing projects will usually divide each project into several project phases to provide better management control and appropriate links to the ongoing operations of the performing organization. Collectively these phases are referred to as the project life-cycle.

2.3.1 TFR project management approach

In TFR, although management indicated that the Transnet Project Lifecycle has been adopted in Freight Rail, full implementation and consistent application thereof was not always evident. The fact that there is no clear framework or structured approach to project management, it is necessary to understand the shortcomings of this process and evolve a strategy for the amalgamation of the conventional TFR concept of project management with the modern project-based approach to project management.

2.3.1.1 Transnet Project Lifecycle

In this study the emphasis is on major capital projects within TFR and the inconsistent application of the Transnet Project Lifecycle might be due to the diverse types of capital investments within TFR or the management thereof according to the legacy planning and capital investment procedures. Although the Transnet Project Lifecycle does not differ materially with the Project Lifecycle approach as advocated by the PMBOK (2003), there is evidence to suggest that it has not been aligned with the Project Lifecycle approach.

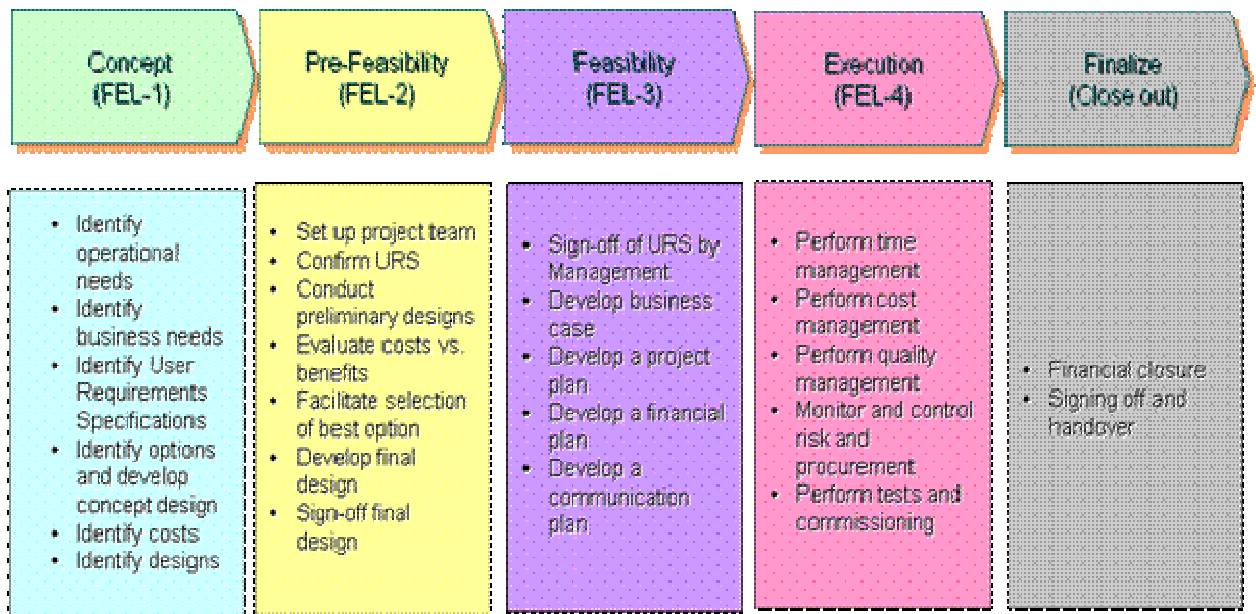


Figure 2-2: Transnet Life Cycle

Each phase is marked by a completion which is often one of the deliverables of the project. The notable difference in TFR approach is that pre-feasibility and feasibility phases are not performed for major projects. The argument here is that the use of

resources is difficult to justify. Whether this has a major impact in the actual performance of the project depends on the nature and scope of the project, however, Toakley (1999) contends that the feasibility phase of a project is the most important phase of a project, since decisions made during this phase tend to always have a significant impact on the final cost and schedule, contributing to project success. It is also the phase of a project having the greatest degree of uncertainty about what can be encountered in the future.

The objective of pre-feasibility and feasibility phases is to get alignment of the project objectives with the business needs and to develop the most efficient process design and execution plan to achieve the overall objectives of the project. Elbeik & Thomas (1998) assert that to determine whether the required outputs or outcomes of the project can be achieved with the available resources, it is imperative to carry out the pre and feasibility studies. This ensures that the concerns of all stakeholders are considered. The key issues addressed by the pre and feasibility studies are:

- Financial: comparing the costs of resourcing the project with the benefits it may bring and the costs that may arise if the project is not implemented.
- Technical – establishing how any new system will mesh with the existing systems, fitness for purpose, whether the organization and staff have competence to work with the new technology and how to manage the transition.
- Environmental and social – stakeholders concerns about the environment and local social conditions.
- Managerial – examining the implications for work practices, including any need for new staff or training, changes to existing terms and conditions of employment and implications for equal opportunities.
- Value-related – investigating motivational and cultural issues to make sure that the project will win support, both for the process used and intended outcomes.

Another drawback of the TFR approach is the absence of gate reviews at each phase of the project. In many organizations these phase are also used as evaluation points, so that as each phase is completed a review is held to determine whether the project is succeeding in its overall performance or even to discontinue the project. Gate reviews are essential means of reviewing the project outcomes to date, confirming their alignment with the project objectives, evaluating the viability of the project and enabling the granting of the necessary authorization for the project to proceed to the next stage. Failure to conduct gate reviews at all the relevant stages of the Project Life Cycle process may result in flaws, which occurred at an early stage being carried forward, and adversely affecting the successful implementation of the next stage, resultantly the whole project may end up failing.

Lastly, the sequential flow of the TFR project life cycle which is synonymous with closed looping and this might inhibit iterative communication. The project manager needs to communicate well about different aspects of the project to various individuals or groups with an interest in its outcome. He or she must enable the flow of relevant information about the project to interest parties at various stages of the project. He or she must win

support for the project and secure resources for its execution also he must keep the organization and any external clients apprised and committed to the project and lastly he or she must communicate information to and from the project team in order to maintain their motivation.

2.3.1.2 Appointment of project manager

The timing of appointment of the project manager to manage the project is crucial for the success and performance of the project. Most organizations select their project managers randomly without following the proper selection process.

One of the controversial aspects of the project management approach at TFR is the appointment of the project manager. According to the Transnet E5 condition of Contracting and Engineering (2008), the appointment of the project manager only happens at the tender award stage and is born out of the contract. The Transnet E5 condition of Contracting and Engineering (2008) is designed to cover the legal requirements of every contract within a project. It lists the duties and functions of the project manager, defined within the Transnet environment. In essence, the role of the project manager here is confined to the overall budgetary and contractual (legal and financial) controller and control over the contract and the project as a whole. Clearly, the scope, quality and time controls are excluded from the functions of the project manager and included in the functions of the technical officer or engineer.

The Project Management Body of Knowledge 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 fulfil the project requirements” (PMBOK, 2004). Project Management duties should occur from the foetal stages of a project and encompass such things as planning, feasibility studies, stakeholder analysis, cost and time deliverables, design life and many other functions necessary for the successful completion of the project. These multitudes of grey areas and shortcomings in the approach to project management at TFR might be the cause for a 55% failure rate of major capital projects in TFR.

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 responsibilities include project planning, executing and managing the work of the project. He/ she is responsible for setting the standards and policies for the projects establishing and communicating the project procedures to the project team and stakeholders. He/ she will resource the project and allocate responsibilities to team project members.

2.3.2 The Classic six-stage project management model

For TFR, the researcher proposes the classic six-stage model developed by Elbeik & Thomas (1998). The TFR project management philosophy is benchmarked against the Classic six-phase project management model by (Elbeik & Thomas, 1998) for a structured approach to project management.

This model also consists of stages, but, unlike the Transnet Project Lifecycle with sequential flow, the six stage model assumes that some stages are carried simultaneously. In particular, the model assumes that communications will take place throughout the project. It also assumes that team building, leading and motivation will take place once the project has been defined and continue until the end.

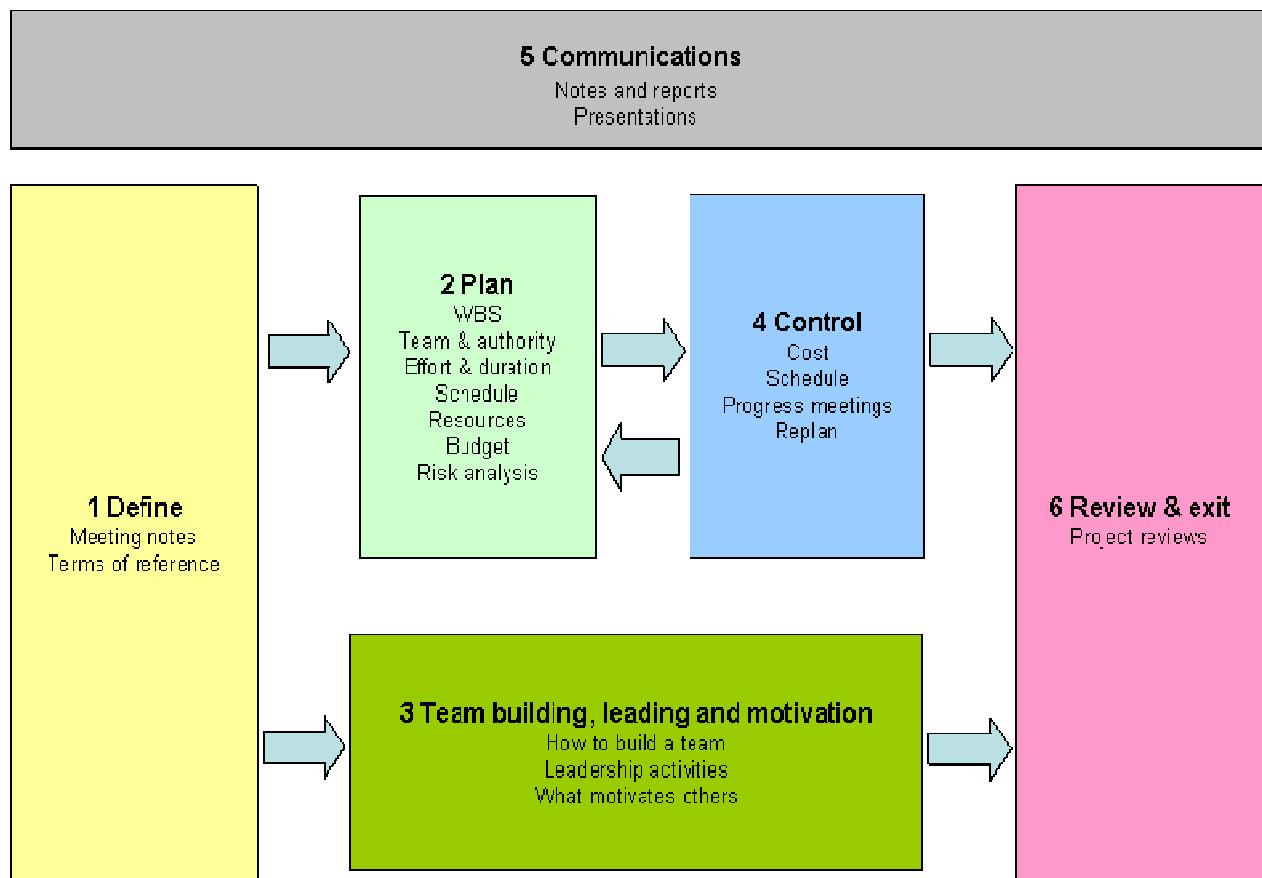


Figure 2-3: Classic six-phase project management model (Elbeik and Thomas, 1988)

In the define stage the project is discussed fully with all the stakeholders and key objectives are identified. The costs and timescales are also established at this stage and there is often a feasibility study at this stage as well unlike in the Transnet Lifecycle. This stage is complete when the project brief has been written and agreed. In the second stage an initial plan is developed. Planning is an ongoing activity because the plan is the basis for reviews and revision when necessary, depending on how the project progresses. The third stage begins with the establishment of a team of staff who

will work on the project. The team members are usually involved in developing the plan and are often able to contribute specialist knowledge and expertise. The building of this team and its motivation and leadership also continue until the project is finished. Once the initial planning has been completed, the activities that will lead to the project outcomes can begin. Implementation takes place during the control stage, as shown in Figure 2-3 in the model. During this stage, the tasks and activities of the team will be monitored against the plan to assess the actual progress of the project against the plan. Regular reviews are usually held during this stage to enable the plan to be revised and for any difficulties that emerge to be resolved.

Communication should take place continuously, both within the project team and between the project team and stakeholders. Some communications will be through formal reporting procedures but many will be informal.

The final stage is the review and exit from the project. The review is held to evaluate whether all the intended outcomes of the project have been met. It is also important because it enables information to be gathered about the processes used in carrying out the project from which lessons can be learned for the future.

However, (Elbeik & Thomas, 1998) assert that the classic six-stage model doesn't offer the blueprint for project management – all projects are different and all project plans are different, but the model do highlight essential elements and provide a framework that can be helpful in developing a structured approach to management of a project to ensure project management success.

2.4 Organizational support

One of the most critical factors for the successful completion of projects is top management support (Tukel & Rom, 1995). Young (2005) identifies senior management support as the single greatest contributor to project success. The support is usually strongest if there is a project champion and this champion is from the top management. Top management usually controls the project manager's access to resources which are supervised by functional managers. The level of support provided by the functional manager is usually determined by the level of support from top management. If the project is part of the functional department, then the availability of resources is not usually an obstacle, because the functional manager is usually also the project manager. However, for projects with matrix organizational forms, or for projects with pure project forms, acquiring adequate resources can be a difficult job. It requires negotiating skills and positional power within the organization. Clearly, full support from the organization for the project helps to facilitate and implement strategies for the successful completion of projects. Top management is perceived to have a stake in the successful completion of the project. As a result of their perceived stake in the task, they have certain expectations, and consequently, engage in certain types of behaviour, sometimes constructive and sometimes destructive (Bourne & Walker, 2006). The stakeholder theory is used to ascertain if major capital projects failures might be attributed to failure at managing the interests of multiple stakeholders throughout the

entire project management process. The support of key stakeholders is essential for project success (Pinto, 2000). Maintaining ongoing relationships in form of active communication system provide project managers with the necessary early warning signs they need to recognise the danger signals indicating that trouble possibly exists among senior stakeholders. These danger signals can take many forms such as interfering in the project without consultation, not providing support and poor communication links caused by too many reporting levels between project manager and senior stakeholders.

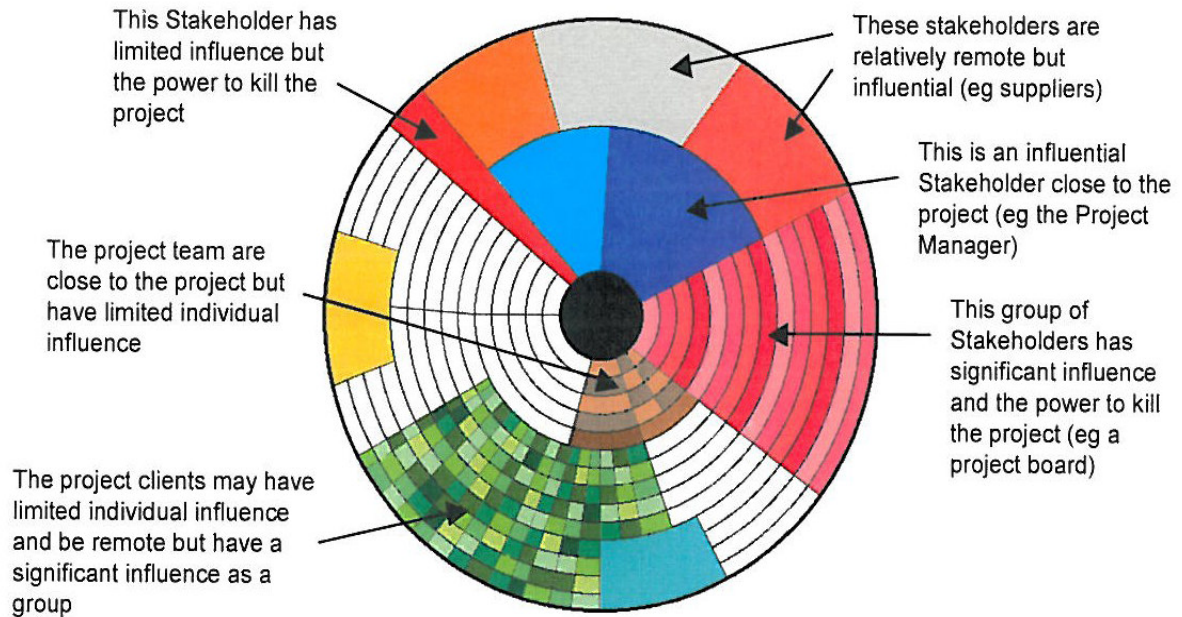


Figure 2-4: The Stakeholders Circle, adapted from Bourne & Walker (2006)

The stakeholder circle (Figure 2-4) is based on the premise that a project can only exist with the informed consent of its stakeholder community (Bourne & Walker, 2006), and that managing the relationships increase the changes of project success. Patterns and colours of stakeholder entities indicate their influence on the project – for example, orange indicates an upwards direction – these stakeholders are senior managers within the performing organisation that are necessary for ongoing organisational commitment to the project; green indicates a downwards direction – these stakeholders are members of the project team; purple indicates a sideways direction – peers of the project manager essential as collaborators or competitors; and blue indicates outwards – these stakeholders represent those outside the project such as end-users, government, “the public” shareholders. The final colour coding is dark hues and patterns for stakeholders internal to the organisation and light hues and patterns for those external to the organisation.

2.5 Leadership, skills and competencies

Traditional project management skills were developed from the requirements of construction and defence industries to plan, control and manage large, complex “tangible” projects (Morris, 1994). From these industries arose the so-called “hard” concepts of project success criteria in the form of controlling and managing schedule, cost and scope. Project management can also be seen as being about managing change (Cleland, 1995), and therefore project managers should consider themselves as change agents adding to the PM role an additional focus on the so-called “soft” aspects of relationship management.

2.5.1 The three dimensional model of project management

Briner et al. (1996) defined a framework of six directions of which a “project leader” must be aware of to control the project’s deliverables and manage a project’s stakeholders successfully. Weaver & Bourne (2002) describe a seven-element framework as the network or “sphere of influence and support” on which a project depends for its very existence. This concept was further developed by Bourne & Walker (2006) as a framework of project management focus and influence to be addressed for project success. Figure 2-5 represents this framework.

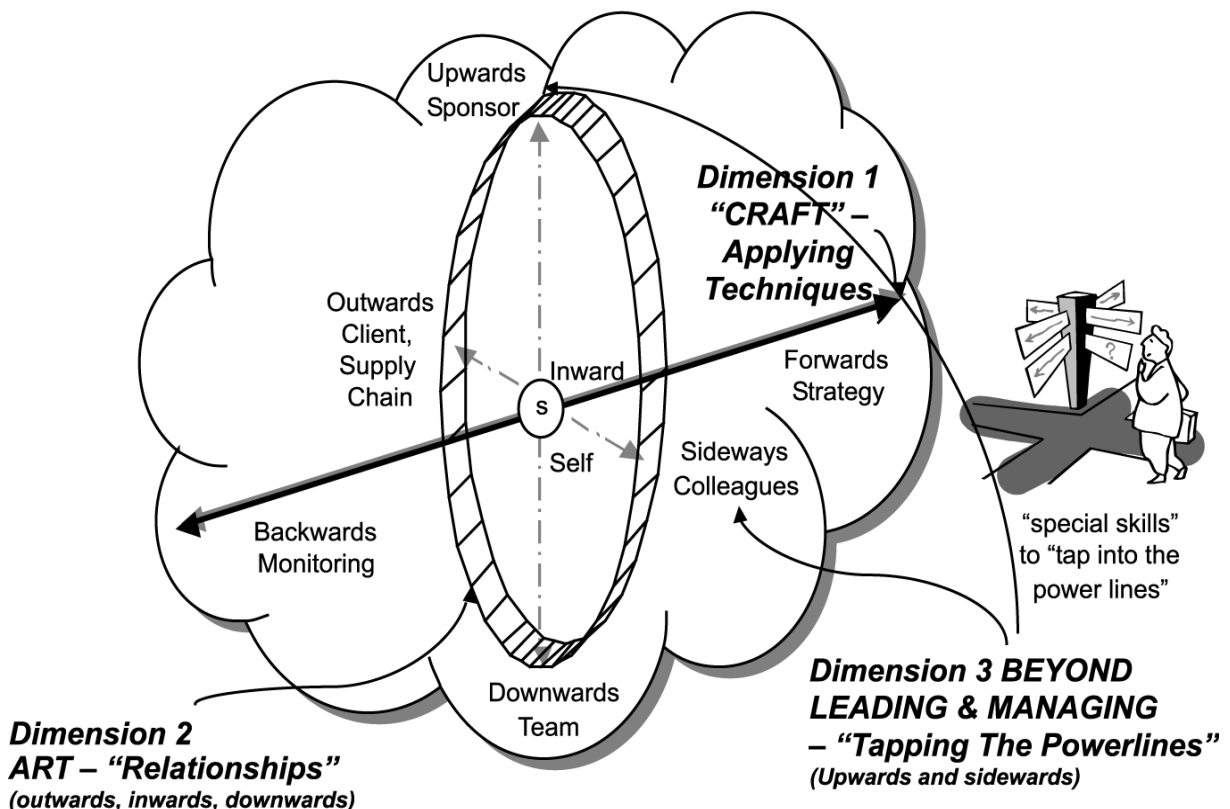


Figure 2-5: Dimensions of project influence adapted from Weaver & Bourne (2002)

The project manager must manage the processes to develop plans, schedules, reports, lessons learnt and forecasts that will serve as communication devices to everyone who

has an interest. This is dimension 1, looking forwards and backwards: it is predominately a skill-set relying upon techniques that value certainty and abhor ambiguity in monitoring and controlling projects. Looking outwards, managing the needs of clients, suppliers and clients, requires a mix of management and leadership skills. Looking downwards, requires considerable leadership skills to motivate followers and ensure all team members have their needs and wants satisfied. The project manager must also manage him/herself, from the point of view of personal discipline, but also from the point of view of having needs and wants that must also be met through successful completion of the project.

Looking inwards, outwards and downwards (and some limited examples of upwards) are dimension 2 skills. Managing upwards to the obvious set of senior management stakeholders is generally considered to be part of dimension 2.

Dimension 3 focuses on satisfying the needs and wants of a project's most influential stakeholders, including the project manager's senior management stakeholders and his/her peers. Bourne & Walker (2003), based their research on one large-scale civil engineering project and two IT related projects, indicated that without attention to the (often conflicting) needs and expectations of all project stakeholders, projects will probably not be regarded as successful even if that project manager was able to deliver within the original time, budget and scope. Projects are affected by both the "hidden agendas" and the overt actions of people or groups referred to as being third dimension project stakeholders. This group extends well beyond the more readily recognised traditional stakeholder groups. In large complex organizations, understanding the power structures and using them to influence project outcomes is often understood as "politics". Awareness of the need, and the ability to manage different types of stakeholders and their "how, why and when" issues so that these needs might be best addressed is an essential part of a successful project manager's toolkit

Pinto (2000) quotes research that demonstrates that, while managers recognise the necessity to work within the organization's political framework, many of them find it distasteful. He characterises political behaviour into three categories:

- Shark – manipulative, self-serving and predatory – the "used car salesman".
- Naive – politics is unpleasant and to be avoided at all costs – the "beginner".
- Sensible – politics is necessary; negotiation and networking are essential tools for project success (Pinto, 2000: 88)

2.5.2 Competencies and capabilities

It is a known fact that, there is competition for human resources especially qualified engineers between TFR and Transnet Capital Projects. Because of its speciality, Transnet Capital Project tends to attract the more qualified and experienced project managers, usually from TFR and this might be the reason for the lack of appropriate skills and expertise in managing major capital projects. Many factors related to the skills and characteristics of project managers and team members are proposed for the successful completion of projects. In their recent study,

Pinto & Slevin (1989) demonstrated the importance of selecting project managers who possess the necessary technical and administrative skills for successful project completion. They showed that the project manager's commitment and competence become most critical during the planning and termination stages. The competence of the team members is also found to be a critical factor during the implementation stages. Note that these factors not only affect project performance but they also have an impact on client satisfaction and project acceptance.

Leadership excellence in the definition of a project's scope and the management of project costs, time, quality and communications are all based on a project manager's ability to lead the human resources affiliated with the project: the project stakeholders. A project's success or failure is the result of the leadership of the project's stakeholders. Gaining the wholehearted support of those people who have, or believe that they have, a claim on those things of value created by the project is the culmination of the leadership displayed by the project manager. The job of the project manager is demanding, complex and varied, requiring the juggling of several issues concurrently. Strang (2003) argues that in order to manage projects successfully, a combination of skills is required, including interpersonal ability, technical competence, a cognitive aptitude, along with the capability to understand the situation and people and then dynamically applying appropriate leadership behaviours.

2.6 Project cultures, structures and processes

The project management environment at TFR is characterised by project cost overruns compared to the initial budget: a) Business case estimates are poor not only because pre-feasibility studies are not performed, but also because they are not budgeted for; b) Finance departments has limited involvement and no “mandatory” involvement in business case development, therefore controls against “gaming” do not exist. There are instances of business cases approved by Investment Committee despite finance findings of insufficient substantiation of base data and assumptions. These issues might be caused by structural and cultural deficiencies in TFR’s project environment. In addition, there is no evidence of cross functional support and integration in as far as the formulation, implementation and the overall management of major capital projects.

2.6.1 Project structures

Project organizational structures are often qualified by their lines of responsibility and lines of authority (Burke, 2005). Galbraith (1971) distinguished different types of project management systems on a continuum according to the relative influence of the project manager and functional managers.

2.6.1.1 TFR Capital Program organizational structure

The capital program structure of TFR is based on the traditional functional structure (figure 2-6). The structure is based on a subdivision of product lines or disciplines into separate departments, together with a vertical hierarchy where the employee has a clearly defined superior. Functional organisational structures are common in companies

dominated by marketing or manufacturing departments, where there is a large amount of repetitive work. Staff are grouped by speciality, such as human resources, production, marketing, engineering and accounting at the top level, with engineering further subdivided into, for example, electrical and mechanical (Burke 2007:307). Functional organisational structures still have projects, but the perceived scope of the project is contained within the boundaries of the function. A project in a functional organisation structure is most likely to be successful when all project resources are located under one functional group.

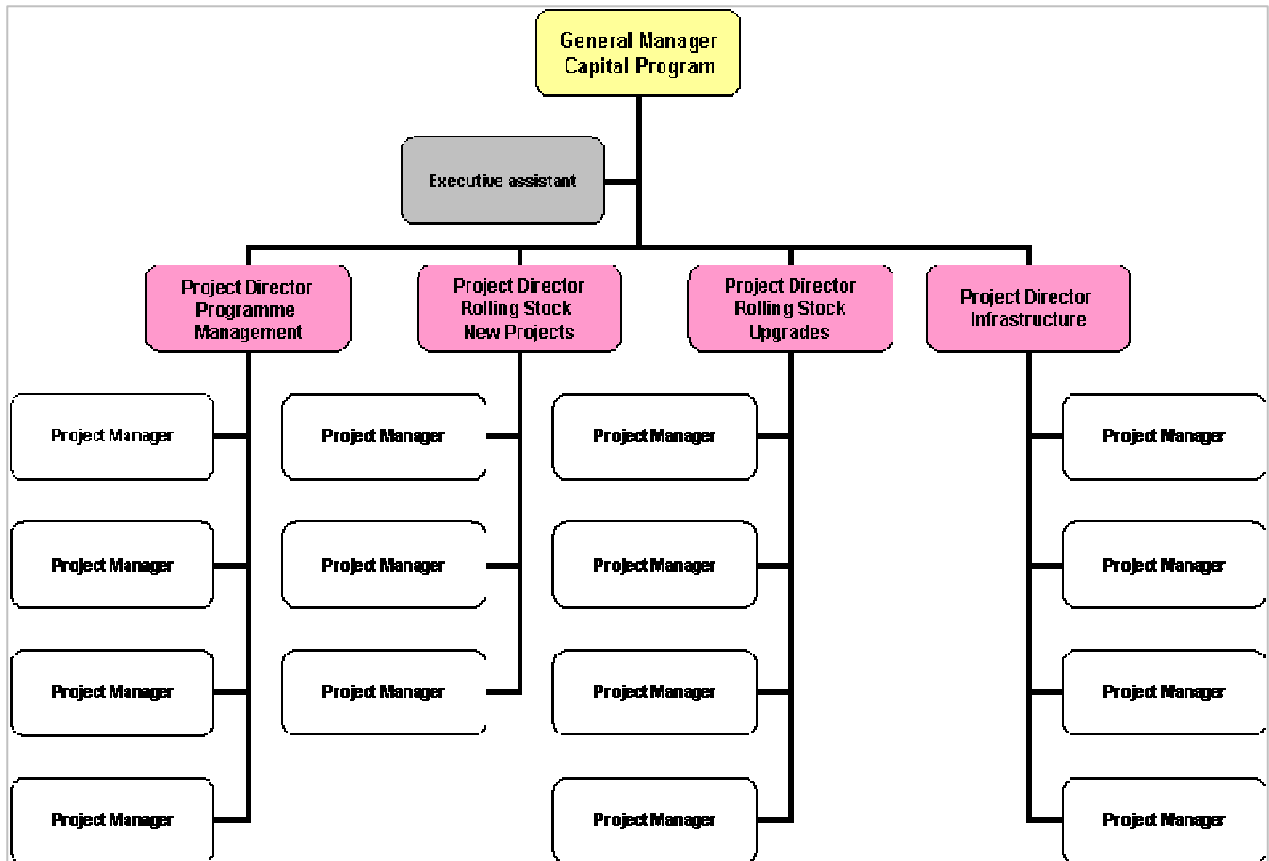


Figure 2-6: TFR Capital Program Structure

Most discussions of project management structures emphasize that the selection of an adequate organizational structure is an important decision for successful project implementation. The Capital Programme structure depicted in Figure 2-6 above is hierarchical with top management holding several levels in a top-down flow with different degrees of authority and responsibility. Hierarchies have acquired a poor image and seen as rigid and bureaucratic, yet in the right circumstances are able to deliver a product or service efficiently and consistently (Mintzberg, 1979). Although there will always be a need to communicate with other parts of the organization, this grouping of staff may make sense if most communication is likely to be within the functional area which is unlikely in a project management environment. Mintzberg

(1979) argue further that there are however potential disadvantage to this kind of division:

- Staff may be forced into a particular function, and generalists will be rare
- Career paths will be within a particular function, so managers may have a limited understanding of organizational issues outside their area of specialism
- Departmental objectives may become more important than the objectives of the organization as a whole
- Many members of staff may never meet an external customer
- Co-ordination of activities across different functional areas may be difficult.

In this form of structure, the project manager's role is limited to coordinating the efforts of the functional groups involved. Functional managers are responsible for the design and completion of technical requirements within their discipline. The project manager acts as a staff assistant with indirect authority to expedite and monitor the project.

2.6.1.2 Pure project organizational structure

A pure project organizational structure is similar in shape to the functional organizational structure except that all the departments and company resources are involved in project work. Project managers have a great deal of independence and authority. This kind of structure is typical of large projects of long duration. A major problem with this kind of organization is the uncertainty of the employees as to their fate upon completion of the project. This termination anxiety can impede project completion. If the parent company has a number of projects running concurrently, the pure project organization could also lead to duplication of effort in many areas and an inefficient use of company resources (Burke 2007:315).

2.6.1.3 Matrix organizational structure

The matrix organizational structure illustrates how the project structure overlays the functional structure and outlines the relationship between the project manager, functional manager and their subordinates. In this case the vertical lines represent the functional department's responsibility and authority while the horizontal lines represent the project's responsibility and authority (Burke 2007:306).

The matrix structure is considered by many practitioners to be the natural project organisation structure and can be applied at different levels ranging from weak to strong. According to the PMBOK (2004:30), weak matrices retain many of the characteristics of a functional organisation. The project manager's role is more one of a coordinator or expeditor than that of a manager. In a similar fashion, strong matrices have many of the characteristics of a project organisation that is full-time project managers with considerable authority and full-time administrative staff. It is widely agreed that the choice of management structures used to implement innovative, temporary, cross-functional and complex project endeavours has important implications for project success (Cleland, 1988 & Winch, 1994). TFR project management structure is hierarchical and functional characterised by bureaucracy and inflexibility. An alternative flexible project management structure is needed to ensure successful implementation of the major capital projects. Dinsmore (1999) is of the opinion that

“successful organisations will have to change their business processes from being hierarchical, functional organisations to being fast tracking, entrepreneurial enterprises made up of portfolios of projects that are ever changing and renewable. This needs a faster, cheaper, better way of doing business embodied in a project management culture”.

2.6.2 Cross functionality

In traditional hierarchical organizations, each functional area works in isolation on their part of the process and then passes the activity to the next department in a serial decision making process. This silo mentality is evident in the Capital Programme structure within TFR by the exclusion of the finance department in the formulation of the business cases. The cross functional project team is typically comprised of people from several functional areas who, at one time or another are involved in the design, engineering or marketing of the product or service. According to Smith (1993), ideally the cross functional team is a small group of key players from each affected functional area who have been carefully chosen for complementary skills and who are committed to a common goal and are mutually accountable for the team’s success. Trent & Monczka (1994) assert that most organizations still structure themselves traditionally. In many cases, culture of the organization encompasses decades of established business practices and formal functional reporting structures and is not a trivial task to realign. Helgesen (1995) identified characteristics that define traditional hierarchies, such as pyramid structure, focus on formalities and information channel constraints, and found that these characteristics tend to reinforce one another. Trent and Monczka (1994); Smith (1993) discuss the following key factors to building and maintaining cross functional project teams.

- Project sponsorship and upper management support: the project sponsor requests the project and holds the budget and resources for getting the project accomplished. In addition to full commitment of the project sponsor, management support from all affected areas is crucial in order for the team to have the time, resources and recognition to accomplish their goals.
- Project goals/ scope/ objectives: the project’s merit to the organization and its link to the corporate strategy and objectives must be clear to the entire organization and particularly to the project team.
- Leadership: the project manager must have a positive attitude, commitment to the project, effective leadership skills and be in a position of authority with respect to the project and the project sponsor.
- Membership/ resources: adequate team staffing and membership with complementary skills are critical to the success of any cross functional project team.
- Communication: communication is key to breaking down functional and physical boundaries when cross functional teams first form. Good communication with a high level of trust, honesty and respect is critical in building and maintaining high team performance.
- Performance/ reward system: Cross functional team, member’s performance must be evaluated and rewarded within the team context and with equal weight to the work they do outside of the project.

2.7 Project management culture

2.7.1 Organizational

Organizational culture plays an important part in the successful management of projects. Gray & Larson (2003) stated that there is a strong interrelationship between project management structure, organisational culture, and project success. It is imperative however, to clarify concept of culture for the purpose of this study. There are two viewpoints on culture found in the project management literature. The term project management culture is often used to imply a dedicated culture that becomes manifest within the project management capability in the organisation. In this sense, the word culture refers to the typical project management environment, including its methodologies, terminology, documentation templates, and behavioural styles (Dingle, 1997). Project management culture, in this context, should be seen as rather a sub-culture of the organisation's culture.

Organisational culture in its most basic form refers to a system of shared norms, beliefs, values and assumptions that bind people together (Schein, 1984). In one of the mostly quoted models of culture developed by Handy (1988), the idea of organizational culture is categorized according to the following:

- A role culture is associated with bureaucracy. The organization tends to emphasise rules, procedures and status within the organization and creative or innovative behaviour is discouraged as a rule. The organization tends to operate within a stable environment over which it is able to exert a controlling influence, as would be the case in a monopoly situation. The role culture correlates well with the process culture identified by Deal & Kennedy (1982). A process culture is deemed to involve low risk environments where focus is on how things are done rather than the outcomes. Employees who are orderly, punctual and detail-oriented are well suited to a process culture environment. This is closely related to the TFR culture in that people have clearly defined delegated authorities with a highly defined structure, the culture is synonymous with bureaucracy; where predictability, continuity and stability are TFR's important virtues. Independence and initiatives are less valued than reliability and professionalism.
- A task culture refers to organizations that are job-oriented and where the emphasis is on getting the job done, influence within the organization is based on expertise rather than on personal authority.
- A person culture appears to be the rarest of all four cultures. It is found in organizations seeking to develop the personal goals and needs of their employees. In this culture, the focus is on the individual and clearly not many organizations could survive with this type of culture, as it would exist primarily to serve the needs of its employees and close family members.
- A power culture depends on a central power source with rays of power and influence emanating from this central figure. The organization functions on precedent, with employees anticipating the wishes and decisions of the central power source. There are few rules or procedures within the organization, as emphasis is on individual

performance, with decisions being taken on the outcome of a balance of influence rather than on logical grounds.

2.7.2 Project management

Organisations can successfully manage projects within the traditional functional structure, if the organisational culture encourages cross-functional integration. The creation of a supportive organisational culture is critical for the success of any project and ultimately the growth of the business. According to Andersen (2003), in many organisations the project management culture it's often at odds with the organisational culture. From the literature and the adopted definition of Deal & Kennedy (1982) on organisational culture it is envisaged that a project management culture would consist of four main dimensions: project process (the way), people (we), project methodology (system and structure elements - do things), and the project environment (around here - meaning the organisation in context). Each main dimension represents a number of associative descriptive elements as identified from the literature. The degree to which an organisation supports these dimensions will contribute towards its project successes. Creating a project management culture inside an organization is an important step to improving project success in an organization (Crawford, 2002; Rad & Levin, 2003 0

The project management culture descriptive elements identified from the literature can be divided into four dimensions:

- The people related dimension refers to the people and their subsequent behaviour involved in the projects and include elements such as interpersonal relationships; management and stakeholder commitment; interdependence; discipline of delivery; risk propensity; conflict tolerance; learning affinity; results orientation; open communication; open system focus and team orientation.
- The system and structure dimension refer to the systems and structural elements that have to be created and applied to ensure project success. Elements included in this dimension are team approach; interdependence; flexible boundaries; customer orientation; project methodology and a supportive environment with regards to structure, procedures and resources.
- The associated descriptive elements included in the process dimension include the understanding of project life-cycle phases; results and speed of delivery; controlled/disciplined procedures; learning and continuous improvement, customer orientation and systems thinking.
- The environment dimension relates to elements such as strategic emphasis; upper management support; project planning support; customer/end-user support and buy-in; project team development opportunities; project execution support; communication and information systems availability and organisational support

Kendra & Taplin (2004) researched project success and developed a four-dimensional success model based on socio-technical system design describing the project management design elements by organizational level. These four design elements are also considered project management success factors.

Element type	Micro	Macro
Social	Project manager skills and competencies	Organizational structure at the project level
Technical	Performance measurement systems	Supporting management practices

Table 2-4: Dimensional success model (Kendra & Taplin, 2004)

Kendra & Taplin (2004) developed a project success model with the four projects management design elements (success factors) surrounding a central focus of project management culture. Signs of a project or project management culture include the following: a standardized project management methodology deployed and used throughout the organization, a meaningful and attractive career path for project managers, effective education, training, and certification for project managers, and training for team members and other stakeholders (including customers, managers, and senior executives), a standard suite of software tools to support project managers, and ongoing support through a Project Management Office at the corporate level (Crawford, 2002).

2.7.3 Paradigm shift

Both Handy (1988); Deal & Kennedy (1982) asserted that culture needed to fit certain aspects of the organizations inner context (size, structure, objectives) and outer context (risk). Deal & Kennedy (2000) also asserted that if culture develops through a relatively slow process of social learning, then it is seriously damaged by major redundancies and downsizings many companies have experienced. They cite outsourcing, mergers, acquisitions, and globalization as major changes which has further weaken or fragmented the organizational culture. They saw a greater need for change initiatives aimed at changing the organizational culture (paradigm), but they warned that while some high profile symbols can be fairly easily manipulated, changing the underlying organizational culture was likely to be far more difficult and time consuming.

Johnson (1987) proposes the cultural web as a managerial toolkit to enable the manager to surface and explore the core assumptions underpinning their paradigms, and therefore facilitate the implementation of change. An effective change implementation process should ensure that the everyday aspects of the organization are altered. The cultural web (Figure 2-7) is depicted in the diagram below:

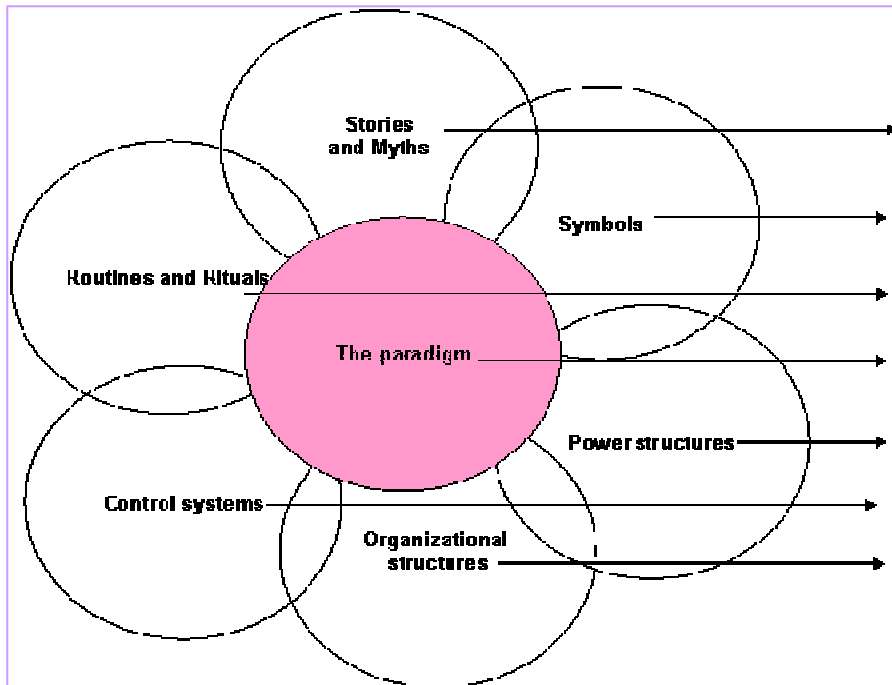


Figure 2-7: The Cultural Web (Johnson, 1987)

According to Johnson (1987) for organizations like TFR to change their core identity (paradigm) which will entail altering everyday processes, behaviours, routines or symbols, the whole set of intangibles (symbols, stories, rituals and routines) as well as tangibles (power structures, organization culture and controls) must be changed. As articulated by the former Transnet CEO, Ramos (2005) TFR needs to shift paradigms, so that investments are managed through projects that will align with business goals, thereby realizing the business vision. The challenge is to encourage project owners to embrace the established project management methodologies and processes in their business. Adoption of these principles 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 according to PMBOK (2005), commitment and buy in from the user client, project team and project owners that should remain constant for the duration of the project.

2.8 Project objectives and strategic alignment

Rail business is complex, capital investments are large, consume a lot of the company's resources and they can only be re-coupled over a protracted period of time.

The capital requirements reflect the strategic direction and objectives of Transnet Freight Rail, but considering the fact that projects outcomes possibly do not fully address the business requirements, misalignment between the project goals and business objectives is suspected. For a company like TFR which has more than a hundred different projects executed simultaneously, it is the researcher's opinion that

investments should at least be considered from the portfolio perspective rather than from the single project point of view.

2.8.1 Project Portfolio Management

A portfolio of projects is said to 'have a business scope that changes with the strategic goals of the organization and success is measured in terms of aggregate performance of portfolio components' (PMI, 2006). Project portfolio management is a methodology providing the necessary mechanism to bridge the divide between project and strategy execution. However, for project portfolio management to be effective, certain degrees of project management maturity levels need to be achieved before real benefits can be derived. Common challenges that face organisations not utilising a project portfolio management methodology due to lack of visibility into their portfolio are:

- No formal process for aligning investments with business strategies
- Not able to prioritise project requests from businesses competing for scarce resources
- Inefficient and over allocation of the scarce resources (money, people, time)
- Allocation of scarce resources to "urgent" projects instead of "important" projects
- No accountability of the business benefits through project life cycle through to post implementation level (only important while project is in execution stage):
- Projects high project failure rate
- Projects regularly exceeding available budget, time overruns and other tying down of the resources.
- While project management may help to an extent in executing a specific project within budget and time, it is ultimately the management of the portfolio that is responsible for selecting and prioritizing the right amount of projects that should be carried out. (Rad & Levin, 2006).

2.8.2 Project Maturity Level

The capability gaps suspected to exist in TRF investment programme indicate the lack of a clear link between the strategic objectives of the business and the project goals that the company invests in. For TFR to determine whether its project management processes are adequate or appropriate, it first needs to assess its level of project management maturity. The ability to implement and manage project portfolios varies between organizations and the degree to which an organization 'practices the application of knowledge, skills, tools, and techniques to organizational and project activities to achieve its aims through projects' (PMI, 2007, p. 7) is what is referred to as its maturity. And the increasing number of frameworks and models (focusing on organizational maturity) developed by PPM practitioners emphasizes the growing significance of those for project-based organizations. These so-called maturity models (PM Solutions, 2005; Rad & Levin, 2006 & Kerzner, 2004) all follow a similar structure, being comprised of 5 maturity levels, with level 1 being the lowest and 5 – the highest in portfolio maturity. And although it could be argued that these models are somewhat different in their approach, they all represent rather novel research in organizational practices supporting performance enhancement in particular for organizations operating on a project-basis.

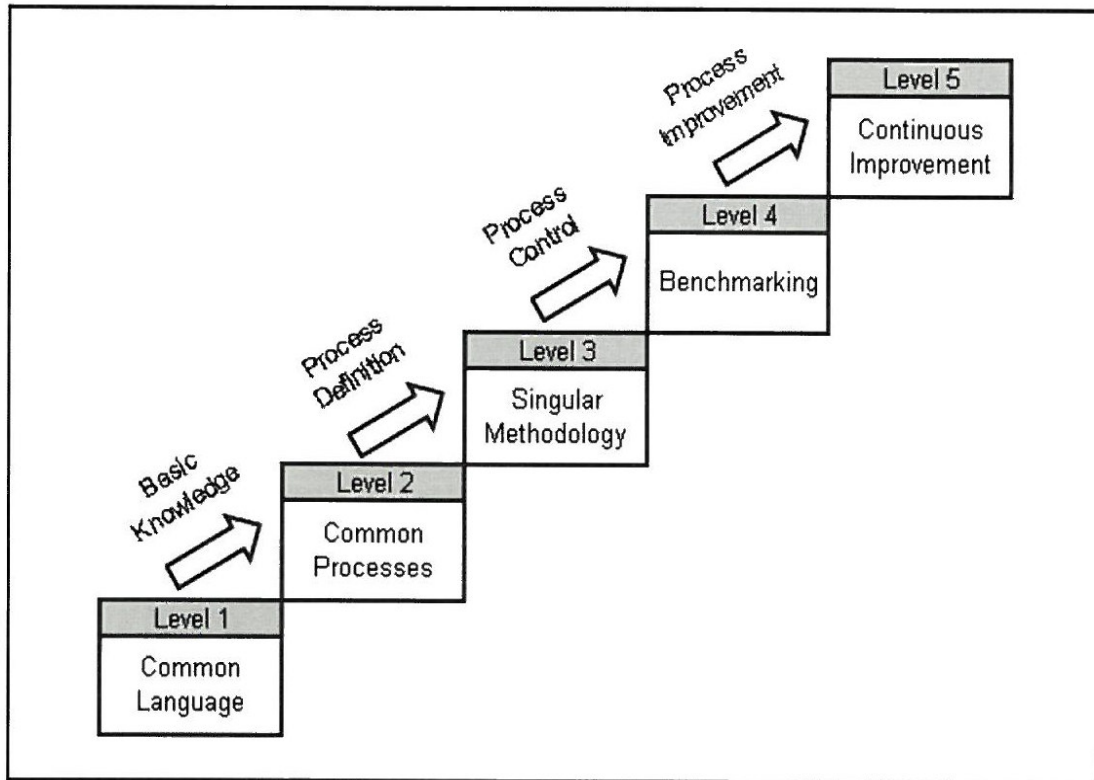


Figure 2-8: Kerzner's Maturity Levels (Kerzner, 2004)

The maturity model developed by (Kerzner, 2004) offers a framework with a number of defined levels of capability against which the current position can be assessed objectively. Kerzner (2004) see project management as a core competency that companies must develop in order to remain competitive in the market. In Kerzner's (2004) view, Project Maturity Models are an important strategic tool for senior management that allow an organization to benchmark its capabilities in respect of project management with its competitors. As such, a Project Management Maturity assessment model is a tool for establishing project management excellence, which is considered a condition for success.

These five levels are shown in figure 2-8 and are described below:

Level 1 – Common Language: the organization recognises the importance of project management and the need for a good understanding of the basic knowledge on project management along with the accompanying language and terminology.

Level 2 – Common Processes: at this level, the organization recognises that common processes need to be defined and developed such that project successes on one project can be repeated on other projects. Also included in this level is the recognition that project management principles can be applied to and support other methodologies by the company.

Level 3 – Singular Methodology: in this level, the organization recognises the synergistic effect of combining all corporate methodologies into a singular methodology, the centre of which is project management. The synergistic effect also makes process control easier with a single methodology than with multiple methodologies.

Level 4 – Benchmarking: this level contains the recognition that process improvement is necessary to maintain competitive advantage. Benchmarking must be performed on a continuous basis. The company must decide whom to benchmark and what to benchmark.

Level 5 – Continuous Improvement: at this level the organization evaluates the information obtained through benchmarking and must then decide whether this information will enhance the singular methodology.

All companies desire to achieve maturity and excellence in project management. Unfortunately, not all companies recognise that the time frame can be shortened by performing strategic planning for project management. (Kerzner, 2004). The simple use of project management, even for an extended period of time, does not lead to excellence. According to Kerzner (2004)...“it can result in repetitive mistakes and what’s worse, learning from your own mistakes rather than from the mistake of the others”.

2.8.3 Alignment between project objectives and business objectives

Companies today must develop and execute innovative business strategies in order to stay competitive. In doing so, projects are often chosen as the vehicles to implement the strategy, and project management is commonly considered as the key business process. In such situations, companies must make sure that projects are executed fully in line with the strategies they support. The project management - business strategy alignment helps organizations to focus on the right projects, given the objectives of the organization.

A theoretical framework regarding the alignment of project management with the business strategy developed by (Srivannaboon, 2005) is used to assess the extent to which project objectives and business objectives are aligned and the process of aligning them should the need arise. The most common challenge, as recognized by researchers and practitioners, is their inability to transform the organization’s strategy into practical operational actions (Schlichter, 2007). Due to the competitive nature of business goals and objectives, the strategies through which they are realized are often driven by the external business environment (Aritua et al., 2009). Outperforming rivals and creating a sustainable competitive advantage (goal) through differentiation from the competition (strategy) would be one example that illustrates this relationship (Porter, 1996). But in order to achieve this successfully, Porter (1996) also points out the need for a strategic fit between each activity and the overall strategy of the firm. So for project-based organizations this translates into projects being the main business activities and the performance of the company’s portfolio of projects indicate to which degree the organization can differentiate itself from the competition. Based on empirical findings, Dietrich & Lethonen (2005) further argue that the management of projects, and portfolios should be a part of the strategy process for the organization to be able to

implement its strategies successfully. This process may be divided into (1) establishing main strategic objectives; (2) formulating the strategy (3) implementing the strategy; and (4) practicing strategic control and evaluation (Munive-Hernandez et al., 2004). And according to Aritua et al. (2009) project and portfolio management should occupy a position between strategy formulation and delivery, enabling and facilitating the implementation of the strategic objectives.

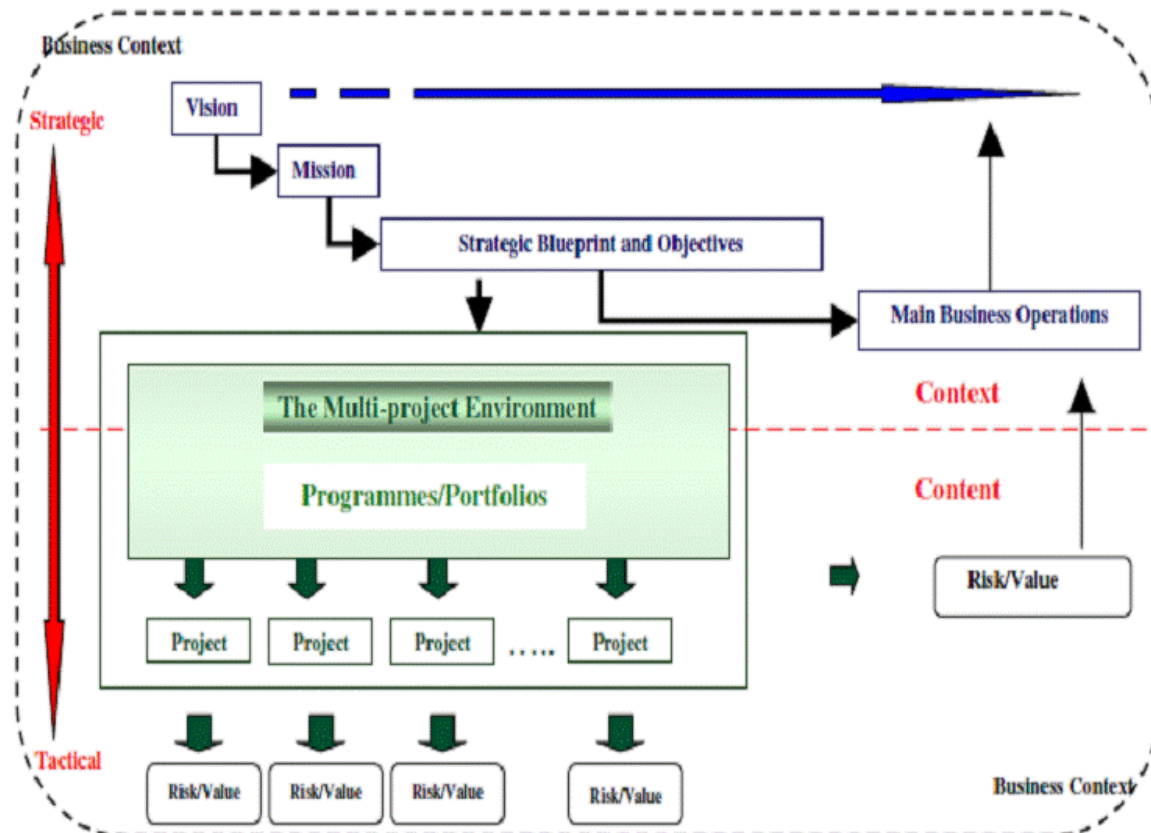


Figure 2-9: System model of a multi-project environment (Aritua et al., 2009)

In their recently developed system model of a multi-project environment (Figure 2-9), Aritua et al. (2009) describe the different linkages and dependencies between the business context (vision, mission and strategic objectives) and the content (portfolios, programs and projects). According to the authors, the ideal situation is given once the contextual matters, which define the strategy, serve as a basis for deriving the content for projects in a way that they can accomplish the strategic objectives. And this ideal situation, bridging the gap between context and content and aligning projects to the overall strategy of the organization, is what multi-project management intends to achieve (Aritua et al., 2009).

The need of having the project portfolio aligned with the strategic goals of the firm is essential in order to obtain and maintain a successfully performing project portfolio. And empirical studies confirm that there is a positive correlation between the strategy-project

portfolio alignment (Cooper et al., 1999; Dietrich & Lethonen, 2005; PM Solutions, 2005). Consequently a portfolio's alignment to the business strategy is often even seen as a prerequisite for a project's successful realization. And Project Portfolio Model, the management of these project portfolios, thus represents the necessary tools or means to reach this anticipated linkage. Therefore it only seems logical that the higher the degree of alignment between PPM practices and the strategic objective of an organization, the more likely it is that the project portfolio will successfully realize the strategy.

2.9 Conclusion

The primary focus of this paper is to investigate and understand the reasons for major projects failure within TFR. In this chapter, the problem analysis/ theoretical concepts from the projects failure point of view were explored. The characteristics of projects, project management concepts and project lifecycle principles were identified. The conventional TFR project management approach was compared to a structured approach to project management. An in-depth analysis of different themes that arose from the problem review was performed. In the next chapter, the literature relevant to the study is reviewed.

3 Literature review

3.1 Introduction

In the previous chapter the theoretical foundation of the study was given. In Chapter 3 the relevant literature is dealt with. There is a large body of literature available in the field of project management. A literature review (or the problem analysis) constitutes “proof of scholarship”, showing that “one knows the literature and have the intellectual capacity to read it and criticise it constructively” (Collis & Hussey, 2003: 293).

3.2 Project failure

There is a large number of studies written to pinpoint the causes of projects failure. A vast number of recognized risk factors that have been identified to be responsible for project failure phenomena, include those concerning project leadership and management, organizational culture and structure, commitment and patterns of belief, user involvement and training, developer expertise, technology planning, scope and objectives setting, estimation and choice/use of methodology (McFarlan, 1981) and (Cusing, 2002). Table 1 summarizes the literature on critical success/failure factors. The theoretical and empirical studies are grouped chronologically.

Table 1: Classification of literature on project success or failure

Theoretical studies	Empirical studies
Avots (1969)	Rubin and Seeling s (1967)
Jonason (1971)	Baker, Murphy and Fisher (1983)
Archibald (1976)	Pinto and Slevin (1987)
Martin (1976)	Morris and Hough H (1987)
Markus (1981)	Magal, Carr and Watson (1988)
Hughes (1986)	Pinto and Prescott (1988)
Schultz, Slevin and Pinto (1987)	Nutt (1989)
	Pinto and Slevin (1989)
	Pinto and Prescott (1990)

Table 3-1: Classification of literature on project success or failure

The success and failure factors were first introduced by Rubin & Seeling (1967). They investigated the impact of a project manager's experience on the project's success or failure. Technical performance was used as a measure of success. It was concluded that a project manager's previous experience has minimal impact on the project's performance, whereas the size of the previously managed project does affect the manager's performance. Rubin *et al.* (1967) study was followed by a theoretical study by Avots (1969). He identified reasons for project failure and concluded that the wrong choice of a project manager, the unplanned project termination and unsupportive top management were the main reasons for failure.

Baker, Murphy & Fisher (1983) suggested that instead of using time, cost and performance as measures for project success, perceived performance should be the measure. Hughes (1986) conducted a survey to identify the factors that affect project performance. He concluded that projects fail because of improper basic managerial principles, such as the improper focus of the management system, by rewarding the wrong actions, and the lack of communication of goals.

In their book, Morris & Hough (1987) studied eight large, complex projects which had great potential economic impact but were poorly managed and generally failed. They identified the success and failure factors for each of them. Based on this experience, they suggested seven dimensions of project success. These included project objectives; technical uncertainty innovation; politics; community involvement; schedule duration urgency; financial contract and legal processes and implementation problems. They concluded that although their analysis of success factors is aimed at large, complex projects, they are also relevant to projects in general. One of the first efforts to classify critical factors was carried out by Schultz, Slevin & Pinto (1987). They classified factors as strategic or tactical. These two groups of factors affect project performance at different phases of implementation. The strategic group includes factors such as "project mission", "top management support" and "project scheduling" whereas the tactical group consists of factors such as "client consultation", "personnel selection and training". In their follow-up work, Pinto & Slevin (1989) identified success factors, and their relative importance, for each stage of a research and development project life-cycle.

Finally, in a similar study by Pinto & Prescott (1990), the relative importance of each group (tactical vs. strategic) over the project life-cycle was analysed. It was found that the relative importance of success factors varies at different stages of the project's life-cycle, depending on the success measure used. When external success measures are employed, planning factors dominate tactical factors throughout the project life-cycle.

Failure has been synonymous with many projects over the last four decades. Reasons for failure have been attributed to technological difficulties, organizational and functional problems, managerial issues, and many other reasons. Traditionally, a project should deliver agreed upon functionality on time and within estimated budget according to Keider (1974) and Saleh (2005). A comprehensive study conducted by Standish Group International in 1995, which included several thousands of information technology projects revealed that only 16% of those projects were finished on time, and within the estimated budget; 32% were terminated before they were completed, while the remaining 52% involved costs higher than the original estimates and were completed behind their schedule (Standish Group, 1994). The statistics cited relative to studies completed by Standish Group and Gartner Group identified a serious and continuing issue related to project's ability to successfully complete relative to their defined goals and objectives.

3.3 Culture and structure

3.3.1 Project management culture

Project management literature indicates that project culture is important to project success (Cleland, 1994; Lientz & Rea, 1999). Kotter & Heskett (1992) also found a relationship between culture and economic performance of projects undertaken by those organisations. One of the main causes of project failure is that the organisational culture in which projects have to be delivered is not supportive of projects (Gray & Larson, 2003). The creation of a supportive organisational culture is critical for the success of any project and ultimately the growth of the business. According to Andersen (2003), in many organisations the project culture is often at odds with the organisational culture. Andersen (2003) further differentiates between the organisational culture of the base or parent organisation, their sub-cultures, and the culture within the project to meet its objectives. However justified, “project management should not be used until the leaders of the organisation are committed to its use and are willing to prepare a suitable culture for project management to germinate and grow”.

Understanding the underlying principles of project management and organisational culture will facilitate the identification of project management culture elements. Authors in project management literature use organisational culture and project management culture as synonymous, without defining the exact meaning. These two concepts are not the same thing, although they do share some underlying dimensions. Hofstede (1997) defines organisational culture as “holistic... a whole which is more than the sum of its parts ... historically determined ...reflecting the history of the organisation”. Organisational culture in its most basic form refers to a system of shared norms, beliefs, values and assumptions that bind people together (Ball & Asbury, 1989; Schein, 1984).

Culture is a characteristic of the organisation, not of individuals, but it is manifested in and measured from the verbal and/or non-verbal behaviour of individuals - aggregated to the level of their organisational unit. People who hold a common conception of what the organisation should be and how work should be organised will tend to create an organisation that realises that conception. Moreover, an individual who joins that organisation will tend to become socialised to that conception and come to perceive the way work is conducted as appropriate and natural (Deal & Kennedy, 1982). Culture is part of the overall organisational design to enable widespread information flow (Cummings & Worley, 1997). Frohman (1998) alludes to the fact that the relationship that exists between management and employees forms companies' cultures. Gray *et al.* (2003) identified 10 primary characteristics which capture the essence of an organisation's culture i.e. member identity, team emphasis, management focus, unit integration, control, risk tolerance, reward criteria, conflict tolerance, means versus end orientation and open-system orientation.

Literature also indicates other elements to be present in a project environment that establish and foster the desired project culture i.e. business sponsorship (Hall, 1999 &

Zimmer, 1999), senior management involvement (Cleland, 1994), middle management involvement (Glaser, Zamanou & Hacker, 1987), team based and participatory approach (Cleland, 1996; Martin & Tate, 1998); Project orientation and control (Hall, 1999), project management methodology (Martin *et al*, 1998; Zimmer, 1999), Communication and information systems (Hall, 1999; Graham & Englund, 1997;) and project review and learning (Bohn, 1994; Peters & Homer, 1996).

From the above mentioned it could be concluded that there is no “ideal” organisational culture, but that there are certain dimensions which can be utilised to underpin a culture that will lead to improved project success and that there are certain success factors that should be part of such a project management culture. If the associated descriptive elements of a successful project, project management and organisational culture are taken into consideration, it is possible to identify the cultural elements in an organisation that can contribute successfully to a project.

3.3.2 Project management structures

It is widely agreed that the choice of management structures used to implement innovative, temporary, cross-functional and complex project endeavours has important implications for project success (Cleland, 1988). The discussion of alternative project management structures dates back to Galbraith’s (1971) conceptual introduction of the matrix organization and its differentiation from functional and product organizations. He systematically compared the advantages and disadvantages of alternative matrix organization structures. Based on Galbraith’s typology some authors favoured matrix project organization structures for their flexibility, their economical use of resources, and the clear differentiation between project authority and functional authority. Others criticized matrix project organization structures due to their complexity (Davis & Lawrence, 1988) and lack of unity of command (Youker, 1977). On balance, these conceptual discussions lack agreement, thus providing little conclusive theoretical direction concerning the relationship of specific project structures to project success. However, the multidimensional approach that simultaneously considers several structural attributes provides empirical evidence that the choice of a specific project management structures can affect project success. Project structures with the project manager lacking appropriate responsibility and authority or senior level support clearly lead to failure. This leads to the conclusion that senior management needs to consider how to integrate the project manager more successfully into the organization’s power and authority structures in order for a project to be successful (Meyer et al., 1995).

The measurement problems associated with project management structure configurations seem to follow the general discourse in the organization science literature (Ulrich, 1990). Several in-depth case studies of major projects support the multidimensional nature of project management structures (Archibald, 1998). The PMBOK (2004) acknowledges three structural attributes:

- the PM’s authority, varying from “little or none” in functional project organizations to “high to almost total” in projectized organizations;

- the PM's role, usually part-time in functional organizations, tending to full-time when moving toward a projectized organization;
- the PM's responsibility, in functional organizations usually a coordinator or a leader, sometimes called a "project officer" in a balanced matrix organization and evolving to a "PM" or "program manager" in a projectized organization.

These three structural attributes are used to describe the five structural types of the one-dimensional approach but they are not used to derive alternative structure types. Other, more recent discussions on alternative project organization structures extend the one-dimensional perspective by focusing mainly on the process level or on the organizational level (Hobday, 2000). Research on the relative effectiveness of different project management structures is limited. Pro and con arguments for specific approaches are largely based on anecdotal evidence or armchair theorizing (Cleland, 1984), for example, Peters & Waterman (1982) based their criticism of matrix on the fact that the 61 "excellent companies" they studied either did not use a matrix arrangement or had a bad experience with matrix management.

Systematic comparisons of different structures are rare and oftentimes fail to take into account other factors that contribute to success. Corey & Starr (1971) surveyed 500 large manufacturing firms and reported that a project matrix or project team was more successful in developing and introducing new products. (Marquis & Straight, 1971) in a study of 100 research and development projects, reported that a functional matrix is likely to produce better technical results while a project matrix is likely to reduce cost and schedule overruns. Another study that examined development projects in nine large firms reported that project structure influenced technical success but not necessarily economic success (Young, 1976). On the other hand, Murphy et al. (1974) reported that no particular structure was associated with the success of over 600 construction and development projects. Perhaps the most rigorous study to date has been conducted by Katz and Allen (1985). Their study involving 86 research and development projects revealed that superior results were achieved with a balanced matrix in which the project manager had primary control over managing the project while the functional managers retained influence over technical details. Keller (1971), however, was unable to replicate this finding and reported that group cohesiveness was a more important predictor of project performance for 32 projects.

The conventional hierarchical management organization is generally incapable of dealing with the added complexity and information demands of a project. Delegating project segments according to functional expertise contributes to bottlenecks and sub optimization since there is a tendency for functional departments to become preoccupied with only their segment of the project. Van der Post (1996:148) summarises the views of many authors in his extensive research, when he states that culture implies the existence of certain dimensions or characteristics that are closely associated and interdependent and that guide the actions of a group of people, i.e. that group's (or organisation's) "way of doing things". The question that involuntarily comes to mind in the quest for effective project management, is whether the project

management “way of doing things” is indeed so significantly different from the conventional (functional) “way of doing things” in an organisation, For organizations that execute projects as well as conventional operations, the former is inevitably organized by way of overlaying a trans-functional, project specific organisation (the project team) ad-hoc over the (vertical) functions specific structure (Kerzner, 1992:120; Kezsbom & Edward, 2001:47). Most text books quote any number of the following as intrusions into the de facto functional organizational culture, associated with operating the two approaches concurrently in the same organisation: the team members are answerable to two bosses – the project leader and the functional manager; heads of functional departments are obliged to train and make resources available to projects and therefore perceive the authority of team leaders as an invasion into and a threat to their own domain; the meritorious evaluation of team members could reside with persons other than their traditional bosses; the leadership for and implementation of a project can take place outside of the “normal” functional structure; hierarchy awareness is diminished because persons of any hierarchical level may give an input to the team and be subordinate to the authority of the team leader; departmental heads become removed from the high load of purpose and action, associated with projects; pursuing project objectives is perceived to be more dynamic than pursuing functional objectives, which cause conflicts regarding priorities and resources; and project teams are often tightly knitted units with own codes of conduct that lead to confrontations in the “mother” organization. Evidently, the trans-functional approach can potentially cause major organizational disruptions that should be met by organizational culture realignment to the new requirements

3.4 Skills, competencies and leadership of the project manager

In most organizations, project managers are accountable for the successful delivery of complete projects. Increasingly, this success depends on project managers’ possessing and utilising skills and competencies that may initially appear contradictory. Until recently, many of the initiatives for improving the practice and profession of project management have been focussed upon enhancing techniques and methods associated with skills that included effective management of time, cost, and scope. The Project Management Institute’s (PMI) Guide to the PM Body of Knowledge (PMBOK) tends to be primarily concerned with management competencies (craft) and the “hard” skills expected of practicing project management professionals with knowledge areas such as project human resource management and project communication management (the essential relationship-focussed areas) relegated to secondary (and less important) roles (PMI, 2000).

A few studies have identified competencies relevant to project managers. Rees, Turner, & Tampoe (1996) identified six traits of effective project managers, assert that effective managers are usually of above-average intelligence, and have good problem-solving ability. Such traits are similar to intellectual competencies (IQ) that Dulewicz & Higgs (2005) referred to as part of leadership competencies. Other traits identified by Rees et al. are behavioural or motivational, such as energy, and skills-based traits, for

example, communication. However, they do not provide evidence that these traits contribute directly to increased project success. Andersen, Grude, & Haug (1987) recognized the importance of the project manager's personal characteristics, such as initiative, when selecting a project manager. This view is similar to that of Hogan (2002), who saw the personality of the leader as being a determinant of effectiveness. However, he also does not directly show the significant contribution of personality characteristics to project success. Successful project execution rests on people skills, conceptual skills and technical skills. EL-Sabaa (2001) is of the opinion that the people skills of project managers have the greatest influence on project management and technical skills the least. Realising the importance of people management skills, Turner (1999) has reframed his definition of a project to recognise its human aspects. He defines a project as an: "... endeavour in which human, financial and material resources are organized in a novel way to undertake a unique scope of work of given specification, within the constraints of cost and time, so as to achieve beneficial change defined by quantitative and qualitative objectives."

Crawford (2000) presented a review and analysis of research-based literature concerning the criteria by which project success is judged; the factors that contribute to the success of projects; and the knowledge, skills, and personal attributes of project managers that lead to achievement of successful project outcomes. Her research clearly demonstrates agreement that the competence, or knowledge, skills, and attributes, of the project manager are critical to project success. Walker & Peterson (1999) agreed, "There is a set of attributes or characteristics possessed by leaders i.e. those that have the best chance of becoming excellent project leaders." They identify competency in three primary areas:

- Knowledge: what an individual knows about project management
- Performance: what an individual is able to accomplish while applying knowledge
- Personal: how an individual behaves when performing the activity; his or her attitudes and core personality traits.

Pinto *et al.* (1998) supported achievement orientation by noting that, "Effective leaders are task driven. They understand that their number-one priority is to complete the project." Pettersen (1991) identified a list of predictors for identifying successful project managers. Among those, he supported the analytical thinking competency cluster within the cognitive competency unit by identifying that "problem analysis" is a key predictor. In Lewis' (1997) book, *Team-Based Project Management*, he supported the teamwork competency cluster within the managerial competency unit by noting that team leadership is a key trait successful project managers must possess.

3.5 Alignment

3.5.1 Alignment literature

The alignment of strategic priorities – often referred to as strategic consensus or strategic fit has become one of the central themes in the strategic management literature over the years. Miles & Snow (1978) define strategic fit as a process that seeks to align the organization with its environment (through a strategy) and to arrange resources (e.g. organizational structure and process) internally in supporting that alignment. Specifically, Boyer & McDermott (1999) describe the alignment as the level of agreement within an organization regarding the relative importance of cost, quality, delivery and flexibility to the organizational goals. Success is expected to be dependent upon the degree of alignment that underlies business strategies (Zeffane, 1992). Generally, functional strategies are suggested to be aligned and integrated within the business strategy. Often research and development, production, human resources IT etc. are mentioned as functional strategies and used to examine the alignment with the business strategy. For instance, there are a number of studies revealing that performance can be improved through a better fit between business strategy and multiple different strategies, including manufacturing strategy (Hartman, 2000 & Malhotra, 2001), IT strategy and research and development strategy (Cooper, 1993 & Wheelwright, 1992)

3.5.2 Traditional view of PM/ Business strategy alignment

Project management is similar to any other functional strategy, and therefore it should be aligned with the business strategy (Harrison, 1992). Research in the literature has examined the idea of alignment in various management areas. For example, many studies have discussed the alignment between tasks, policies and practises (Boyer & McDermott, 1999). The literature frequently mentions research and development, production, human resources among others as functional strategies and uses these as the variables to examine alignment in relation to the business strategy. Because project management is similar to these functions, it too should be aligned with the business strategy. However, the traditional literature on aligning project management to business strategy is vague. Most studies link the business strategy with project management though project selection, viewing it as part of the alignment process (Baker, 1974; Cooper, Edgett & Kleinschmidt, 1998). Added to this is the project portfolio management, another concept suggested in literature to ensure the strategic alignment of project management and business strategy. (Baker, 1974; Cooper, Edgett & Kleinschmidt, 1998) define project portfolio management as a dynamic decision process, whereby a business's list of active projects is constantly updated and revised. Here the choice of the business strategy drives the portfolio management, whose major purpose is to select, prioritize, balance projects and align projects with the business strategy (Archer, 1999). This is the approach; in the researchers, opinion is more fitting to the TFR environment, which will be the focus of this study in as far as the alignment of project objectives and business objectives is concerned.

3.5.3 Theoretical foundations of the PPM

Nowadays an increasing number of organizations operate on a project basis and often face challenges to carry out these projects on time, within budget and on scope. The discipline to successfully manage each project, Project Management, has evolved to an established field for researchers and practitioners. These practices seem to be insufficient though when companies deal with many projects at the same time, also called multiple projects or project portfolios (Aritua, Smith & Bauer, 2009 and Rad et al., 2006). Contrary to project management, PPM is a rather new area of interest to the academics. As such, not many studies have been executed in order to make it a well-established theoretical field. What PPM refers to is the management of portfolios or collections of projects that help 'deliver benefits which would not be possible were the projects managed independently' (Turner & Speiser, 1992, p. 199). Furthermore, PPM is linked to 'the strategies, resources, and executive oversight of the enterprise and provides the structure for the management of multiple projects executed simultaneously (Levine, 2005, p. 1). The most common challenge, as recognized by researchers and practitioners, is their inability to transform the organization's strategy into practical operational actions (Schlichter, 2007). Hence, the major focus when developing PPM tools and practices has been on process improvement. The objectives of PPM slightly differ among authors but most agree that managing the project portfolio ensures a balanced portfolio, links the portfolio to the organizational strategy and maximizes the value of the portfolio (Elonen & Artto, 2003; Dooley et al., 2005).

While project management may help to an extent in executing a specific project within budget and time, it is ultimately the management of the portfolio that is responsible for selecting and prioritizing the right amount of projects that should be carried out. Although the importance of alignment of an organization's strategy and its business activities has been discussed extensively in the literature over the past decades, its connection to project portfolios is rather new. And researchers and practitioners have been emphasizing that if an organization wants to realize its business strategy successfully the objectives of the projects within a portfolio need to be aligned with the strategy (Archer *et al.*, 1999; Cooper *et al.*, 2000; Elonen *et al.*, 2003; Dooley *et al.*, 2005; Levine, 2005; Dietrich *et al.*, 2005 & Srivannaboon, 2006).

The detailed alignment process proposed by Srivannaboon (2006) entails, projects first being selected into to support the implementation of the business strategy (alignment at strategic level). Then during the project execution alignment with the business strategy being monitored (alignment at project level), and information being fed back to business leaders to allow for adaptation of the business strategy (alignment at the emergent strategic feedback level). Here it was found that most companies used project stage gates to adapt and maintain the alignment during the project execution. This level of mediating process provides strategic feedback, usually resulting from environmental changes, that can lead to what Mintzberg (1994) calls "emergent strategy" or a strategy that is not intended or planned but emerges from a stream of managerial decisions through time.

3.5.4 Recent view of PM/ Business strategy alignment

Only recently have researchers started to explore the alignment of project management more thoroughly (Artto *et al.*, 2004; Morris, 2004). Jamieson & Morris (2004) suggest that most of the components of the strategic planning process such as internal analysis, organizational structures and control systems, have strong links to project management process and activities and thereby strongly influence “intended” business strategies. They emphasize that “emergent” strategy is a key factor that influences intended strategy through the components of strategic management process. Here, Mintzberg (1994) defines that an intended strategy is planned by decision makers and an emergent strategy is a product of any unplanned action. In addition, Artto *et al.*, (2004) suggest that an important managerial challenge of the project management/ business strategy alignment is to encourage projects and individuals in their role in emerging strategies to create new ideas and renew existing strategies. These are done through stage gates or go/kill decisions as part of the project life cycle at the end of each phase. Stage gates are specific points where projects are checked to confirm whether they will be further pursued or not (Cooper, 1993). These gates allow businesses to stop projects or repeat a certain part of a stage due to partial failure. These studies lead to a new perception that the process for aligning project management with the business strategy is a dynamic process that begins at the strategic level, cascaded down to the project level and is constantly monitored as part of the emergent approach.

3.6 PM approach

PMBOK (2003) contends that due to the nature and uniqueness of projects, projects will always have a degree of uncertainty which is defined in project management as the risk component associated with a project. Projects are inherently complicated with all the various stakeholders and integration required to fulfil the stakeholders' objectives. To ease the project's complicity, projects are divided into project phases. Collectively the project phases are known as the project life-cycle, according to Knipe et al (2002).

One of the most widely reported results of research on the practicing of project management in formerly functionally only structured organisations, is that an informal approach to project management is a sure path to disaster (Nicholas, 1990; Kezsbom et al., 2001; Mantel *et al.*, 2001:35; Frigenti et al., 2002:45). Mantel *et al.* (2001:35) are even of the opinion that the more complex an organisation's projects are, the more formal the approach or style of project management should be.

Formalising project management approach requires that an organisation-wide strategy for project management must be initiated and visibly supported by top management. Tettermer (1991), Brown (2000) & Botha (2003) assert that a strategy is essential, because it is a prerequisite for the displacement of traditional relationships and practices with new ones. It also serves to comfort high level administrators during the period of change. It will also demonstrate top management's belief in the validity of the project management process. Because project leaders have in principle only one chance (a project is executed only once with no or very little rehearsal), their decisions

must be right the first time. There should therefore be consistency about the cause-and-effect-relationships of their decisions, which only a well-structured strategy and the resulting policies can provide.

Acknowledged that project management plays a major role in the successful implementation of strategy for businesses. As companies compete, they use project management to implement their strategies. One problem with this approach according to Phillips, Bothell & Snead (2002) is that “competition and a global marketplace have created a demand for better, faster, and more cost-effective projects. Yet in many organizations, there are no formal processes or methodologies for the effective selection and management of projects”. Phillips et al. (2002) went on to say “in the past project management was about “figuring it out as we go” or about relying on just a few within the organization who were inherently good at managing projects. With the high cost of project failure, it is not smart business to let individuals and teams “figure it out as they go, with the hope that they will be good at it”

3.7 Organizational, senior management and project sponsor support

Young (2005) identifies senior management support as the single greatest contributor to project success. Project management literature is only beginning to equate the level of leadership and support of the project sponsor with the success of the project (Crawford & Brett, 2001; Hall, Holt & Purchase, 2003; Helm & Remington, 2005). Kendall & Rollins (2003) found that of the project management offices they surveyed, 97% identified a lack of executive involvement and poor communications with the project manager as one of the major causes of projects failure. The project sponsor’s engagement throughout the process is a key ingredient to successful projects. According to Helm *et al.*, (2005), Recent articles like *Surviving the Sponsor Exit* (Melymuka, 2004a) and *Firing Your Project Sponsor* (Melymuka, 2004b) not only stress the importance of the role of the project sponsor with respect to project success, they also quote advice from a number of senior project managers who suggest ways of dealing with inadequate sponsor performance.

Geiger (2006) identified an active project sponsor as responsible for gaining and sustaining support for the project and for acquiring the human capital needed for the project. The active sponsor needs to communicate regularly with executives to establish and maintain a clear understanding of the projects goals and resource requirements for the project. The sponsor should have a global understanding of the business, should have the ability to understand, and communicate regularly to other executives the value of the project. Active sponsorship is essential for gaining corporate-wide project support And also ensures the project needs are aligned with the expectations of the sponsor. To ensure the proper resources are available to resolve or escalate project threatening issues, the sponsor’s authority is used. The benefits of having a sponsor engaged during the early planning of a project are often realized when the completed project meets the expectations of the customer. Having an active sponsor can help the

project meet expectations when it is complete, however the project sponsor can generate mixed feelings amongst the project team through the increased involvement. Scepticism among the project team is often due to the added visibility and scrutiny the sponsor brings with them. This scepticism is a result of mistrust or an ignorance of the intentions and benefits of the sponsor's involvement (Kendra and Taplin, 2004).

IT-Cortex (2006), a consulting company, reported that most project managers formulate and hold to their own opinions of the root causes for project failures but these conclusions are partial, fragmented, and greatly influenced by individual areas of experience. Frese & Sauter (2003) concur with the conclusions of IT-Cortex that the main factors for successful projects were sponsor involvement and support. A successful project has been defined as a project that finishes on time and budget, meets specifications, and is accepted by the consumer (PMBOK, 2004). PMBOK (2004) emphasizes the importance of regular communication between the project manager and sponsor, and the importance of the sponsor maintaining strong relationships with supporting groups. The research conducted by IT-Cortex found that projects are more likely to fail than they are to succeed and that only one out of five projects is likely to finish on time, budget, and meet the expectations of the customer. While the risks and associated failure rates are intimidating, projects are required to meet the needs of clients, support daily operations, and to grow the business. Professionals are required to minimize risk and maximize project benefits, which may begin with a better understanding of the role and impact of the sponsor. The study can assist current and future project managers in understanding the critical role and potential impact of the project sponsor on the success of a project.

Project failure has also been seen as closely related to the stakeholder's perception of the value of the project and their relationship with the project. The key to successful project relationships is in the understanding that different stakeholders have different expectations and different definition of success (Bourne & Walker, 2006). The project's success or failure is strongly influenced by both the expectations and the perceptions of its stakeholders, and the capability and willingness of project managers to manage organizational politics. In conclusion, in order to achieve a successful project outcome, the project manager must be adept at managing the interests of multiple stakeholders throughout the entire project management process.

3.8 Conclusion

In this chapter, the researcher examined literature relevant to this study, which sought to analyze the root causes of major capital projects failure. The methodology used to gather the associated data is discussed in chapter 4.

4 Research design concepts

4.1 Introduction

This chapter delineates the research design employed to analyse the root causes of major projects failure within TFR. In addition, this chapter addresses the suitability of the research design and approach, and provides justification for the research design. The sampling techniques used are described. The instrumentation and materials, the reliability and validity of the instruments, data collection and analyses that explain the descriptive analysis used in the study, and the measures that were taken to protect the participants' rights are also discussed.

Collis & Hussey (2003) defines research as a process of systematic inquiry that is designed to collect, analyse, interpret and use data to understand, describe, predict or control an educational or psychological phenomenon or to empower individuals in such contexts. Research encompasses activities that increase the sum of knowledge hence it can be said that the research process begins with recognising there is a need for specific information. Following this recognition, a plan to resolve and meet the information need should be constructed.

Given the generic research objectives stated above a mixed-method approach appeared to be suitable for the present investigation. This means that both qualitative and quantitative methods of data collection were used. Table 4.1 below illustrate the advantages of each type of research method which should be taken into consideration in determining which methodology to use in a research undertaking.

Quantitative methods	Qualitative methods
Based on familiarization of current research rather than specific situations	Based on familiarization with real-life context or situations
Concern to establish significant, and separate relationships between a limited number of variable	Concern to understand the interrelationship between different factors
Seeks to achieve abstraction from repeated observations	Seeks to find out how people understand a situation and how their understanding influences their actions
Variables are expressed in the language of investigation	The preconceptions of the researcher are suspended and the language of the informants is valued and utilized.

Table 4-1: Quantitative and Qualitative methods, adopted from Newman (2003)

Collis et al., (2003) argue that it is quite usual to apply a mixture of approaches when conducting business research. "The use of different research approaches, methods and techniques in the same study is known as triangulation and can overcome the potential bias and sterility of a single-method approach" (Collis et al., 2003). The main advantage of triangulation is the greater validity and reliability of the research results (Denzin, 1978). Easterby-Smith, Thorpe & Lowe (2002) distinguish between the following types of triangulation:

- data triangulation: which entails gathering data through several sampling strategies, so that slices of data at different times and social situations, as well as on a variety of people, are gathered?
- investigator triangulation: which refers to the use of more than one researcher in the field to gather and interpret data.
- methodological triangulation: involves using more than one method to gather data, such as interviews, observations, questionnaires, and documents
- triangulation of theories: : involves using more than one theoretical scheme in the interpretation of the phenomenon

Within the scope of the present investigation a methodological triangulation was applied. Methodological triangulation can be classified as simultaneous or sequential (Morse, 1991):

"Simultaneous triangulation is the use of the qualitative and quantitative methods at the same time. In this case, there is limited interaction between the two datasets during the data collection, but the findings complement one another at the end of the study. Sequential triangulation is used if the results of one method are essential for planning the next method. The qualitative method is completed before the quantitative method is implemented or vice versa."

For the present inquiry a sequential triangulation of research methods was used, including focus group interview and survey research. This means that two different types of methods were used. One of these was qualitative and one was quantitative. Thus, the intended research can be subdivided into two stages: (1) focus group interviews, and (2) survey research,

In the second stage the quantitative survey method was applied (Dillman, 2000; Oppenheim, 2000). The findings from stage 1 as well as an extended literature review built the basis for the design of a questionnaire.

4.2 Population

This research was conducted by issuing questionnaires to the entire population of forty four (44) project managers working on various major capital projects at TFR across the country. The questionnaires were designed around the simplified four-point Likert scale using closed questions (Cooper & Schindler, 2001). The type of research to be undertaken can be classified as quantitative in nature. The survey was chosen because questionnaires are easy to compile, cost-effective and confidentiality of the respondents is guaranteed.

4.3 Sample

According to Cooper et al., (2001), statistical studies attempt to capture a population's characteristics by making inferences from sample characteristics. The eligibility criteria for the study participants were that they had to be project managers working on major capital projects within TFR. In this research, a census of the population was taken hence, there was no need to imply inferences from the sample data.

4.4 Data collection methods

Data was collected using questionnaire survey, distributed to all project managers involved in managing major capital projects at TFR. Data was also collected through focus group interviews conducted with the selected project decision-makers within TFR as an additional source of data collection and expert interview method.

4.4.1 Focus group interviews

Considering the nature of the study, a convenience sample method was used to conduct a group focus interviews with four Chief Engineers designated as Project Directors and the Chief Financial Officer in his capacity as the Chairman of the Investment Committee. The focus group interview helped finalize the design and content of the questionnaire. These five senior employees were excluded from the census. This is also in line with Leedy & Ormrod (2001) who used the term convenient sampling where people or other units that are readily available are chosen. This was decided by the researcher given the time constraints for the study completion.

Powell & Single (1996:499) describe this as a group of individuals selected and assembled by the researcher to discuss and comment on, from personal experience, the topic that is the subject of the research.

The main purpose of the focus group research according to Social Research Update (1997) is to draw upon respondent's attitudes, feelings, beliefs, experiences and reactions in a way which would not be feasible using other methods, e.g. observations, one-on-one interviews or questionnaire surveys. The article further mentions that these attitudes, feelings and beliefs may be partially independent of a group or its social setting, but are more likely to be revealed via social gathering and the interaction which being in the focus group entails. Comparing this to individual interviews, which aim to obtain individual attitudes, beliefs and feelings, focus group elicit a multiplicity of views and emotional processes within a group context. In conclusion, the article goes on to say that a focus group enables the researcher to gain larger amount of information in a shorter period of time. The advantages of focus group interviewing according to Wimmer & Dominick (1997:97) are that it is much cheaper and quicker to run than intensive one-on-one interviews and respondents tend to be more complete and less inhibited. Kitzinger (1994) suggests that the idea behind the focus group method is that group processes can help people explore and clarify their views in ways that would be less easily accessible in a one-on-one interview. Group discussion is particularly

appropriate when the interviewer has a series of open ended questions and wishes to encourage research participants to explore the issues of importance to them, in their own vocabulary, generating their own questions and pursuing their own priorities. Kitzinger (1994) goes on to list some of the potential advantages with focus groups as: it does not discriminate against people who cannot read or write; can encourage participation from those who are reluctant to be interviewed on their own and can encourage contributions from people who feel that they have nothing to say or who are deemed unresponsive (but engage in the discussion generated by a group).

On the other hand, Wimmer and Dominick (1997:641) claim that focus groups are not a good research methodology because of the potential influence of one or two respondents on the remaining members of the group. These critics say that a dominant respondent can negatively affect the outcome of the group and that group pressures may influence the comments made by individuals. Limitations can be overcome by careful planning and moderating, but others are unavoidable and peculiar to this approach.

For the actual focus group interview, the researcher managed to attend and handled one session of the focus interview with the decision makers (the CFO and 3 Project Directors) on major capital projects in TFR. Due to time constraints, the researcher was only given a hour after the Investment Committee meeting to conduct the interview. The interview was held on 09 February 2011 at Umjantshi Boardroom, Parktown and a recorder was used to record the conversation in addition to note taking. The focus group questions can be found in Appendix A.

4.5 Survey questionnaire

The questionnaire is used as a research instrument to gather large amounts of data in a relatively short period of time. Nadler (1997) explained that survey research is an efficient and effective tool to use when the desire is to obtain a large amount of data in a relatively short period. It is important to define what exactly a survey is. As defined by Hartley (2001:184) a survey is “a system for collecting information to describe, compare or explain knowledge, attitudes and behaviour”. Rossi & Freeman (1982) refers to the survey as “a systematic collection of information from large study groups, usually by means of interviews or questionnaires administered to samples of units in the population”. Moreover, there are three main components of surveys. Hartley (2001:185) defines them as 1) the systematic collection of information is the focus of the surveys; 2) the information gathered come from the respondent’s self report in which they indicate their views, expectations and reflections; 3) the sample of the survey must be representative of the whole population.

The data to be collected is limited and relative to the variables being examined in the questionnaire. The advantages are quite apparent. For one, it is very easy and inexpensive to administer to a large number of people simultaneously. Secondly, participants are likely to be comfortable in answering the questions since they can

maintain their anonymity. As such, they may tend to answer critical or sensitive questions more truthfully and inhibited. Also since the questions are pre-determined and standardized, the manner of asking the questions are generally consistent and devoid of any variability that may be due to changes in the manner of delivery if asked verbally, as in an interview. The disadvantage of this, however, is that questions may tend to be interpreted differently by the participants and there is usually no way of clarifying or asking for further questions unless the researcher is present during the time of the questionnaire completion. Another disadvantage of this method is the possibility of low response rates if it is administered to a large sample. This may be due to a number of factors, one of which may be failure of the respondent to turn in his or her answers on time. In addition, this method cannot be used when the subjects are illiterate.

4.5.1.1 Questionnaire form

Primary data was collected using a survey questionnaire. The self-administered, closed-ended 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 failures. 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 facing major projects and possible reasons for failures.

The questionnaire was divided into five parts and the sample of the questionnaire is attached in Appendix B. The formation of the parts was connected to the three research objectives of the research study.

- Part A was designed to gather respondent's background information such as age, race gender and years of experience in major capital projects within TFR.
- Part B was meant to collect information on what is the respondent's point of view on the project management approach currently followed in TFR. The aim was to relate the answers to the first objective of the study.
- Part C was designed to collect information on the respondent's point of view on the alignment between the project goals and business objectives to ascertain if there was any. The aim was to relate the answers to the second objective of the study.
- Part D was designed to gather the respondent's point of view on the appropriateness of present organizational (project) structure, culture, process and skills and competencies required to successfully manage major capital projects. The aim was to relate the answers to the third objective of the study.
- Part E was meant to collect information on the respondent's point of view on reasons for major capital project failures within TFR. The aim was to determine which factors the respondents felt were contributing to major capital projects failure in TFR.

The questionnaires were distributed via e-mail to various projects project managers. These participants were briefed on the objective of the survey and were requested to complete the questionnaire within three weeks. This control measure enabled the researcher to determine the turnaround time for the questionnaire completion without

compromising on the time constraints. The questionnaire was divided into various sections that focussed on fundamentals for projects failure. Questions were designed to target knowledgeable, experienced and suitably qualified individuals who are engaged in managing projects within TFR. The survey was made available for a period of no less than 30 days. If a minimum number of survey responses ($N = 30$) is not achieved at the end of the 30 day period, the survey access time will be extended with another 5 days. All participants were again solicited to complete the survey. A subject information letter was distributed to all participants to create awareness. The questionnaires were distributed in an electronic Microsoft excel via e-mail to all the project managers.

Employing a quantitative survey design was appropriate for this study, which sought to analyse the project manager' perception of root causes of major capital projects failure in TFR. Other reasons for a survey research design were its uniqueness, which involves gathering information not available from other sources, and its standardization of measurement, which describes the same information collected from every respondent. Consistent standardized measurement across all respondents ensures that comparable information was obtained about everyone who participated in the study.

4.5.2 Ethical considerations

Ethical considerations cannot be ignored in social science research. As a result, the governing principles of research ethics were followed to ensure the protection of the participants' rights and to meet ethical standards of Transnet Freight Rail. None of the participants was forced or coerced into being in the study. Participation was voluntary. Although participation in this study did not pose any risks to the participants, this principle of informed consent required that the prospective participants be fully informed about the procedures and any possibility of risks or discomfort. The confidentiality of the individual respondents was ensured. Any information that they shared was not made available to anyone who was not directly involved in the study. The participants were assured that their responses would remain anonymous. These ethical procedures were designed to safeguard the participants and minimize confirmation bias and other sources of invalidity (Johnson, 2004) that have the potential to be in every study.

4.6 Data analysis

Data coding of data will start upon receipt of completed surveys. Responses will be analysed by the researcher and include the use of descriptive statistics such as means, frequencies and standard deviation. Responses will be compared to ascertain whether the results obtained were significant and did not happen by chance. Responses will be collated on an excel spreadsheet and coded to assist in the analysis. The spreadsheet will be tested for validity and the results will be tabulated and graphically presented using the frequency distribution. All relevant questions on the questionnaire will be related to the objectives of the study.

4.7 Conclusion

The research methods and designs for this study were explained in chapter 3. The research locations, research subjects, research instruments, methods of data collection and data analysis methods were also explained. The researcher employed a quantitative survey research design (cross-sectional survey) and focus group interviews with the selected project director in TFR. A total of 44 project managers were invited to participate in the survey. Chapter 5 reports the findings structured around the research objectives addressed in this study. The chapter also includes descriptive statistics for the demographic variables.

5 Results and discussions

5.1 Introduction

The intent of this chapter is to summarise the results of the empirical research, based on the focus group interviews which were conducted and the replies to the questionnaires which were distributed to all project managers involved in managing major capital projects at TFR. The empirical research was done by means of a field study using a structured questionnaire.

5.2 Data collection and preparation

According to Cooper *et al.*, (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 designed and submitted to the entire population of project managers who work with 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 an intensive literature review, the focus group interview with the major projects decision makers and study of the environment and its influences, questionnaires were prepared using the four point Likert scale suggested by Cooper and Schindler (2001). Respondents were asked to complete questionnaires and e-mail them back to the researcher. Responses were transcribed onto an excel spreadsheet. Data were collated and responses were coded for the ease of statistical analysis.

Tests for validity and missing data revealed that every question had a valid response in addition, no respondent had left a question unanswered. Frequency distributions were calculated for each question. All relevant questions on the questionnaire were related to secondary objectives of the study.

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 and MANOVA recommended by Cooper (2001) for use on randomly selected samples, was not applicable.

As this was a census of the entire population of project managers within TFR, all questions were answered and means and frequency distributions appeared 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.

5.4 Results and analysis of findings

Results from the focus group interviews are presented followed by those from the survey questionnaire. An analysis of the findings with reference from the theoretical concepts discussed in Chapter 2 and Literature Review in Chapter 3 is made towards the end of this section.

5.4.1 Focus group interviews

5.4.1.1 Focus group questions

On beginning the focus group interview, the researcher established the rapport immediately by thanking the participants for their time. Due to time constraints, open-ended were asked, hence the response were general not specific. The participants of the focus group all had the same understanding of the company and the question that were asked. Responses were captured in writing and also recorded on the boardroom recorder. Below is a list of questions that were posed to the panel of participants and the responses received?

Project Management Approach

1. What criteria are used to appoint the project managers for the project? Please elaborate

The participants responded: "Experience, technical and people's skills are a necessity for the successful execution of any project. The challenge facing TFR with major projects is the absence of those skills. We tried in past to develop these skills only for TCP to come and poach our project managers. This is a HR issue because of differences in pay scales between or project managers and those of TCP".

"Leadership qualities, the right skills to match the project, a person who is well rounded in technical and managerial skills"

"It all depends on the type of the project, complexity and the amount capital involved. For high end projects technical, managerial and of course experience is very much needed"

2. Do you think the TFR concept of project management is clearly defined and understood, if not why?

The participants responded: "From where I'm standing, I think the concept is clearly defined and understood. I have to admit though that the concept seems to be good on paper and adherence is another story".

“Look we follow the lifecycle approach of the project. We do training on the lifecycle approach and I think every project manager should be used to it by now”.

“I think the overall approach is good, only the methodologies used in managing capital projects are failing”

“We have a formal structured approach to project management that is clearly defined and the project managers have their own approaches which they use to manage projects”

3. What are measures of success of a project, please elaborate?

The majority of the participants cited projects completed on time, within budget and to the correct specifications as the current measure of project success. One participant added successful meeting of the company objectives as an added measure to the triple-constraint. Another participant remarked “A project is considered failed if one or more of following statements are true:

- The financial budget is exceeded.
- The project is not delivered on time.
- The result does not meet the expectations created.
- Commitment to implement results is not ensured”

4. How involved are you with the project management team?

This was a personal question, two participants mentioned that they were closely involved with the project team with one participant acknowledging that “As a project director, it is my duty to be as intimately involved with the project team as possible, of course I am involved, although not nearly as much as I would like to be. One has to take into cognisance the fact that we have quite a number of projects executed at the same time across the country. It is thus impossible if not practical to be all over at the same time.

Structure, culture and processes

5. In your opinion, what sort of structures is most fitting for project management and is the current one appropriate; if not why is it not implemented.

The participants responded: “It is obvious that our current structure is failing in some respects, but it works relatively well in other cases, and changing the structure requires an overall restructuring of the whole company”.

“We try as much as we can to create the structures that are receptive to project management, structures that promote communication up-down and horizontally, but any structure is as good as the human factor who make it. We lack the necessary skills and expertise necessary for the management of major capital projects”.

“Integration is key to any structure; I think if different department can work together our structure will work”

6. Discuss why there is no multi-disciplinary team involvement in execution of major capital projects; don't you think this might be the root cause of projects failure if not why?

The participants remarked that multi-disciplinary involve cultural changes, and cultural changes need to be made if and only current cultural aspects are failing. One participant alluded to the fact that cultural changes involve a lot more than just changing our

structure “ people are used to situations, trying to alter the status quo will not only destabilize the company, but also we will not be able to deliver on our shareholder mandate”

7. Discuss why major capital project are not perceived as strategic as opposed to mega capital projects at TFR, what’s your opinion.

The participants responded by saying that the perception is wrong that major projects are perceived as non-strategic. The only difference was that mega projects were executed by Transnet Capital Projects in line with our shareholder agreement and besides stakes are high in mega projects where failure can make or break the company

Strategic Alignment

8. Do you think your decision to approve or reject any capital proposal is informed by the strategic objectives of the company?

All participants concurred with the statement, but that was in as far as the mega projects were concerned. “Yes, we try to link capital investments with the strategic objectives of the company; especially in as far as mega projects are concerned. You have to take into consideration that major projects mostly cater for regulatory, safety and environmental concerns of the company but that does not mean that they cannot be linked to the strategic objectives.

9. Do you think the project goals are revised if the strategic objectives of the company are changed?

The participants responded: “We have projects running for 10 to 20 years. The feasibility of changing focus of those projects midcourse is not possible. The long timescales of our projects make revising them often synonymous to fruitless and wasteful expenditure”.

“As much as we could try to review the project goals in relation to the strategy, strategy takes a long time to develop”.

“No, project goals are set at the beginning of the project and they are set in such a way that they are aligned to the strategy in the long-term”

10. Do you think capital projects are selected in line with the TFR business goals?

All participants concurred to the statement. “Yes, except projects addressing safety, regulatory and environmental issues”. One participant remarked “it all depends on the nature and type of a project. If we think that the project has more to offer, it obviously has to be aligned to or strategic objectives, but we are dealing here with many projects of values ranging from R5m to R20m which cannot possibly be given the same status as the projects ranging from R50m to R100m for example”

Reasons for projects failure

11. Discuss the key factors that cause major capital projects failure?

The participants alluded to the fact that the major challenges facing TFR currently seem to stem from the way they approach the management of capital projects. They agreed that not much attention is paid to major project as opposed to mega projects. “We seem

to treat major project as sustaining Capex with little prospect of adding capacity or bottom line to TFR”.

The human resource factor came up as one of the major contributor of failure to major capital projects. “Not many project managers are equipped with necessary skills, experience and expertise to handle major capital projects. I think we just don’t reward them enough. We cannot afford to pay market related salaries to experienced project managers given the current state of the company and that’s our constraint.

Structural defects, not having an effective functioning project support office, poor planning and silo effects were some of the factors put up as major causes of capital projects failure within TFR.

“Lack of a defined scope and a lack of a defined project and not communicating out to all those out is always an issue.”

12. Discuss why TFR currently have a high percentage of major capital projects failure

The participants all mentioned various factors to which in their opinion they thought were contributing to the failure rate on major capital projects. Some of the factors mentioned included:

- Clear statement of requirements
- Proper planning and estimator factors
- Project implementation factors
- Human factors
- Inappropriate use of scheduling methodologies
- Projects are lack of user input, incomplete
- Requirements and specifications, and changing requirements and specifications.
- Lack of proper resources
- Poorly defined scopes etc.

5.4.1.2 Concluding remarks

Due to time constraints, the project directors reminded the researcher of their prior engagements. Although, these were not only the questions prepared for the focus group interview, the researcher feel that the questions posed were able to share some light on the major reasons for major capital projects failure in TFR.

5.4.2 Survey research

In total thirty nine research questionnaires were collected. Thirty eight (38) were legitimate and one (1) questionnaire spoiled. The responses were collated on an excel spreadsheet. Responses were coded to assist in the analysis process. The various questions on the questionnaire were categorized with respect to applicability to the secondary 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 secondary objectives supporting the research question. 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.

The rating system used was a Likert scale type, a four point scale that is used to quantify opinion based on the formulated questions or items. A Likert scale is a type of psychometric response scale often used in questionnaires and is the most widely used scale in survey research. When responding to a Likert questionnaire item, respondents specify their level of agreement with the statement. The scale is named after Rensis Likert, who published a report describing its use (Likert, 1932)

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 = agree

Response rated 4 = strongly agree

5.5 Research results

5.5.1 Demographic profile of respondents

The demographic profile of the respondents is shown in Figures 5.1, 5.2 and 5.3. The respondents' demographic profile was limited to their race, age and gender as this was not deemed crucial for this study. Further profiling was however done to determine the amount of project management experience that the respondents have within TFR in Figure 5.4.

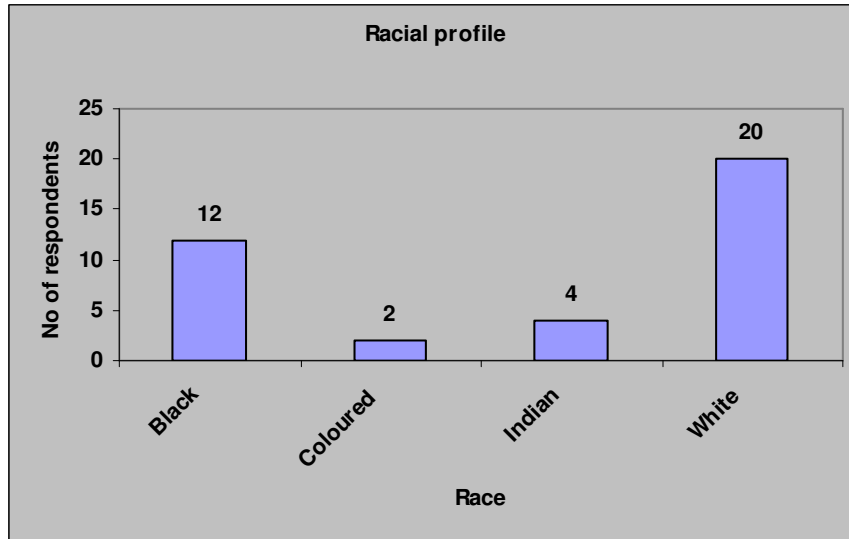


Figure 5-1: Racial profile

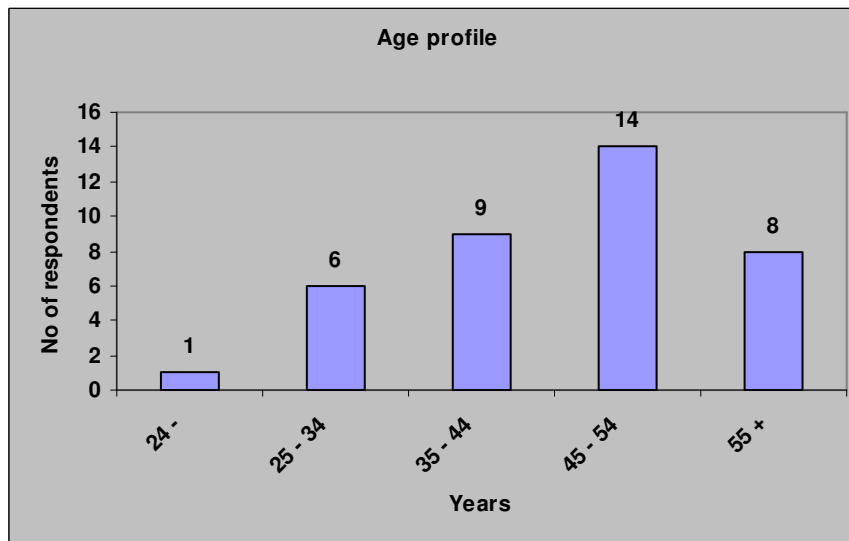


Figure 5-2: Age profile

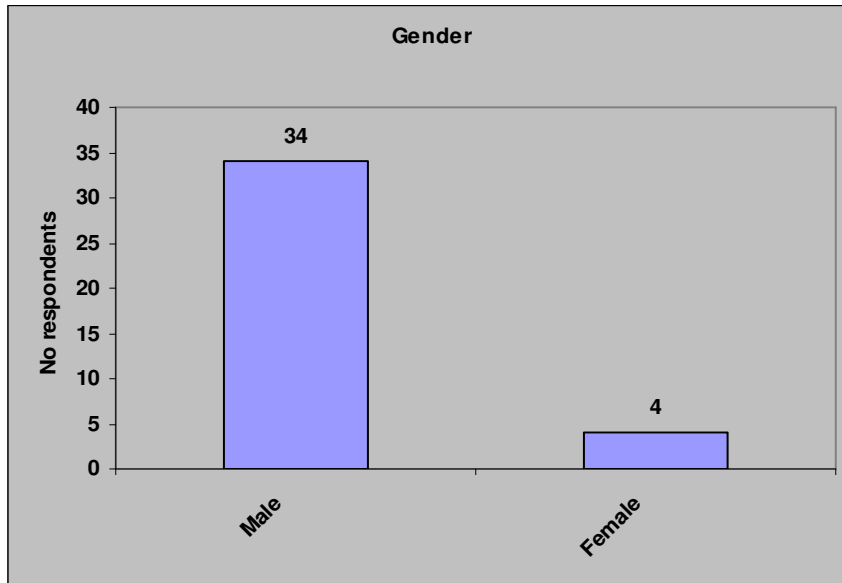


Figure 5-3: Gender profile

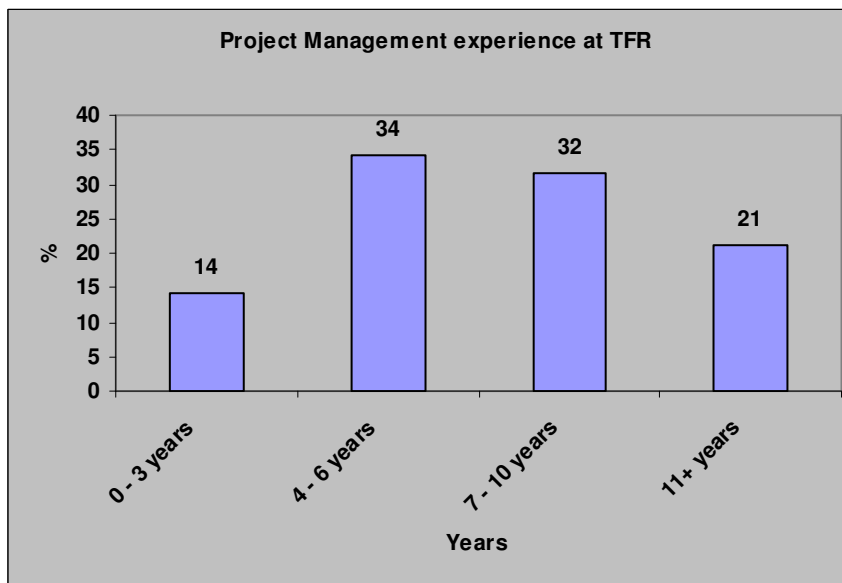


Figure 5-4: Project management experience within TFR

As can be seen from the profile, the respondents were mostly male (89%) and white (53%). The age profile is more varied though with the largest section of the profile being respondents aged between 45 and 54 (37%).

The respondents, on average, have project management experience within TFR of 9.5 years. Finding 1: The respondents were a highly experienced group of project managers with a fair level of project management experience within TFR.

5.5.2 Results for secondary objective 1

To compare the conventional TFR project management approach with the modern business approach to identify gaps and inconsistencies in the project management approach.

5.5.2.1 Response to question 5

Question 5: TFR concept of project management is clearly defined and understood.

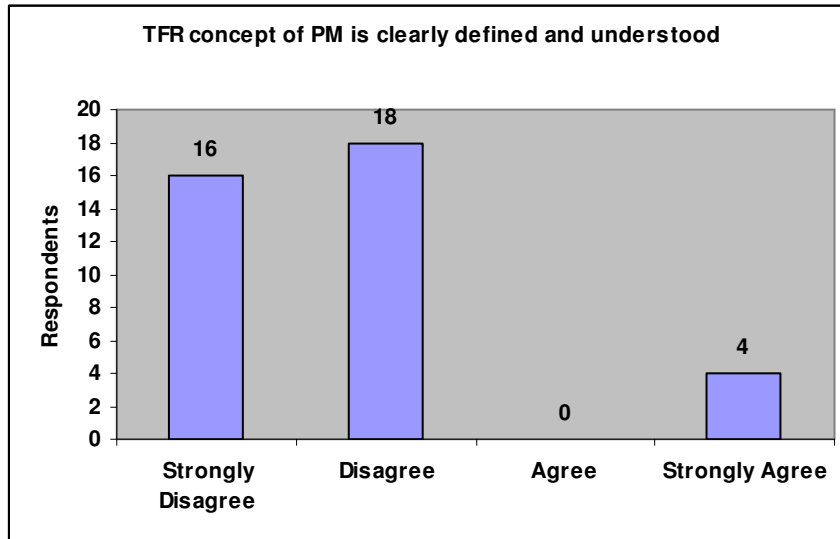


Figure 5-5: TFR concept of PM clearly defined and understood

The results show that the majority of respondents 18 out of 38 disagree and another 16 respondents strongly disagreed with the statement that the TFR concepts of project management is clearly defined and understood. It is perfectly clear from the above response that the TFR concept of project management is not clearly defined and understood by the majority of project managers.

5.5.2.2 Response to question 6:

Question 6: The Project Manager with the right skills to match the project is appointed.

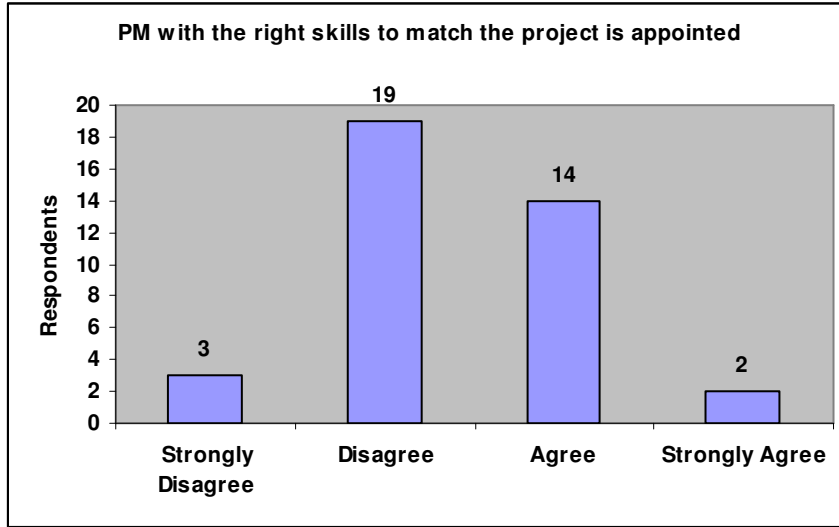


Figure 5-6: PM with right skills

The majority, nineteen (19) of the project managers felt that there is a mismatch between the skills and the appointment of project manager to manage the project. This mismatch could be because of various issues including the diverse nature of major capital project projects executed or different scale and number of project executed by one project manager at the same time.

5.5.2.3 Response to question 7

Question 7: The project manager is involved in the project selection process.

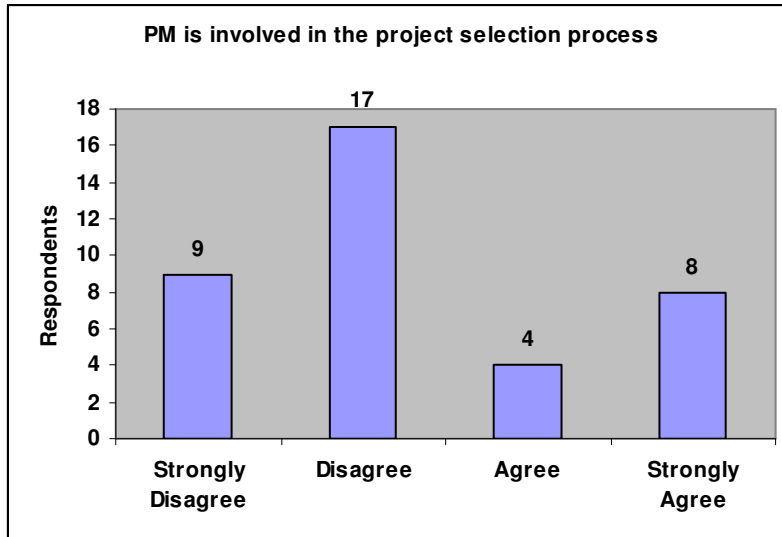


Figure 5-7: PM involved in selection process

The most frequent response to this question was 'disagree'. Seventeen of thirty eight respondents noted from their past experience that project managers are not

involved in the project selection process. This could be the direct result of the appointment of project manager according to Transnet E5 condition of Contracting and Engineering (2008) where the project manager is only appointed during the tender award stage instead of the conceptual phase.

5.5.2.4 Response to question 8

Question 8: Principles of project management are applied uniformly

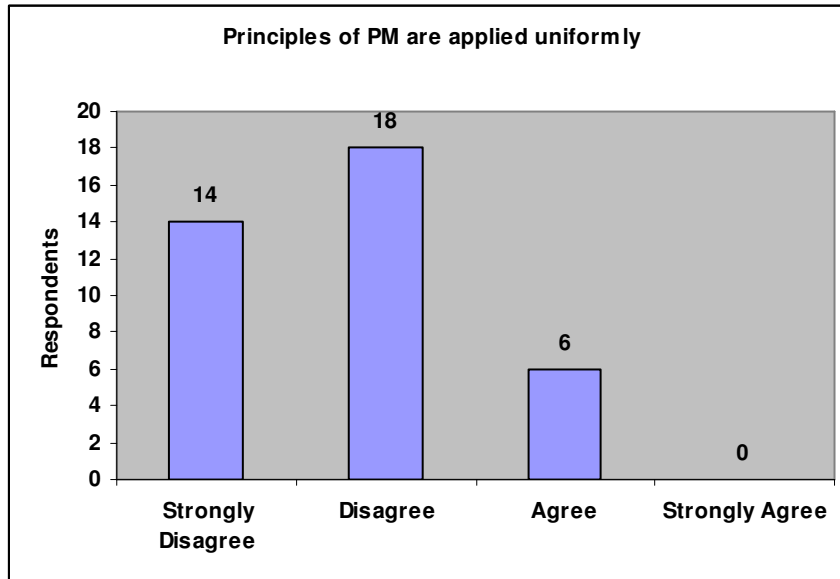


Figure 5-8: Principles of PM applied uniformly

The most frequent response to this question was 'disagree' Eighteen of the thirty-eight respondents believe that the principles of project management are not applied uniformly on all projects. This could mean that some project managers sometimes used their own methods and project management techniques when managing projects.

5.5.2.5 Response to question 9

Question 9: The project manager is appointed at the concept phase of the project.

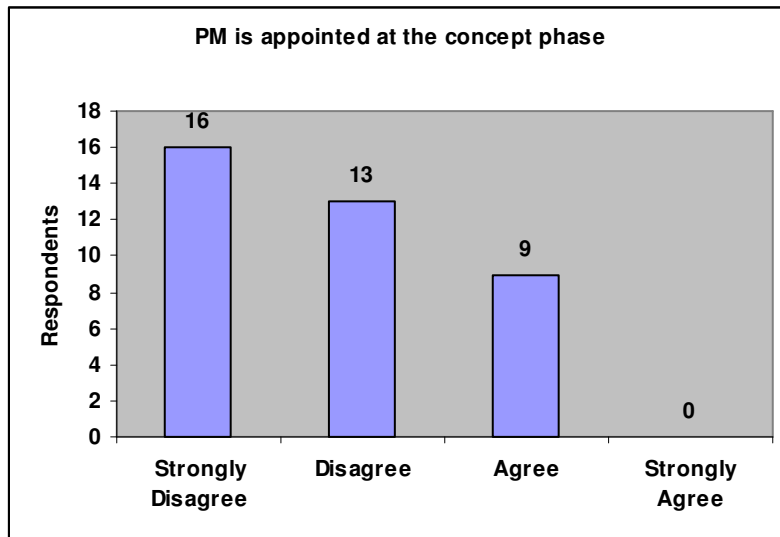


Figure 5-9: PM appointed at concept phase

The overwhelming majority of the respondents, twenty-nine (29) out of the total of thirty-eight (38) respondents noted from their past experience that project managers are not appointed at the concept stage of the project.

5.5.2.6 Response to question 10

Question 10: Project outcomes are always clearly defined by the sponsor

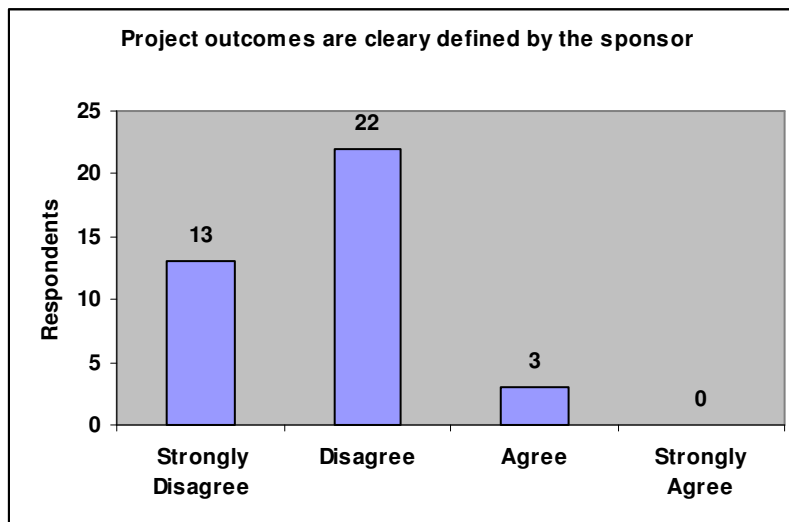


Figure 5-10: Project outcomes are clearly defined

Twenty-two of the thirty eight respondents disagreed with the statement that the project management outcomes are clearly defined by the sponsor.

5.5.2.7 Response to question 11

Question 11: General lack of leadership (from project owner)

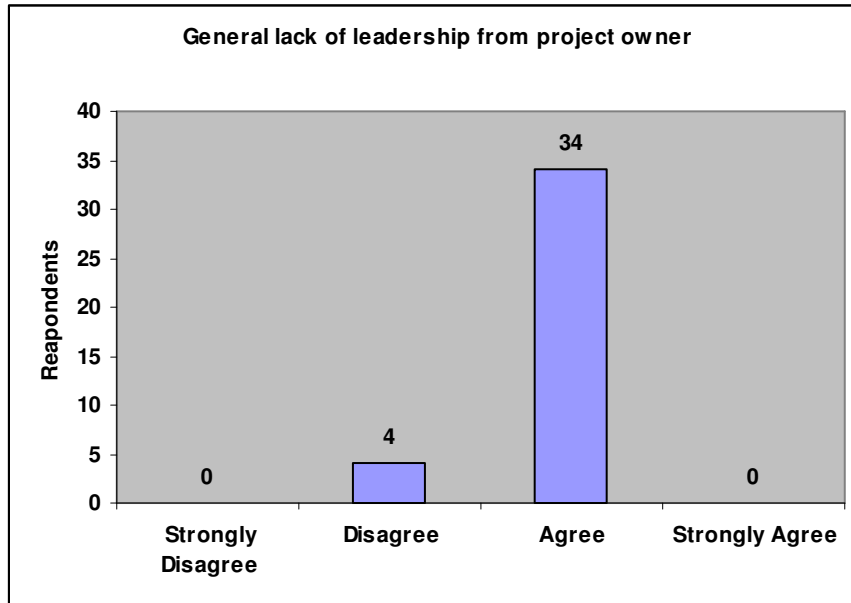


Figure 5-11: General lack of leadership

The majority (thirty-four) of the project managers felt that there is a general lack of leadership from the project owners to take decisions and solve problems in timely manner.

5.5.3 Summary of results for objective 1

The majority of the respondents felt that

- The TFR concepts of project management is not clearly defined and understood
- There is a mismatch between the appointment of the right project manager to manage the project i.e. the project manager with the right skills is not appointed to manage the project
- The project manager is not involved in the selection of the project
- The principles of project management are not applied uniformly on all projects
- The project managers are not appointed at the concept stage of the project
- The project management outcomes are not clearly defined by the sponsor
- there is a general lack of leadership from the project owners to take decisions and solve problems in timely manner.

5.5.4 Secondary objective 2:

To ascertain the alignment between business goals and project goals within TFR

5.5.4.1 Response to question 12

Question 12: Projects selected in line with business goals

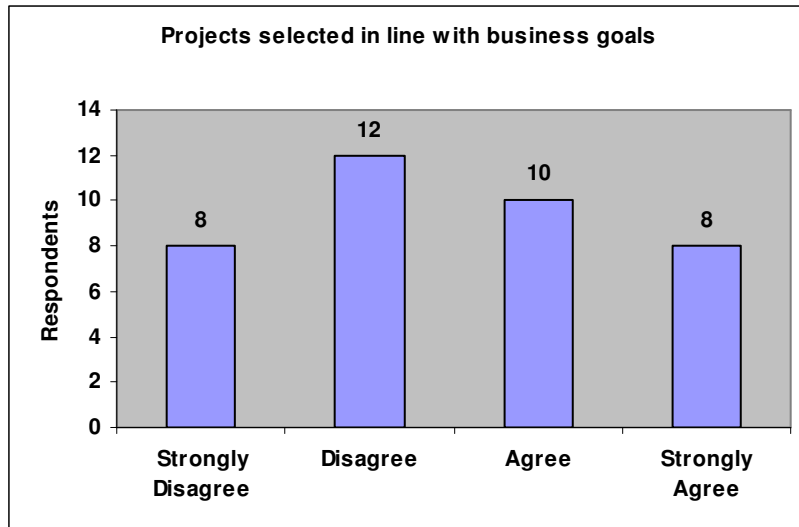


Figure 5-12: Projects selected in line with business goals

The most frequent response to this question was 'disagree'. Twelve of the thirty-eight respondents believed that the projects are not selected in line with the business goals.

5.5.4.2 Response to question 13

Question 13: Project outcomes aligned with business goals

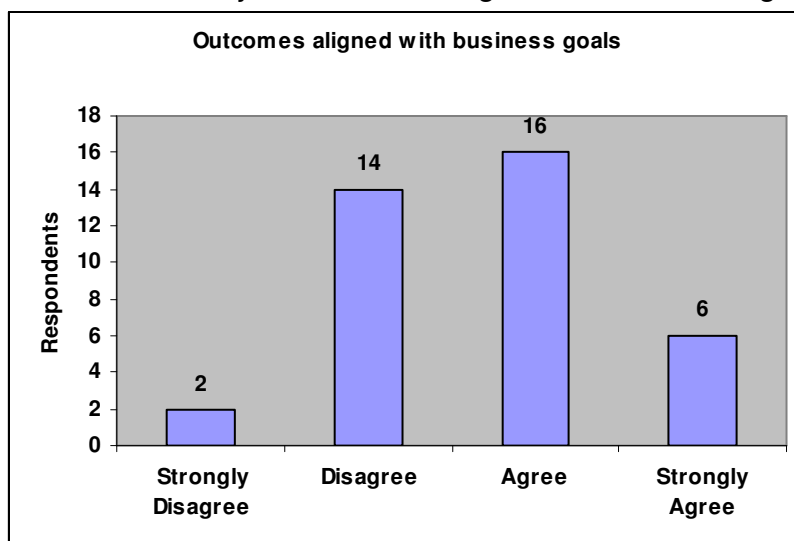


Figure 5-13: Outcomes aligned to business goals

The most frequent response to this question was 'agree'. Sixteen of the thirty-eight respondents affirm that the project outcomes are aligned to the business goals.

5.5.4.3 Response to question 14

Question 14: Project results satisfy the business requirements in the long-term (beyond 5 years)

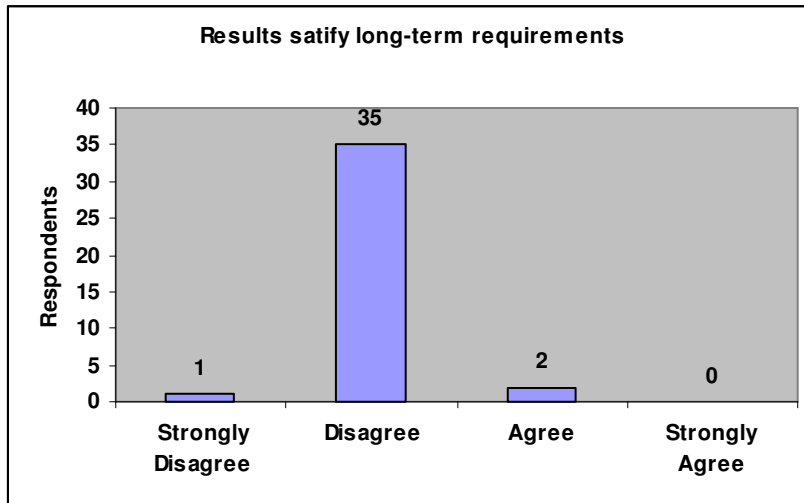


Figure 5-14: Results satisfy long term requirements

The most frequent response to this question was 'disagree'. Thirty-five of the thirty-eight respondents believed that project results do not satisfy business requirements in the long term.

5.5.4.4 Response to question 15

Question 15: Identified strategic goals are clearly formulated so that projects could be defined from them.

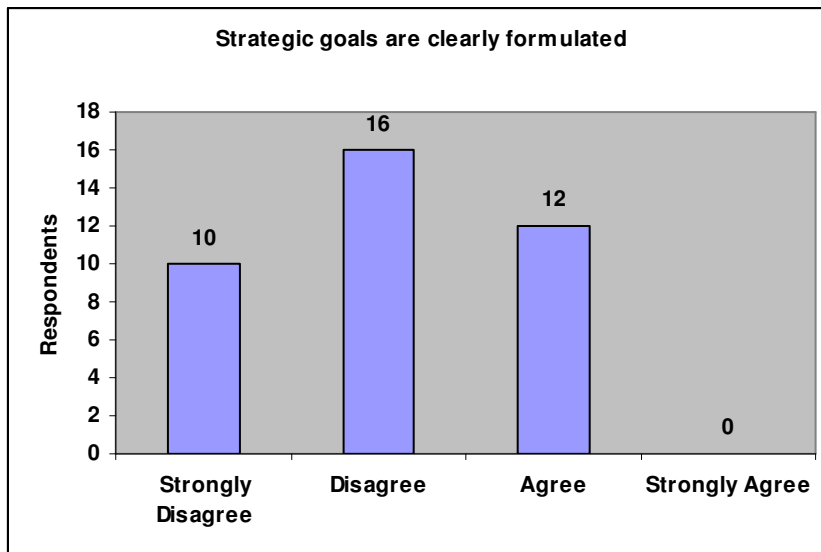


Figure 5-15: Strategic goals are clearly formulated

The majority of the respondents, sixteen project managers felt that the strategic goals are not clearly formulated so that projects could be defined from them

5.5.4.5 Response to question 16

Question 16: Project results have a strategic fit in the design and execution of future products and services.

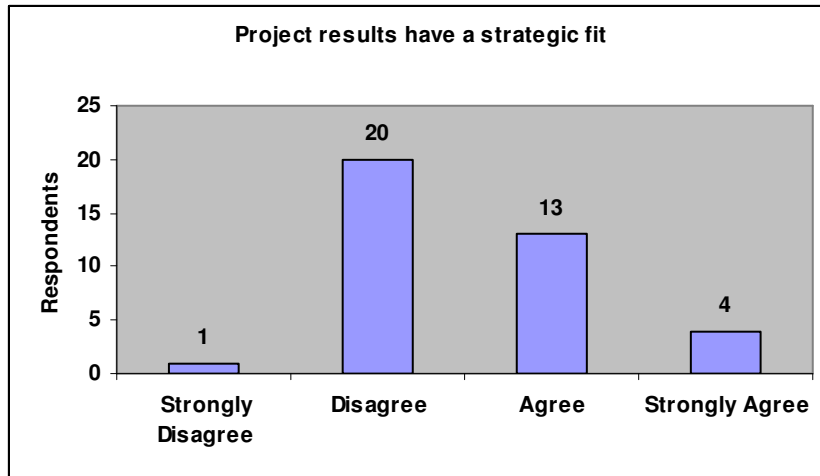


Figure 5-16: Results have strategic fit

The most frequent response to this question was 'disagree'. Twenty out (20) of thirty-eight respondents disagreed while thirteen of the respondents agreed that project results have a strategic fit in the design and execution of future products and services.

5.5.4.6 Response to question 17

Question 17: Projects are selected in line with business growth and expansion strategies

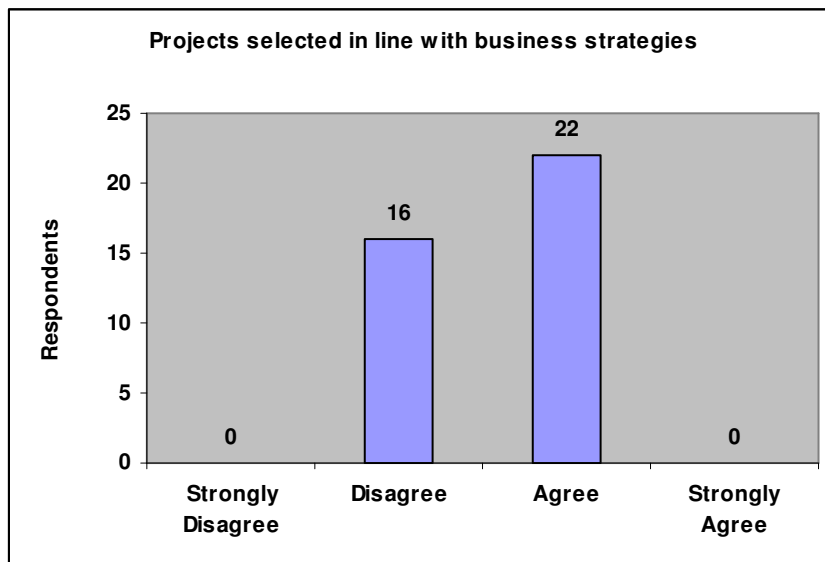


Figure 5-17: Projects in line with business strategies

The most frequent response to this question was 'agree'. Twenty-two (22) of the thirty-eight respondents believe that projects are selected in line with business growth and expansion strategies.

5.5.4.7 Response to question 18

Question 18: Changes in the strategic goals is invariably followed by changes in project goals

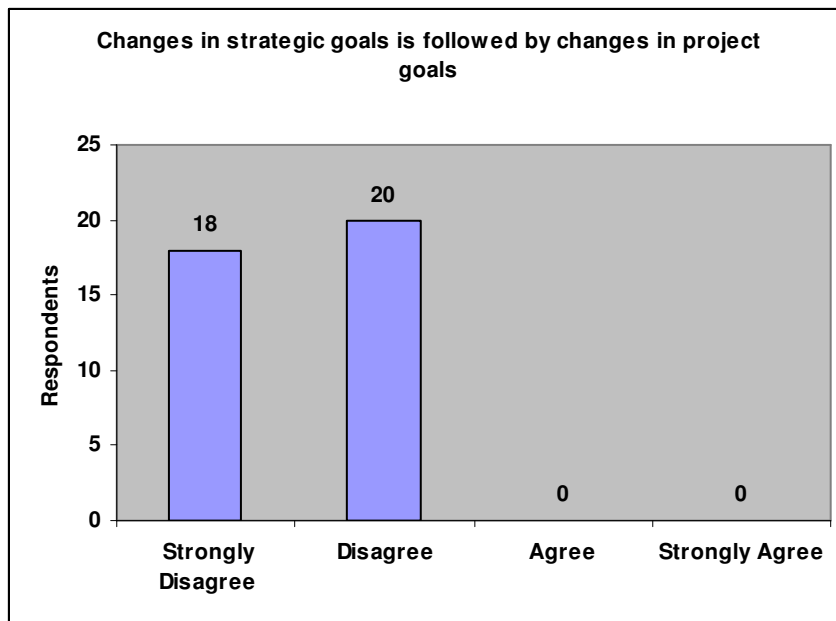


Figure 5-18: Changes in strategic goals

The most frequent response to this question was 'disagree'. Twenty (20) and eighteen (18) of the thirty-eight respondents disagreed and strongly disagreed respectively with the statement that changes in strategic goals are followed by changes in project goals.

5.5.5 Summary of results for objective 2

The majority of respondents believed that

- The projects are not selected in line with the business goals
- The project outcomes are aligned to the business goals
- The project results do not satisfy business requirements in the long term
- The strategic goals are not clearly formulated so that projects could be defined from them
- The project results do not have a strategic fit in the design and execution of future products and services;
- The projects are selected in line with business growth and expansion strategies
- Changes in strategic goals are not followed by changes in project goals

5.5.6 Secondary objective 3:

To review the structures, cultures and processes used in establishing and managing major capital projects and to make recommendations on how these could increase major capital project success within TFR.

5.5.6.1 Response to question 19

Question 19: PM has PM knowledge to complete the project

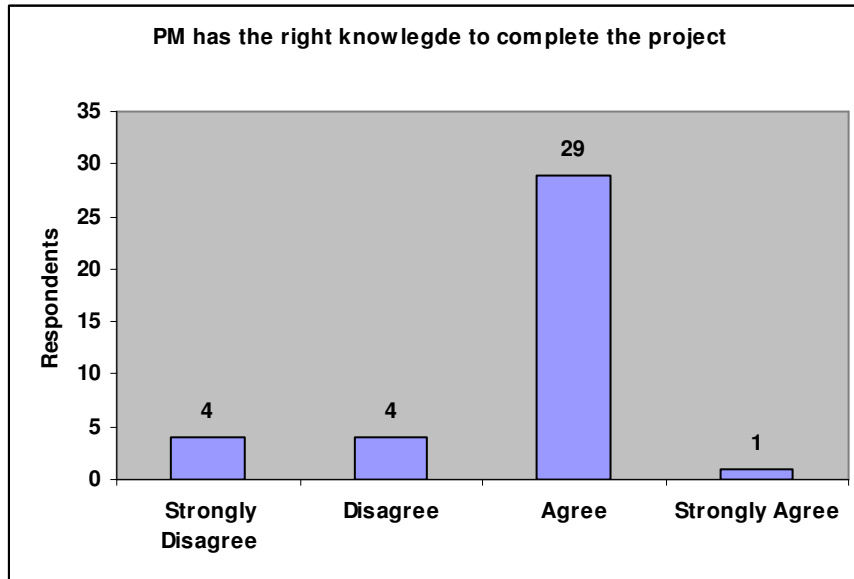


Figure 5-19: PM has the right knowledge

The most frequent response to this question was 'agree'. Twenty-nine (29) of the thirty-eight respondents believed that the project manager appointed to manage the project has the right knowledge and skills to manage the project.

5.5.6.2 Response to question 20

Question 20: The project manager has the necessary authority and power to control the execution of the project.

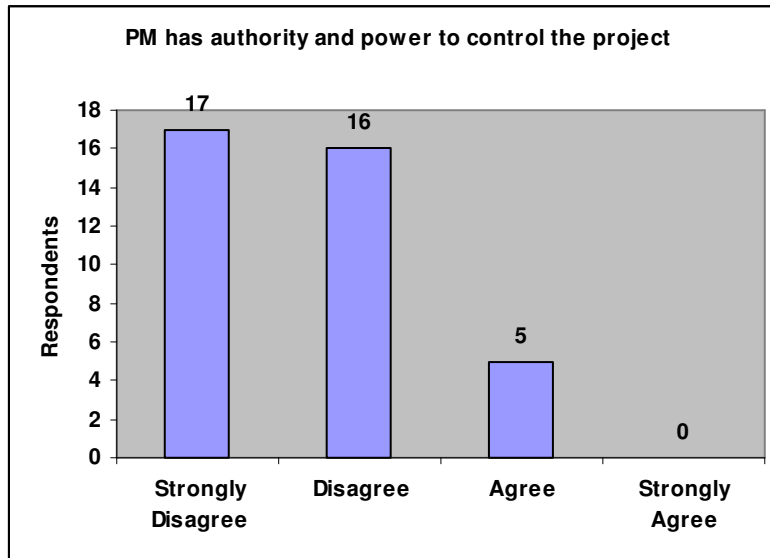


Figure 5-20: PM has authority and power

The most frequent response to this question was 'strongly disagree'. Seventeen (17) and sixteen (16) of the of thirty-eight respondents disagreed and strongly disagreed respectively with the statement that the project manager has the necessary authority and power to control the execution of the project

5.5.6.3 Response to question 21

Question 21: Project deliverables are generally produced on time and within budgets

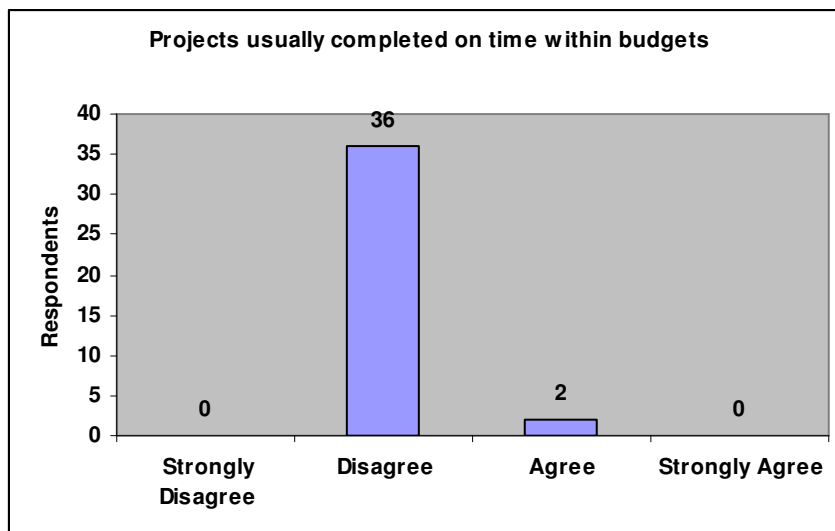


Figure 5-21: Projects completed on time

A whopping thirty six (36) of the thirty eight respondents felt that the major capital projects were not completed on time and within budgets and that is a true reflection on major projects within TFR as evidenced by the high failure rate.

5.5.6.4 Response to question 22

Question 22: Appropriate project management structures are used to manage the capital projects.

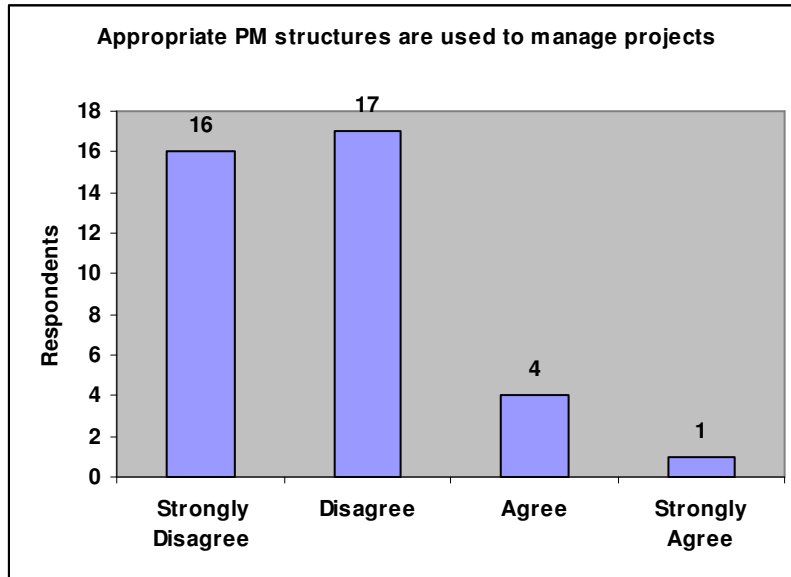


Figure 5-22: Appropriate structures are used

The most frequent response to this question was 'disagree'. A whopping seventeen (17) and sixteen (16) of the thirty eight project managers disagreed and strongly disagreed respectively with whether appropriate structures are used to manage the projects.

5.5.6.5 Response to question 23

Question 23: There is generally support from other functional departments for the successful implementation of the project.

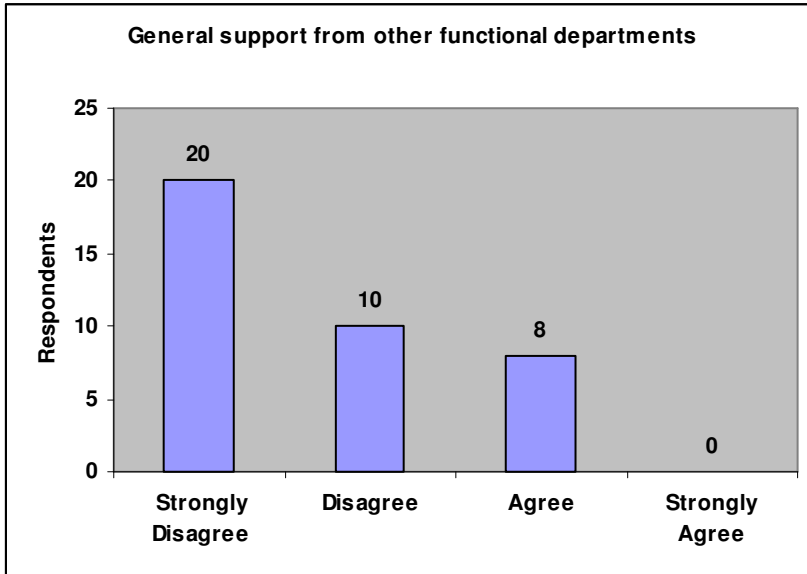


Figure 5-23: Support from other departments

The most frequent response to this question was 'strongly disagree'. Twenty (20) of the thirty-eight project managers felt there was generally no support from other functional departments. This is attributed partly to the functional structures used by the Capital Program department.

5.5.6.6 Response to question 24

Question 24: Cultural and ethical differences

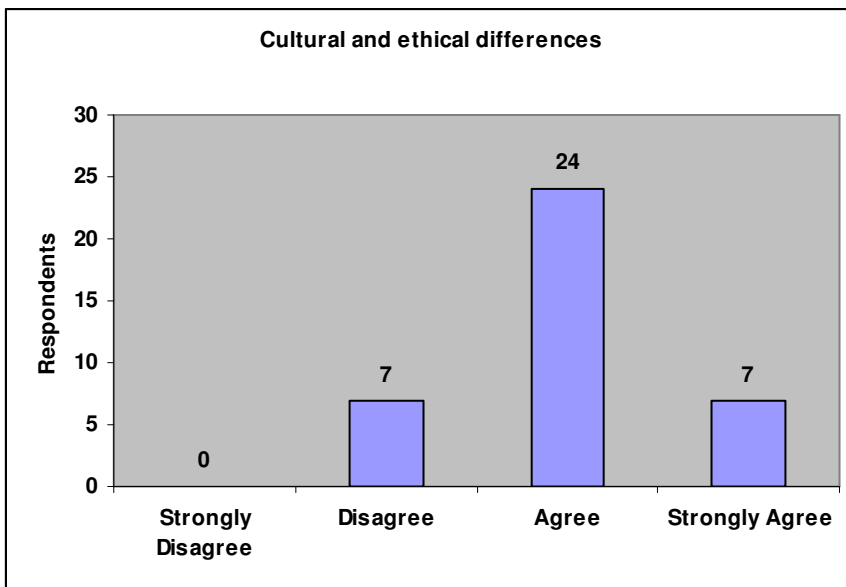


Figure 5-24: Cultural and ethical differences

The majority, twenty four (24) of the project mangers felt that cultural and ethical differences are a recurrence problem on projects.

5.5.6.7 Response to question 21

Question 21: The project managers feel that they have the right skills, capacity and experience to deliver the project successfully

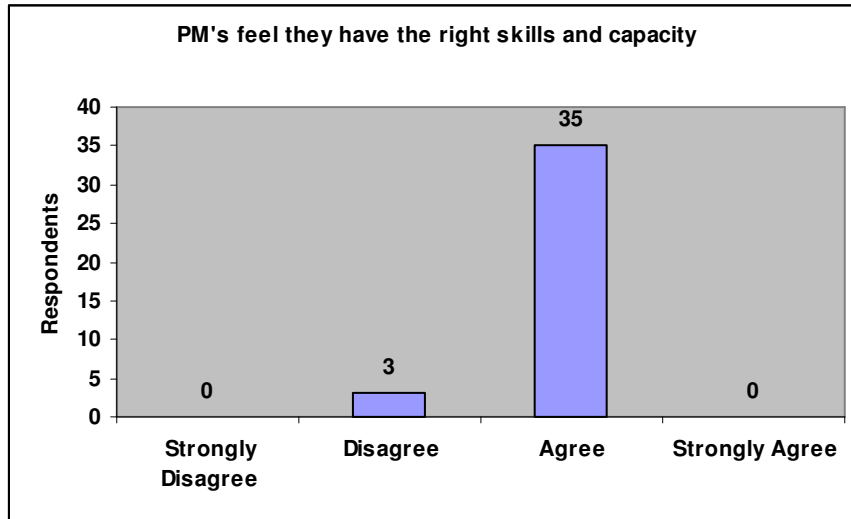


Figure 5-25: PM's feel they have the right skills

The most frequent response to this question was 'agree'. An overwhelming thirty-five (35) of the thirty-eight respondents believed that the project managers have the right skills, capacity and resources to successfully manage the project.

5.5.7 Summary of results for objective 3

The majority of the respondents felt that

- The project manager appointed to manage the project has the right knowledge and skills to manage the project
- The project manager has no authority and power to control the execution of the project
- The major capital projects were not completed on time and within budgets
- Inappropriate structures are used to manage the projects
- There was generally no support from other functional departments
- Cultural and ethical differences are a recurrence problem on projects
- Project manager have the right skills, capacity and resources to successfully manage the project

5.5.8 Discussion per objective and integration

5.5.8.1 Objective 1

To compare the conventional TFR project management approach with the modern business approach to identify gaps and inconsistencies in the project management approach.

TFR concepts of project management is clearly defined and understood.

90% of the respondents either strongly disagreed or disagreed with the statement that the concept of project management is clearly defined and understood. That points directly to the inconsistencies and gaps in approach to project management at TFR. However, the results of the focus group painted another picture, most of the participants asserted that the concepts of project management are clearly defined and understood with one participant remarking however that it might be defined only on paper with no adherence by the project managers. Another participant admitted that although the concept is defined, the project managers might be using their own approaches. As Phillips et al. (2002) remarked “in the past project management was about “figuring it out as we go” or about relying on just a few within the organization who were inherently good at managing projects. With the high cost of project failure, it is not smart business to let individuals and teams “figure it out as they go, with the hope that they will be good at it”. It is the responsibility of senior management to make sure that the concept of project management is clearly defined and understood by all the project managers working on major capital project.

Conclusion drawn

Due to the inconsistency in the results, the researcher believes there is an insufficient ground to conclude that the TFR concept of project management is not clearly defined and understood.

PM with the right skills to match the project is appointed to manage the project.

50% of the respondents disagreed against 38% who agreed that the project manager with the right skills to match the project is appointed to manage the project. The results of the focus group indicated that all participants felt that the project manager with the experience, technical and people’s skills is appointed to manage the project. One participant remarked that “it all depend on the type of the project, complexity and the amount capital involved”. The selection of the project manager is one of the most crucial elements of project success. Effective project management requires that the project manager and his team to 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.

Conclusion drawn

Although 58% of the respondents disagreed while 42% agreed, the researcher feels that there is insufficient difference between those who agreed and those who disagreed. In light of these responses, the researcher cannot draw any firm conclusions as to whether the right project manager with the right skills to match the project is appointed to manage the project.

The project manager is involved in the project selection process

68% of the respondents answered that the project manager is not involved in the project selection process against the 32% who agreed that the project manager is involved in the selection process. PMBOK (2004) 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.

Conclusion drawn

Given that the majority of respondents disagreed, it may be concluded that the project manager is not involved in the project selection process

Principles of project management are applied uniformly

84% of the respondents either strongly disagreed or disagreed with the statement that the principles of project management are applied uniformly irrespective of the size of the project. These results confirm the earlier assertion that pre-feasibility (FEL-1) and feasibility (FEL-2) studies on major projects which is the normal practice followed by the Project Life Cycle are not undertaken at TFR in as far as major capital projects are concern.

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 sightedness, 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.

Conclusion drawn

Given that the majority of respondents disagreed, it may be concluded that the principles of project management are not applied uniformly irrespective of the size of the project.

The project manager is appointed at the concept phase of the project

42% of the respondents strongly disagreed and 34% disagreed that the project manager is appointed at the concept phase 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. According to the Transnet E5 condition of Contracting and Engineering (2008), the appointment of the project manager only happens at the tender award stage and is born out of the contract. The Transnet E5 condition of Contracting and Engineering (2008) is designed to cover the legal requirements of every contract within a project. It lists the duties and functions of the project manager, defined within the Transnet environment. In essence, the role of the project manager here is confined to the overall budgetary and contractual (legal and financial) controller and control over the contract and the project as a whole. Clearly, the scope, quality and time controls are excluded from the functions of the project manager and included in the functions of the technical officer or engineer.

The PMBOK (2004) 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 manager 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.

Conclusion drawn

Given that the majority of the respondents (76%) disagreed, it can be concluded that the project manager is not appointed at the concept phase of the project.

Project outcomes are always clearly defined by the sponsor

Almost 92% of the respondents either strongly disagreed or disagreed completely with the statement that project outcomes are always clearly defined by the sponsor. Not understanding the true needs of the company can prompt project managers to jump to a quick solution, decreasing the chances for selecting the best solution. Solution jumping can take place in the department where the problem/opportunity is identified, or by the project manager himself/herself. Sometimes the project manager feels the pressure to get the project started right away without understanding the true needs of the company. Without this true understanding, it is very difficult to select the best solution to the problem. Project sponsors at TFR seems not willing to ensure that project managers are familiar with the project outcomes by holding weekly meetings to discuss and debate new and ongoing projects, increasing the odds for selecting the best solution, and keeping projects on schedule (Heekens, 2002).

Conclusion drawn

Given that the majority of the respondents (76%) disagreed, it can be concluded that the project outcomes are not always clearly defined by the sponsor.

General lack of leadership (from project owner)

90% of the respondents concurred with the statement that there is a general lack of leadership from top management especially the project sponsor. This is also supported by the results of the focus group interview, when the participants were asked how involved they were with the project team. One answered that it was impossible to be in two places at the same time with another admitting that he is not involved as much as he would like to be.

This is also supported by the findings by Hamlin (2001). According to (Hamlin, 2001, p. 16) an extremely high rate (90%) of all projects fail because top managers do not get actively involved, lack project leadership and leave the implementation issues to middle managers. (Senge, 1999, p. 10) states the need for a strong sponsorship by arguing that there is no point in going forward unless the top manager is aboard. Leaders have to *“Walk the walk and talk the talk”*, and lead by example, if they are to be respected by followers (Lewis, 2003, p. 100)

This is strongly supported by the investigation of BCS (BCS, 2004: 21) that states that without strong, sustained, and high-quality leadership, capital projects are almost doomed to failure from the start. In addition, the investigation of (Hinge, 2003: 1) states that lack of a strong executive senior sponsor is a good predictor of failure or difficulty during change projects.

Conclusion drawn

Given the positive response to this question from a majority of respondents, it may be concluded that there is a general lack of leadership from project owner.

5.5.8.2 Objective 2

To ascertain if there is alignment between business goals and project goals within TFR.

Projects selected in line with business goals

This was almost evenly contested with 53% of the respondents disagreeing with the statement and 47% agreeing with the statement that projects are selected in line the business goals. The results of the focus group interviews were also not clear on whether the projects are selected in line with the business goals, one participant even made the comment that projects are selected in line with business goals in as far as mega projects were concerned.

According to Cleland and Ireland (2002), 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), 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.

Conclusion drawn

Given the fact that the results were almost even, 53% disagreed and 47% agreed, the researcher believes there is insufficient grounds to conclude that major capital projects are selected in line with the business objectives.

Project outcomes aligned with business goals

Again this statement was almost evenly matched with the majority 58% of the respondents agreeing against the 42% who disagreed with the statement that the project outcomes are aligned with the business goals. The results of the focus group interviews are also not conclusive with one participants remarking that major projects unlike mega projects mostly cater for regulatory, safety and environmental concerns of the company.

The long term project strategic plans are usually developed at the top executive level and implemented by middle management. In most cases, these middle managers do not understand the organization's capabilities and top management's expectations. In many organizations, business projects are only loosely connected to the bigger picture of the business strategy (Grundy & Brown, 2002). This poses a problem in the successful completion of these projects. For an organization to achieve its objectives and goals, it must have a strategy for managing its projects in a way that captures their full value and effectively maps them to the needs of the organization (Johnson, 2003:1).

Project portfolio management is one of the methods used to integrate the projects and business strategy. Studies show that companies rarely evaluate the outcomes of the projects within the portfolio, whether these outcomes really have contributed to the organization's goals (Dooley et al., 2005). There is however, no evidence that project portfolio theory is used in managing the major capital projects at TFR.

Conclusion drawn

Given the fact that the results were almost evenly matched, 42% disagreed and 58% agreed, the researcher believes there are insufficient grounds to conclude that major capital projects outcomes are aligned to business goals.

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

An overwhelming majority of the respondents 92% disagreed that the project results satisfy the 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.

Conclusion drawn

Given that the overwhelming majority of the respondents (92%) disagreed, it can be concluded that the project results do not satisfy the business requirements in the long term.

Identified strategic goals are clearly formulated so that projects could be defined from them.

68% of the respondents disagreed while 32% agreed with the statement that identified goals are clearly formulated so that projects could be defined from them.

As previously established by the majority of project managers who answered that projects selected in TFR seem not to be aligned to business goals, it would be expected that the identified strategic will also not be clearly formulated so that projects could be defined from them.

Porter (1996) points out the need for a strategic fit between each activity and the overall strategy of the firm. Therefore, for organizations, this translates into projects being the main business activities and the performance of the company's project portfolio indicating to which degree the organization can differentiate itself from the competition. Here, the direction of the business strategy takes a crucial part in composing the project portfolio (Cooper et al., 1999) and this ultimately underlines the benefits of actually having each project portfolio aligned with the company's strategic objectives.

Conclusion drawn

Given that the overwhelming majority of the respondents (68%) agreed, it can be concluded that the identified goals are clearly formulated so that projects could be defined from them

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

55% of the respondents disagreed while 45% agreed that project results have a strategic fit in the design and execution of future products and services. 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. If the project does not fit, then the project should not go ahead and the organization should not invest in the project. If it does, this will help to identify its overall priority and importance to the organization (Harpham, 2003). As has been pointed out by Porter (1996) the strategic fit between an organization's business strategy and its actions is necessary for achieving sustainable competitive advantage. Moreover, the direction of the business strategy is a key driver in composing project portfolios (Cooper et al., 1999). Therefore, achieving an alignment between the business strategy and the project portfolio is of vital importance for the successful performance of the portfolio and hence the organization in general.

Conclusion drawn

Given the fact that the results were almost evenly matched, 55% disagreed and 45% agreed, the researcher believes there are insufficient grounds to conclude that major capital projects outcomes are aligned to business goals.

Projects are selected in line with business growth and expansion strategies

58% of the respondents agreed while 42% disagreed 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.

Conclusion drawn

Given the fact that the results were almost evenly matched, 42% disagreed and 58% agreed, the researcher believes there are insufficient grounds to conclude that major capital projects selected in line with business growth and expansion strategies..

Changes in the strategic goals is invariably followed by changes in project goals

An overwhelming majority 100% of the respondents either strongly disagreed or disagreed with the statement that change in strategic goals is invariably followed by

changes in project goals. The results of the focus group also concurred with these results that project goals were not changes if the strategic goals changes. The participants remarked that due to long timescales of certain projects, it was nearly impossible to change the project goals midway just because the strategy has changed.

It projects are oriented towards enhancing the features of an existing product or service that has been discontinued then time, resources and efforts are wasted or if projects have a goal that is no longer aligned to the strategy and has a very small chance of achieving the organizational goals, then these projects would also be redundant and, logically, should be killed regardless of the stage they are at. (Elonen and Artto, 2003), of course, this has proven to be easier said than done, as companies are often reluctant to terminate a project well underway.

This is a direct reflection on TFR capital program 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. Capital program should definitely focus more attention on this aspect of project management and benchmark their efforts to the PMBOK 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.

Conclusion drawn

Given that the overwhelming majority of the respondents (100%) disagreed, it can be concluded that the changes in strategic goals is not followed by changes in project goals.

5.5.8.3 Objective 3

To review skills and competencies, structures, cultures, and processes used in establishing and managing major capital projects, to make recommendations on how these could increase major capital project success within TFR.

The project manager has project management knowledge to complete the project

The majority 76% of the respondents agreed that the project manager has the project management knowledge to complete the project. This was expected of the respondents as they felt that they have the knowledge to successfully complete the projects.

According to Meredith *at al*, (2002:36) successful project managers have high administrative and technical credibility, show sensitivity to personal conflict and possess the political know how to get help from senior management when needed. The project manager needs strong communicative and interpersonal skills and must have the general knowledge of technology being used (Kerzner, 1998). Above all, the best project manager is the one who get the job done, within the stipulated cost and time, with performance and to the satisfaction of the customer.

Conclusion drawn

Given that the overwhelming majority of the respondents (76%) agreed, it can be concluded that the project manager has the project management knowledge to successfully complete the project.

The project manager has the necessary authority and power to control the execution of the project.

The majority of the respondents 87% of the respondents either strongly disagreed or disagreed with the statement that the project manager has the necessary authority and power to control the execution of the project.

(Turner, 1999: 74) that one of the pitfalls of project management is that project managers receive responsibility without having the adequate authority to control the project. Heerkens (2002) suggests that the challenge common for project managers, is the responsibility vs. authority trap. He states that firmly embedded in the project management folklore is that the responsibility given to project managers is not commensurate with the authority they believe they need to complete the project in purely functional organizations, the gap between responsibility and authority will be quite wide.

Conclusion drawn

Given that the overwhelming majority of the respondents (87%) disagreed, it can be concluded that the project manager has no authority and power to control the execution of the project

Project deliverables are generally produced on time and within budgets

The overwhelming majority 95% of the respondents felt that project deliverables are generally not produced on time and within budgets. This could be the direct reference to the major capital projects within TFR. There could be a number of reasons why project deliverables are generally not produced on time and within budgets and these are the major causes of capital projects within TFR

Conclusion drawn

Given that the overwhelming majority of the respondents (95%) disagreed, it can be concluded that the project deliverable are generally not produced on time and within budgets.

Appropriate project management structures are used to manage the capital projects.

87% of the respondents thought that inappropriate project management's structure are used to manage capital projects. The results of the focus group interview also confirmed the assertion the structures used are not appropriate for project management. One participant responded that obviously the current structures were failing in some respects, with another blaming integration as the shortcoming of the structure. Project managers pointed out the inefficiency of going through the project director to coordinate tasks with other departments. As project managers, they believe that a flat organization would be the ideal because they would have the authority to contact other key players

themselves. By coordinating the tasks themselves, they increase the accuracy of the information, and make changes in the schedule as needed. More than 50 percent of TFR project managers attribute the success of their projects to the good personal relationships at work. In most cases, they don't follow official communication channels. They establish good relationships with people from other departments, and approach them directly whenever they need to get the job done. This shows the importance of good interpersonal skills, but also reiterates the need for an organization structure that facilitates communication across the company.

Conclusion drawn

Given that the overwhelming majority of the respondents (87%) disagreed, it can be concluded that the structures used were not appropriate for project management

There is generally support from other functional departments for the successful implementation of the project

Again, here the majority of the respondents 79% thought that there is generally no support from other functional departments for the successful implementation of the projects. In the study by Brown (2000), the following principles were indicated being important for successful cross-functional operation:

- Visible support for the cross-functional teams by top management through clearly aligning their authorities and accountabilities with project priority;
- A mechanism to resolve conflict quickly and effectively;
- Bi-lateral respect for the co-ordination role of the project leader by the functional managers, and for the specialised functional skill of the functionaries by the project leader;
- Effective communication channels and free access to information between project participants;
- Willingness of both functional managers and project leaders to negotiate resources and to reconcile project objectives with functional objectives;
- An organisation culture of collaboration, i.e. attitudes of co-operation and helpful behaviour;
- Line managers to understand the goal and priorities of the projects in which their staff are involved;
- Clear authority for a team member to represent his / her functional area's input;
- Line managers to regularly monitor the problems that their team members are encountering;

Conclusion drawn

Given that the overwhelming majority of the respondents (79%) disagreed, it can be concluded that there is generally no support from other functional departments for the successful implementation of the project

Cultural and ethical differences

63% of the respondents agreed that cultural and ethical differences are a recurrence problem in the management of projects. Culture influences project management, top management support, and even project success. Culture may vary within the organization (e.g. for operator, engineering, and executive culture Schein (1996). Differences may derive from cultural distinctions, as well as unequal importance given by project managers and their customers to the various success measures of the project. Mismanaging cultural differences can render otherwise successful managers and organizations ineffective and frustrated when working across cultures. When successfully managed, however, differences in culture can lead to innovative business practices, faster and better learning within the organization, and sustainable sources of competitive advantage (Hoecklin, 1996).

Both, effectiveness and efficiency can be affected by culturally diverse team members. Cross-cultural characteristics make it potentially more creative in problem solving than nationally homogeneous teams (Chevrier, 2003). Diversity increases ambiguity, complexity and confusion in group processes. The impact of national cultures on the functioning of international work teams depend on managing processes. Cross-cultural teams could not be effective without special personal qualities of their members as "openness", "patience" and "self control". Team members may leverage the new ideas (Chevrier, 2003). Diversity on a project team can be an asset and can be more innovative and creative than teams in which everyone is alike. Multiple points of view can be brought to bear on any project (Miller, 2000). Members of groups that have been raised in the same culture believe certain things and expect certain types of behaviour. Culturally homogeneous groups tend to speak the same language, which can be an advantage in terms of the use of the same words, expressions, meanings, and rely on the same verbal and non-verbal meanings. In addition, it is easier to create cohesiveness among members of culturally homogeneous groups, but one of the dangers of homogeneous groups is that groups then become "group thinks". A heterogeneous group, on the other hand, one with members of different cultures and backgrounds is more likely to come up with alternative solutions to a problem or situation (Miller, 2000).

Conclusion drawn

Given that the overwhelming majority of the respondents (82%) concurred, it can be concluded that cultural and ethical differences are a recurrence problem in the management of projects

The project managers feel that they have the right skills, capacity and experience to deliver the project successfully

The overwhelming majority of the respondents 92% felt that the project managers have the right skills, capacity and experience to deliver the project successfully. Leadership excellence in the definition of a project's scope and the management of project costs, time, quality and communications are all based on a project manager's ability to lead the human resources affiliated with the project: the project stakeholders. A

project's success or failure is the result of the leadership of the project's stakeholders. Gaining the wholehearted support of those people who have, or believe that they have, a claim on those things of value created by the project is the culmination of the leadership displayed by the project. Project leaders must be skilled in the various project management techniques. One of the primary tasks of project leaders is to facilitate the project management process (Brown, 2004: 19). Very few project leaders, however, start their careers in project management, but usually in a functional skill. Training in the project management philosophies, principles and techniques is thus vital.

Conclusion drawn

Given that the overwhelming majority of the respondents (92%) concurred, it can be concluded that the project managers have the right skills, capacity and experience to deliver the project successfully

5.5.9 Root cause analysis of major projects failure

The purpose of this section of the questionnaire is to establish the fact that although there are a number of projects executed and implemented every year in TFR, some projects were stopped while others were deemed not successful even though they had been implemented. The respondents were then requested to indicate which primary reasons they believe contributed to projects not being successful. To determine which factors are critical causes of major capital projects failure within Transnet Freight Rail, the respondents were asked to rate 15 factors on a scale of importance from one to five where five means the factor is critically important. The mean score of each of these factors was determined over all the respondents and the factors rated with this value from most important to least important. The results can be seen in Figure 6.12

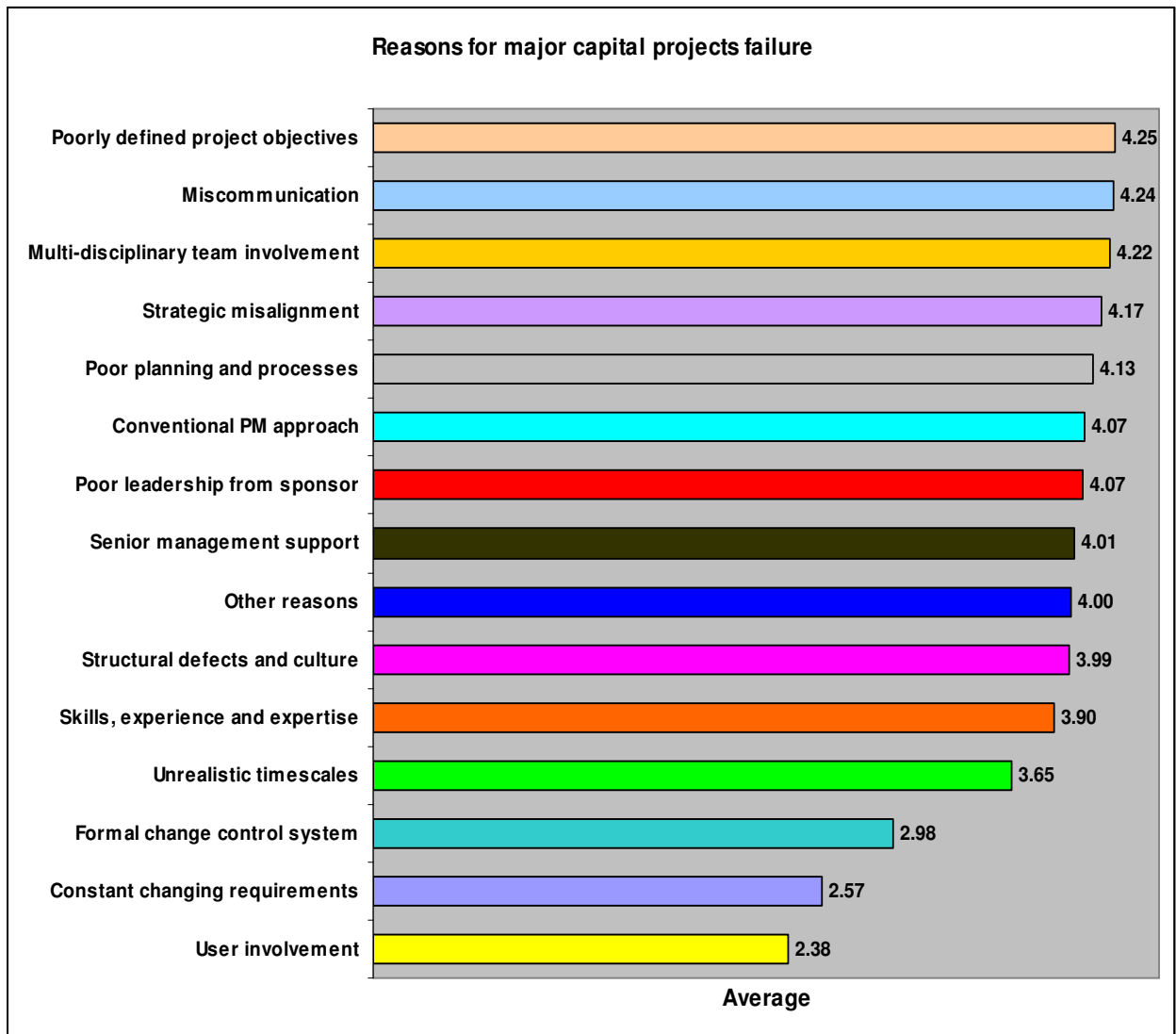


Figure 5-26: Reasons for major projects failure

As can be seen from the results in Table 5-26, the most important factors identified by the respondents as reasons for major projects failure were poorly defined scope, miscommunication, lack of multi-disciplinary team involvement, strategic misalignment

etc, and this is consistent with many studies on project failures. The one glaring contradiction is the user involvement which, while being one of the top 4 causes of project failure in many studies, it was only ranked last by the project managers. The reason might be because many studies on projects failures were conducted in Information and Technology environment in which the user involvement is the key success factor for any project.

Table 5-1 below presents all the generic types of root causes factors. In principle, any symptom of a project failure should belong to one of the root causes

Root Cause	Examples
Project Management factors	<ul style="list-style-type: none"> • Conventional project management approaches • Poorly defined project objectives • Poor planning and planning process • Miscommunication
Top Management factors	<ul style="list-style-type: none"> • Poor leadership from the sponsor • Senior management support and commitment
Organizational factors	<ul style="list-style-type: none"> • Inappropriate structures (lack of multi-disciplinary team involvement) • Cultural defects • Strategic misalignment
Process factors	<ul style="list-style-type: none"> • Lack of project management skills and expertise • Lack of formal change control systems
Communication factors	<ul style="list-style-type: none"> • User involvement • Constant changing requirements • Unrealistic timescales

Table 5-1: Root causes analysis of major projects failures

This table shows clearly that there are commonalities in failure factors in all domains. The unique failure factors in specific domains can easily be mapped to one of the major causes. Failure factors for individual projects can span multiple categories. In addition, each specific case has different types of failure factors. In conclusion, Applying good project management practices would help to avoid these failure factors, and leading to project success.

5.6 Conclusion

This chapter presented the results obtained from the focus group interviews conducted with the selected decision makers for major capital projects within TFR and the results of the survey conducted with the project managers responsible for managing major capital projects in TFR. The results were discussed, analysed and integrated. In the last chapter, conclusions and recommendations stemming from the results will be made.

6 Conclusion and recommendations

6.1 Introduction

In the previous chapter, the results obtained in the study were presented, integrated and analysed. In this final chapter recommendations and conclusions are made based on the literature study from chapters three, as well as the empirical study conducted in chapter four. The questionnaire results were utilised to compare the relation of the critical factors for project success in theory and in practice. Conclusions were drawn on the literature study and the empirical study (theory and practice). From this, recommendations were made on how to reduce the failure rate of major capital projects at TFR and increase their success bearing in mind the amount of resources to be employed in major capital projects within the next five years.

6.2 Objectives of the study

The primary objective of this research was to do a theoretical and empirical study to identify the root causes of major capital projects failure within Transnet Freight Rail. In order to realize the primary objective, the following secondary objectives needed be met:

- To compare the conventional TFR project management approach with the modern business approach to identify gaps and inconsistencies in the project management approach.
- To ascertain if there is alignment between business goals and project goals within TFR.
- To review skills and competencies, structures, cultures, and processes used in establishing and managing major capital projects, to make recommendations on how these could increase major capital project success within TFR.

In order to do this, data were collected using the focus group interviews and the survey research and the summary of the findings is summarised below:

6.3 Summary of the findings

The findings of the study highlight a number of interesting details concerning the causes of the high rate of major capital project in Transnet Freight Rail.

Objective 1: To compare the conventional TFR project management approach with the modern business approach to identify gaps and inconsistencies in the project management approach.

As can be seen from Figures 5-5 to 5-11, a wide variety of statements were asked of the respondents with regards to TFR conventional project management approaches to identify gaps and inconsistencies in the project management approach. It is notable that the results obtained proved that there are indeed inconsistencies and gaps in the project management approach applied at TFR with the modern business approach particularly the approach advocated by the PMBOK (2004). For example, PMBOK (2004) advocates that the project manager should be appointed at the conceptual phase of the project while the project manager at TFR is appointed at the tender award stage and the failure to undertake pre-feasibility (FEL-1) and feasibility (FEL-2) studies on major projects which is the normal practice followed by the PMBOK (2004) clearly shows that the principles of project management are not applied uniformly.

The results also show that there seems to be no clear framework for the implementation of a structured approach to project management at TFR. For example: the project manager is not involved in project selection process, his or her buy in and commitment is not fully sought from the initiation of the project and the project outcomes are also not clearly defined by the sponsor.

PMBOK (2004) advocates that 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

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, control, and close a project. Each of these processes must have clearly defined outputs that contribute to successful project delivery. The failure to provide leadership (by the sponsor) to take decisions in a timely manner, solve problems and become actively involved in projects could be the major contributor to major capital project failure in TFR. The findings coincide with the findings by Hamlin (2001). He stated that most capital projects fail because top managers do not get actively involved and leave the implementation issues to the middle managers.

(Harrington, 2000, p. 71) states that failing to build and sustain commitment from the sponsor of the project is one of the main risks to successful project implementation.

Objective 2: To ascertain if there is alignment between business goals and project goals within TFR.

As can be seen from Figures 5-12 to 5-18, a wide variety of statements were asked of the respondents with regards to the alignment between the business goals and project goals within TFR. The aim of the study was not to measure to what extent TFR has managed to achieve strategic alignment but to ascertain if there is alignment between strategic goals and project goals. Considering the fact that no evidence of the use of project portfolio management could be established at TFR, the results proved that there is no alignment between the business goals and the project objectives. This is consistent with the studies done by Elonen and Arto, (2003) and Dooley et al., (2005). Authors agreed that managing the project portfolio ensures a balanced portfolio, links the portfolio to the organizational strategy and maximizes the value of the portfolio. Levine (2005) agreed that project portfolio management is a way to help link projects with the firm's values and culture and Killen et al., (2008) indicated that there seems to be a linear correlation between the performances of project portfolio management to the alignment of the organization's strategy

The results of the focus group and survey were evenly matched in most of the survey questions and the focus group results were not clear on the alignment between business objectives and project objectives. The decision makers however admitted that alignment between business goals and project goals is only relevant in as far as, mega projects are concerned and that in itself mean that alignment in major projects doesn't have to a necessity. Quite an interesting fact came out of the survey, when all the respondents remarked that changes in strategic goals are not followed by changes in project goals. This result is supported by several studies that companies in general are very inconsistent in changing project goals when the strategic goals change (Cooper et al., 1999; Killen et al., 2008). A reason for that could be that although companies in general see the need for strategic alignment, they fail to review the fit on a regular basis. And if the business environment has changed and the strategic goals have been altered the lack of alignment may have been easily overlooked.

Another reason could be a lack of overview of the project portfolio to check whether it has steered away from the previously set strategic goal. The over-engagement with single projects, regardless of how large or important they could be, could shift the focus from the portfolio level.

Objective 3: To review skills and competencies, structures, cultures, and processes used in establishing and managing major capital projects, to make recommendations on how these could increase major capital project success within TFR.

As can be seen from Figures 5-19 to 5-24, a wide variety of statements were asked of the respondents with regards to skills and competencies, structures, cultures and processes used to managing major capital projects. While the project managers believe that they have the necessary skills and competencies to successfully manage the major capital projects and the correct project manager is appointed with the capacity and resources to successfully manage the project, they felt that they however lack authority and power to successfully manage the project. This is consistent with the findings by Kezsbom et al., (2001:256) and Mantel *et al.* (2001:3) which stated that to enable a project leader to assume the responsibilities for the execution of a project, he/she needs to acquire resources and schedule their application against targets of cost and time and necessary authority must be vested in the project leader to enable the said negotiations. The authors saw this as one of the biggest problems for the project managers, to be loaded with responsibility for results, but insufficiently authority to pursue the resources. Burke (2003:297) refers to this as the “responsibility – authority gap”. The results confirmed the earlier assertion that inappropriate structures and processes are used to manage projects, that might be the contributing factors to high major capital projects failure within TFR, and the results confirmed the researcher earlier observation of unsupportive organizational culture as the major cause of project failure as alluded to by Gray et al., (2003).

The silo mentality pointed out earlier was also confirmed by the results of the study, the majority of the respondents thought that there was generally no support from other functional departments for the successful implementation of major projects. This could be attributable also to that functional structure used to manage capital projects at TFR. In Keller (1971) findings, “The conventional hierarchical management organization is generally incapable of dealing with the added complexity and information demands of a project. Delegating project segments according to functional expertise contributes to bottlenecks and sub optimization since there is a tendency for functional departments to become preoccupied with only their segment of the project “sums it all up.

6.4 Limitations of the study

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

- Despite the confidentiality and anonymity of the research instrument, responses may have been biased due to participants feeling they must respond in a socially acceptable manner.
- Respondents may have felt that negative responses reflected on their abilities in managing projects and not on factors beyond their control.
- The focus group interviews were only conducted for an hour, the researcher felt that the answers were lacking in depth and not all of the intended questions were asked due to time constraint.

6.5 Conclusions

Overall, the reasons for project failure have a wide range of causes. They range from failure to implement best practices, to no clear link between the project and the organization's key strategic priorities. Typically, there is a lack of constraint and limitless scope in as far as the reasons for project failure. A project is a complex, non-routine, one-time effort limited by time, budget, resources, and performance specifications designed to meet customer needs (Gray, and Larson, 2008) and Project management is a set of tools, techniques, and knowledge that, when applied, helps to achieve the three main constraints of scope, cost and time (PMBOK, 2004). However, based on literatures, 52.7% of projects were not able to complete on time and over cost, and 31.1% not fulfilled the scope (Standish Group, 1995). Today, emphasis on an integrated project management process is the focus of all project effort towards the strategic plan of an organisation, and reinforces control of both the project management techniques and tools, and the interpersonal skills necessary to orchestrate successful project completion (Kerzner, 2002).

On the strength of the findings as discussed above, certain inferences can be made: From the comparison of the TFR conventional project management approach with the modern business approach, gaps and inconsistencies in the project management approach were identified which could be the root causes of major capital projects failure within TFR. These included:

- The appointment of the project manager during the tender award state instead of the conceptual stage in order to get the buy-in and commitment from the project manager which is the normal practice in project management.
- The non-involvement of the project manager in the project selection process.
- The non-adherence to principles of project management when managing capital projects by failure to undertake pre-feasibility (FEL-1) and feasibility (FEL-2) studies which is the normal practice followed by the project lifecycle.
- The undefined project deliverables by the sponsor could be the reason some of major capital projects are cancelled mid-way resulting in irregular and fruitless or wasteful expenditures

- The general lack of leadership, support and commitment from the project owner ensures that major capital projects are almost doomed to fail from the start.

In trying to ascertain whether there was alignment between business goals and project goals within TFR. No evidence of the project portfolio management could be found; the researcher therefore assumed that major capital projects were managed individually even though TFR deals with many projects at the same time. No firm conclusions could be drawn on whether the projects selected at TFR were in fact aligned with the business goals; if the projects outcomes were aligned with the business goals and also if the project results had a strategic fit in the design and execution of future products and services. However, it can be concluded that the major capital projects results did not satisfy the business requirements in the long run, the identified strategic goals were clearly not formulated so that projects could be defined from them and changes in strategic goals of the company were not followed by changes in project goals. .

In trying to review skills and competencies, structures, cultures, and processes used in establishing and managing major capital projects, to make recommendations on how these could increase major capital project success within TFR. The following is concluded.

- The project managers have the project management knowledge to successfully manage the projects.
- The project managers have no authority and power to control the execution of the project
- The projects deliverables are generally not produced on time and within budgets
- Inappropriate structures are used to manage major capital projects
- There is generally no support from other functional departments for the successful implantation of major capital projects.
- Cultural and ethical differences are a recurrence problem in the management of projects
- The project managers have the right skills, capacity and experience to deliver the project successfully

6.6 Recommendations

Project management demands that projects be on target (scope), be on time (schedule), be implemented within available resources (cost), and ultimately satisfy the customers. Project professionals, particularly project managers, in various organizations understand these challenges of ensuring that projects meet these four projects requirements in fulfilling project objectives. As a result, the subject of projects failure continues to be an area of concern to many organizations and indicates why it is important to investigate the root causes of major capital project failures and project success. The specific problem addressed by this study was that it was not known which factors contribute to the alarming failure of major projects within TFR.

The following recommendations arise from the study:

TFR needs to formalize the organisation's approach to project management

One of the most widely reported results of research on the practicing of project management in formerly functionally only structured organisations, is that an informal approach to project management is a sure path to disaster as articulated by Nicholas, 1990; Mantel *et al.*, 2002:45). Mantel *et al.*, 2001:35 are even of the opinion that the more complex an organisation's projects are, the more formal the approach or style of project management should be. The grey areas in TFR project management approach are apparent when comparing it with modern approaches to project management. Formalising project management requires that an organisation-wide strategy for project management must be initiated and visibly supported by top management. Tettemer (1991), Brown (2000) and Botha (2003) assert that a strategy is essential, because it is a prerequisite for the displacement of traditional relationships and practices with new ones. It also serves to comfort high level administrators during the period of change. It will also demonstrate top management's belief in the validity of the project management process. Because project leaders have in principle only one chance (a project is executed only once with no or very little rehearsal), their decisions must be right the first time. There should therefore be consistency about the cause-and effect-relationships of their decisions, which only a well-structured strategy and the resulting policies can provide.

TFR needs to develop a project management supporting organisational culture

It is clear that the silo mentality culture, currently uncounted at TFR is not in line with the rapid changing project management environment. The culture of an organization and the culture of a project within that organization are mutually interdependent. Aligning organisational, project and individual performance helps to strengthen the project management culture, facilitates continuous planning and review, and provides tools for business systems. The consistent call for different departments in organisations to work in an integrated and cooperative way towards organisational goals is not surprising given the cross-functional nature of project management. Several authors draw attention to aspects that confirm the need for the organisation to have a collaborative culture, to promote teamwork, and to focus on the collective capabilities to its disposal (Kerzner, 1992:120; Kezsbom & Edward, 2001:47-52). 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.

TFR needs to adopt an appropriate project management structure

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. However, 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 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, TFR must adopt a matrix organisational structure.

Establish an appropriate management role for the project leader with reference to the type, size and complexity of a project

The projects of a sizeable organisation possess several characteristics that can lead to their classification on a continuum from simple to complex. A singular management approach to all of an organisation's projects will invariably lead to frustration and resistance from project staff on smaller projects that see it as too much extra work, not "justified" and too time consuming for a small project. It will also invariably lead to frustration of staff on big projects due to them not getting the extra support that their big projects require and which that one methodology cannot provide. The particular methodology applied to a specific project must therefore fit a project's characteristics, and not the other way round (Ford & Randolph, 1992; Frigenti & Comninos, 2002). This means that the management role for the project leader must be appropriately aligned with the type, size and complexity of a project.

Establish a balanced relationship between the project leader's responsibility, authority and accountability

To enable a project leader to assume the responsibilities for the execution of a project, he/she needs to acquire resources and schedule their application against targets of cost and time. For in-house resources, this acquisition is done by way of service level agreements negotiated with departmental heads as the suppliers. For outsourced resources, contractual agreements must be negotiated with relevant suppliers. For both approaches, authority must be vested in the project leader to enable the said negotiations. Traditionally, one of the biggest problems for the project leader is to be loaded with the responsibility for results, but not (sufficiently) loaded with authority to pursue the resources. Burke (2003:297) refers to this as the "responsibility – authority gap". The fundamental issue at stake is the necessary balance of the responsibility for results, with authority to acquire resources, with accountability for the outcomes of the authority applied.

Special efforts must be directed at the development of cross-functional teams and team work

(Ford & Randolph, 1992:284) define a team as "a small group of people allied by a common goal and sharing performance objectives. They generally have complementary skills or knowledge and an interdependence that requires that they work together to accomplish a common team goal. Team members hold themselves mutually accountable for their results. Such teams are not usually found on the custom organisation charts". From this definition can be inferred that a project is executed by a temporary, cross-functional team which is participative in nature; hence for success the members must be allowed free and equal access to communication. (Ford & Randolph, 1992:284) also suggest that project team members possesses qualities like objectivity, flexibility, not avert to risks, be independent decision makers, low sensitivity for conformity and low power and rule orientation.

Project leaders must be skilled in the project management processes and techniques

The primary tasks of a project leader in a project is to have the right thing at the right place at the right time, to integrate all the inputs into a single point of responsibility and to lead (or push) the project to timeous completion. All of that requires the application of skills and techniques as specific steps in a systematic and systemic process. However, Botha (2003) found that very few project leaders start their careers in project management, but usually in one or other functional skill. The basic approach of this paper is that there is a substantial difference between functional and project related actions and behaviours. As concluded by Brown & Botha (2005:6), proper skilling in project management principles and techniques is in the final instance imperative for effective project management in an organisation.

A supportive orientation in the organisation

Several sources confirm the need for a supportive, involved style of management or leadership at senior levels in the organisation. Calls are also made for similar leadership

styles within project management. The need for top management support and organisation support is also one of the frequently cited success factors in the project management success literature (Morrison, 2005 & Brown, 2004)

TFR needs to establish a clear link between its business strategy and all the projects it invest in.

Project management should take place in an environment characterised by a clear focus and direction. Statements in this regard include explicit calls for an organisation that has a clear focus, or strategic direction, the need for projects to clearly align with the organisation's strategy and direction, and other conditions that can be associated with an environment where there is organisation wide alignment also keeping in mind that projects should not only be aligned to the organizational strategy but should also be reviewed for relevance in relation to each other. Because TFR is involved in multiple projects at the same time, project portfolio management should be applied in practice regardless of whether it is in the form of a set of guiding principles or if they adopt a standardized project portfolio management framework to help them achieve their organizational goals. As far as the researcher can ascertain, TFR is still on level 2 of Kerzner's Project Maturity Model, and for TFR to reach the higher levels of maturity, it needs to adopt a proven project management system and use it consistently. TFR must be able to access its maturity through the system and conduct regular audits to understand its current level of maturity.

Project Lifecycle

The Project Lifecycle methodology is neither prescriptive nor procedural, however it is recommended that the fullness of the methodology be implemented as it defines anticipated deliverables at each phase with required reviews performed, monitoring and expediting when required. Although current processes are, still applicable they need alignment with the Project Lifecycle methodology in order to provide a uniform standard for the evaluation, development and delivery of capital investment projects within TFR. On the issue of undertaking FEL-1 and FEE-2, Management should review the nature of projects and issue a guideline where deviations from the Project Lifecycle methodology will be allowed or whether all aspects of the Project Lifecycle will be applied to all projects.

6.7 Closing notes

The completion of this research report is achievement of an important personal milestone. Writing this research report has fulfilled the personal objective of gaining insight into the subject of capital projects failure. The challenge to create a substantial research, applying the knowledge and techniques obtained throughout the MBA course, has been an inspirational journey. Combined with the process of writing the dissertation in order to pinpoint the key issues presented, and to understand the underlying theory and its context, the journey has been stretching. The insights gained into the specific area, has challenged my personal curiosity, and identified potential for continuing personal development in the future.

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8 Appendices

8.1 Interview schedule

This is the focus group interview schedule of the questions

- Discuss the key factors that cause major capital projects failure?
- What are measures of success of a project, please elaborate?
- Do you think your decision to approve or reject any capital proposal is informed by the strategic objectives of the company?
- How involved are you with the project management team?
- In your opinion, what sort of structures is most fitting for project management and is the current one appropriate; if not why is it not implemented.
- What criteria are used to appoint the project managers for the project (skills, capability, experience, technical etc.)?
- Do you think the TFR concept of project management is clearly defined and understood, if not why?
- Do you think the project goals are revised if the strategic objectives of the company are changed?
- Do you think capital projects are selected in line with the TFR business goals?
- Discuss why we currently have a high percentage of major capital projects failure within TFR.
- Currently, there is no multi-disciplinary team involvement in execution of major capital projects; don't you think this might be the root cause of projects failure if not why?
- Discuss why major capital project are not perceived as strategic as opposed to mega capital projects at TFR, what's your opinion.

SUBJECT INFORMATION LETTER FOR PARTICIPANTS

Dear Participant

I am currently studying towards a Masters degree in Business Administration through the Graduate School of Business Leadership (UNISA). For the purposes of my study, I intend to carry out research into the root causes of major capital projects failure within Transnet Freight Rail.

The investigation requires the completion of a questionnaire by interested project managers currently working on major capital projects in TFR. Kindly note that by responding to the questionnaire, you would not only be making a valuable contribution to this research, but also provide invaluable insights into the future prevention of major capital projects failure within TFR. 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. When completed, kindly save and send back to recipient as an attachment by no later than 11 March 2011.

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

Yours faithfully
Mavela Xaba

	Black	Coloured	Indian	White
1. Please indicate your race				

	24 Years and younger	25 – 34 years	35 – 44 years	45 – 55 years	More than 55 years
2. Please indicate your age					

	Male	Female
3. Please indicate your gender		

	0 – 3 years	4 – 6 years	7 – 10 years	More than 11 years
4. Project management experience in TFR				

TFR Project Management approach	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
5. The concept of project management is clearly defined and understood.				
6. The project manager with the right skills to match the project is appointed to manage the project.				
7. The project manager is involved in the selection process				
8. The principles of project management are applied uniformly irrespective of the size of the project				
9. The project manager is appointed at the concept phase of the project.				
10. Project outcomes are always clearly defined by the sponsor				
11. There is a general lack of leadership (from project owner) to take decisions and solve problems in timely manner				

Alignment between project goals and business objectives	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
12. The projects are usually selected in line with the business goals				
13. The project outcomes are aligned with the business goals				
14. The project result usually satisfy the business requirements in the long term (5 years and beyond)				
15. Identified strategic goals are clearly formulated so that projects can be defined from them				
16. The project results have a strategic fit in the design and execution of future products and services				
17. Projects are selected in line with business goals and expansion strategies				
18. Changes in the strategic goals is invariably followed by changes in project goals				

Structures, cultures and processes	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
19. The project manager selected has the project management knowledge to complete the project				
20. The project manager has the necessary authority and power to control the execution of the project				
21. Project deliverables are generally produced on time and within budgets				
22. Appropriate project management structures are used to manage the capital projects.				
23. There is generally support from other functional departments for the successful implementation of the project				
24. Cultural and ethical differences are a recurrence problem on projects				
25. The project manager feel that hey have the right skills, capacity and experience to deliver the project successfully				

Reasons for projects failure	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
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. Lack of appropriate skills and expertise in managing projects				
7. Poor leadership at any and all levels				
8. Cultural and strategic goals misalignment within TFR				
9. Poor planning and planning process				
10. Lack of senior management support and commitment				
11. Poorly defined project requirements				
12. Project outcomes not addressing business needs				
13. Lack of multi-disciplinary team involvement				