Perceptions of Project Success Criteria in Anglo Platinum Limited

Geoffrey Lawrence Meyer

A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

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ABSTRACT

This study attempts to investigate some of the difficulties in achieving success in mining projects by exploring success criteria of projects and the role of project managers in mining projects. Anglo Platinum was used as a case study for this research.

A structured interviewing method was used to answer three research questions. A cross section of project role players within the company was interviewed; these were: executives/sponsors, project managers, project users and project support. The key findings are:

- Success criteria for mining projects in Anglo Platinum are:
    - Meeting project specifications, project completed within budget, project completed on schedule (time) and owners' needs satisfied, project completed safely
- The most critical success criterion for mining projects in Anglo Platinum is meeting the owners' needs
- The respondents were divided on the question of whether project managers are responsible for project management success or project success

The success criteria and critical success criteria for projects in Anglo Platinum is in line with what is suggested in literature but like Anglo Platinum, literature is divided on whether project managers should deliver project management success or the project business case. It is believed that the lack of uniform understanding is partly responsible for sub-optimal project performance.

DECLARATION

I, _____, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Geoffrey Lawrence Meyer

Signed at ……

On the …….. day of …….. 2009

DEDICATION

My wife Tshepo and daughter Khanya

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CHAPTER 1: INTRODUCTION

1.1 Purpose of the study

Mining is an extremely risky activity as expressed by Adam Smith (Smith 1910:61): “Of all those expensive and uncertain projects, however, which bring bankruptcy upon the greater part of the people who engage in them, there is none perhaps more perfectly ruinous than the search after new…mines”. Mining involves the extraction of a finite resource and therefore, projects are required in mining not only to discover new mines and bring them into production but also to sustain existing operations (Smith and Van Wyk 2008). Some of the greatest risks relate to the geology of the ore body, the mineralogy of the ore, the price of the mineral extracted, local and global economic conditions, cost forecasting etc.. (Cavender 1992; Dominy, Noppe and Annels 2002; Snowden, Glacken and Annels 2002). In order to increase the likelihood of success, careful attention has to be paid to the project management required to convert the concept into a profitable mine (Werner 1988).

The purpose of this research is to determine critical success criteria for projects in Anglo Platinum. This study first establishes the measures that are used to determine project success and then to determine the importance of each success measure. The study further looks at whether project managers still perceive project success as delivering the traditional cost, time and quality or whether perceptions have changed to include the delivery of the business case.

1.2 Context of the study

When a mining company makes a decision to embark on a project where large sums of shareholders money are risked, the management team needs to ensure that the stakeholders will reap the benefits promised (Van Der Merwe 1997).

When large capital investment projects are conducted in the minerals industry, they usually follow a set process before the project is executed. The project begins with a conceptual study, followed by a prefeasibility study and a feasibility study being conducted just before detailed design and execution (Jaafari 1990; Munns and Bjeirmi 1996; Smith, Pearson-Taylor, Anderson and Marsh 2007).

Proposed capital investments or projects are divided into three sub-categories which are related to the confidence level of the study stage. These sub-categories are governed by a stage-gate review and approval process and comprise:

Conceptual studies, pre-feasibility studies and feasibility studies have ±25%, ±15% and ±10% confidence levels respectively. The feasibility studies form the final stage gate where the "go" or "no go" decision is made before viable and approved projects enter the detailed design and execution phase.

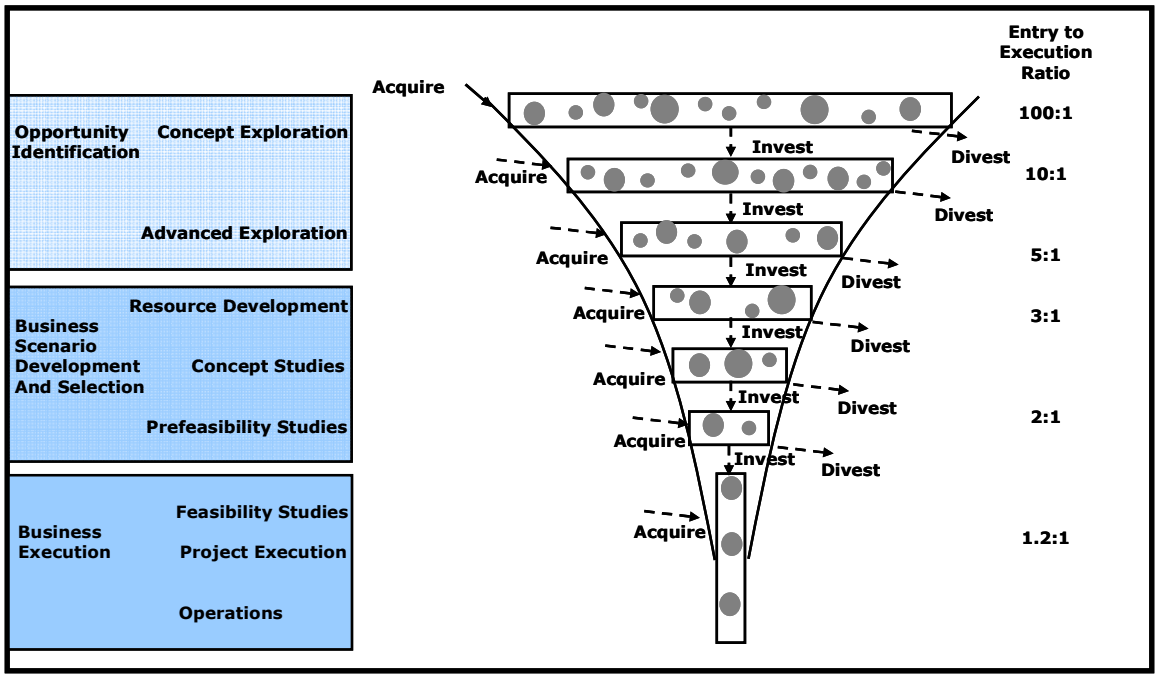

Figure 1: Prospect to production investment pipeline (Pratt 2006)

Figure 1 above diagrammatically depicts the process followed from project conceptual studies (top) to execution (bottom) – this is called the project cycle. The figure shows that a company typically will have many projects at the conceptual phase which are reduced in number with non-viable projects being

rejected as more detailed studies are conducted. The “entry to execution ratio” shows the typical elimination process of non-viable projects that takes place before a conceptual project reaches the execution stage.

Traditionally, project management success was measured on cost, quality and time – the so-called iron triangle (Atkinson 1999). Measuring the success of mining projects by applying the iron triangle as success criteria only, will leave many projects not delivering the business case. The criteria used to determine project success is the subject of this research.

1.3 Problem statement

1.3.1 *Main problem*

The purpose of the research is to identify critical success criteria (SCS) for mining projects in Anglo Platinum and the role of the project manager in delivering project management and project success.

1.3.2 *Sub problem 1*

The first sub problem is to identify the Success Criteria for Mining projects in Anglo Platinum.

1.3.3 *Sub Problem 2*

The second sub problem is to determine what the most critical success criterion is for mining projects in Anglo Platinum.

1.3.4 *Sub problem 3*

The third sub problem is to determine the role that project managers in Anglo Platinum play in delivering project management and product success.

1.4 Significance of the study

Project management has largely focused on project management success where a project's performance is measured against cost, time and quality (De Wit 1988; Munns and Bjeirmi 1996; Atkinson 1999; Cooke-Davies 2002) with some authors exploring the concept of project success which is measured against the overall objectives of the project. This study explores the understanding of the entire value proposition of conducting the project in the first place. This involves the traditional project management controls of time, cost and quality (Youker 1989; Van Der Merwe 1997), as well as assessing the performance of the executed project in delivering what the shareholders expect (Cusworth and Maskell 2000). Barnes (1991) expands the traditional narrow definition of project management, to project management being the means whereby an organisation identifies and implements "beneficial change".

Numerous authors (De Witt 1988; Pinto and Covin 1989; Pinto and Pinto 1990; Cooke-Davies 2002; Chen and Lee 2007) have explored the concept of critical success factors (CSFs) for projects with their studies concentrating on projects in different industries as well as multi-national projects. The study of CSFs however needs to be preceded by a study of critical success criteria (CSC) which is the measure being used to determine success (Munns and Bjeirmi 1996; Collins and Baccarini 2004). This is a case study focused on exploring the CSC of a single company – Anglo Platinum. Most projects quoted in the literature are mainly in construction, government, information technology and research and development. This study will therefore shed more light on the mining industry that has seen few academic articles written in the area of CSC.

There is disagreement in the literature as to who is responsible for delivering project success (Munns and Bjeirmi 1996). Some authors believe that project managers are responsible for delivering project management success of cost, quality and time only. Others argue that the project manager should deliver the

business case and be the organisation's strategic leaders (McElroy 1996; Hyvari 2006).

From this study one should be in a position to gauge what Anglo Platinum expects of project managers regarding the success of projects.

1.5 Delimitations and limitations

1.5.1 *Delimitations*

A single country, instead of multi-national or international, projects will form the basis of this study as it has been shown that "international projects face significantly greater obstacles to success than do similar domestic projects" (Kealey, Protheroe, MacDonald and Vulpe 2005:291). South Africa is the country that was selected to conduct the studies because it was more convenient to gather data there as the author resides in that country. The failure rate of international projects was also found to be greater than similar domestic projects due to the complexity introduced by the different environments.

A specific industry's projects was selected i.e. mining projects and not multi-industry projects as there are differences in the CSC for projects in diverse industries (Tukel and Rom 1998). All projects are also not the same and different success criteria are emphasised with different project types (Shenhar, Dvir, Levy and Maltz 2001). Restricting the study to mining projects should therefore limit the spread of success criteria.

Studies conducted of projects in the construction, information technology, manufacturing, utilities, environmental, defence and other sectors (Tukel and Rom 1998) suggest that there are distinct characteristics particular to projects conducted in the same country but in different industries. This research will focus on revenue generating minerals exploitation projects in the mining industry where shareholder value can be directly enhanced by the project conducted. Indirect

benefit projects e.g. Business process re-engineering projects are explicitly excluded.

1.5.2 *Limitations*

Some of the anticipated weaknesses are as follows:

The results may be highly dependent on the current events e.g. the current economic climate of the minerals industry (Bell 2005). Commodity prices were trading at record highs in the first half of 2008 resulting in a frenzy of project activity to capitalise on the higher prices (Steyn 2008). Commodity prices have since come off the boil following the realisation of the depth and extent of the credit crisis that has plunged the world into a recession.

Anglo Platinum is currently (August – December 2009) undergoing a restructuring exercise that may see many employees retrenched. This will affect morale and the manner in which some may respond to questions which may introduce a bias into the results obtained.

1.6 Definition of terms

Conceptual study – this is the least accurate estimation of a project's costs and revenues

Pre-feasibility study – is a study conducted after the approval of a conceptual study but before feasibility studies are conducted. The project team would usually present several options at this stage and propose the option they deem to be most feasible for further investigation at the feasibility stage.

Feasibility study – this is the highest accuracy study that is used to complete an investment proposal where a go/no go decision is made.

Success factors – those project inputs that will lead directly or indirectly to project success (Cooke-Davies 2002)

Success criteria – the measures by which success or failure of a project are determined e.g. cost, time, quality, financial, stakeholder satisfaction etc. (Cooke-Davies 2002)

Project management success – This is a success measure against the traditional project management criteria of cost, time and quality (Cooke-Davies 2002)

Project success – This is a success measure against the overall project objectives which normally include project management success criteria (Cooke-Davies 2002)

Project cycle – the process a project goes through from concept studies, pre-feasibility studies, feasibility studies, execution, operations and finally project closure.

Business case – this is the business reason for embarking on a project. It could be gaining market share, securing mineral rights, providing greater value to shareholders etc. (Munns 1995; Baccarini 1999; Shenhar et al. 2001)

EPCM – Engineering, Procurement, Construction Management

1.7 Assumptions

Key assumptions made in this research are as follows:

It was assumed that this research will not be unduly influenced by recent global events but that project performance is assessed over the entire project lifecycle which, in the case of mining projects can be more than 30 years.

It is further assumed that the respondents have sufficient knowledge of the subject to answer the questions clearly and concisely.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The success criteria that are quoted most often in literature are those of a project achieving the cost, quality and schedule (time). There is a trend that has emerged from literature that the delivery of the above mentioned success criteria are not sufficient to deliver project success.

2.2 Definition of topic or background discussion.

A distinction needs to be made between success factors and success criteria. Success criteria are the measurements of success whereas success factors facilitate the achievement of success (Lim and Mohamed 1999; Collins and Baccarini 2004).

Success criteria are therefore those measurements that are used to determine whether a project conducted is a success (Atkinson 1999; Shenhar et al. 2001; Collins and Baccarini 2004). This can be the achievement of net present value, internal rate of return, completing the project within budget etc.

Success factors on the other hand are those activities that management can influence that will contribute towards the project being a success (Lim and Mohamed 1999; Westerveld 2003; Collins and Baccarini 2004). Examples of success factors include top management support, the skills of the project team, leadership abilities of the project manager etc.

It is believed that this investigation will shed some light on some of the weaknesses in the current manner in which projects are conducted.

2.3 Success criteria for mining projects in Anglo Platinum

Success criteria are defined in literature as the means of measuring success (Atkinson 1999; Lim and Mohamed 1999; Westerveld 2003; Collins and Baccarini 2004). The list of success criteria is exhaustive as different industries have different criteria used for success and indeed different projects have different objectives which may change the perception of success criteria.

Many authors have written about project success criteria. There is overwhelming support for the notion that the golden triangle (Wang and Huang 2005) or iron triangle (Atkinson 1999) or the triple constraint (Shenhar and Dvir 2007) of cost, quality and time (De Wit 1988; Atkinson 1999; Lim and Mohamed 1999; Dvir et al. 2003; Collins and Baccarini 2004; Wang and Huang 2005; Shenhar and Dvir 2007) is not sufficient to describe project success criteria. Recent literature almost unanimously indicate that other criteria broadly grouped as satisfaction criteria from different stakeholders need to be included as well (De Wit 1988; Atkinson 1999; Lim and Mohamed 1999; Dvir et al. 2003; Collins and Baccarini 2004; Wang and Huang 2005; Shenhar and Dvir 2007). These include the satisfaction of project owners, project users, the project team, the customer and other stakeholders.

The success criteria identified by Baccarini (2004) were used as the basis for this study and they are:

Project completed on time

Project completed on budget

Meeting project specifications (quality)

The project team members are satisfied

Effectiveness of project management effort

Project satisfies owners' needs

Users of the project are satisfied and,

Third parties affected by the project are satisfied

2.3.1 *Project completed on time*

One of the fundamental requirements for a successful project is the quality of the planning and progress tracking that is conducted for vital resources (personnel, money and material/equipment) (Pinto and Covin 1989; Youker 1989; Atkinson 1999). Dvir et al. (2003) state that project planning does not guarantee success but a lack of planning will almost “guarantee failure”.

The Project Management Body of Knowledge (PMBOK) advocates that in order for effective project planning to occur, an organisation needs established processes and procedures. These processes include:

Activity definition – This involved identifying all the activities that have to be performed in order to complete the project (Morgan 1987; Wateridge 1995; PMI 2004).

Activity sequencing – This step involves determining the logical sequence of all the activities that have to be carried out in the project (Morgan 1987; PMI 2004).

Activity resource estimating – Based upon the activities defined and their sequence, the resources are then planned for. These include personnel, equipment and material. The quantity and sequence of the resources are also estimated under this step (Burstein and Stasiowski 1982; Stallworthy and Kharbanda 1983; PMI 2004).

Activity duration estimating – Based upon the previous three activities, the estimated durations of each activity are determined. This activity is usually done by someone who is most familiar with the work being conducted (Morgan 1987; PMI 2004).

Schedule development – Once the activity durations are estimated, they are then scheduled through specifying a start and completion date for each activity. The schedule is updated until project approval as better information is obtained while the project proceeds. The risks to schedule and their estimated impact are also identified and mitigated where possible (PMI 2004).

Schedule control – The project manager controls the schedule by managing deviations to schedule, understanding what caused them and devising action plans to make up “lost” time (Burstein and Stasiowski 1982; Stallworthy and Kharbanda 1983; Morgan 1987; PMI 2004).

Mining projects are often fast tracked in an attempt to realise the benefits of the project sooner (O'Brien and Biery 2008). Introducing urgency in a project creates its own set of problems as due thought required for each stage of the project may not be conducted adequately (Morris 1988). When planning is conducted correctly, uncertainty is reduced and the likelihood of project success is increased (Dvir et al. 2003).

2.3.2 *Project completed on budget*

Project cost control is achieved through cost estimation, cost budgeting and cost control.

Cost estimation is achieved through estimating the costs of all activities’ i.e. labour, material, equipment, services, inflation/escalation and contingency. The more front end loading is done for a project, the less the cost deviations from budget are during execution (Burstein and Stasiowski 1982; Stallworthy and Kharbanda 1983; Morgan 1987; Youker 1989; Wateridge 1995; Atkinson 1999; PMI 2004).

Cost control is achieved through managing those factors that cause change to the budget/baseline. This involves:

- agreeing on change requests,

- managing changes that occur,
- ensuring that cost overruns do not exceed the authorised budget limits,
- ensuring that incorrect or unplanned changes do not become part of the plan,
- informing all stakeholders of the changes to plan and
- taking the appropriate steps to bring expected overruns within budget (Burstein and Stasiowski 1982; Stallworthy and Kharbanda 1983; Morgan 1987; Youker 1989; Wateridge 1995; PMI 2004).

Scope changes are one of the biggest contributors to cost overruns and need to be managed prudently.

As shown in Figure 2 below that changes made late in the project life cycle can be detrimental to project success as costs may increase with late scope changes without the project manager having control over such costs (Werner 1988; PMI 2004; Olsson 2006).

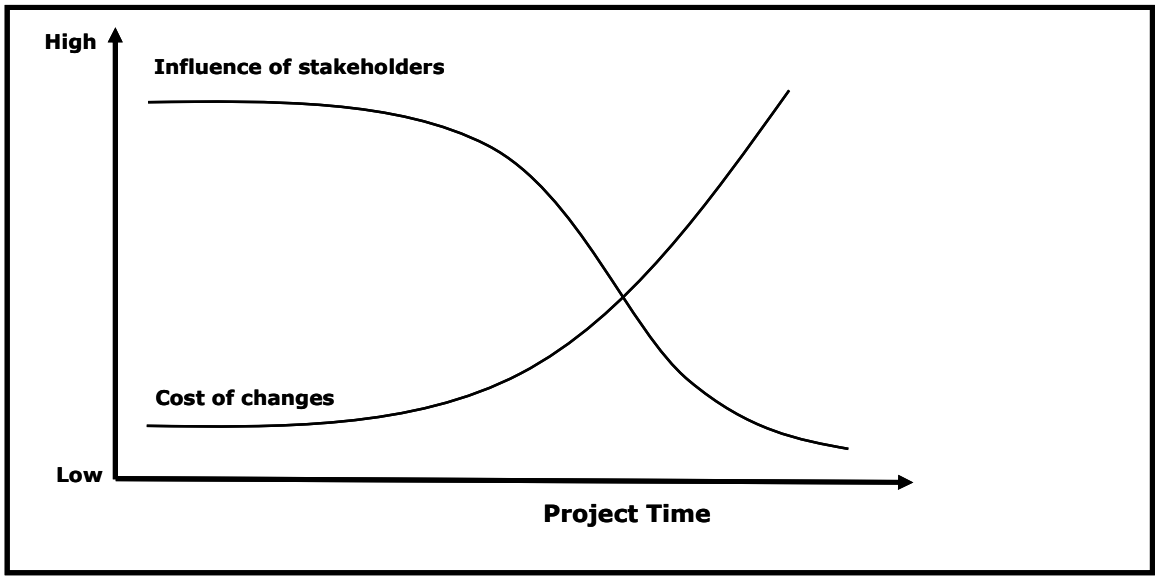

Figure 2: Relative ability to influence project costs (PMI 2004)

In order to minimise the detrimental impact of scope changes on project success, a mature scope change process should be in place to ensure effective controls (Cooke-Davies 2002). In order to minimise chances of cost overruns, it has been found that scope changes should be kept to a minimum and preferably limited to the early stages of a project where flexibility is the greatest (Youker 1989; Olsson 2006).

2.3.3 *Meeting project specifications (quality)*

Ensuring that a project meets the specification is an activity that takes place throughout the project. Meeting safety standards has been included as part of ensuring a project meets specifications (Lim and Mohamed 1999). The following activities are necessary to ensure quality standards are met: quality planning, performing quality assurance and performing quality control.

Quality planning is done to ensure that quality is proactively included in the planning, designing and building phases of the project and not merely included retrospectively when the need is identified after inspections. It has been shown that the expense incurred in planning for quality is less than having to rectify an aspect of the project where quality has been found to be lacking after construction (Stallworthy and Kharbanda 1983; Morgan 1987; Youker 1989; PMI 2004).

Performing Quality Assurance involves conducting planned activities in order to meet requirements. These tasks are specific to the product being produced and form the framework for continuous process improvement. This process will assist in identifying and eliminating activities that are in the schedule that are non-value adding (Morgan 1987; PMI 2004).

Performing Quality Control involves continuous monitoring of key project results to ascertain compliance with standards. This process will assist in identifying and eliminating activities that cause unsatisfactory results. Statistical methods are often used to identify quality defects (Morgan 1987; PMI 2004).

2.3.4 *Effectiveness of project management effort*

The effectiveness of the project management effort is determined by how well the iron triangle of cost, quality and time are managed as a group (Atkinson 1999). The reason that these are combined into a separate group is that the traditional project definition has centred around the application of tools and techniques and the use of resources to accomplish a unique and complex task within specified time, cost and quality constraints (Munns 1995; Atkinson 1999; Baccarini 1999; Collins and Baccarini 2004; PMI 2004; Wang and Huang 2005).

Projects measured against the iron triangle of cost quality and time as a success criterion basically answer the question “Was it done right?” (Atkinson 1999:339).

2.3.5 *The project team members are satisfied*

Atkinson (1999) lists the most important stakeholders as top management, the customer/client, the project manager and the project team members. The project team members have a vested interest in the project from a remuneration, job assessment, job satisfaction etc perspective (Mallak et al. 1991; Pettersen 1991).

In order to ensure that the project is on track to meet its objectives, it is important that, throughout the implementation stage, team members and key stakeholders receive feedback on the progress of the project and their performance on the project. This will allow for early detection and resolution of problems that may become more complex and costly to resolve as time passes (Pinto and Covin 1989; Belout and Gauvreau 2004; PMI 2004) (see Figure 2).

Communication between the project team, the parent organisation and the client is a key component of project success as this enables early correction of a project that may be slightly off-track or making the appropriate adjustments to a project where environmental issues, affecting the project, may have changed (Morgan 1987). The project manager should also ensure that the communication channels are appropriate to facilitate adequate transfer of communications and data between the parties (Pinto and Covin 1989; Pinto and Pinto 1990).

2.3.6 *Project satisfies owners' needs*

Projects are ultimately undertaken in order to satisfy a business need and projects are often used to implement strategic change within an organisation (Shenhar et al. 2001; Shenhar and Dvir 2007). A project that successfully satisfies the owners' needs is said to have achieved product success (Morgan 1987; Munns and Bjeirmi 1996; Collins and Baccarini 2004) as it would have achieved its original project goal (Baccarini 1999). Product success is the achievement of project success and answers the question: "Did they get it right?" (Atkinson 1999:339).

Whereas project management success is a short term measure and can be measured immediately after a project is handed over, project/product success is a longer term measure that is done after the project has been utilised for years (Munns 1995; Baccarini 1999; Collins and Baccarini 2004; Wang and Huang 2005).

2.3.7 *Users and third parties affected by the project are satisfied*

A project manager should identify all the project stakeholders, understand their interests in the project and rank them in order to identify the critical stakeholders for the project. Whereas it is not always possible to please all stakeholders, the project manager must ensure that all of the critical project stakeholders are satisfied (Mallak et al. 1991; Atkinson 1999; Baccarini 1999; Wang and Huang 2005; Mtegha et al. 2006; Shenhar and Dvir 2007).

Satisfaction is always an evasive goal to achieve as the perspective of individuals is different. The project team needs to have operational information management systems in order to fully appreciate and manage the expectations of particularly the critical stakeholders (Baccarini 1999; Lim and Mohamed 1999; PMI 2004).

2.3.8 *Conclusion of success criteria literature review*

There are many project success criteria that have been identified in the literature. There are two main groups of success criteria; those concerning project

management success and those concerning product success. The list used is mostly derived from that compiled by Collins and Baccarini (2004) as it includes the success criteria written about in most project success literature and these are:

Project management success

Project completed on time

Project completed on budget

Meeting project specifications (quality)

The project team members are satisfied

Effectiveness of project management effort

Project/product success

Project satisfies owners' needs (goal)

Users of the project are satisfied and,

Third parties affected by the project are satisfied

2.4 Critical success criteria for mining projects in Anglo Platinum

Traditionally, project managers used the iron triangle of cost, time and quality as the only success criteria (Youker 1989; Atkinson 1999; Shenhar et al. 2001; Westerveld 2003; Collins and Baccarini 2004; Chen and Lee 2007; Shenhar and Dvir 2007) but this has proved to be insufficient as a success measurement of all the aspects of a project.

The iron triangle success criteria are very important to determine whether the project management aspects of a project have been done correctly and answers the question “Did they do it right ?” (Atkinson 1999:339). Other success criteria that answer the question: “Did they get it right ?” (Atkinson 1999:339) need to be included in order to determine if the organisational goals have been achieved (De Wit 1988; Atkinson 1999; Baccarini 1999; Shenhar et al. 2001; Cooke-Davies 2002; Stal-Le Cardinal and Marle 2006; Chen and Lee 2007).

Many literature sources suggest that the most critical success criteria for projects is meeting the owners strategic needs (Munns and Bjeirmi 1996; Baccarini 1999; Collins and Baccarini 2004). The proposition that will be tested in this research is therefore whether meeting the owners strategic needs is viewed as the most critical success criteria for projects in Anglo platinum.

2.4.1 *Project management success*

The success criteria of time, cost and quality fall into the category of process goals as they measure the success of the project management process (De Wit 1988; Atkinson 1999; Lim and Mohamed 1999; Shenhar et al. 2001; Collins and Baccarini 2004).

The project management aspects of a project are very important particularly when measuring the progress of a project during execution. Because all projects are not the same, different projects will rely more or less than others on different success criteria (Shenhar et al. 2001). There are some projects e.g. government infrastructure projects where completing a project on time and within budget may be the most important criteria or other projects such as the Sydney Opera House where the quality of the final product is the most important and time is a lesser criteria for success (De Wit 1988; Munns 1995; Shenhar et al. 2001). Mining projects also rely heavily on completing projects on time and the right quality as the project may be timed to coincide with the commodity cycle (Collins and Baccarini 2004). Significant value can be lost when a mining project is completed late and the price of the commodity being produced has fallen.

The iron triangle of cost, time and quality however are not sufficient to describe the success criteria for all projects. There is an increasing need for organisations to use projects to steer strategy in new directions (Shenhar et al. 2001; Shenhar and Dvir 2007). Project management success is therefore viewed to be subordinate to product success (Munns 1995).

2.4.2 *Project/product success*

“Project success”, also called product success in literature, means different things to different people. An architect will rate the aesthetic value of the end product highly whereas an accountant will focus on the monetary aspect of a project (Shenhar et al. 2001; Westerveld 2003). It is therefore important to understand what the organisations and key stakeholders’ objectives were in commissioning the project in order to ascertain whether their success criteria have been met through the project (Shenhar et al. 2001; Collins and Baccarini 2004).

Numerous projects are commissioned with the ultimate objective of satisfying a business need or meeting the owners’ strategic objective (Munns 1995; Munns and Bjeirmi 1996; Van Der Merwe 1997; Baccarini 1999; Shenhar et al. 2001; Westerveld 2003; Collins and Baccarini 2004). This could be increasing a company’s market share through the production of a product or increased sales or profits etc. (Shenhar et al. 2001). The stakeholders that need to be satisfied do not only include owners or managers but users and customers as well (Westerveld 2003; Collins and Baccarini 2004). The owners are however the most important stakeholder whose needs must be met above all other stakeholders(Collins and Baccarini 2004).

Unlike project management success, where success is measured during the project or shortly after completion, project success is only judged after project completion which in some cases may be many years after the project is completed (Munns 1995; Baccarini 1999; Shenhar et al. 2001; Collins and Baccarini 2004).

2.4.3 *Conclusion of critical success criteria literature review*

Traditional success criteria focussed on project management success only which largely ignored the initial purpose for doing the project. Recent developments in project management have extended the success criteria to include product success.

Success criteria therefore, includes project management success criteria of time, cost and quality as well as product success criteria of meeting the owners'' strategic objectives, satisfying users needs and satisfying the need of stakeholders that are affected by the project.

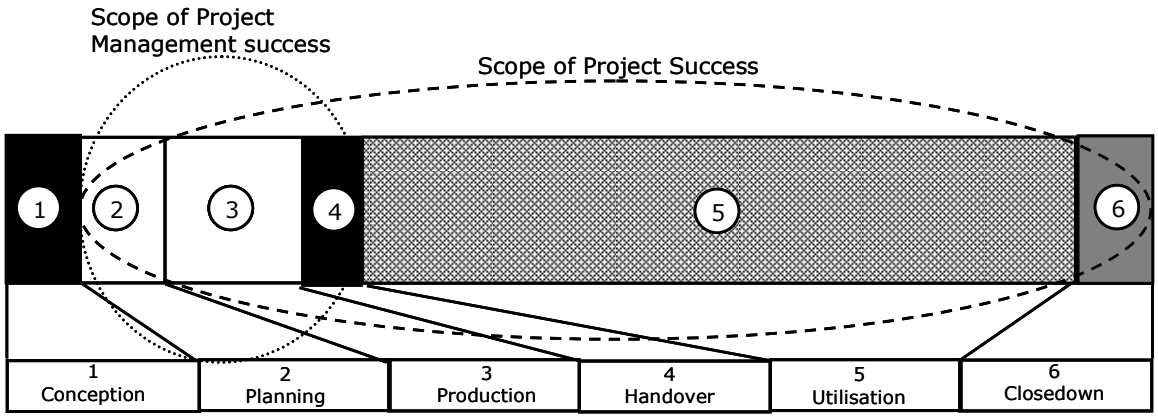

Figure 3: The scope of success within projects (Munns and Bjeirmi 1996)

Project management success cannot guarantee product success. As seen in figure 3, project management success is a sub-set of project success There are many projects that have been unsuccessful from a project management perspective where the costs were too high or were completed very late e.g. the Thames Barrier, Fulmar North sea oil project, Concorde, the Sydney Opera House etc. but achieved project success as they were well appreciated by the stakeholders well after the projects were completed (Munns 1995; Shenhar and Dvir 2007). Conversely, the Los Angeles Metro subway system was successful

from a project management perspective, having been completed in time, within costs and the correct specifications, but the project was not successful in that it did not meet its designed objectives of changing the commuters' behaviour from using their vehicles to using the subway system (Shenhar and Dvir 2007).

It is therefore expected that, even though project management success is important, project success would be more important. Furthermore, it is expected that meeting the owners' strategic needs, as a subset of project success, would be the most critical success criteria.

2.5 Do project managers deliver project management success or project success?

Project management literature is unanimous about the difference between project management success and project/product success (De Wit 1988; Munns 1995; Atkinson 1999; Baccarini 1999; Lim and Mohamed 1999; Shenhar et al. 2001; Collins and Baccarini 2004; Wang and Huang 2005; Shenhar and Dvir 2007). What is not agreed upon is who is responsible for delivering project management success and project success.

2.5.1 *Project Manager responsible for product success*

It is not wrong to have a project team being responsible for project performance after handover nor is it new. Munns and Bjeirmi (1996) sites an example in 1730 where the project team responsible for building the Tunnel Bridge were also kept on for 20 years after the physical construction was complete. They were given a maintenance contract to ensure that the project was successful after completion.

Shenhar et al. (2001) argues that project managers are strategic leaders who are responsible for delivering the project business case. In this instance project managers are not merely responsible for the project management aspects of the project but the entire project's success. In order to achieve this, projects must be managed not just operationally where time cost and quality is delivered but

strategically where the goals of the project are achieved (Shenhar et al. 2001). Should the project manager be responsible for project goals, his/her performance measures should also include long-term measures as the overall project success can only be seen after the project has been in use for some time (Baccarini 1999).

In order to ensure overall project success one has to either have the project manager being involved in the project after project handover or the owner needs to become involved in the scoping and execution stage of the project (Munns 1995).

2.5.2 *Project manager responsible for project management success only*

Most authors however believe that project managers are responsible for project management success only and that the owners are responsible for Project success (Munns 1995; Munns and Bjeirmi 1996; Baccarini 1999; Collins and Baccarini 2004).

The project manager is responsible for specifying the target cost and time during the scoping phase and then managing the project in the execution phase to achieve these but once the project is delivered, they move onto another project and are not responsible for the project thereafter (Munns 1995). The link between project management success and product success must be provided by the project owners even though the project team must warn senior managers where there are aspects beyond their control that may threaten the viability of the project (Munns 1995).

It is therefore desirable to separate the project management effort from the attainment of overall project success.

2.5.3 *Conclusion on what project managers deliver*

From literature it can be concluded that project managers should be responsible for project management success and owners should be responsible for the broader issue of product or project success.

The conundrum being investigated is therefore that even though project success should be the meeting of the owners' strategic needs, project managers are responsible for delivering project management success of cost quality and time only. The project manager should warn the owner where external factors threaten the success of the project but it is the owner that should ensure that the project is specified adequately so that when project management is successfully delivered, it coincides with the delivery of overall project success.

2.6 Propositions

2.6.1 *Proposition 1*

Success criteria for Anglo Platinum mining projects include:

Project completed on time

Project completed on budget

Meeting project specifications (quality)

The project team members are satisfied

Effectiveness of project management effort

Project satisfies owners' needs

Users of the project are satisfied and,

Third parties affected by the project are satisfied

2.6.2 *Proposition 2*

The most critical success criterion for Anglo Platinum mining projects is meeting the owners' strategic needs.

2.6.3 *Proposition 3*

Project managers are responsible for project management success and not overall project success.

CHAPTER 3: RESEARCH METHODOLOGY

A qualitative, quantitative or mixed approach could have been followed to gather information about this research. It was decided that a qualitative approach with in-depth interviews was the best way to gather data on the subject.

The qualitative approach was selected because in-depth interviews would allow one to capture the true meaning of the responses which would allow greater understanding of the answers given but also allow the respondent to be more precise about the answers given (Cresswell 2003).

3.1 Research methodology /paradigm

The study of project success can be characterised from both a positivist and constructivist perspective. Justification for a constructivist approach could be that even though much has been written on the subject; there is not consensus regarding the criteria for success and role of project managers in achieving success. A positivist approach is however taken as there is great overlap in the literature about success criteria that suggests that opinion on the topic is converging.

The qualitative approach is regarded as best to understand success criteria within Anglo Platinum as different perspectives result in different understanding of success (Baccarini 1999; Collins and Baccarini 2004). The method will first explore the respondents understanding of the topic through open ended questions and then elucidate the answer by asking specific closed questions.

3.2 Research Design

The research took the form of a descriptive study where the data was gathered indirectly through respondents' perception of the underlying issues. A semi-structured interview-based methodological approach was followed where qualitative data was collected as respondents were asked to indicate their perceptions through open ended questions, questions that were graded on a Likert scale and questions where the most appropriate answer was selected from a predetermined list.

The manner in which projects are conducted has changed in the last ten years and is expected to change further as more understanding of past mistakes occurs (O'Connor and Reinsborough 1992). The study data will therefore be cross sectional as another such study in the future could yield different results.

Advantages of this approach:

The primary advantages for conducting qualitative in-depth interviews follow below:

In-depth interviews will allow rich data to be obtained where underlying issues can be understood. Large-scale surveys may be unable to extract the nuances of a given topic that can be explored in an interview (Bell 2005).

A selected group of individuals were interviewed where a 100% response was obtained. The response percentage for surveys is notoriously low which complicates reliable data gathering.

“Questionnaires are easy to do badly and difficult to do well” (Rugg and Petre 2007:65). An in-depth survey will ensure that the respondents understand the questions fully and answer them more thoughtfully and thoroughly than a questionnaire would allow (Delisle and Olson 2004).

Disadvantages of this approach:

The number of responses sought for in-depth interviewing are much less than the minimum responses required for a survey-based questionnaire. It is possible that the views of the individuals selected may be biased and therefore not representative of what happens in Anglo Platinum (Bell 2005).

A disadvantage of an in-depth study of the success of projects in Anglo Platinum is that generalisation of the results is not easy. Extrapolating such results will require an understanding of how similar another organisation is to Anglo Platinum (Bell 2005) and is therefore not advised.

The wording of interview questions is as much a weakness of interview questions as it is of survey questionnaires. One has to ensure that questions asked are not ambiguous and are well understood by the respondents (Delisle and Olson 2004; Bell 2005).

3.3 Methodological Limitations

The author works for Anglo Platinum where the need for such an investigation was identified. It is likely that some bias is introduced in this research where cues are taken from experiences at Anglo Platinum that will guide the direction of the investigation. This has however been mitigated by ensuring that all concepts used are supported in literature.

As discussed in 3.2 above, a limitation of the approach taken is the difficulty in generalising the results to other similar mining companies as their approach to project management may be very different from what occurs in Anglo Platinum.

The impact of recent events is likely to distort the answers given to survey questions e.g. the recent 2008/9 global credit crisis may influence the responses on project success.

3.4 Population and sample

3.4.1 *Population*

The critical success criteria are being researched for Anglo Platinum projects. The total population is made up of project managers, project users, project sponsors/owners, other stakeholders and project support staff.

3.4.2 *Sample and sampling method*

Interviews were held with a cross section of project stakeholders within Anglo Platinum. At least twelve individuals were selected; three from each of the following groups:

Project users

Project support

Project managers

Project owners/sponsors

These groups were selected as they formed the main sub-groups of personnel who directly or indirectly contribute towards a project.

Information was gathered through structured in-depth interviews where open and close-ended questions were asked. The respondents were asked to rate the close-ended questions on a Likert scale and by selecting the most appropriate answer from a list.

The qualitative data was assessed by summarising the answers given by each respondent and establishing whether there are themes that develop from the responses (Bell 2005).

The interviewees were selected through informally asking key players within the project environment who they believe best understand projects in Anglo Platinum.

Table 1: List of respondents

Position of group	**Number to be sampled**
Project managers	3
Project support	3
Project owners	3
Project sponsors (executives)	3

3.5 The research instrument

Data was gathered using a semi-structured interview with open-and close-ended questions.

The interview questions in Appendix A was adapted from similar work done by Collins and Baccarini (2004). A spreadsheet was used to record the answers given by each interviewee for each of the questions.

3.6 Procedure for data collection

Data was gathered through semi-structured interviews. The interview questions were piloted by conducting the interview on one individual before proceeding with the interviews. This individual was chosen due to they extensive experience in the roles of project owner and project support.

Appointments were made with the selected individuals over a period of approximately two weeks; depending on their availability. The sequence of the interviews was to initially interview one individual each from the groups listed in table 1 and the second and third round of interviews will follow the same logic. The interviews were scheduled starting with those individuals held in the highest regard from the list.

The interviewees were asked if a recorder could be used to supplement the notes that were taken during the interview and none objected to the usage of the recorder.

3.7 Data analysis and interpretation

The open-ended questions were analysed by ascertaining if themes or patterns emerge from the responses given (Cresswell 2003).

A simple frequency analysis of the answers was conducted for those where a Likert scale and selection from a list is used. A frequency analysis of the data was deemed to be a simple but appropriate means of analysing the data as it is similar to the analysis conducted by Pinto (1990) and Collins and Baccarini (2004).

3.8 Validity and reliability

Validity in the context of this research refers to the extent to which respondents answering survey questions have a common understanding of what is being asked for, which is congruent with what the questionnaire designer intended to question (Cresswell 2003; Bell 2005). Reliability, on the other hand, refers to the

accuracy and precision of the method used to obtain the data (Cresswell 2003; Bell 2005).

3.8.1 *External validity*

Following from the definition of validity given above, external validity refers to the ability to extrapolate the conclusions obtained when collecting data from a particular sample to a population outside of the sample scope (Leedy 1980; Terre Blanche and Durheim 1999).

As discussed in 3.2 above, a limitation of the approach taken is the difficulty in generalising the results to other similar mining companies as their approach to project management may be very different to what occurs in Anglo Platinum. The external validity of the case study approach is therefore weak and results obtained should not be extrapolated.

3.8.2 *Internal validity*

Internal validity refers to the validity of data within the context of the research. The check on internal validity is whether the processes followed to arrive at a certain conclusion are valid (Terre Blanche and Durheim 1999). In order to improve the internal validity of the research, piloting was done by piloting the interview questions among two individuals who are part of the intended sample to elicit responses on their understanding of the survey questions and adjust the questions where appropriate.

The internal validity of the questions is also improved as the questionnaire used was adopted from the one developed by Collins and Baccarini (2004) where the latter is an Associate Professor and Director of the project management course at Curtin University of Technology – Australia. The original questionnaire was obtained through email correspondence with Professor Baccarini.

3.8.3 *Reliability*

The reliability of the data collected refers to the repeatability of the results obtained i.e. the similarity of results obtained should more than one set of data be collected under the same conditions (Terre Blanche and Durheim 1999; Bell 2005).

Conducting in-depth interviews with a small number of interviewees as apposed to eliciting responses through a survey is less reliable as the selected group could be biased (Bell 2005). This is mitigated by carefully selecting the individuals to interview and only using those that have proved their competency in their role to all stakeholders.

Perceptions will also change depending on the perception of consequences, to themselves and their companies. It was made clear in the interview, that the data was sterilised to such an extent that it would be impossible to trace the person that provided the data.

This study will at best be a cross-sectional study. Perception is likely to change with time as improvements are made in the way projects are conducted and the environment in which business is conducted, changes.

CHAPTER 4: PRESENTATION OF RESULTS

4.1 Introduction

Information gathered from the semi-structured interviews was recorded on a spreadsheet and graphs plotted of the response frequencies. The open-ended question responses were grouped as far as possible where respondents refer to the same concept but all responses were captured.

4.2 Interview piloting

The interview questions were first piloted by interviewing two people within Anglo Platinum who have many years experience with projects. There were some changes suggested that were subsequently made to the questionnaire. These were:

It was suggested that the executives and the sponsors be grouped together as their function in projects was the same. The group titled “project sponsor” was then changed to project support to cover those individuals that are part of the project team in the capacity of service providers.

Wherever the term “product” was used, it was replaced by “project” in order to improve the understanding of the questions asked.

One of the answer options of Questions 6 and 7 of section B was changed from “Anytime in the project lifecycle” to “Continuously through the project lifecycle”.

One of the answer options of Question 4 of section B was changed from “Project rarely successful” to “Project seldom successful”.

4.3 Research context

4.3.1 *Demographic profile of respondents*

The demographic questions were asked primarily to ensure that the individuals interviewed had sufficient mining experience and specifically, mining projects experience.

All the identified interviewees were interviewed and they confirmed that their current roles are:

Project user

Project manager

Project owner/sponsor/executive and,

Project support

Figure 4 below shows that 3 individuals were interviewed from each of the groups shown above.

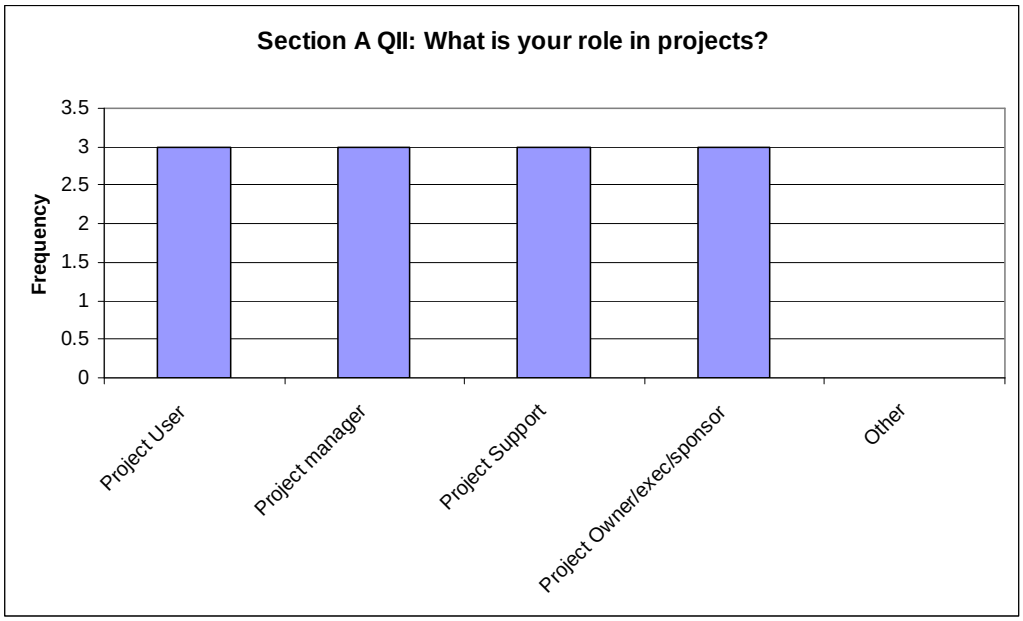

Figure 4: Project roles

Figure 5 shows that 83% of the interviewees have greater than 21 years mining experience and 67% of them have been directly involved with more than 10 mining projects (Figure 5).

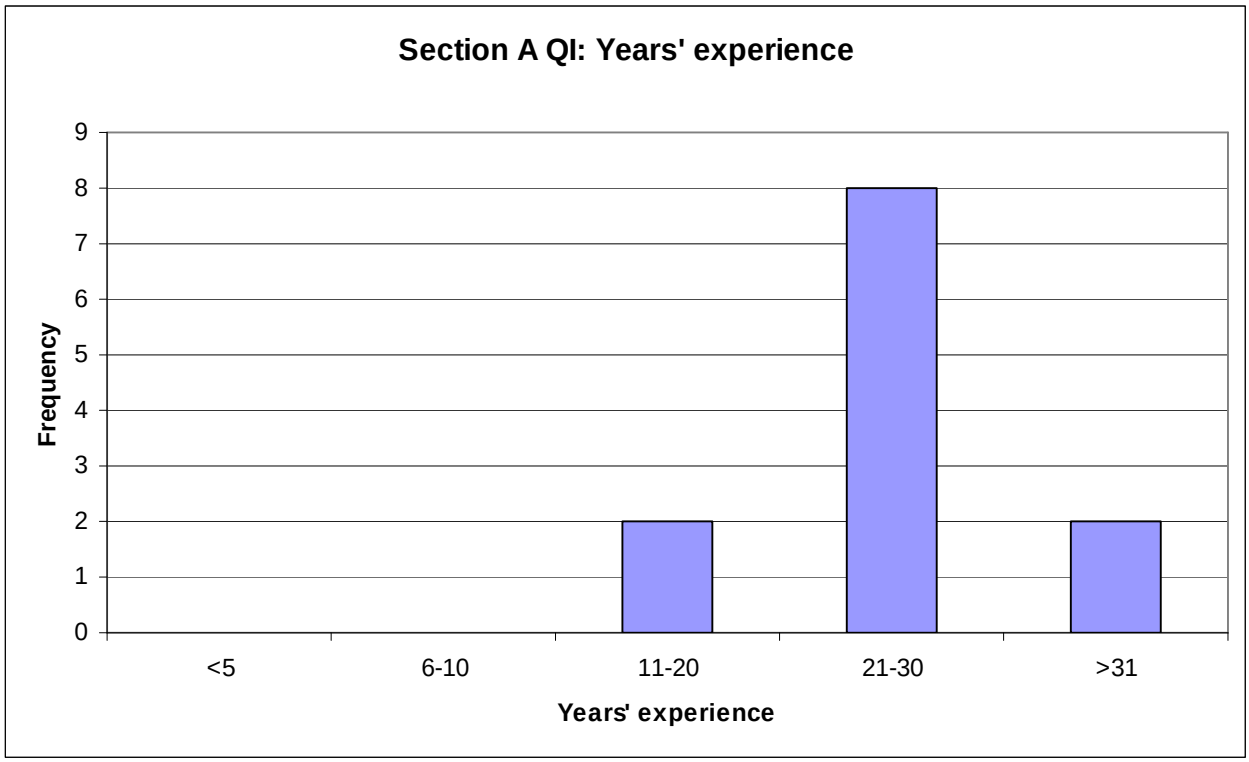

Figure 5: Mining experience

Figure 6: Number of mining projects completed

4.3.2 *Understanding of project success*

Section B Question 1 was an open-ended question where a response on the interviewee's perception of project success was elicited. Figure 7 shows that there was a spread of answers to this question with the top five responses being:

Project completed to scope definition

Project completed on time

Project completed within budget

Owners' needs satisfied

Project completed safely

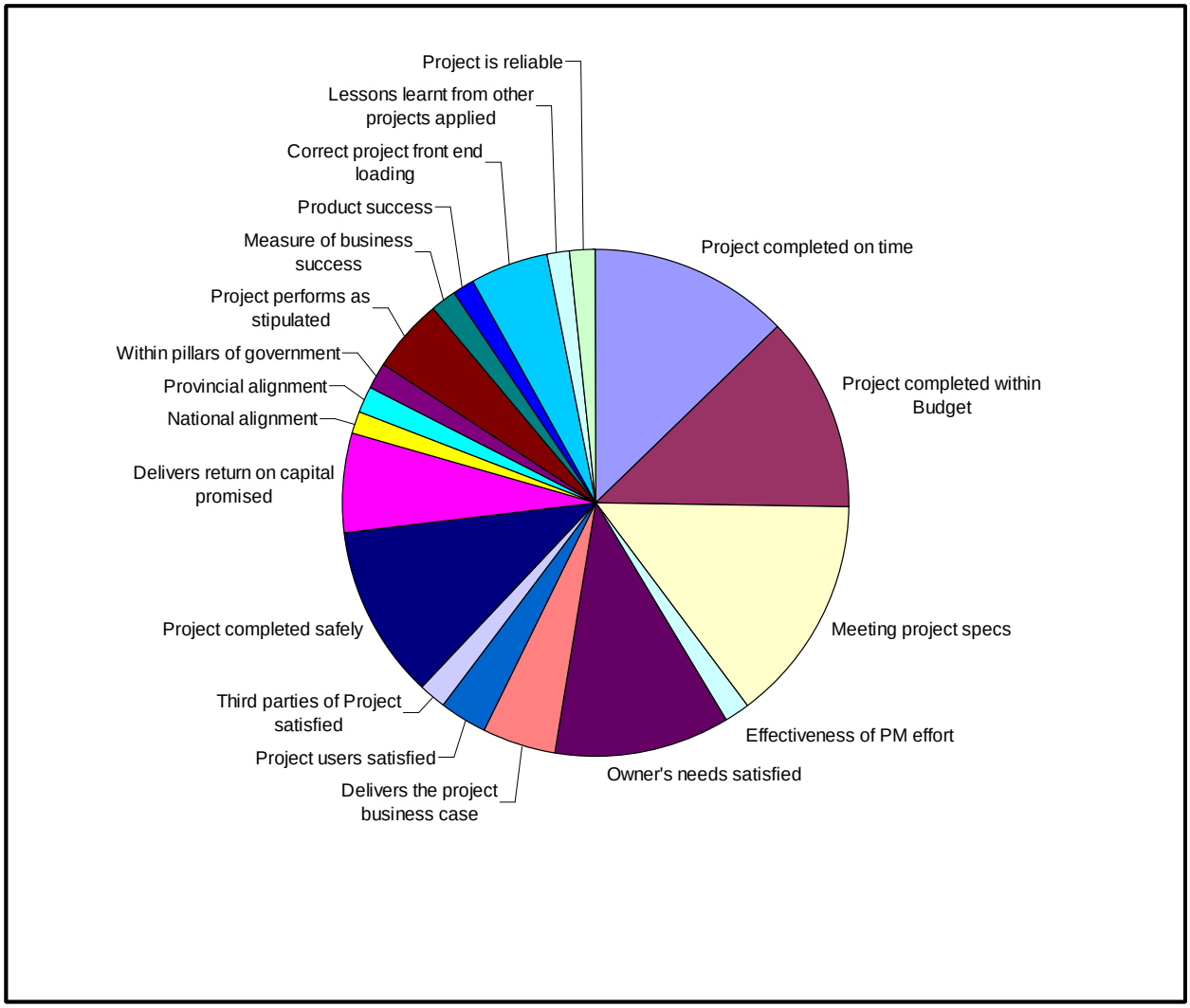

Figure 7: What does the term "project success" mean to you?

The traditional project management parameters of cost, quality and time were identified as the most important meaning of project success followed by the satisfaction of owners' needs and completing the project safely.

4.4 Results pertaining to proposition 1:

Success criteria in Anglo Platinum

There was also a large spread of answers to the question of the criteria used to measure project success, with the highest response frequency being the following (from highest to lowest frequency):

Meeting project specifications

Project completed within budget

Project completed within time

Owners' needs satisfied

Delivering the business case

It was interesting to note that for an open-ended question, the responses weighed more towards project management success criteria of cost, quality and time. Meeting owners' needs and delivering the business case also featured among the most quoted success criteria.

One of the respondents mentioned that meeting the project budget is currently one of the most important criteria due to the current credit crunch. Executives want to ensure that projects do not overspend as this will hurt their cash flows which is costly in an environment where credit is expensive.

Satisfying the owners' needs was explained aptly by one of the project managers who recalled a project he had to complete where a specific sampler was specified by the client and the sampler constituted one of the most important aspects of the project. The project was delivered within budget and on time but was deemed a failure because the sampler did not meet expectations.

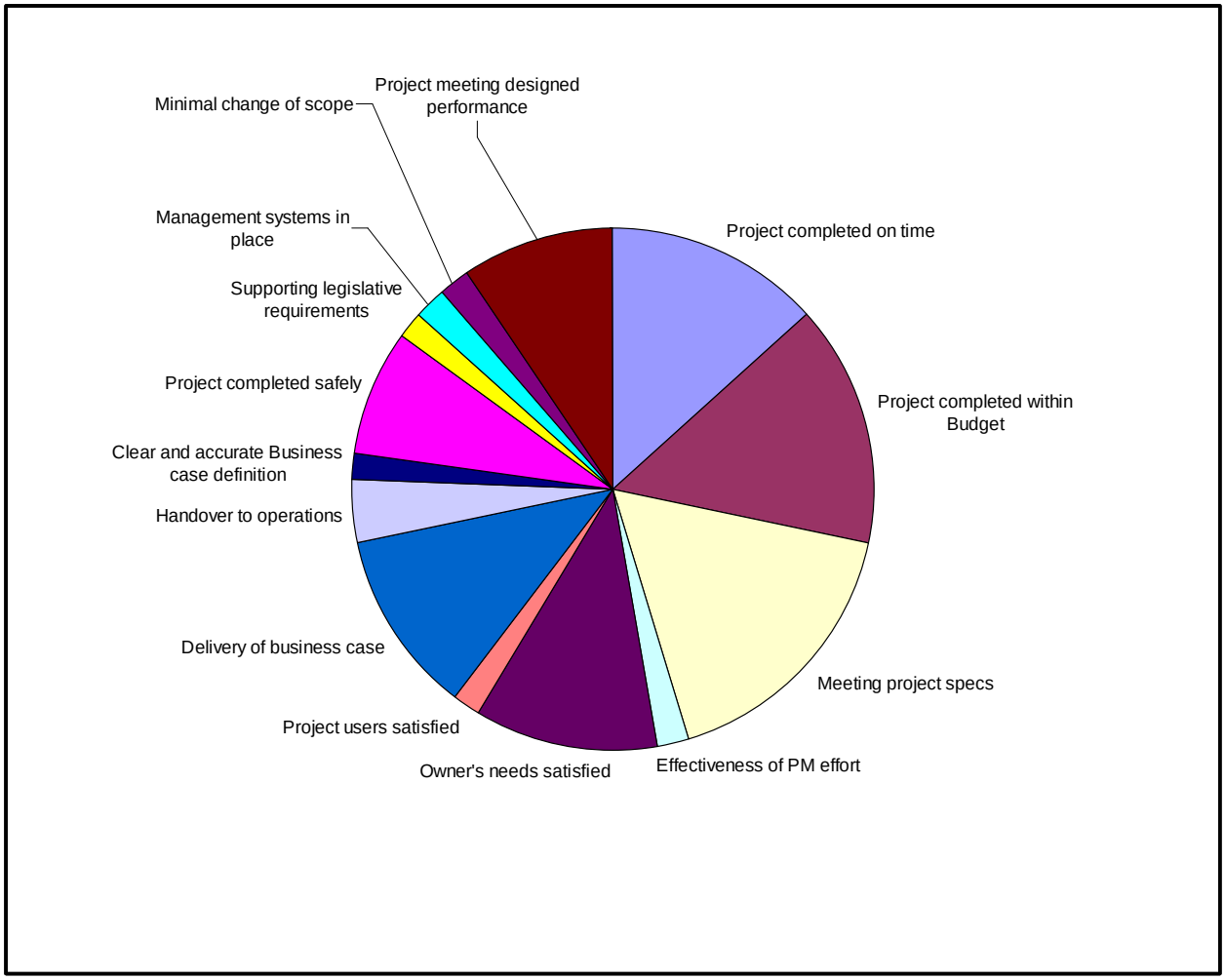

Figure 8: What criteria do you use to measure project success?

The following were found to be success criteria for projects in Anglo Platinum:

Project completed to scope definition

Project completed on time

Project completed within budget

Project completed safely

Owners' needs satisfied

4.5 Results pertaining to proposition 2

4.5.1 *Critical success criteria*

Question 3 was a closed question where specified success criteria needed to be scored from “not critical” to “very critical”. Figure 9 and 10 show that the satisfaction of owners’ needs emerged as the most critical success criteria. This was followed by the project management success criteria of cost, quality and time.

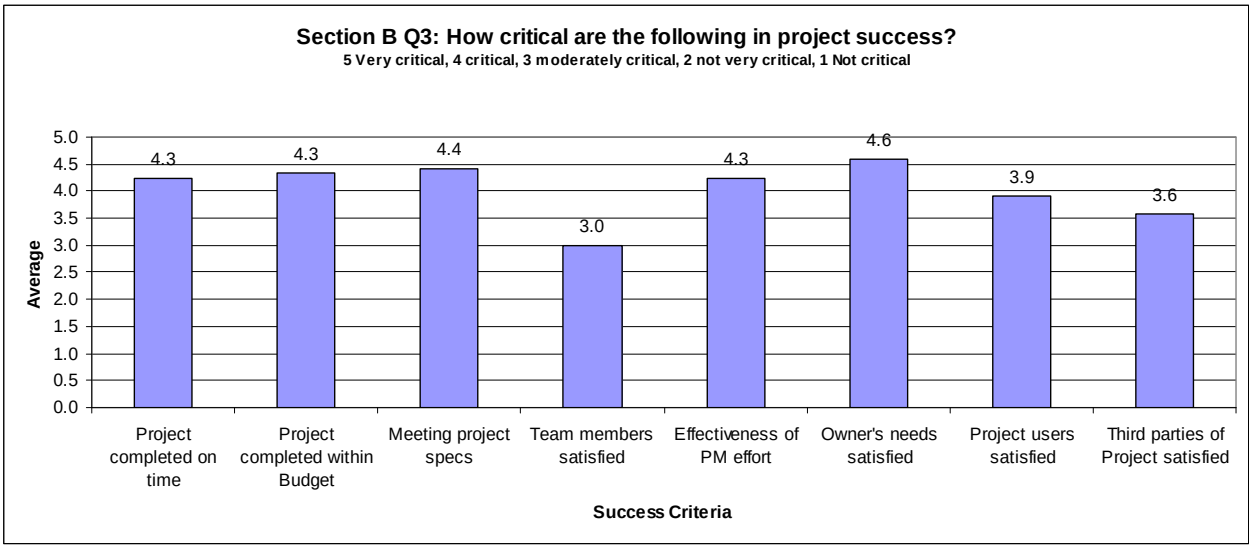

Figure 9: Criticality of success criteria

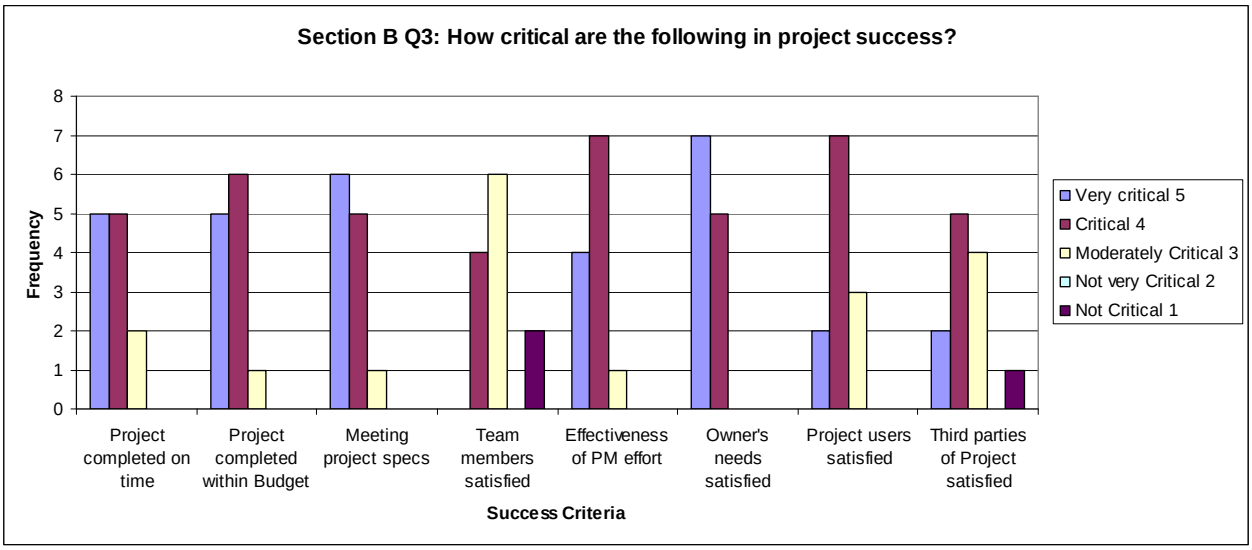

Figure 10: Criticality of success criteria cont...

The most critical success criteria is meeting owners' needs followed by the project management criteria of time, cost and quality. The understanding of the difference between the two was demonstrated in question 4 and 5. When weighed against each other, respondents felt that satisfying owners' needs was more important that delivering project management success.

4.6 Results pertaining to proposition 3

4.6.1 *Is project management success the same as project success?*

Section B question 4 attempted to discover if the respondents considered there to be a difference between project management success and project success. The responses indicated that projects would be generally successful if cost, time and quality objectives were met (see Figure 11). One respondent noted that he did not select "Project always successful" because there are instances when a project could achieve cost, quality and time without being successful overall. These are cases where a project may have been scoped incorrectly.

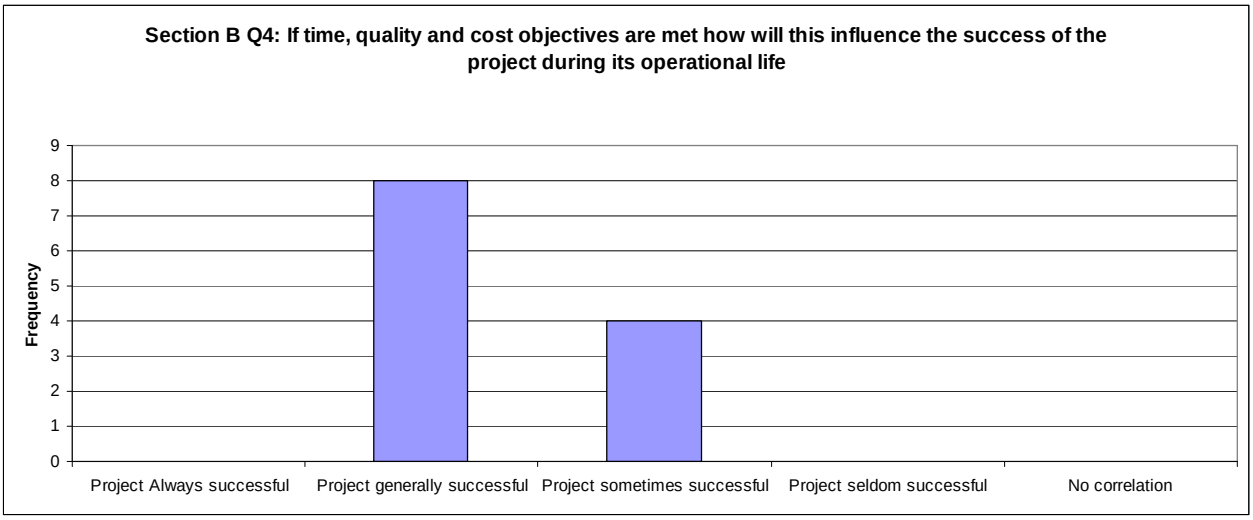

Figure 11: If project management objectives are met how will this influence the success of the project during its operational life?

4.6.2 *Is project management success more important than project success?*

One of the respondents noted that: “In the mining industry, it is often better to have a project that is slightly late and slightly over budget than to have one that does not achieve its intended purpose.” Question 4 and 5 are similar and are aimed at seeing whether the answers are consistent. The answers in question 5 (see Figure 12) are consistent with those given for question 4. The general responses suggested that project management objectives are seldom more important than producing a useful project for the client.

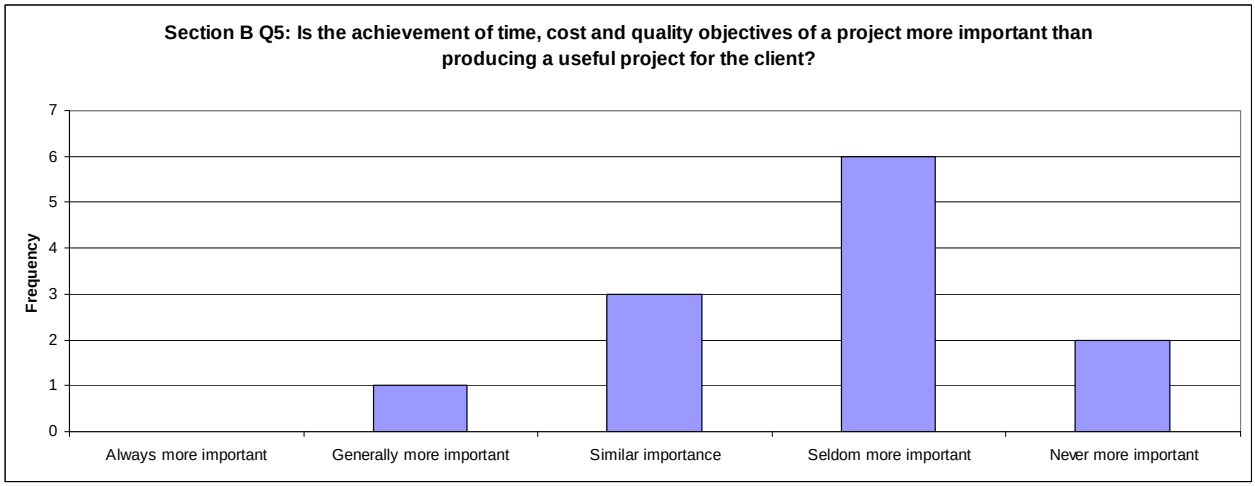

Figure 12: Is the achievement of time, cost and quality objectives of a project more important than producing a useful project for the client?

4.6.3 *When should project management success be measured?*

Respondents almost unanimously (92%) answered that project management objectives, unlike overall project success, can be measured at any stage of the project lifecycle as it "is a measure of actual progress versus plan" as shown in Figure 13. The one respondent who answered differently believed that you can only measure how the project progressed against cost, quality and time after the project is complete. This view was countered by the majority who felt that "you have to keep track throughout the project and pick up deviations early" as you "may have a disaster at the end" if that is the only time project management success is measured.

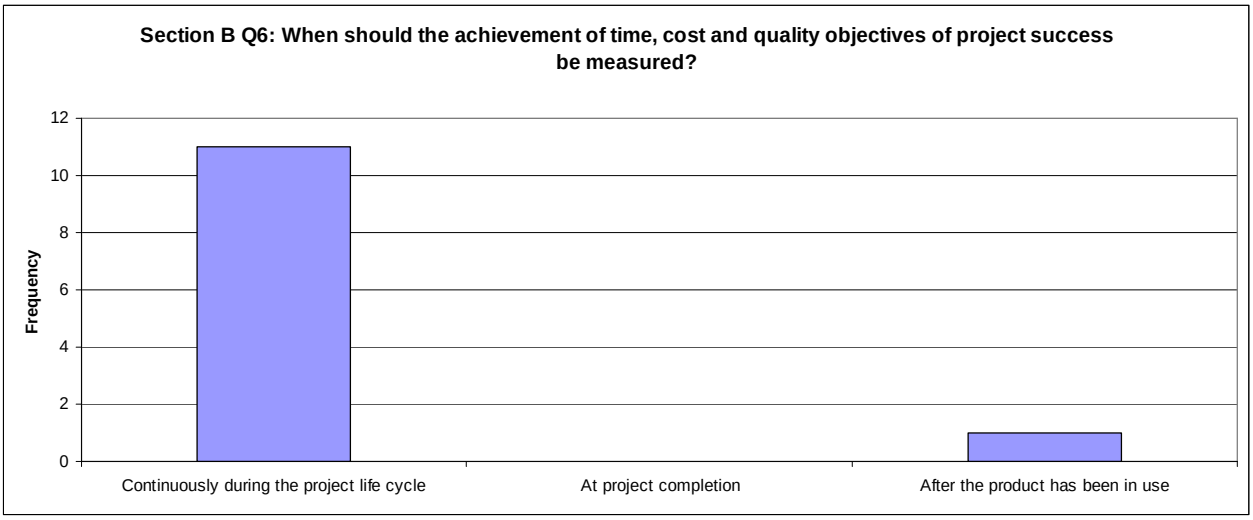

Figure 13: When should the achievement of project management success be measured?

4.6.4 *When should project success be measured?*

The respondents overwhelmingly agreed (83%) that project success can only be measured after the project has been commissioned and has been in use for some time (see figure 14). This, they explained, is because one could often deliver a successfully managed project only to find that the project does not deliver the desired product. These answers are also consistent with the answers given in questions 4 and 5.

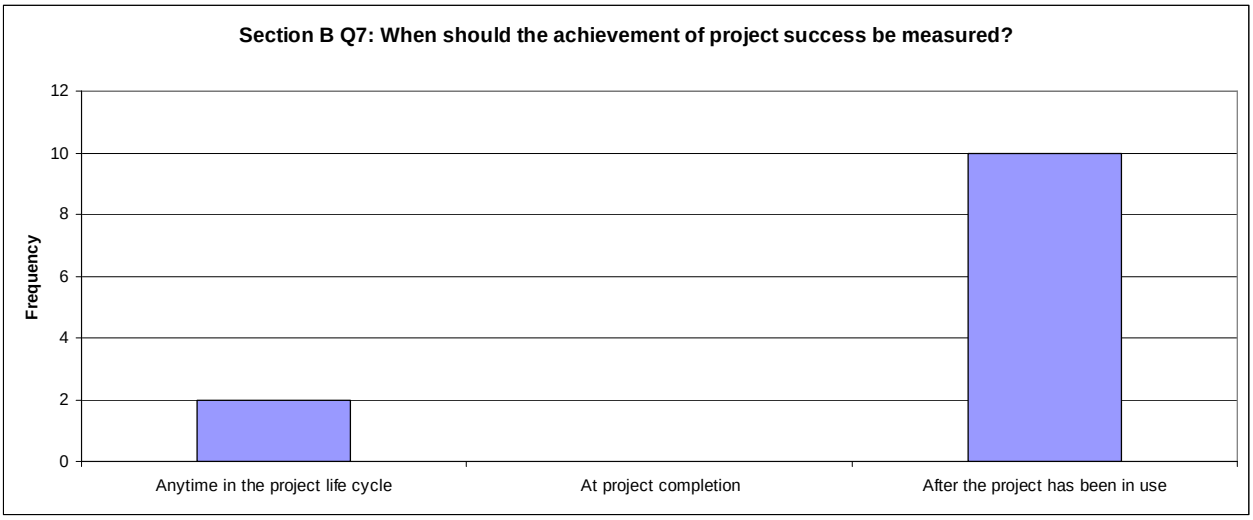

Figure 14: When should the achievement of project success be measured?

4.6.5 *What are project managers responsible for? (Open-ended question)*

Literature suggests that project managers are responsible for the project management aspects of a project i.e. cost, quality and time. From the responses to question 8 of section C, shown in Figure 15, it appears that Anglo Platinum project staff concurs with this view even when an open ended question is asked. The spread of answers given however, may suggest that the understanding of a project managers responsibility is not succinct.

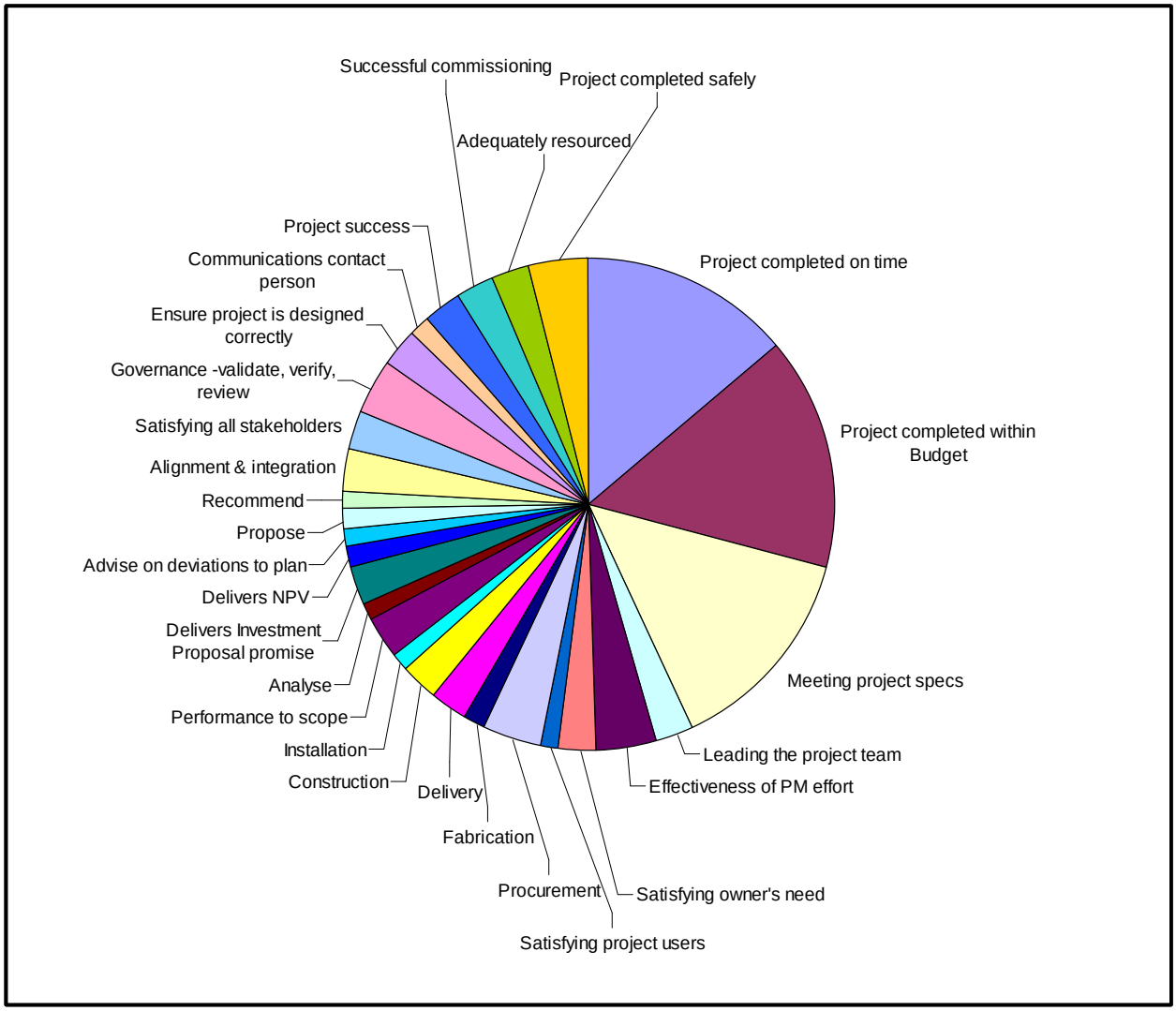

Figure 15: What are project managers responsible for?

4.6.6 *What are project owners' responsible for?*

An open ended question (Section C question 9) about a project owners' responsibility produced results as per Figure 16. The frequency of responses was as follows (from highest to lowest frequency):

Project support

Clear scope definition

Delivering the business case

Strategic direction

Providing resources for project team

Providing capital

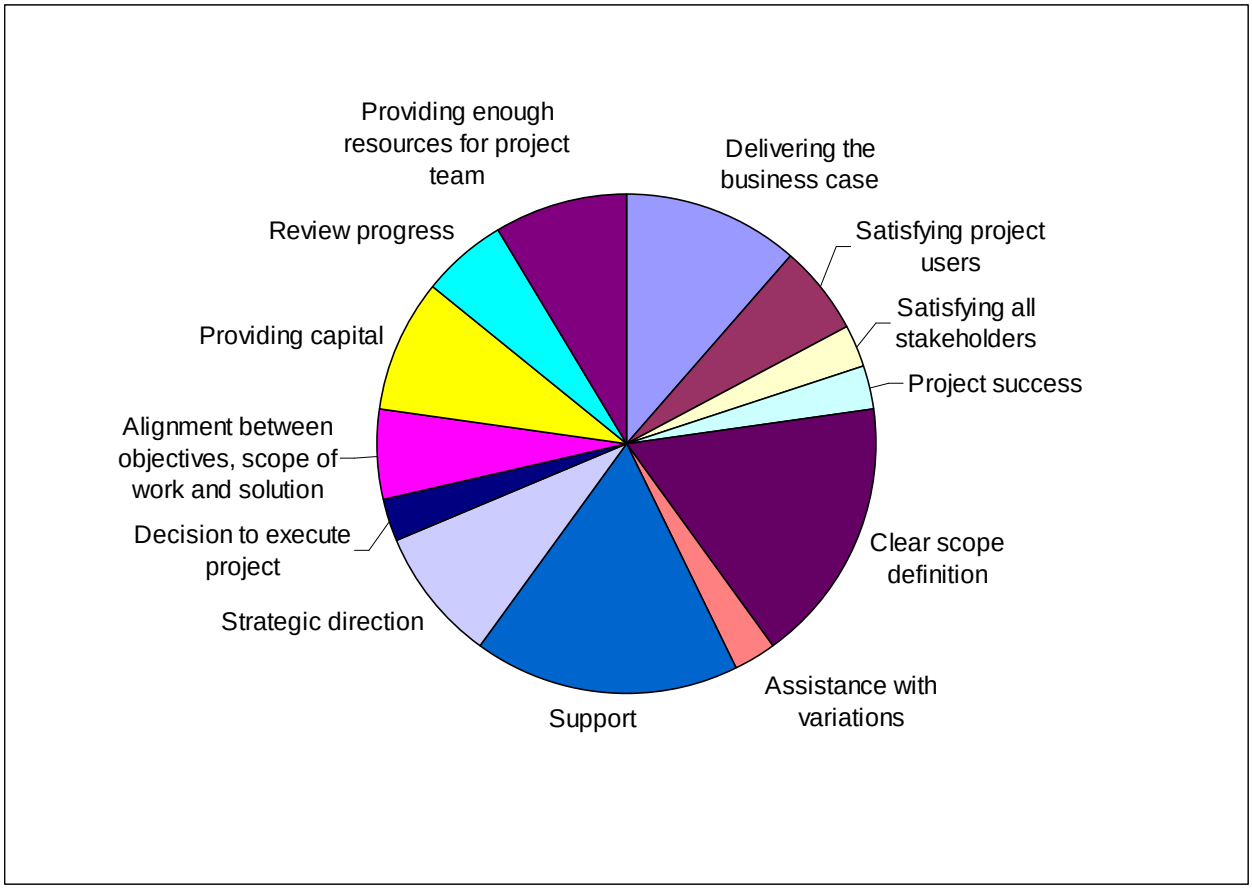

Figure 16: What are project owners' responsible for?

4.6.7 *What are project managers responsible for? (Closed question)*

A closed-ended question (Section C question 10) on the responsibility of project managers yielded a very succinct answer. Figure 17 shows that the respondents unanimously agreed that project managers are responsible for cost, time and quality.

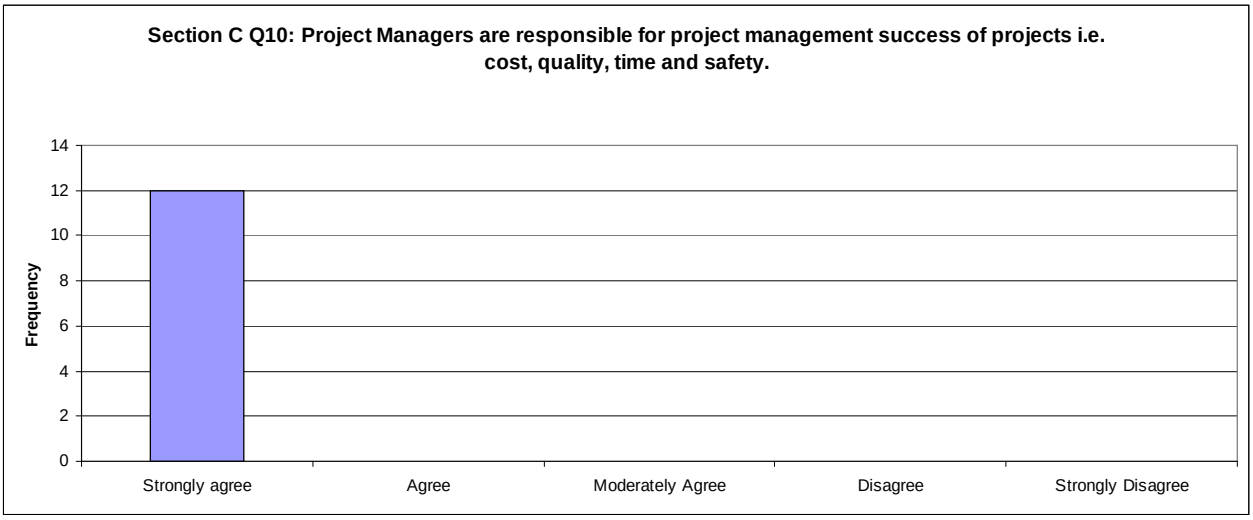

Figure 17: What are project managers responsible for?

4.6.8 *Are project managers responsible for the project business case?*

Section C question 11 attempted to elicit whether Anglo Platinum expects its project managers to deliver the business case as suggested by some authors. Figure 18 below shows that there are as many respondents who disagree that project managers are responsible for delivering the business case as there are that agree that project managers at Anglo Platinum are responsible for delivering the business case.

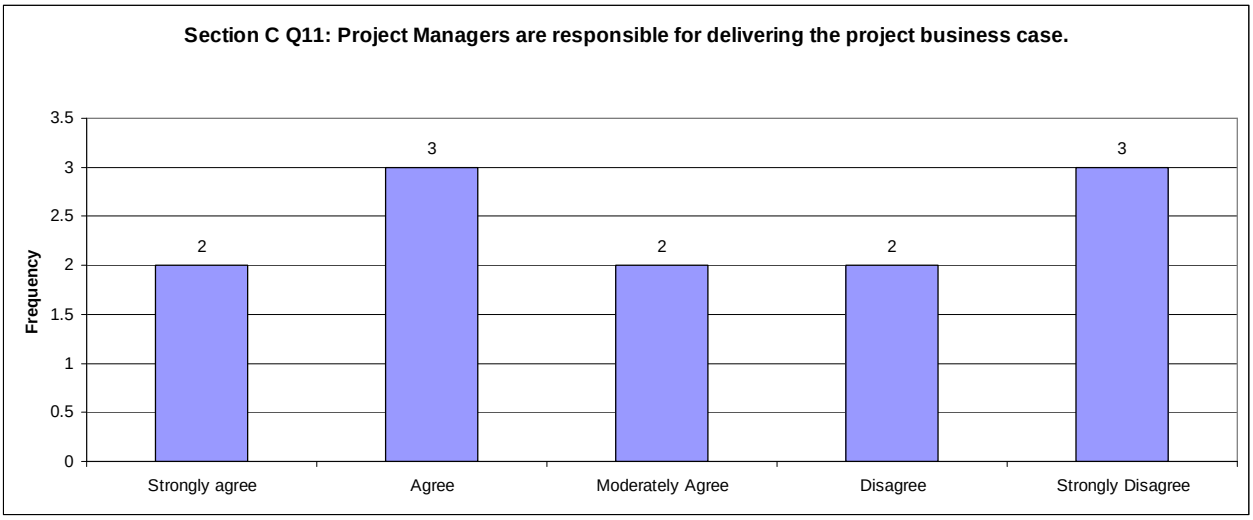

Figure 18: Are project managers responsible for delivering the business case?

4.6.9 *Are project owners' responsible for the project business case?*

The responses as to whether project owners' are responsible for delivering the business case showed that most agreed that this was their responsibility (see Figure 19). It is interesting to see that even though the closed question showed that project owners are responsible for delivering the business case, the open ended question (question 9) did not show it that clearly.

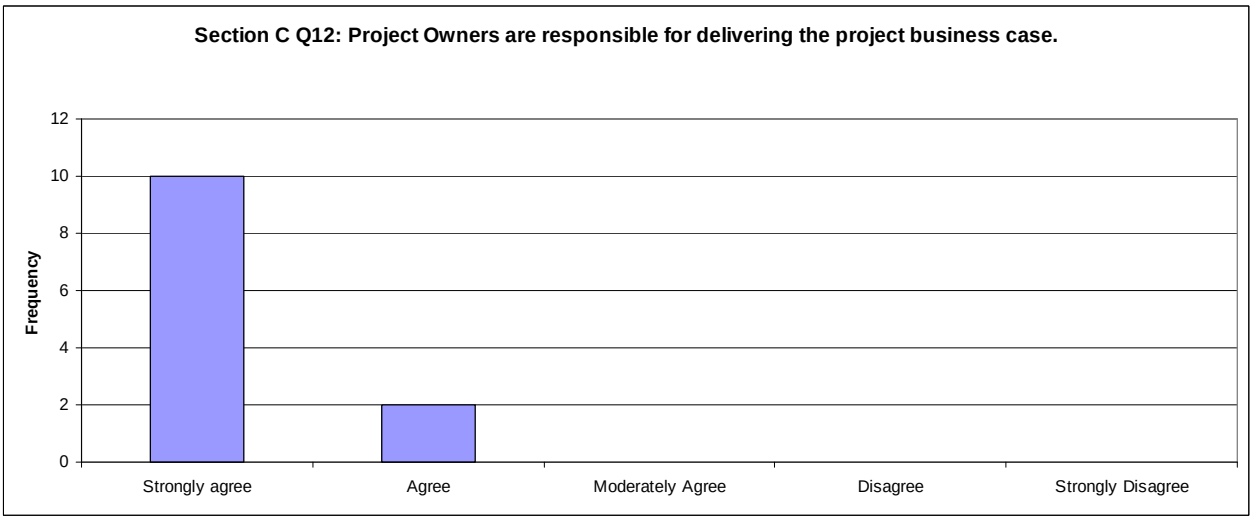

Figure 19: Are project owners responsible for delivering the business case?

4.7 Summary of results

All the respondents identified were interviewed as planned after corrections were made to the survey questions following the pilot run. The respondents mostly had between 21-30 years experience and had successfully completed more than 10 projects.

The highest frequency for success criteria in Anglo Platinum was completing a project within budget and time, to the correct specifications, meeting the owners' needs and delivering the business case.

The highest frequency for critical success criteria was meeting the owners' needs even though the project management success criteria of cost, quality and time also had high frequencies.

The respondents made a distinction between project management success and project success. It was unanimously agreed that project managers are responsible for project management success but the answers given for whether project managers deliver the business case were not as crisp.

CHAPTER 5: DISCUSSION OF RESULTS

5.1 Introduction

In attempting to ascertain the critical success criteria of projects in Anglo Platinum, employees were selected that had the sufficient experience in Anglo Platinum projects to be able to provide a clear picture for the purposes of this study.

The success criteria were found to be the project management success criteria and product success criteria as expected from the literature.

Critical success criteria within Anglo Platinum were found to be the satisfaction of owners' needs. This was followed closely by project management success criteria of cost, quality and time.

It is generally believed within Anglo Platinum that project managers are responsible for cost, quality and time but there was divided opinion among the respondents whether project managers are responsible for delivering the business case.

5.2 Demographic profile of respondents

The demographic profile of the respondents was important to ensure that the people selected to interview would give a balanced and accurate view of Anglo Platinum's project environment.

Responses were obtained from the identified project role players within Anglo Platinum i.e. project managers, project sponsors/executives, project owners and project support. Three respondents were obtained from each group

The experience of the respondents within mining and particularly with mining projects was satisfactory as most had >21 years' experience and had been involved in more than 10 mining projects.

5.3 Discussion pertaining to Proposition 1

Respondents viewed the success criteria for projects in Anglo Platinum as follows (in order of response frequency):

Meeting project specifications

Project completed within budget

Project completed on time

Owners' needs satisfied

Project completed safely

The list overlaps with the list suggested by the literature review in all the criteria except the satisfaction of third parties, the satisfaction of team members and the satisfaction of project users. One would have expected that the satisfaction of third parties would be a criterion for success particularly because some of the third parties include government and communities which are critical stakeholders in Anglo Platinum projects. The reason for not regarding the satisfaction of third parties could be a topic of further research where it may be discovered that third party requirements are completed through obligation (meeting the letter of the law) rather than an appreciation for its importance to project success.

Satisfying the project team is not a success criterion for Anglo Platinum projects as can be seen from the responses and articulated by one of the project managers interviewed.

Proposition 1 was adequately answered with the responses being largely in line with literature except for the three criteria mentioned above.

5.4 Discussion pertaining to Proposition 2

The research shows that Anglo Platinum views meeting the owners' needs as the most important success criterion. This is in line with the research proposition and literature.

Other, less critical, success criteria included meeting the budget and specifications, the effectiveness of the project management effort and completing the project on time.

The results above were further corroborated in 4.5.2 and 4.5.3 above where a distinction was drawn between the project management and project success objectives. It was clearly articulated that meeting project management criteria generally coincided but not always with a successful project. Anecdotal responses indicate that project management success and project success do not coincide when a project has been specified incorrectly. The project manager could therefore deliver the project within budget, on time and at the desired quality without meeting the ultimate goal of the project. The respondents also further noted that the achievement of cost, quality and time (project management objectives) is of secondary importance to producing a useful project for the client.

The second research proposition was adequately answered and the critical success criterion identified is in line with what literature suggests and agrees with the research proposition.

5.5 Discussion pertaining to Proposition 3

When an open ended question (section c question 8) was asked about the responsibilities of project managers, the responses were in line with what is suggested in literature i.e. project managers are responsible for cost, time and quality. There was however a large spread of answers that may suggest that the responsibility of project managers in projects is not clearly defined. When asked whether they believe project managers are responsible for delivering the business case, section c question 11, the following responses were obtained:

Strongly disagree (25%)

Disagree (17%)

Moderately agree (17%)

Agree (25%)

Strongly agree (17%)

There were an equal number of respondents that agreed and strongly agreed as there was who disagreed and strongly disagreed. This somewhat contradicts the answers given in section c question 8 as the delivery of the business case was not identified there as a project management responsibility.

One would therefore conclude from this that the respondents' opinions were divided on whether project managers deliver the business case or not. The Anglo Platinum project managers' job description was examined in an effort to glean some understanding of the reason for the disagreement. The job description turned out to be a very lengthy, long winded document outlying numerous responsibilities. It is believed that this job description may be the source of some of the confusion.

Some of the respondents were later questioned on the reasons for disparate answers and answered that Anglo Platinum executives are aware of this confusion and are in the process of rectifying it. Initially project owners were solely responsible for the business case and were also responsible for delivering projects. Increased demands on the project owners forced the company to separate the project owners' role from the project management role. This however led to a disjoint between the project owner and project management where the owner was no longer involved in the scoping and execution of the project. Anglo platinum are currently looking at returning the responsibility and accountability of projects to the project owner.

Literature is also divided on whether project managers deliver cost quality and time only versus delivering the business case however, it is not expected that these differences would exist within a company. Proposition 3 is therefore inconclusive and points towards remedial action required within Anglo Platinum to ensure that all project role players are aligned regarding the role of a project manager.

5.6 Conclusion

The success criteria for projects in Anglo Platinum are in line with what is suggested in literature. The success criteria in this study were found to be:

Meeting project specifications

Project completed within budget

Project completed on time

Owners' needs satisfied

Project completed safely

Meeting owners' needs was identified as the most critical success criteria. This is also in line with what literature suggests.

It was proposed that project managers are responsible for project management success of cost, quality and time and not delivering the business case. The respondents were

divided on this issue. Some contemporary views on project management suggest that project managers are the companies' strategic leads and are/should deliver the business case.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

Conclusions on the research conducted into critical success criteria for projects in Anglo Platinum are presented in this section.

6.2 Conclusions of the study

This research report examined the criteria for successful projects in Anglo Platinum.

The success criteria identified by the respondents interviewed largely coincided with what was suggested in literature. The success criteria identified include the following:

- Meeting project specifications
- Project completed within budget
- Project completed on time
- Owners' needs satisfied
- Project completed safely

Critical success criteria identified were also in line with what was suggested in literature. The critical success criteria for projects in Anglo Platinum, in order of criticality, were identified as being:

- meeting the owners' needs
- meeting the budget
- meeting the project specifications
- the effectiveness of the project management effort,

- completing the project on time

The responsibility of a project manager in Anglo Platinum was, as expected, found to be the delivery of cost, quality and time however there was confusion where a substantial number of respondents believed that the project manager was responsible for delivering the business case as well. The author believes that even though project managers should be aware of the business cases of their projects and should highlight those aspects that may lead to its non-delivery, they should not be held responsible for delivering the business case.

6.3 Recommendations

The study has shown that there are differing opinions of the project manager's responsibilities within Anglo Platinum that may be leading to sub-optimal execution of their duties.

- The project manager's job description is not sufficiently succinct to clarify what their role should be. It is recommended that the job description of the project manager be amended to focus on the delivery of cost, quality and time in projects as is the general expectation. The job description should then make it clear that even though the project manager is not responsible for the business case, the objective of the project owner is to align the delivery of the project with the business case and the project manager should bring to the project owners' attention instances where there is a conflict between what the project plans are and the business case.

- During discussion with various stakeholders, it emerged that Anglo Platinum were changing the structure of the projects department from being an "independent" department from the day to day mining operations to being answerable to the project owner (mine manager). This is the structure that was in place before it was

made “independent”. The reason for making it independent was that the project owner did not have the time to oversee a project as well as run a mine. With Anglo Platinum looking at reverting to previous set up where projects reported to the mine manager, cognisance should be taken of the problems that were experienced then. It is suggested that the project owner appoint a person to oversee projects on behalf of the project owner. This will ensure that you do not go full circle and repeat the issues that were problems in the last structure.

- It is also recommended that a workshop be held where the responsibilities of the different project stakeholders be discussed particularly the role of the project manager and programme manager.

6.4 Suggestions for further research

This study was done on the perceptions of project success generally within Anglo Platinum. Shenhar and Dvir (2007) have conducted research on the perceptions of project success for specific projects. The questionnaire that they present in appendix 2 could be used to gather information on various projects within a company or an industry.

Many mining companies have, like Anglo Platinum, outsourced the project management function to contract companies. It would be interesting to conduct similar research on more mining companies in South Africa to ascertain whether there are differences in the perception of the responsibilities of project managers or if this was merely confined to Anglo Platinum. One could then further ascertain whether the different roles of the project managers could be linked to the performance of projects or the companies. This study could also be further expanded to look at different industries to ascertain if there are differences in perception of success between them.

The role played by project owners in ensuring that projects are correctly specified also needs to be examined further. Literature and this study has shown that the project owner is key in delivering a successful project as their responsibility spans the entire project lifecycle from conception to mine closure. The conflicting priorities of short term mine

planning and performance versus long term projects is a delicate balance that the astute mine manager has to master.

The performance of projects conducted by EPCM companies versus projects conducted in-house is another area of investigation. The analysis should look at all the aspects of cost, quality and time, associated with projects from the study phases through to the performance of the project after completion. This study would highlight the benefit or otherwise of outsourcing the project management function of projects.

Now that this study has explored critical success criteria for mining projects, the next logical step is to identify the critical success factors (CSF) of mining projects. Success factors may differ from project to project but there are some critical success factors that are sacrosanct the run through all mining projects. It would also be interesting to determine if all the role players within a company have the same view regarding the CSF of their projects.

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APPENDIX A – INTERVIEW STRUCTURE

SECTION A

DEMOGRAPHICS - This information is for research comparison purposes only.
All information will be kept confidential.

I Your professional experience in the industry that you work in:

< 5years 6 to 10 years 11 to 20 years 21 to 30 years > 31 years

II What is your role in projects?

Project User (i.e. operations)
Project Manager
Project Sponsor
Project Owner (Executive)
Other_____

III How many mining projects have you been directly involved with?

0
<5
5-10
10-15
15-20
>20

SECTION B

The purpose of this section is to identify success criteria and critical success criteria.

1. What does the term “project success” mean to you?

2. What criteria do you use to measure project success?
(Criteria are the standards by which judgment is made)

3. Typically in your projects, how critical are the following criteria in judging project success?

(Use the following five point scale of criticality)

1 = not critical
2 = not very critical
3 = moderately critical
4 = critical
5 = very critical

Project completed on time
Project completed on budget
Meeting Specification
Effectiveness of the project management effort
The product satisfies owners' needs
The users of the product are satisfied
The project team members are satisfied
Third parties affected by the project are satisfied

4. If the time, cost and quality objectives of a project are achieved, how will this influence the success of the product during its operational life?

(Select one answer only)

a) Product always successful
b) Product generally successful
c) Product sometimes successful
d) Product rarely successful
e) No correlation

5. Is the achievement of time, cost and quality objectives of a project more important than producing a useful product for the client?

(Select one answer only)

a) Always more important
b) Generally more important
c) Similar importance
d) Rarely more important
e) Never more important

6. When should the achievement of time, cost and quality objectives of project success be measured?

(Select one answer only)

a) Anytime in the project lifecycle
b) At project completion
c) After the product has been in use

7. When should the achievement of success of the product be measured?

(Select one answer only)

a) Anytime in the project lifecycle
b) At project completion
c) After the product has been in use

SECTION C

The purpose of this section is to identify what project managers are responsible for.

8. What in your opinion are project managers responsible for?

9. What in your opinion are project owners responsible for?

10. Indicate your agreement with the following statements in terms of project responsibilities.

(Use the following five point scale of agreement)

1 = strongly agree
2 = agree
3 = moderately agree
4 = disagree
5 = strongly disagree

Project Managers are responsible for the project management success of projects i.e. cost, quality, time and safety.
Project Managers are responsible for delivering the project business case.
Project Owners are responsible for delivering project the business case.

END OF INTERVIEW

THANK THE INTERVIEWEE FOR THEIR PARTICIPATION.

APPENDIX B – CONSISTENCY MATRIX

Research problem stated here					
Sub-problem	**Literature Review**	**Propositions**	**Source of data**	**Type of data**	**Analysis**
The first sub problem is to identify the Success Criteria for Mining projects in Anglo Platinum.	(Collins and Baccarini 2004), (Atkinson 1999), (Chen and Lee 2007),(PMI 2004) , (Lim and Mohamed 1999), (De Wit 1988), (Shenhar et al. 2001), (Westerveld 2003) and (Youker 1989), (Stallworthy and Kharbanda 1983), (Burstein and Stasiowski 1982), (Munns and Bjeirmi 1996), (Morgan 1987)	Success criteria for Anglo Platinum mining projects include: Completing the project on time, Completing the project within budget, Completing the project to specifications, Meeting the owners' strategic objectives, Satisfying users' needs, Satisfying the needs of those stakeholders affected by the project	The data was collected through structured interviews of Anglo Platinum project stakeholders	Qualitative data was collected through open ended questions; Ordinal data was collected on a Likert scale.	The open ended questions was analysed for themes and patterns. A simple frequency analysis was conducted of those answers graded on a Likert scale.

The second sub problem is to determine what Critical Success Criteria are for Mining projects in Anglo Platinum.	(De Wit 1988), (Atkinson 1999), (Shenhar et al. 2001), (Westerveld 2003), (Collins and Baccarini 2004), (Baccarini 1999), (De Wit 1988), (Munns 1995), (Munns and Bjeirmi 1996)	The most important success criterion is Meeting the owners' strategic needs	The data was collected through structured interviews of Anglo Platinum project stakeholders	Qualitative data was collected through open ended questions; Ordinal data was collected on a Likert scale.	The open ended questions was analysed for themes and patterns. A simple frequency analysis was conducted of those answers graded on a Likert scale.
The third sub problem is to determine whether project managers in Anglo Platinum deliver project management success or product success.	(Collins and Baccarini 2004), (Baccarini 1999), (Munns 1995), (Shenhar et al. 2001), (Munns and Bjeirmi 1996), (Pettersen 1991)	Project Managers are responsible for project management success and not overall project success.	The data was collected through structured interviews of Anglo Platinum project stakeholders	Qualitative data was collected through open ended questions; Ordinal data was collected on a Likert scale.	The open ended questions was analysed for themes and patterns. A simple frequency analysis was conducted of those answers graded on a Likert scale.