

PROJECT PORTFOLIO MANAGEMENT PITFALLS IN A NAMIBIAN MINING COMPANY

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ABSTRACT

Existing literature provides guidelines to, and describes a number of pitfalls experienced in the process of implementing strategy by means of project portfolio management (PPM) and also indicates several pitfalls in the implementation of strategies via project portfolio management. The research reported in literature was mainly performed in developed countries, often in fields such as research and development and new product development. Southern African mining companies however operate in a difficult, uncertain and often volatile environment that differs significantly from environments where the pitfalls have been identified. This provides the opportunity to study the effects of such an environment on PPM processes and the related pitfalls. This paper therefore explores how the difficulties in implementing strategies experienced by a Namibian mining company compare to those described in literature.

Interviews were conducted with two executive managers, four senior managers and four middle managers of a mining company in Namibia in order to obtain their views of how the problems they experience differ from those indicated in literature. Atlas.ti was used to rank problems experienced with strategy implementation according to the frequency that they were mentioned by respondents. The study also investigated how different stakeholder groups within the organisation perceive these pitfalls.

A number of problems that are *not* described in the literature studied emerged from the interviews. These are: (a) a poor distinction between strategic and operational projects, (b) inexperienced project teams hampering the implementation of strategy by means of projects, (c) long-term, strategic projects that had to be funded by operational cash flow and, (d) the adoption of a strategy that is not focused well enough. Pitfalls related to organizational aspects are perceived to have the most serious consequences.

The problems mainly relate to uncertainties regarding the longer-term future of the industry and volatility and uncertainty in the environment that necessitates frequent changes to strategy. Low profit margins and threats to future competitiveness result in a relatively short-term orientation – including an over-emphasis on short-term financial results – that affect the effective implementation of strategy. These findings could be of value to the board and executives of this company and of similar companies.

Key words: Project portfolio management; pitfalls; mining; Southern Africa.

INTRODUCTION AND OBJECTIVES

It is much easier to develop a strategic plan than to implement it; in reality, many strategic plans are never implemented successfully (Allio, 2005; Meskendahl, 2010; Okumus, 2003). Project portfolio management (PPM) is a way of implementing strategy by means of projects (Project Management Institute, 2013; Office of Government Commerce, 2011). This paper investigates how the problems experienced in implementing strategy in a Namibian mining company compares to problems experienced elsewhere.

Investing in Southern African mining companies has for many years been lucrative. However, such investments imply relatively high risk as the industry is well known for its boom and bust cycles. In recent years the nature of the challenges that mining companies encounter has changed substantially: mining companies are now faced with challenges of an increased focus on social and environmental issues, declining ore reserves, resource scarcity, market volatility, war for talent, frequent mergers and acquisitions, and keeping up with technology. These challenges create an extremely volatile environment that puts the robustness of any strategy to the test.

Background of the case and its environment

The mining sector is a big contributor to Namibia's Gross Domestic Product (GDP); contributing 11,1% in 2016 (Malango, 2017), which is 4,9% down from 2015. Namibia's economic development has just entered the efficiency driven stage where there is much focus on the ability to produce products and services efficiently. In 2015 the Fraser report placed Namibia as the fourth most attractive destination for mining in Africa. In 2016 the same report placed the country five places lower as the ninth most attractive destination for mining in Africa. This was due to a proposed empowerment policy and changes in legislation. The New Equitable Economic Empowerment Framework (NEEEF) and additional conditions to licenses were cited as the main drivers for the ranking degradation creating uncertain and unfavourable investment conditions (Malango, 2017). The following factors further contribute to a dynamic and uncertain operating environment:

- There is increased pressure on mining companies to deliver high levels of environmental and social performance (Amupadhi, 2017);
- Geopolitical developments, which further exacerbate global uncertainty (Malango, 2017);
- Unpredictable commodity price fluctuations (Amupadhi, 2017);
- Poor labour relations between employee representatives and the employer (Malango, 2017);
- Extreme variability of geological features, which makes the case organization a high unit cost producer in comparison to other mines in the world (Amupadhi, 2017);
- Declining size of mineral resources (Malango, 2017);
- Highly variable and low grade resources (Malango, 2017).

The case organization has been in operation since the early 90's and belongs to a multinational mining group. The organization currently employs about 1700 permanent employees and has an average turnover of approximately 2,4 billion Rand (ca. 132 million GBP) per annum (2015-2017). Table 1 shows the 2017 budget for Strategic Projects. Capital expenditure is for a trial mining campaign that differs from the current conventional mining method, as it is more mechanized and less labour intensive. Stay-In-Business (SIB), on the other hand, is money invested to optimize or improve the current 5-year business plan.

Table 1: 2017 Strategic Project budget for the case organisation

Strategic Project Budget - 2017		
Capital expenditure project	R 260 Million	35%
Stay-In-Business	R 440 Million	60%
Rehabilitation	R 31 Million	4%
Research and Development	R 6 Million	1%
Total expenditure	R 737 Million	100%

The organization is structured according to a strong matrix structure and hence has a Manager of Project Managers that reports to the Chief Executive Officer. A comprehensive project management methodology is in place and addresses the following aspects for each project: initiation, funding decision, definition and planning, execution, handover and close out, and post-completion audit.

The organization has a large variety of potential projects. These project ideas vary significantly in type, size, duration and cost, thus making selection of the “right” projects into the portfolio a daunting task. Although Killen *et al.* (2008) as well as Cooper *et al.* (1999) found that focusing strongly or exclusively on financial measures is related to weaker portfolio value creation, the main expectation from providers of capital is that projects in the case organization (as is the case in many other organizations) will meet the return on investment (ROI) required by the business case.

Objectives

Project Portfolio Management (PPM) has been identified and well researched as a means to realize company success through proper strategy implementation (Oosthuizen *et al.* 2016).

The environment of a mining company in a developing country differs from industries and countries where most of the research in PPM has been done. The pitfalls experienced may therefore also differ from environments where most of the research has been carried out. According to Kumar *et al.* (2008) most of the research in PPM has been done in the following environments:

- a) Financial Portfolio Management: This type of portfolio “deals with managing a variety of asset classes (such as stocks, bonds and cash) in order to maximize return for some specified period of time, while attempting to minimize risks” (Reilly and Brown, 2002 in Kumar *et al.*, 2008).
- b) New Product Development Portfolio Management: This type of portfolio is the most popular and deals with projects that result in new, marketable products (Cooper and Edgett, 2003 in (Kumar *et al.*, 2008). It is widely used because it addresses challenges related to resource scarcity, project failure rates and, ensures alignment of projects to strategy.
- c) Research and Development Portfolio Management: The objective of the portfolio is “to optimize resource allocation among projects in a way that balances risk, benefits and alignment to corporate strategy” (Dickinson *et al.*, 2001 in Kumar *et al.*, 2008).

Empirical evidence on the effectiveness of strategy implementation via PPM in mining companies in a developing country, is still lacking.

This paper describes how the pitfalls in the case organization's project portfolio methodology compare to the pitfalls listed in literature. It also describes how different stakeholder groups within the organisation perceive the effects of these pitfalls on project portfolio selection. Lastly, it indicates how some pitfalls appear to have more serious consequences on the project portfolio than others.

LITERATURE REVIEW

The literature review focused on determining what an organization needs to have in place in order to be able to select and admit the right projects into its portfolio. The links between organizational strategy and portfolio management are discussed first. This is succeeded by a discussion about the objectives of portfolio management and governance and formalization of processes to support portfolio management. Finally, the pitfalls in strategic project management identified in literature are presented. The literature review and the framework of Jabareen (2009) were used to develop the conceptual model that is described later.

Organizational strategy

In today's fast-paced economy where capital has become difficult to obtain, executives need to manage their organizations to maximize shareholder value. In order to generate more value for shareholders, an organization often needs to change its strategies, management processes and organizational capabilities in response to changes in its internal and external environment (Armour and Mankins, 2001). According to Goetsch and Davis (2014) an organizational strategy is an approach adopted to ensure successful performance in the marketplace and to position the organization well for the long-term. Organizations execute their strategic objectives through projects, therefore "doing the rights projects" is crucial for business success (Nicholas and Steyn, 2017).

Changes in the broader environment often warrant changes in strategy; the environment is an important determinant of strategy. Changing markets, for example, require an adjustment in strategy which often necessitates a change in project management organization and processes (Kaiser *et al.*, 2015). Strategy and projects hence influence each other: strategic planning influences the projects that a company will take on and project opportunities, in turn, influence the strategic plan (Steyn, 2015; Kaiser *et al.*, 2015). Shenhar *et al.* (2001) suggested that, because of the global competitive environment, *projects in future would no longer be operational tools for executing strategy, but would become the engines that drive strategy into a new direction.* The implication of this is that project selection and organizational strategy are inseparably intertwined.

Project Portfolio Management (PPM)

Global competitiveness is a phenomenon that describes the situation where the world of business is intensely competitive, resulting in small and large companies across the globe competing against each other (Goetsch and Davis, 2014). In order to keep ahead of its competitors an organization needs to think strategically and put forth plans to ensure it will gain and sustain a competitive advantage, now and in the future.

A project portfolio is a group of projects or programs in an organization that strive towards a certain strategic objective, share resources and compete for capital and PPM is used where an

organization's resources are constrained and decisions need to be made regarding which projects the organization should pursue (Nicholas and Steyn, 2017). This implies that any organization that funds, manages and allocates resources to more than one project has a project portfolio. Four objectives of portfolio management are to: (a) maximize the value of the portfolio, (b) seek balance in the portfolio, (c) strategic alignment and (d) pick the right number of projects (Cooper *et al.*, 1999).

The success of any portfolio will depend broadly on doing the right projects and doing them well. Archer and Ghasemzadeh (1999) and Jonas *et al.* (2013) state that the process of portfolio selection follows three phases. The first phase considers the strategic aspects of the portfolio whereas the second phase evaluates each project independently of the others. The third phase addresses project selection based on selected project parameters and interaction with other projects in the portfolio. According to Archer and Ghasemzadeh (1999), project selection is a periodic activity through which project proposals as well as projects that are currently underway, are evaluated and selected into the portfolio to meet the firm's objectives, with consideration of available physical and financial resources. The success of any portfolio relies heavily on continuously selecting the right projects, reprioritizing them and – based on the priorities – allocating resources.

Governance and formalization of processes to support Project Portfolio Management

Formalization forces organizations to have a standard approach to managing projects. The formalization of PPM and the management of individual projects improves the overall PPM quality of the organization. Formalization here is defined as the extent to which processes, procedures, work rules and policies are clearly specified and followed (Teller *et al.*, 2012). An organization that uses established standards that have been developed explicitly for the project management domain can have a positive effect on project success (Teller *et al.*, 2012). However, organizations should not necessarily strive towards the highest possible maturity level (Nicholas and Steyn, 2017).

The success or failure of a project is not entirely attributed to the effort invested by the project manager and project team. A lack of governance results in the absence of a framework for ethical decision-making and managerial action within an organization (Too and Weaver, 2014). Hence, the extent of PPM formalization as well as factors related to project governance are necessary for effective PPM.

Pitfalls in project selection, evaluation and execution

The pitfalls identified in literature are grouped below into (a) those that exist because of organizational factors, (b) are related to PPM processes and (c) ones related to project management.

Organizational factors

- Conflicting objectives at senior management level (Elonen and Artto, 2002; Too and Weaver, 2014).
- Power and politics play a big role in authorizing and prioritizing projects (Steyn, 2015; Elonen and Artto, 2002; Too and Weaver, 2014).
- Organization not structured as a strong matrix structure, which is preferred for PPM (Elonen and Artto, 2002; Kaiser *et al.*, 2015).
- The organizational climate is not conducive for projects to flourish (Morris and Geraldi, 2011).

- Senior management and other stakeholders do not pay enough attention to scope at initial stages (Steyn, 2015; Oosthuizen *et al.*, 2016; Cooper *et al.*, 2000; Elonen and Artto, 2002).
- Senior managers are swamped with too much data and get little meaningful distilled information and hence quality of resource allocation is poor (Steyn, 2015; Elonen and Artto, 2002; Cooper *et al.*, 2000).
- Senior management involvement and support of projects e.g. relationship with the project team, involvement in project termination and process that links projects to strategy (Steyn, 2015; Oosthuizen *et al.*, 2016; Elonen and Artto, 2002; Fricke and Shenhar, 2000; Too and Weaver, 2014; Cooper *et al.*, 2000).

Project Portfolio Management

- The link between strategy and projects is non-existent i.e. projects selected do not fit strategically (Steyn, 2015; Oosthuizen *et al.*, 2016; Elonen and Artto, 2002).
- PPM is not a formalized process i.e. lack of policies, procedures and structured decision making (Oosthuizen *et al.*, 2016; Gutierrez and Magnusson, 2014; Teller *et al.*, 2012).
- The portfolio is not balanced according to risk (Cooper *et al.*, 2000; Steyn, 2015; Nicholas and Steyn, 2017; Archer and Ghasemzadeh, 1999).
- The project portfolio is not managed as an on-going dynamic and systematic process (Steyn, 2015; Oosthuizen *et al.*, 2016; Elonen and Artto, 2002; Kaiser *et al.*, 2015; Jonas *et al.*, 2013; Meskendahl, 2010).
- Project selection and evaluation models are not used (Cooper *et al.*, 2000; Steyn, 2015; Nicholas and Steyn, 2017; Archer and Ghasemzadeh, 1999).
- A comprehensive list of all projects underway is not available (Steyn, 2015; Oosthuizen *et al.*, 2016; Cooper *et al.*, 2000; Elonen and Artto, 2002).
- Too many projects are selected and initiated without due consideration of the available resources (Steyn, 2015; Elonen and Artto, 2002; Cooper *et al.*, 2000).
- Project selection focuses on cheap, short-term projects, which restrict the organization's ability to exploit other opportunities with long-term results (Steyn, 2015; Oosthuizen *et al.*, 2016; Elonen and Artto, 2002; Cooper *et al.*, 2000).
- Projects and programs are not formally ranked according to priorities. This results in the movement of resources to and from projects resulting in multitasking (Steyn, 2015; Elonen and Artto, 2002).
- The gating process between project phases is insufficient (e.g. project performance and especially the business environment are not sufficiently assessed at each project gate and decisions are not made to re-prioritize projects) (Steyn, 2015; Elonen and Artto, 2002; Cooper *et al.*, 2000).
- White elephant projects are kept alive and consume scarce resources (Steyn, 2015; Oosthuizen *et al.*, 2016; Cooper *et al.*, 2000; Elonen and Artto, 2002).

Project Management

- Feasibility study/business case does not adequately define the project (Steyn, 2015; Nicholas and Steyn, 2017; Archer and Ghasemzadeh, 1999).
- Lack of project management practices or guidelines (Oosthuizen *et al.*, 2016).
- Roles are not well defined i.e. role clarity and levels of work (Steyn, 2015; Oosthuizen *et al.*, 2016; Elonen and Artto, 2002).

- Review points serve merely as a platform to report good news and to obtain a rubber stamp to proceed with the project (Steyn, 2015; Oosthuizen *et al.*, 2016).
- Projects are not being scheduled around formal priorities and the schedule of key resources (Oosthuizen *et al.*, 2016; Elonen and Artto, 2002; Cooper *et al.*, 2000).
- Project buffers aren't managed adequately and duration estimation is ambitious resulting in project delivery delays (Steyn, 2015; Oosthuizen *et al.*, 2016).
- Project success needs to be defined in terms of economic success, long-term sustainability, schedule, budget and quality (Oosthuizen *et al.*, 2016; Meskendahl, 2010; Shenhar *et al.*, 2001).

CONCEPTUAL MODEL

Figure 1 shows the conceptual model for the research study developed from the literature review using the framework from Jabareen (2009).

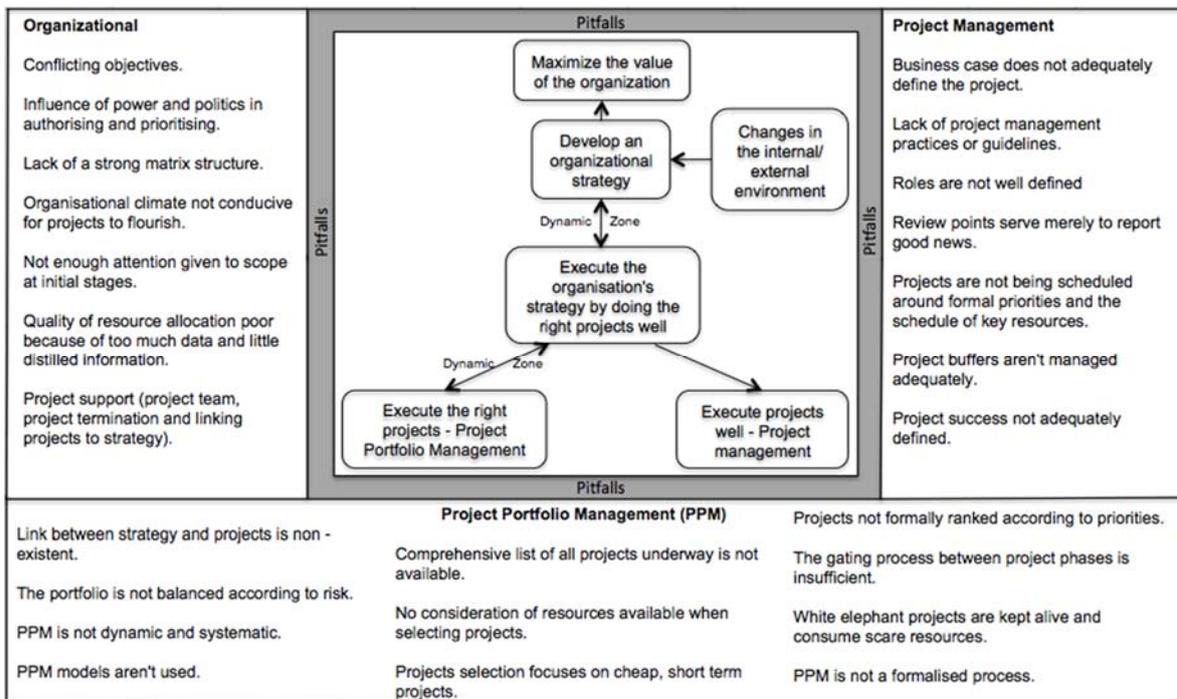


Figure 1: Conceptual model

RESEARCH METHODOLOGY

This section provides an overview of the chosen research methodology, i.e. the process of collecting information (Mouton, 2001:56) and explains the reason for the choice. The detailed steps taken to conduct the research are also explained.

Rationale for the Research Method

A case study methodology was chosen to investigate this research problem. Although the case organization employs about 1700 employees, only about 20 of these employees are actively involved in the management of Strategic Projects. "How" and "why" type of research questions about a contemporary set of events over which the researcher has little or no control are well suited for case study research (Yin, 2013; Rowley 2012). Eisenhardt (1989) also mentions that case studies

are “well suited to new research areas for which existing theories seem inadequate” while Rowley (2012) says that case studies allow us to undertake an investigation into a phenomenon in its context.

Research Design and Philosophy

Qualitative research is often associated with an interpretive philosophy (Saunders *et al.*, 2016). This is because the researcher has to make sense of or interpret subjective and socially construed information about the phenomenon being studied. The research design of this study started with a deductive approach to test for the existence in practice of the pitfalls identified in theory. Inductive inferences were also made where possible from the primary data collected in order to build on theory. Semi-structured interviews were used to collect data and this was followed by a qualitative analysis.

Research Strategy

In general terms, a strategy is a plan of action to achieve a goal. A research strategy may therefore be defined as a plan of how a researcher will go about answering the research questions (Saunders *et al.*, 2016). There are a variety of research strategies for qualitative research, including action research, case study research, ethnography, grounded theory and narrative based research Saunders *et al.* (2016). For reasons explained above, the case study was selected.

A case study is an in depth inquiry into a topic within its real life setting (Saunders *et al.*, 2016:184). In this case the setting is a Namibian mining company and the context within which it is being studied is the Strategic Project Management Department.

The case study method has however been criticised by some researchers because of misunderstandings about the ability to produce generalizable, reliable and theoretical contributions to knowledge (Flyvbjerg, 2011). The criticism is mainly because of using small samples and using interpretive, qualitative research (Saunders *et al.*, 2016:185). These arguments have however been countered and the value of qualitative research is being recognised more widely. An explanatory case study was used deductively in conjunction with theoretical propositions to test their occurrence in the case study in order to build and verify an explanation. This approach ensures that there is a clear link to theory. A mixed method research strategy was considered in order to improve triangulation but sufficient data could not be collected.

Target Population

The target population consisted of all employees who manage strategic projects and are part of middle, senior or executive management. The employees in the target population had to have an educational background in accounting, finance, engineering, geology or project management. The target population was four executive managers, six senior managers and five middle managers.

Research Instrument

Semi-structured interviews were used as the research instrument to gather data after which the data was qualitatively analysed. This data was used to answer the “how” and “why” research questions of the study. The research instrument was selected because a semi-structured interview provides the opportunity to probe answers, thereby ensuring that the interviewee explains and builds on responses.

Data Analysis

The content of the qualitative data was analysed using Atlas.ti software. The main objective was to search for themes across the qualitative data collected. According to Saunders *et al.* (2016:579) searching for themes is a systematic yet flexible and accessible approach to analyse qualitative data and can be used irrespective of whether a deductive or inductive approach is adopted.

Saunders *et al.* (2016:580) propose a four-stage procedure to conducting a Thematic Analysis: 1. Become familiar with the data, 2. Code the data, 3. Search for themes and recognize relationships and 4. Refine themes and test propositions. Although the four-stage procedure is presented in a linear or sequential manner, the process of thematic analysis is a dynamic process that could require going back and forth between the four stages.

RESULTS

This section gives an overview of the results that were obtained after conducting semi-structured interviews. From the target population of 15, 10 people were available for interviews. This included four middle, four senior and two executive managers who are involved in strategic projects. Their responses were recorded with their consent. The interviews were conducted face-to-face and each took 60 to 90 minutes to complete. Content analysis was done on the ten interview recordings using Atlas.ti version 1.6.0. The interview recordings were imported into Atlas.ti and 53 codes were developed. A total of 393 quotations from the 10 interviews were linked to the codes developed. Descriptions of the first 29 codes that contribute to 80% of the quotations are provided in the Appendix.

In the case organization four new pitfalls that were not identified in literature, were uncovered. Of the pitfalls identified in literature, eight were found in the case organization, six were found to exist to a certain extent, while eleven were not found in the case organization. The interviews also provided explanations of the perceived importance of these pitfalls. The paper also indicates how some pitfalls appear to have more serious consequences on the business or portfolio than others. Lastly, differences between the perceptions of the different stakeholder groups are presented and discussed.

New pitfalls not predicted in literature but found in the case organization

As mentioned earlier, the mining and resource industry in Namibia is experiencing some unique uncertainties. This leads to frequent changes to strategy which, in turn, complicates strategy implementation. The uncertain and dynamic operating environment may lead to a low capital investment in the industry and hence a short-term investment approach.

Differentiating between strategic and operational projects

The distinction between strategic and operational projects is very clear in literature but in practice this distinction is not always all that clear. Strategic projects are characterised by a relatively high uncertainty in the attainment of their outcome and normally requires a significant investment. They grow the organization substantially or propel it into a new direction. Operational projects, on the other hand, address short-term problems and their outcome is easily quantified. Most of the projects that are deemed strategic in the case have some operational characteristics. Uncertainties regarding the longer-term future competitiveness of the industry cause the organization to select

projects that are in theory operational, but in practice are considered strategic. It seems that the organization is under the pretence that it is moving into a new direction or growing substantially while in reality, as a result of the environment it operates in, it is focused on the short-term. These projects are therefore similar to descriptions of stay-in-business or bread-and-butter projects by Steyn (2015).

Strategic project financing from operational cash flow

An organization projects through its strategy where it wants to be at some future point and develops tactics that are then implemented through the execution of strategic projects. A major constraint for many organizations is the availability of investment capital. Strategic projects are therefore scheduled for execution according to a particular sequence that assumes that the funding will be available when the specific project is due for execution. The business model of the case organization and its shareholders dictates that strategic projects should be financed from profits before dividends to shareholders are declared. This implies that the timing of project execution is dependent on the availability of such short-term profits. The mining and resource industry is cyclical which exposes commodity prices to market volatility, resulting in volatile profits. It can result in a situation where, even though a project would deliver value, it cannot be implemented, due to lack of funds. The financing of strategic projects from operational cash flow can therefore be an impediment to the execution of strategy.

The impact of additional debt from an external financier on the organization's gearing ratio would need to be thoroughly assessed. The gearing ratio is a measure of a company's financial leverage and shows the extent to which funding by external financiers compares to its own shareholder equity. One of the senior managers said: *"If you are being funded by an external source it would be interesting to see what would change in terms of project management, reporting, controls, flexibility in mine plan changes etc."* Currently debt is not incurred to finance projects.

Inexperienced project teams

Strategy is executed by doing the right projects well (Nicholas and Steyn, 2017). Doing projects well requires a match between the project requirements and the level of experience or expertise. Experience *at all levels* is extremely important in project management i.e. Project Manager, Project Planner, Clerk of Works, Construction Manager and Draughtsman etc.

Namibia, being a developing African country, has a shortage of technically skilled individuals. Although there are currently two fully-fledged universities that offer engineering or technically orientated fields of study, most individuals are educated in foreign countries and a number of expatriates are working in the country to transfer skills. The case organization has a foreign EPCM (engineering, procurement and construction management) partner that is responsible for all its project work. The experience required to plan and execute a large project is very often underestimated. *"We built a large processing plant knowing that no one on the project team had ever worked on a project of that magnitude before, resulting in it being late, over budget and only able to reach the planned throughput rates three years later following some additional modifications"* said a Senior Manager who worked on the project and added *"We planned the majority of that project during its execution"*.

Most of the literature on PPM however reports on studies conducted in developed countries where project management experience and skills are probably not in such short supply. It is proposed that

a lack of experience in Project Management results in project failure, which ultimately results in the failure of strategy implementation.

Strategic focus

As discussed earlier, organizational strategy is executed through strategic projects. Synergy should exist between these projects; they should be complementary and executed in a particular sequence to support the attainment of the ultimate objective. In the case organization, an example was uncovered where funds were allocated to a project that had nothing to do with core business but was linked to the organization’s rather diverse strategy: funds that could have been used to improve production were spent on refurbishing an old bulk freshwater supply system to the town where employees are accommodated. This illustrates the pressure on mining companies to deliver high levels of environmental and social performance, mentioned by Amupadhi (2017). One Senior Manager said “...some parts of our strategy have nothing to do with mining although it is a key component of doing business in the extractive resource industry”. This is associated with what Elonen and Artto (2002), Oosthuizen *et al.* (2016) and Steyn (2015) refer to as a link between strategy and project selection. It is proposed that, if the organization’s strategy is diverse / not focused well and the tactics non-complementary, projects will be selected that are linked to strategy but that may not necessarily result in the maximization of organizational value.

Pitfalls predicted in literature and found in the case organization

Table 2 lists eight pitfalls that are predicted in literature and that were found to exist in the case organisation. As a result of poor front-end planning, scope changes were problematic. Conflicting objectives by Senior/Executive Managers may also contribute to frequent scope changes during the execution of a project. Furthermore, the absence of a PPM model prevents formal and transparent prioritization. Lastly, multitasking, project buffers and the definition of project success for the organization are relatively new concepts that are not well adopted and understood in a mining company whose core competencies are in operations rather than in projects.

Pitfalls predicted in literature and found to a certain extent in the case organization

Table 3 shows the six pitfalls that were predicted in literature and found to exist to a certain extent in the case organization. These are pitfalls for which there is evidence for the existence however, the responses from the interviewees were not unanimous as there is some evidence that they may not exist or only exists when preventive controls fail. As an example, one of the Executive Managers stated that securing the long-term future of the organization is vital however, when you don’t deliver results in the short-term it is difficult to focus on the long-term, resulting in short-term thinking which eventually results in a big focus on stay-in-business projects as a survival strategy.

Table 2: Pitfalls predicted in literature and found in the case organization

Pitfalls	Categorization	Finding in the case organization
Scope changes	Organizational	Scope changes occur when front-end planning is done inadequately.
Conflicting objectives by senior managers	Organizational	In many cases a conflict exists because of the time frame that a particular manager is responsible for i.e. 6 months, 1 year, 5 years etc., as well as how a particular decision may impact their performance i.e. remuneration.

Use of PPM models	PPM	There is no Project Portfolio Management model in use.
Multitasking within the portfolio	PPM	Project managers very seldom work on a single project only. They might have projects that are at different stages in the project lifecycle.
Business case sufficiency	Project Management	Business cases are often optimistic especially regarding the estimation of operating costs, efficiencies and throughput of the system.
Project prioritization	Project Management	The prioritization of projects is not done formally, systematic and transparent.
Project buffer management	Project Management	The understanding of the management of project buffers in the organization is low.
Definition of project success for the organization	Project Management	The definition of project success for the organization is based on the traditional cost, time and quality constraints.

Table 3: Pitfalls predicted in literature and found to a certain extent in the case organization

Pitfalls	Categorization	Finding in the case organization
Power and politics	Organizational	Power is formally delegated to an executive with procedures on how it should be used. The influence of politics only comes into play when power is not formally delegated or procedures are outdated.
Senior Management support	Organizational	Senior management is extremely supportive of the project portfolio. As soon as you cast the net wider and go to individual business units or departments it can become a bit more complicated.
Linkage of projects to strategy	PPM	Various governance processes through the execution of the project ensure that the linkage to strategy exists. There are however compromises because the strategy is diverse and non-complementary.
Portfolio balance and risk	PPM	The project portfolio is made up of projects that are critical for the next steps of the business and hence the portfolio isn't well balanced.
Comprehensive list of all projects	PPM	It should not be difficult to develop a comprehensive list of projects however there should be criteria to qualify what goes onto the list.
Big focus on Stay In Business projects	PPM	When the company's immediate future is very bright then it is just natural that the focus should be on the long term. However, when things are very difficult it is almost impossible to be concerned about the future.

Pitfalls predicted in literature and not found in the case organization

Table 4 shows eleven pitfalls that were predicted in literature but not found in the case organization. Despite the lack of experienced team members, this is predominantly because of the relatively high level of maturity of the organisation, including the adoption of a project management methodology. According to the maturity model in Nicholas and Steyn (2017:570) the case organization would likely be at Level 3, gravitating towards Level 4 because of the project management methodology that is standardised for most projects. An established Project Management Office also exists and individuals within the organisation can follow careers in project management. The project management methodology implemented in the organization consists of

5 phases. Each phase has detailed inputs, tasks and deliverables, which prevent most of these pitfalls from manifesting.

Table 4: Pitfalls predicted in literature and not found in the case organization

Pitfalls	Categorization	Finding in the case organization
Strong matrix organizational structure	Organizational	The Portfolio Manager is an integrator and synthesizer of the strategic projects in the organization. This ensures that Project Managers clearly understand their roles and can focus on the delivery of projects.
Organizational climate for projects to flourish	Organizational	The case organization is conducive for projects to flourish by the mere fact that there is a fully resourced and functional Strategic Projects department.
Systematic and dynamic method	PPM	The assessment of projects entering the portfolio is systematic and is based on the following elements: value, risk/complexity and strategic fit.
The gating process between project phases	PPM	Large projects within the organization have to undergo both internal and external (Group) assurances of Technical, Operational readiness, Financial and Project management for each phase of the project.
White elephant projects	PPM	Most white elephant projects are either parked or terminated.
Resource contention	PPM	A project is allocated to a Project Manager based on experience, academic discipline or need for exposure. The workload of the Project Manager is also assessed to prevent resource contention issues.
PPM is a formalized process	PPM	Project Portfolio Management is a formalized process.
Adoption of project management guidelines	Project Management	Project management practices are well adopted and a formal project management framework is in place.
Role clarity	Project Management	There is normally a kick-off meeting where the role of each member is clarified. This is further affirmed through the project schedule.
Review points	Project Management	There are various review platforms where Project Managers report on the status quo of projects i.e. progress, immediate risks, challenges, successes, safety, finances etc.
Data vs. information for resource allocation	Organizational	A presentation that highlights the opportunity and business case is sufficient to get the allocation process underway.

Relative importance of the pitfalls

A Pareto analysis was done, using the number of quotations per code generated in Atlas.ti to determine the relative seriousness of the consequences of pitfalls. Figure 2 confirms that some codes were cited up to 32 times whereas others were cited only once. This alludes to some codes being considered more important and prevalent than others, resulting in larger perceived consequences. As an example, a big focus on SIB received 22 quotations whereas role clarity received 2 quotations. Most of the codes in the top 80% are related to organizational factors, which

in turn can be linked to the highly uncertain operating conditions the case organization is exposed to. This in turn leads to relatively short-term thinking.

The top three codes in the Pareto diagram account for 15% of the total quotations. These codes, that all refer to a relatively short-term approach are: (a) Five year business plan, (b) Short-term thinking and (c) Big focus on Stay-In-Business (SIB). The five-year strategic business plan was adopted as a means to curb long-term uncertainty by focusing and optimizing the short-term as far as practically possible. According to one of the Executive Managers “...this approach was taken because the immediate future of organisation doesn’t look very bright as a result of the uncertainties, which make it almost impossible to worry about the future i.e. beyond 5 years”. The five-year plan assumes that operations will come to an abrupt end at the end of year 5 despite the ample, though uncertain, potential beyond year 5. Little consideration is given to a vision beyond the 5-year horizon.

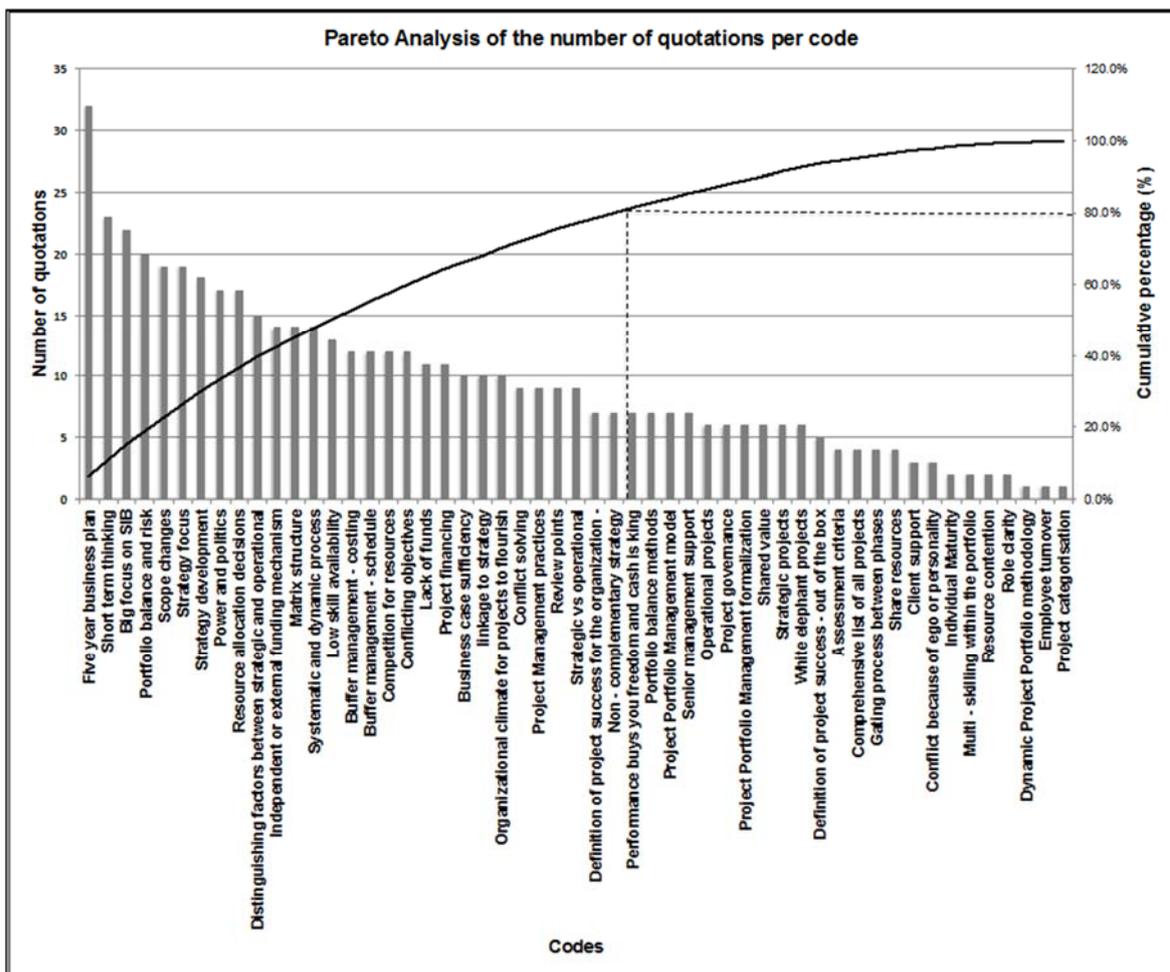


Figure 2: Pareto analysis of the number of quotations per code

The majority of projects selected in the portfolio are SIB with only one project aimed at the longer term. The current SIB projects improve revenue, reduce cost or expand mineral resources that will be almost depleted within 5 years. These are all projects that have been selected on the basis of beneficial financial criteria. Killen *et al.* (2008) as well as Cooper *et al.* (1999) however found that focusing strongly or exclusively on financial measures is related to weaker portfolio value creation. Over-emphasis on financial measures in uncertain and difficult circumstances is not uncommon: In a separate study in one of the major South African mining groups, it was found that for selection of

projects to grow the business, financial measures has a weight of 79% compared to a combined weight of 11.57% for strategic aspects: competitive advantage and differentiation, potential market share and improved portfolio alignment (Janse van Vuuren, 2015).

The short-term approach and focus on financial measures is attributed to uncertainties regarding the longer-term future of the mining industry. It is therefore postulated that volatility and uncertainty in the environment, low profit margins and threats to future competitiveness lead to a short-term orientation, including an over emphasis on short-term financial results, that affect the effective implementation of strategy.

Some items mentioned in literature rank very low or are absent in the Pareto analysis: role clarity, resource contention and multi-skilling each attained two quotations and thus rank very low in the analysis. It is proposed that this is because of: (a) a comprehensive project management methodology that is well adopted in the organization, (b) the organization is fairly mature in relation to the maturity model by Nicholas and Steyn (2017) and (c) these pitfalls are not closely linked to strategy and hence are not impacted by the uncertain external environment.

Perception of the pitfalls by different stakeholder groups

The three stakeholder groups in the case organization each have different perceptions of the pitfalls but unanimously agree that all pitfalls identified in literature can be an impediment to delivering value. The differences in perception are shown in Figure 3 and were developed by using Atlas.ti.

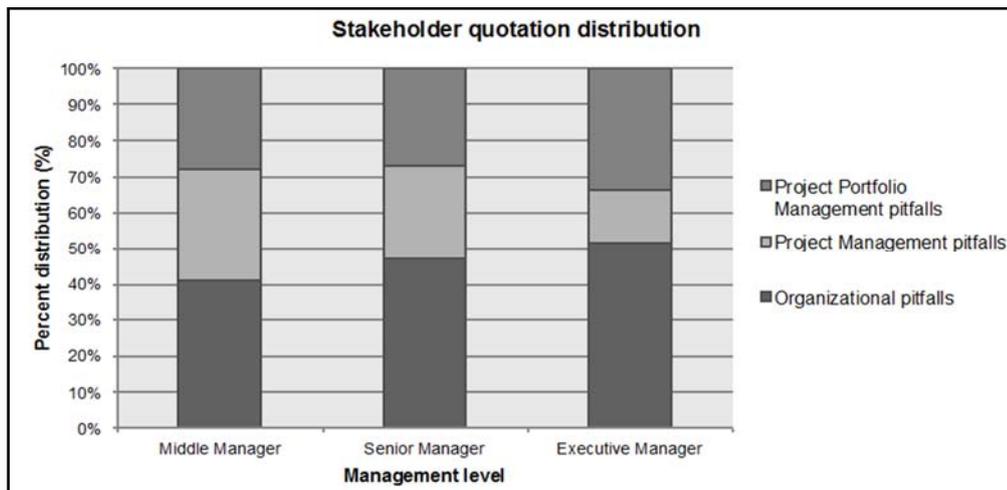


Figure 3: Perception of pitfalls by different stakeholder groups

The following can be deduced from the stakeholder quotation distribution diagram:

- a) The higher the management level, the more the focus is on organizational pitfalls. Most of the organizational factors are closely coupled to the organization's strategy. Strategy is developed by Executive Managers and is influenced by changes in the internal and external environment. Executive Managers therefore had the highest focus on organizational factors, as they are accountable for projecting where the organization would like to be in the future.
- b) The lower the management level, the more the focus is on project management pitfalls. Middle and Senior Managers are responsible for the successful delivery of projects. They therefore had the highest focus on project management pitfalls. They are confronted by

the pitfalls affecting project management and often resolve these rather than elevating them to Senior and Executive Management.

- c) The higher the management level, the more the focus on PPM pitfalls increase. PPM is all about selecting the right projects into the portfolio and is closely linked to organizational strategy, and is hence done by senior employees. Executive Managers know why the portfolio consists of largely short-term projects whereas Middle Managers only knew what projects the portfolio is comprised of.

CONCLUSIONS AND RECOMMENDATIONS

While several pitfalls related to strategy implementation by means of PPM are known, this study highlights some dissimilarities experienced in an environment that differs from those typically studied to date.

Four new pitfalls that were not found in literature were identified. These are: (a) a poor distinction between strategic and operational projects, (b) inexperienced project teams, (c) long-term, strategic projects that had to be funded from operational cash flow and, (d) the adoption of a strategy that is poorly focused. It was further found that eight pitfalls predicted in literature do exist in the case organization, six pitfalls were found to exist to a certain extent and eleven pitfalls were not found.

The Pareto analysis showed that some pitfalls have more serious consequences than others. This is indicated by some codes receiving more quotations than others. While the literature studied does not indicate the relative importance of different pitfalls, in the case organization the top three codes represent 15% of the total quotations and are all linked to a relatively short-term focus resulting from uncertainties regarding the longer-term competitiveness of the mining industry. The bottom three codes represent 0.6% of the quotations. These lower-ranking codes received few quotations because of the organization's maturity level and the adoption of a comprehensive project management methodology.

The three stakeholder groups each had differing perceptions of the pitfalls. It appears that at higher management levels, the focus is more on organizational pitfalls. The lower down in management level, the more the focus is on Project Management. Lastly, the higher the management level, the more focus is also on PPM pitfalls. The three stakeholder groups differ in their level of experience, responsibility and the time frame they respectively focus on e.g. 1 month, 1 year, 5 years, etc. It is postulated that the level of experience, responsibility and time frame that a stakeholder focuses on, influences his perception of particular pitfalls.

While the work from the case study cannot be generalized to volatile and uncertain environments elsewhere – and not even to all Southern African mining companies – it does indicate some issues that were not found in literature and thus complements existing literature. Further studies in other Southern African mining companies should be performed in order to shed more light on the implications of the effect of uncertain and volatile environments on strategy implementation.

While there is very little the organization can do about the highly dynamic and uncertain environment it operates in, the case organization should improve its PPM processes by focusing on eliminating the pitfalls that are perceived to have more serious consequences. There is a plethora of literature available on best practice in strategic project management and the organization should not deviate from these generally accepted best practices.

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APPENDIX

1. **Five-year business plan** – This includes all quotations that refer to the organization's relatively short-term outlook as a result of its 5-year business plan. This plan assumes a virtual termination of all activities at the end of year five (despite there being potential beyond year five). The 5-year plan therefore optimizes short-term profit and focuses very little on the longer term (i.e. beyond year five).
2. **Short-term thinking** – Short-term thinking refers to all quotations that indicate a short term or narrow strategic focus by the organization.
3. **Big focus on SIB** – A collection of all quotations that describe how the majority of projects selected into the portfolio are Stay-In-Business (SIB). These are projects that have to be done in the short-term to survive and finance longer-term objective or projects.
4. **Portfolio balance and risk** – A collection of quotations that describe various methods in which a mining company with a short-term outlook attempts to balance its portfolio.
5. **Scope changes** – Scope changes refer to all quotations that discuss examples of scope changes in previous projects as well as the reasons for scope changes.
6. **Strategy focus** – This code contains all quotations that define the ultimate direction of the organization's strategy i.e. Stay-In-Business, growth, emergent or blue ocean etc.
7. **Strategy development** – This code contains all quotations related to a) how strategy is developed, b) who develops strategy and c) who implements strategy.
8. **Power and politics** – The power and politics code contains quotations that relate to examples where power is used to influence project selection, the impact this has on the portfolio and situations that make the influence of power possible.
9. **Resource allocation decisions** – This code contains all quotations that relate to the allocation of financial and labour resources. It also contains quotations that describe how much information is required before a capital financing decision is made.
10. **Distinguishing factors between strategic and operational** – This code contains factors that distinguish operational projects from strategic projects e.g. short-term vs. long-term.
11. **Independent or external funding mechanism** – All quotations that discuss the pros and cons of the current funding method as well as alternative funding mechanisms.
12. **Matrix structure** – This code contains all quotations that discuss the advantages and disadvantages of the matrix structure that is currently used by the organization.
13. **Systematic and dynamic process** – This code contains a collection of all quotations that relate to the process of portfolio management being systematic and dynamic. Systematic refers to the way projects enter the portfolio and are evaluated. Dynamic refers to the degree to which the portfolio adapts to changes in the internal or external environment.
14. **Low skill availability** – This code contains all quotations that make reference to a lack of skills or inexperienced project teams.
15. **Buffer management-costing** – This code contains all quotations that discuss different forms of a cost buffer or a cost contingency for the project budget. It also relates to quotations about the management of such a buffer.
16. **Buffer management-schedule** – This code contains all quotations that discuss different forms of a schedule buffer or a schedule contingency for the project duration. It also relates to quotations about the management of such a buffer.
17. **Competition for resources** – This code contains all quotations that discuss the competition for resources between strategic and operational projects as well as the effects of this competition.
18. **Conflicting objectives** – This code contains all quotations that describe examples of situations in the organization where a conflict was observed because of differing objectives or priorities.
19. **Lack of funds** – The code contains all quotations that discussed a shortage of funds for projects in the organization because of the self-financing business model.

20. **Project financing** – This code contains all quotations that made reference to the different funding sources for operational and strategic projects.
21. **Business case sufficiency** – All quotations that discuss the adequacy and success of business cases in sufficiently justifying projects.
22. **Linkage to strategy** – This code contains all quotations that make reference to how the organization ensures that strategic projects selected are linked to strategy.
23. **Organizational climate for projects to flourish** – The code contains all quotations that discuss the extent to which the organization is conducive for projects to be executed well.
24. **Conflict solving** – This code contains all quotations that relate to ways in which situations of conflicting objectives are resolved.
25. **Project Management practices** – All quotations that make reference to the use of a formal project management guideline/framework for the execution of all projects within the organization.
26. **Review points** – This code contains all quotations from the interview data that discuss the purpose of review points during project phases.
27. **Strategic vs. operational** – This code contains all quotations that discuss the difference between strategic and operational projects in theory and practice.
28. **Definition of project success for the organization** – This code contains quotations that define project success by cost, time and quality.
29. **Non-complementary strategy** – This code contains all quotations that make reference to a strategy that is diverse.