THE ROLE OF OUTSOURCING IN THE PROJECT HOUSE - MINING HOUSE RELATIONSHIP

Prepared by

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ABBREVIATIONS

AATS	Anglo American Technical Services
AC	Alternating Current
AGMA	American Gear Manufacturing Association
API	American Petrochemical Industry
ASME	American Society of Mechanical Engineers
BEE	Black Economical Empowerment
BOO	Built, Own and Operate
BOOT	Built, Own, Operate and Transfer
BOT	Built, Operate and Transfer
BS	British Standard
BTO	Business Transformation Outsourcing
capex	Capital expenditure
CIRR	Commercial Interest Reference Rates
DC	Direct Current
EPC	Engineer, Procure and Construct
EPCM	Engineer, Procure, Construct and Manage
HAZOP	Hazardous operation plan
IRR	Internal Rate of Return
IT	Information Technology
JV	Joint Venture
MTO	Material Take Off
NMMC	Navoi Mining Metallurgical Combinate
OECD	Organisation for Economic Co-operation and Development
opex	Operating or running cost
P&ID	Process and Instrumentation Diagram
PFD	Process Flow Diagram
PMG	Platinum Metals Group
QCP's	Quality Control Procedures
ROE	Rate of Exchange
SCADA	Supervisory Control And Data Acquisition
SPO	Strategic Project Office
UN	United Nations
US$	United States Dollar
Y2K	Year 2000
ZAR	South African Rand

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A study dedicated to my wife, Elsie

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ABSTRACT

The relationship between the Mining House / Owner and Project House can be spectacularly successful for both partners (and has resulted in the emergence of a few successful new project houses and plant operation companies all over the world), but can also be disastrous for both parties, if managed incorrectly. The main requirement for a successful relationship between a Mining- and Project House is that there must be something in it for both parties. This is not only measured in customer perception of value for money (Mining House) and profits by the Project House, but is also affected by mutual respect, the working relationship and the perception that both can profit from the relationship by the following activities:

- Procurement of goods and services.
- Providing assistance in absorbing and adopting process technologies.
- Addressing environmental concerns like Environment Impact Assessment, HAZOP studies as well as disaster management plans.
- A project management team who can ensure proper control and timely reporting to the financial institutions, ensuring there are no cost and time overruns.
- Provide due diligence in order to assign proper value to the assets, business portfolios, brand equity, technology/product, etc.
- For retrofits, revamps, technical/ energy audits, upgrading the processes / quality of product through minimal investment routes.
- In ensuring all aspects of quality management right from the concept to commissioning stage, involving corporate commitment to the quality management process enabling the companies to follow good manufacturing practices.
- To provide knowledge management services i.e. depth of knowledge rather than the breadth.

Until recently, most Mining Houses locked outsourcing in the back room - using it to pass off unimportant functions and processes to competent specialists so that managers could focus on more critical activities and core business. This is all changing as outsourcing is increasingly making its way into executives' strategic toolkit**s**. In other research studies [5; C; K; N] three types of

outsourcing relationships have been identified namely conventional, collaborative and (business) transformational outsourcing.

Mining Houses can use conventional outsourcing to generate cost efficiencies in support processes. Collaborative outsourcing is used both to upgrade business processes and to provide flexibility to respond to changing business needs. Business transformation outsourcing holds a higher standard and is a comprehensive approach to create both new capabilities and to use them to achieve a clear strategic objective.

DISSERTATION'S STRUCTURE

For the successful completion of any task there must be a clear objective of what the desired outcome must be, together with a strategy of how this objective will be achieved. The contrary is even closer to the truth – if you aim at nothing, you will probably achieve nothing.

The Objective

The objective of this dissertation is not to solve all problems in the outsourcing relationships between Mining- and Project Houses, but rather to smooth the current bumpy road of outsourcing in the mining and mineral processing industry by highlighting the various options together with their advantages and disadvantages.

The required outcomes of these objectives are:

- Empowering the responsible managers to make informed decisions, by selecting the best possible model for their specific situation.
- Give them an understanding of the other party's situation as well as areas which are causing conflict of interests. This knowledge will enable these managers to manage their specific relationship optimally and achieve the required end results to the benefit of both parties.

Strategy

In order to achieve the above objectives the responsible managers not only need to understand the various options available to them (together with their advantages and disadvantages), but also the history, perceptions in people's minds, the expectations of the other parties and, probably the most important of all, their concerns and possible reactions in specific situations.

The starting point is looking at the history of outsourcing in the mining and mineral processing industry, the reasons therefore and objectives thereof together with the various options and processes utilised to date. During these discussions in chapter one it becomes clear that outsourcing is managed at two levels namely strategic management or corporate level (chapter 2) and project level (chapter 3).

Although some topics may be seen as being 'repeated' in both sections, the contents thereof differ as it's implemented at different levels. In the Strategic Management level the focus is on the inter-company level (also described as executive level in some references) while the project specific level focuses on the problems experienced at middle to high level management (project management level) which in turn can also differ from project to project. From there the focus shifts to the different phases of a typical mineral processing project together with the different contracting models and their unique pitfalls, such as Project House selection criteria (chapter 4).

Once the problems experienced, set-up and strategies of outsourcing have been discussed for the different phases of project execution, the focus moves to the different levels of outsourcing, including what many describe as the ultimate price in the outsourcing game - business transformation outsourcing. BTO is discussed in chapter 5 together with issues like visibility versus control and sole outsourcing.

At this stage the relevant manager may have a reasonable knowledge of outsourcing, but outsourcing is a journey, not a destination. Because the relationship must still be managed, the attention shifts to guidelines for changing and improving outsourcing relationships, managing sole outsourcing, life after signing a long term agreement and summarised under the impact of best practices on outsourcing arrangements (chapter 6).

The dissertation is concluded with a practical example in a case study of the De Beers / BatemanBV arrangement (chapter 7) and final conclusions (chapter 8).

Background

This dissertation is a combination of research based on various outsourcing websites and publications, case studies of problems experienced on projects (highlighted during informal discussions with Project House project managers and Mining House project team staff) [15] and 9 years of personal working experience. This personal experience covered the spectrum from the consulting industry; equipment suppliers (supplying equipment and small LSTK projects to Mining- and Project Houses) to Project Houses who were executing mega projects on behalf of Mining Houses. Although every attempt has been made to be as objective as possible, the limited exposure to the Mining House's operations might have resulted in less detail from their side in comparison to the Project House's.

Chapter 1

MAIN FACTORS AFFECTING THE MINING- PROJECT HOUSE RELATIONSHIP

1.1 Introduction

Outsourcing can also be described as the common ground linking for instance Mining- and Project Houses. Although this inter-dependent relationship has been in existence for a few decades, it is still quite fragile and under constant pressure to reach the maturity of a mutually acceptable equilibrium. This 'imbalanced relationship' is further complicated by continuous changes to the economic constraints on projects caused mainly by varying prices in the mineral commodity industry. This not only caused a number of changes over the years, but also created quite a few different scenarios that can be followed by the Mining House when outsourcing a project to a Project House [1c].

To be able to manage this relationship to the satisfaction of both parties not only requires understanding of the relationship, but also of each party's background, viewpoint and objectives and, most important of all, the possible options within and potential of this relationship. Like most relationships, the reason for its existence and history are paramount for understanding and managing it.

1.2 History of Mining – Project House relationship

During the industrial revolution in the early 20th century (1900's to 1950's) most medium and large companies were growing steadily due to increased customer demand for supplies. This also affected the mining industry world wide as the demand for raw materials increased resulting in the formation of Mining Houses that were able to fund new mines and other large industrial scale capital developments like processing plants.

Due to the information and technology boom in the early second half of the 20th century (1950's to 1980's) the mining industry expanded rapidly, redrawing boundaries by new process developments causing shortages of specialist state of the art technical skills. Consequently the focus shifted onto centralised in-house capabilities to keep a competitive

edge in a technology crazy market and protection of intellectual property (IP) which, at the time, was considered as the most secure option to keep new technology from competitors and gain the competitive edge.

'Turnkey contracts' and 'Intellectual Property' quickly became the new buzz-words which extended the market possibilities even further into new and unknown territories and disciplines. For Mining Houses (as well as the early Project Houses) to be able to compete successfully in this lucrative market, it was necessary to match the capabilities of its competition as technology was not readily available [1i]. The result was that new expertise / technology was required which did not exist in-house, and was mostly acquired by one of the following three methods:

- Technology being developed internally by personnel, with the required skills and expertise, who were recruited for this purpose.
- Buying companies that possessed the required expertise or technology.
- Merging with other companies that possessed the required expertise or technology.

Although this approach served the South African mining industry in particular with such distinction over many years that it became one of the undisputed mining industry leaders and enabled the country to survive during years of isolation [1t], there were some unforeseen outcomes due to continuous, and sometimes uncontrollable, rapid growth and absorption of smaller specialised companies into larger ones. The results of these three approaches, which were unforeseen at that time, are listed below [1t].

- The growth tempo became uncontrollable as management systems could not keep up with demands of such growth and the challenges of managing these new fields.
- Companies expanded into fields beyond their expertise, core business and management experience. Unprofitable business units were carried along for possible future projects of the same nature and the protection of intellectual property.
- Large exposure of the Mining House or Mother Company to risks on large projects, as it was not shared beyond the Mining House or Mother Company.
- Fluctuations in markets put stress on resource management due to large changes in workloads.

- A large percentage of specialists did not like the "big company culture" and preferred to move on as soon as possible, resulting in the loss of experience and know-how.

These changes were not limited to the South African mining industry, but the consequences thereof differed from country to country with two main trends. Some large mining houses got bigger through more mergers which were the rule in South Africa (BHP Billiton [X]) and in case of some Australian companies like Newmont [T]. Others, like most Australian, American and Canadian companies, started to sell off mineral rights (because of the 'use it or lose it' legislation) resulting in a number of smaller enterprising style mining companies emerging especially in the Australian industry. (Also referred to as 'junior mining companies' or junior Mining Houses' by some literature) [16].

The late 20th century (1980's to 2000) saw another change from the 1950's to 1980's period in the management of specialised services. Although the reasons varied vastly, it can be summarised as follows [1t]:

- A number of Mining Houses / large companies became unprofitable and sometimes went into liquidation due to lack of understanding of markets into which they had expanded.
- Mineral commodity prices came under extreme pressure (Gold price dropped from US$850 in 1985 to US$270 in 2000) due to globalisation and more suppliers entering the market as more reserves became available.
- With the globalisation of markets and end of the cold war it was noted that most technology was already developed; available cheaper in other countries or even relatively freely available. The rise of internet communications and e-commerce resulted in a re-think of the Intellectual Property protection (which was now almost totally available on the Internet) versus customer value perception protection.
- The number of specialised fields grew exponentially and became even more specialised therefore making it more difficult to keep up with technology due to the high technology environment.
- Large projects became more unique and expensive, occurred less frequently (due to reduced number of huge economically viable deposits) while plants were fine-tuned and purposely designed to ensure survival in a globally competitive market.

- The computer age together with information technology developments allowed a quick transfer of information without sacrificing security.

These factors forced changes in management strategies and resulted in large companies, like Mining Houses, selling off and closing specialised business units and concentrating on their core business. For example: Mining Houses sold off or closed their engineering and project execution divisions and concentrated on managing their mines with only a small department of key staff available as internal consultants to the various mines. When the need arose for a specialised service like development of a new mine shaft or processing plant, it was now outsourced to an independent Project House within the mineral processing industry.

1.3 Outsourcing: what is it really about?

In today's market 'outsourcing' has become a niche word and is regularly used as a management tool to attempt to make more profit, or as an excuse to get rid of an unwanted department. This conventional outsourcing approach can be taken a step further with collaborative and Business Transformation Outsourcing (BTO) which features in almost every company's strategy [5] and although generally applicable to departments like IT, accounting, procurement, human resources, property management etc, it is just as applicable to project management and implementation.

For many managers, outsourcing is synonymous with contracting and sadly many organisations opt for outsourcing as a 'quick fix' to deal with incompetence, financial pressure or losing the competitive edge in the market. Not only do these managers fail to consider the long term implications and true potential of outsourcing, but they are also wrongly under the impression that they are outsourcing (as per their company's strategy) while they are only using outsourcing companies as labour brokers to supply temporary staff without committing themselves to an employer – employee relationship (again in most cases an incorrect expression in the eyes of the law). This results in outsourcing historically being wholly *tactically geared to the acquisition of additional resources* which is not necessarily the correct description or in line with the company strategy. This is especially valid for some reimbursable contacts with Project Houses used by Mining Houses.

Some managers will define outsourcing as an alternate word for subcontracting vendors or even for a strategic alliance and joint venture (JV). To really understand the effect

outsourcing has, as well as the advantages of outsourcing in the mining industry and how to manage it, the first step will be to define what outsourcing really is about.

1.4 The objective of outsourcing:

The objective of outsourcing is explained more clearly by answering the question of what do managers try to obtain by outsourcing [5]:

- Concentrating resources on core business capabilities.
- Implementing a variable cost approach by paying only for services provided, as and when needed.
- Obtaining immediate cash infusion if associated with transfer of assets to vendor.
- Improvement of overall performance (deliverable driven) by increasing profits, reducing operating cost and improving efficiency.
- Improve end user / client satisfaction.
- Keep apace of industry trends and new developments.
- Provide access to new technology / methodologies.
- Reduce risk or share it with others
- Implement tools for growth
- Standardise diverse methodologies / technology.
- Manage methodologies / technology while the customer or vendor implements new methodologies / technology.
- Obtain new or additional resources.
- Provide flexibility to increase or decrease resources.
- Obtain services and / or capacity which are not available in-house.
- Reduce time to market place - from time of capital expenditure to production (and returns) coming in.
- Compensate for lack of infra- and / or management structure.

Although the above reasons may be thought of as quite specific and unique for the mining industry, the reasons for outsourcing vary very little from industry to industry. For example, when looking at the Human Resources Outsourcing attached in figure 1.1 a few very similar conditions appear.

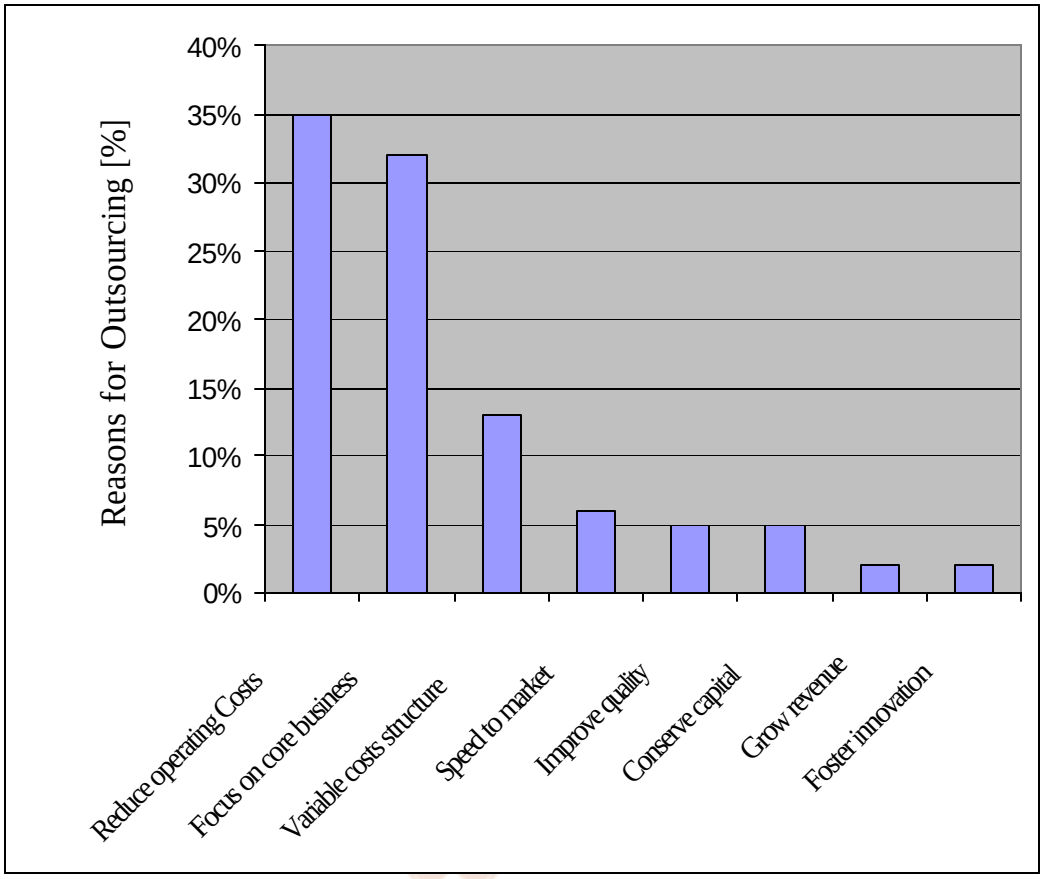

Figure 1.1: Reasons for outsourcing human resources [B]

It can be argued that most of the above objectives can also be met (stand-alone or combined) by partnerships, joint ventures, subcontracting or mergers; the difference is that outsourced services are cost orientated and do not normally form part of core business, while other options are regularly used as part of core business processes [1c; 1h].

1.5 Definition of outsourcing

Putting a definition to outsourcing is not a simple task as there are various types and levels of outsourcing. The Concise Oxford Dictionary defines outsourcing as "contract (work) out", but this is only half the truth. Outsourcing is also described as the purchasing of a functional service for a company from another business [A] which can be described as follows:

- A management tool.
- Emphasis on what is to be done, rather than on how and who.

- Task level management responsibilities rest with supplier
- Work takes place mainly / entirely off site.
- Supplier provides all resources
- Employee relationships managed by supplier
- Payment is typically based on performance (deliverables), but can also be time based (reimbursable contracts)

When looking at the human resources outsourcing web page [B], outsourcing is defined as the contracting of one or more of a company's business processes to an outside service provider to help increase shareholder value, by primarily reducing operating costs and freeing management resources to focus on core competencies.

Numerous other definitions are also quoted in reference [4], but the fundamental concept of outsourcing is quoted as *"Ownership of a certain part of process of producing a product or rendering a service is handed over to the successful partner. In return the company requires a level of service that is underlined by key performance indicators that ultimately make up the metrics of the contract"* [4] seems to be the most applicable and closest to reality. The key areas in this definition are *transfer* and *business processes.*

When looking at other definitions like subcontracting, partnerships, joint ventures and strategic alliances it becomes apparent that *outsourcing, in all its different applications, is the collective description bringing all these actions* (some more prominent than others) *together under a single umbrella*. Edwin B. Dean of NASA [also quoted in 1c] probably described the purpose of outsourcing the best by *"giving somebody else the problems within your business which you cannot solve well yourself"*.

The following other definitions are also regularly used to describe processes used in or associated with outsourcing agreements

Subcontracting can be defined as the result of a main enterprise (contractor or service provider) commissioning another enterprise (subcontractor) to provide him with goods or services that he will use for his own commercial purposes, often but not always, by incorporating these goods or services into a whole project [2].

Volume subcontracting is when the main contractor uses a subcontractor to supply goods or services which he is not able to do, due to workload. Specialist subcontracting is when the main enterprise uses the subcontractor to supply goods or services he does not produce or is not able to produce himself. Although subcontracting can take on many different forms, its main areas are the supply of products, equipment and services.

Final liability for the design of the product normally remains with the main contractor limiting the exposure of the subcontractor to risk and reduces possibility of shared risk for the main contractor [2].

Partnership is a business in which two or more entities (individuals or companies) carry on continuing business for a profit as co-owners. Legally a partnership is regarded as a group of entities (individuals or companies) rather than a single entity, although each of the partners files their share of the profits on their individual tax returns [A]. Responsibilities are clearly defined as to which partner is responsible.

Joint Venture is a business in which two or more entities (individuals or companies) join together under a contractual agreement to conduct a specific business enterprise (like a project) with both parties sharing profits and losses. The venture is for one specific project only, rather than for a continuing business relationship such as a strategic alliance or partnership [A].

Strategic alliance is a partnership in which you combine efforts in a business effort involving anything from getting a better price for goods by buying in bulk together or seeking business together with each partner providing part of the product. The basic idea behind the alliance is to minimize risk while maximizing your leverage. [A]

1.6 Different levels of outsourcing.

Too many people have realised too late that outsourcing does not mean throwing a problem over a wall, waiting for the solution to come back and then answering with a cheque back over the wall. More often than not the problem is not clearly defined, the client does not understand it fully himself, nor is he certain which way to go. Add to this the complications of law and contracts, scope definition and variables of the day to day economic changes and the result is a minefield.

The fact is that outsourcing still requires management and control notwithstanding the level and type of outsourcing agreement. The closer the outsource service provider is linked to the client company, the easier are the management and control portion of the outsourced services, but the exposure to risk are bigger, because not all risk rests outside the client company.

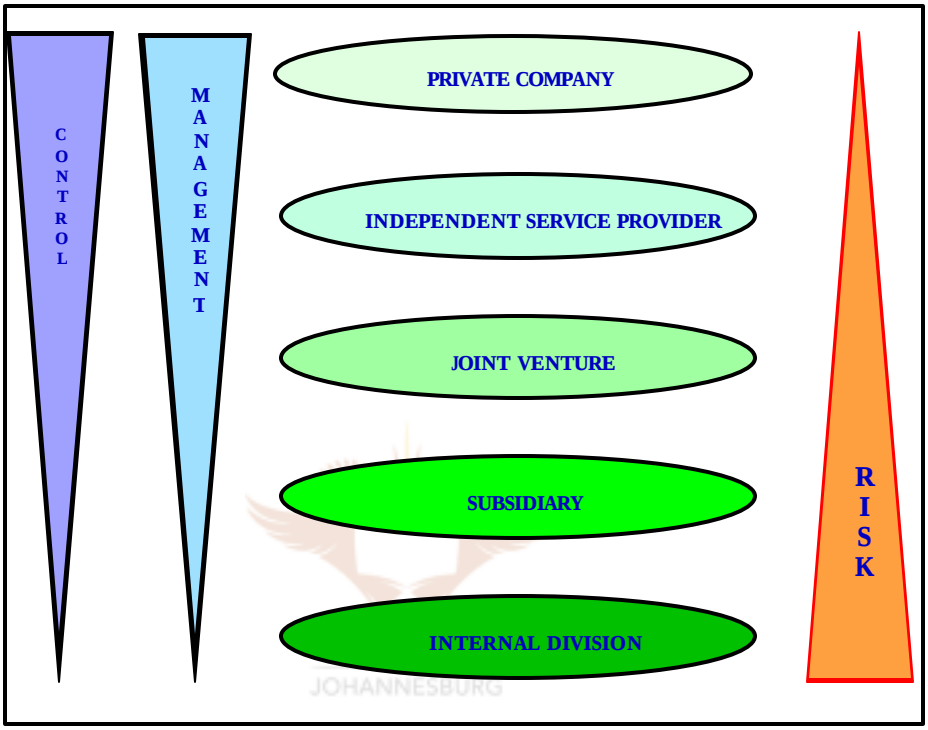

Figure 1.2: Levels of outsourcing management, control and risk versus service provider types. [adjusted from 4]

High level outsourcing normally involves individual (strategic) activities or specialists while medium level outsourcing can be defined as functions being outsourced. Low level outsourcing is the supply of processes, like plant operation or maintenance staff, involving quite a number of people (with their own management pyramid) and is normally happening at the coal face where the work is done with a relatively low skilled work force [4].

A number of references use the same structure linking it to the functions (Strategic versus Individual activities; Tactical VS Function Services and Operational versus processes) rather than outsourcing levels while others are using management levels (Top, Middle and Lower). The principle is in essence the same therefore the above structure is to be used to ensure conformity.

Individual activities: Outsourcing of individual activities means moving specific positions out of an organization. This is normally a highly specialised person operating as a consultant, paid per hour or deliverable and requires fairly little management and is easy to control[3].

Functional services: Functional services outsourcing is the outsourcing of a system or business process like Human Resources, IT, mine stores or finances. It is a relatively small number of people with one or two levels of management and normally non-core business processes. Controls and management are relatively easy as deliverables can be clearly defined against which payments are done [3].

Processes: Outsourcing of processes normally stretches over various levels and requires a fair amount of manpower which comes complete with its own management structures. These processes are not always that easy to manage due to the number of people involved, external factors like weather, working hours, strikes and flow of information. Deliverables get more difficult to define upfront due to uncertainties and the inevitable changes during the project life cycle. The result is that prices are based on estimated quantities (such as rates) which are re-measurable in cases of uncertainty or LSTK (lump sum turn key) for more clearly defined scope with less uncertainty. Classic examples of process outsourcing in the mining industry is the construction of new facilities or expansion thereof which do not form part of normal mining procedures and maintenance shut-downs [3].

1.7 Outsourcing options – types of contract

Due to the complexity and uncertainty in the mineral processing industry a number of typical contract options have developed over the years. Although these contract types are not unique to the mining industry, they had a large effect on it because the mineral commodity industry was one of the first industries to be exposed to such complicated and widespread risks.

Unfortunately, as in most cases, a lot of incorrect and different definitions and abbreviations exist for example EPCM (meaning Engineer, Procure, Construct and Manage) actually describes the scope of work, but is regularly used to indicate reimbursable contracts. Currently there are three main streams namely Services, Reimbursable and Lump Sum Turn Key (LSTK) contracts. The advantages and disadvantages of each option are discussed in section 4.3.

1.8 Modern Outsourcing trends

Current Mining House strategies are in line with modern trends which are generally to focus on core business and outsourcing the non-core portion of the business. This is, however not the limit as the ideal would be to have very little operational risk, capital, time and management input while taking the lions' share of the profit. It is not surprising that these tendencies are in line with those listed by the outsourcing journal [F] for USA and European non-mining industries:

- Continued growth of traditional outsourcing by outsourcing of non-core and transactional business processes as a percentage of total operating budgets.
- New outsourcing areas as companies are now finding value in outsourcing certain strategic or industry-specific processes as well.
- Competitive pressure to outsource together with rapid technology advances, is forcing companies to outsource certain processes to stay ahead of competitors and meet customer needs.
- Technology advances are enabling faster and cheaper deployment of outsourcing solutions.
- More choice of outsourcing providers, as the number of service providers have dramatically increased becoming more specialised, vertically and in BPO more horizontal.

In the South African market a few new equity companies (which acquired mineral resources by redistribution, but lack mining and operating skills to develop and operate the process plant) are taking outsourcing to it's ultimate limit by outsourcing plant construction, ownership and operations together with the risk to BOO(T) (Built, Operate, Own (and Transfer)) partners. Although this principle has been deployed elsewhere in the world such as the Australian and Canadian mining industry, it only really started to come to light in South Africa when the new Mining Bill was implemented in 2002 [13].

Although South African Mining Houses, that form the bulk of Project Houses client base, seem to be preferring the conventional way of outsourcing, the question if it is the optimum solution for both parties, still remains unanswered. With the globalisation of the mining and mineral commodity industry, the intensiveness of such questions will increase together with the demand for answers as the South African industry is fighting for its position as one of the world leaders.

1.9 Summary

It is recognised that Mining and Project Houses are interdependent on each other with both parties destinies integrated with the other, whether they like it or not. To make things more exciting, were most of the Project House's skilled resources (now core personnel and specialists) originally trained by Mining House programs [1c] creating even more rivalry. The general statement that "Mining Houses do not trust contractors" is probably a bit harsh, but there is also truth in it as Mining Houses were slow to realise the implications of contract laws and regulations with the result that 'fly by night' Project Houses / contractors took undue advantage. Since then both parties are starting to realize their interdependency and that the fighting between themselves, is to the detriment of all.

For Mining - and Project Houses to progress beyond these historical problems and embrace the future, they need to resolve their issues both at corporate / company management level and project level. Because corporate / company management level is generally associated with strategic issues, and also to a large extent determines project level relationships, strategic management issues in the Mining– Project House relationship are addressed in chapter 2.

Chapter 2

MANAGING OUTSOURCING: STRATEGIC MANAGEMENT ISSUES IN THE MINING– PROJECT HOUSE RELATIONSHIP

2.1 Introduction

The Mining- Project House relationship picture is generally clear, but also contains grey areas. History has shown that it takes two to tango and that no company consists only of angels or devils – each one has its fair share of the good and the not-so-good. In today's modern flat company structures, executive management is forced to trust their project management teams, from senior and middle management level, due to lack of time and systems to familiarise themselves with all the information so that they can form their own opinion.

Because executive management (from both Mining- and Project Houses) is dependent on their respective project team's feedback, their perception is normally what the project teams want them to believe and usually has a close resemblance to the picture painted by the project team management. This picture may not always be the full truth nor fully accurate, but as it is normally the only feedback executive management gets, they have to rely on it. Reality has shown that most of the conflict and accusations made, are due to individuals (from both sides) trying to hide their own incompetence, slip-ups and failures with the other party seldom totally innocent.

In order to be realistic and objective, the factors that cause this conflict at strategic and / or senior management levels must be assessed at the appropriate company executive level and not project level. Once agreement is reached at strategic and/or executive levels, the project level differences can be relatively easily resolved as the stage is already set.

2.2 Industry uncertainty and changes

The mining and mineral processing industry is probably the fastest changing industry in the modern world, after the information technology sector. The difference is that where the information technology sector changes are governed by market demands and new technology developments (which are largely controlled by the industry themselves) the mining and

mineral processing industry changes are caused by registration, political stability in countries of mining operations, mineral commodity prices, available reserves and new deposits found [11].

Although the industry does have some input into the outcome of these factors, like the new South African Mining Bill [13] (with its 'use it or lose it' law on mining reserves like the Australian and Canadian laws) and the amount spent on exploration which does have an effect on the possibility of new reserves found, the effect thereof is very limited resulting in these changes being beyond the industry's, and specially the Mining House's, control.

The result is not only fast changing of mining and mineral resources ownership (mines and reserves change hands regularly) [16], but also the profitability of projects (due to metal prices) which puts extreme pressure on executive management of both Mining- and Project Houses[12]. These continuous changes and associated uncertainty have a definite downstream effect as Mining Houses must regularly investigate the various different options.

Project Houses on the other hand, accuse the Mining Houses of wasting their time and money by requesting tenders, proposals, bankable feasibility studies, update prices, etc. including regular extensions of price validity periods. As most of this work is done at Project House's cost (free of charge to the Mining House), Project Houses experience it as money wasted because Mining Houses cannot make up their minds, whilst little effort is made by the Project Houses to understand the complexity of project financing or the volatility of the mineral commodity market environment which determine the Mining House's profitability.

2.2.1 Shrinking markets

Mineral demands (and prices) are affected by the fabrication industry trends and the implementation of new technology. For example fibre optics is replacing copper wire in telecommunication cables, resulting in a worldwide collapse in copper prices and shares. This had a huge impact on the Chilean economy and mining industry which is one of the main copper producers in the world and highly dependant on copper sales. For very much the same reason together with economic and political instability, Anglo American unexpectedly pulled out of the Zambian copper belt early in 2002.

Zinc prices have dropped drastically and have maintained these low prices for the past few years [12] which resulted in the shelving of the Gamsberg Zinc Project in Namakwaland

(Western Cape in South Africa) which is now uneconomical to explore due to the complex ore body.

Together with low metal prices worldwide, pressure from organisations like Greenpeace is having an effect on the exploration of mineral commodities. People from first world countries are willing, and can afford to pay a premium for raw materials, where the environment is not harmed by either mining or ore processing, hence the requirement to replace roaster plants with more environmental friendly, but more expensive, BIOX plants.

2.2.2 Mining reserves

All mining reserves were deposited millions of years ago resulting in the number of deposits not increasing in number or concentration, but only found via exploration. The result is that the race is on for high concentration (gram commodity per ton ore); easy to mine (preferably open pit mining or other cheap mining methods like leaching); simple ore bodies (which require low complexity processing plants) and is close to infrastructure where low cost services are available.

Add to this the 'use it or lose it' laws of various countries, together with local registrations like percentage local shareholding requirements and the result is fierce competition between Mining Houses where only the strongest and most cash positive companies will survive. Because very few Mining Houses have the financial strength, technology and mineral reserves to develop new projects on their own, joint venture projects like BHP Billiton [X] and Copper Alliance in Chile, Newmont [T] and Navoi Mining Metallurgical Combinate (NMMC) in Uzbekistan; Goldfields [U], Ashanti and Ghanaian government in Ghana are becoming the rule and not the exception.

This is not the only complication as various economically viable mineral deposits lie untouched due to lack of infrastructure and political stability such as in countries like Angola; Democratic Republic of Congo and Mozambique where the infrastructure costs make projects uneconomical. Another alternative is to move the processing portion to other countries (like the KOEGA Aluminium Smelter which will probably be moved from India to South Africa) due to cheaper resources like electricity.

Whatever the consideration, Mining Houses cannot afford to keep unlimited reserves on their books, thus they are buying and selling reserves to position themselves strategically in

the market with only the best valued commodity reserves on their books without limiting themselves to one mineral commodity.

2.2.3 Outsourcing service providers

For Mining Houses the market choice of only five relatively large reputable Project Houses with track records of successful mega-projects in South Africa is small in comparison with other industries. Choices are currently limited to Bateman, DRA, EMS (Murray & Roberts group), Flour Daniel's mining division and Hatch Africa (in alphabetic order).

These Project Houses are not only servicing the South African mining industry, but also about 40% of South African originated global (mostly London based) Mining Houses (like Goldfields and Anglo American which include AngloGold and Amplats) global projects like Ashanti in Ghana, Kassese in Uganda as well as numerous Australian and South American Projects). The number of Project Houses with track records of successful mega projects in the mining and mineral processing industry in the world in total is probably less than 20.

This leaves the Mining Houses in a predicament – any more reductions in this market will result in lack of competition which can, and probably will, increase the cost of mines and mineral processing plants further. On the other hand they cannot afford to pay school fees for a new Project House finding its feet, as they also manage shareholders money ant they want maximum return on their investment. This problem is discussed further in section 6.3 as sole outsourcing.

2.2.4 Personnel

In the days when the gold price was US$ 800.00 plus per ounce (1970's to 1980's) all South African Mining Houses had training programs to train their future managers, engineers, artisans and draftsmen. With increasing financial pressures (gold price dropped to approximate US$ 350 per ounce) these programs were aborted together with those of other industries like Spoornet (South African Railways and Harbours), Iscor (Iron mining and steel producer).

These programs were so good that not only did they ensure that the South African mining industry was one of the undisputed world leaders, but resulted in these trained manpower resources being headhunted by other world players. Although the changes took place in the region of 1984, the almost catastrophic result of a fast shrinking workforce only started to

show from 2000 onwards. The main reason is that these trained manpower resources are starting to retire from the market and people realised with a shock that very few managers, engineers, artisans and draftsmen were trained from 1984 to 2002 (a period of 18 years) and the knowledge and know-how was never transferred to the new and up-coming workforce [17]. The Elizabeth Bay project from Bateman Minerals had an average drawing office age of above 55 because no one in the South African engineering industry had invested in training of proper draftsmen (not CAD operators) for the past 20 years.

The competition for the remains of this shrinking resource pool of expertise (which was mainly trained by the Mining Houses, but now employed by Project Houses) is getting so fierce that non-poaching of personnel agreements are starting to become part of Mining-Project House contractual agreements. Reality is that Project Houses are generally able to pay better and thus tend to have the upper hand.

Although hourly paid contract staff, employed on a project specific basis without severance packages, are common in South Africa and UK, the same does not apply to the rest of the first world countries where the lions share of project engineering is being undertaken.

2.3 Personal relationships

More and more people are starting to realise that the chance of a successful project is largely determined by the personal relationship between the Mining- and Project House project teams. Because most of these teams consist of engineers – a sector, which is notorious for bad people management and interpersonal relationships – the pressure, is becoming even more severe.

Some Mining House project managers are still under the impression that you are only successful if you can prove to your superiors that you are beating up the contractor (Project House) and grinding him into the ground. Sadly the only real loser is the Mining House, as a Project House will make such an error only once. Next time round they will not only add an "annoyance" factor (which can be as high as 5% of total contract price), but will also be better prepared and may even beat the Mining House's project manager at his own game.

The success of projects is not limited to financial bottom lines (see intellectual property versus customer value perception in section 2.5) but is also determined to a large extent by how the Mining- and Project Houses project teams get along. Clashing personalities regularly

result in fighting each other (which normally forces the rest of the team to pick sides) rather than doing the work, which is to manage the project properly. Compatible personalities and good interpersonal relationships on the other hand create an atmosphere where even the most demanding obstacles can be overcome with minimum impact on the project due to team efforts [M].

Mining Houses tried to counteract this by requiring Project Houses to submit the names and CV's of key project position candidates as part of the required tender documentation. Although this allows the Mining House to assess the quality of people offered by the Project House both technically and on interpersonal relationships (track record in industry), the approach still has shortcomings as clashing personalities cannot be avoided with only one party's cards on the table.

A win-win situation can however be achieved if both the Mining- and Project House executive management sit together and appoint a project team with input from both sides [5]. This will not only enable both parties to get the full benefit of a combined team effort, but will also unleash the full potential of strategic outsourcing relationships to the advantage of both parties. The value that can be generated by strategic relationships such as BTO is discussed in Chapter 5.

2.4 Sharing responsibility and risk

Project risks have always been and will always be a contentious issue. Project Houses will argue that they are expected to take the risk by performance guarantees, timeframes and penalty clauses without being financially compensated (especially on reimbursable man-hour contracts) [1v]. Mining Houses on the other hand, argue that it is their money and that they are taking the risk that there may not be a market once the project is commissioned.

When looking at the overall picture both parties are in a certain sense correct – there are two distinct types of risk, namely project related and industry related risks.

2.4.1 Industry risks

Industry risks are carried by the project owner and shareholders (normally the Mining House) and include the following aspects:

- No market for commodities once project is commissioned, such as various copper projects in Chile.
- Overrun of project cost on reimbursable projects.
- Required items and services missed in original scope / estimation resulting in additional costs.
- Labour problems like strikes, political instability in the country where project is located, etc, results in losses due to plant not been operated or commodities not exported (oil industries in Nigeria and Venezuela)
- Reserves not as good as estimated or drastic changes in ore body compensation as to those tested during exploration by drilling (BHP Billiton's Hartley platinum plant in Zimbabwe)
- A single service provider outside the Project House scope being late and delaying the whole project (like a road by the local government authority)
- Late completion of project resulting in the Mining House (project owner) not able to meet market commitments thereby losing a supply contract.

2.4.2 Project risks

Project risks on the other hand are carried by the responsible Project House (depending on scope) and normally include the following:

- Overrun on cost for LSTK projects.
- Laws and a culture of sueing Project Houses and contractors for over-engineering after completion like in Australia and USA.
- Labour and political problems during construction.
- Penalties and loss of bonuses due to late completion. (consequential damages are normally excluded)
- Delays due to client involvement and not being able to make decisions promptly.
- Nominated Mining House suppliers failing to perform and delaying the whole project.
- Unknown variances like material and labour cost increases or transport routes having been changed due to war in countries like in the Middle East.
- Rate of exchange variances, although this can be limited by forward cover, which is available in most cases.

- The plant not meeting the required contractual performances like plant throughput (ton per day), gold recovery (%), power consumption (kW per ton ore treated), use of consumables and chemicals like flocculants and arsenate (g per ton dry solids) etc.
- Plant availability and maximum maintenance requirements.

In the 1950's when outsourcing became the new buzzword, some outsourcing clients argued that once the contract has been placed with the service provider the full responsibility is his and they just have to wait for the answer to come back over the wall. The results were generally catastrophic for these clients, as they were exposed to risks they never knew existed. Not only did some service providers fail to deliver on time and / or to the operational requirements, but their liabilities were generally limited to 10% of contract value, which meant that they could walk away after 10% of contract value was spent on fixing problems. Reality has also shown that very seldom are the evaluation systems of such a standard that management can make informed decisions as there are normally conflicts between the various stakeholders interests [1v].

2.5 Intellectual property versus customer value perception

Intellectual property has long been considered as the way of keeping an advantage over the competition. The reality is that 99% of all chemical and metallurgical mineral processes are defined in handbooks and available on the internet and websites as well as documented in a vast amount of research, which has been done all over the world on the various processes, including the advantages and disadvantages of each one. In the mining and mineral commodity industry, equipment suppliers are more than willing to share their knowledge and experience regarding the various processes to ensure that their equipment is purchased. With all these changes taking place, it is now possible to purchase (widely available) intellectual property much cheaper than the cost to develop in-house. [F]

A possible exemption is relatively new processes like the BIOX technology from Goldfields (Biomin Division) which can only be used under license, but again it is available in a different form from various other companies like Bactech, BREM (Geotech) and Mintek. New niche processes bundled into core project equipment on the other hand, like pulsating columns from Bateman or AC furnaces from Titaco, are available to any client who can afford it and having a *workable application* (bearing in mind that the industry is so small that no failures can be tolerated). If the patent license is held by a Project House like the pulsating columns by

Bateman, the only requirement is normally that the Project House has the first right of refusal.

The difference in strategies for managing intellectual property and customer value perception are well illustrated by the following strategy form Sony. Not only did Sony, to a large extent, keep the market segment by focussing on customer value perception, but created an even bigger market for them by customer value perception.

Case Study: Sony Play stations and walkmans.

Another classical practical and more well-known example of unsuccessful intellectual property protection and how to manage it are Sony Play Station and Walkmans. When they are sold, they include the technology to make it work. Competitors bought some stock, copied it with minor changes (to avoid patent infringements) and within six and four months respectively, competition products were on the market. The question asked is 'But why is Sony Play station and Walkmans the only "brand" being considered when people talk about these appliances?'

The answer comes from Sony's successful marketing strategy [6]. While Sony knew that the competition were copying their technology they created the perception with the public that, notwithstanding who offers you what, Sony is the only brand offering you real value for your money. This resulted in a mindset change from intellectual property to focusing on customer value perception[6].

Research has also shown that customer value perception has little or nothing to do with most companies' standard operational concerns such as leveraging core competencies, decreasing time to market or increasing productivity and profits. Customer value is created most effectively by continuously shifting focus to the most appropriate field, thus creating a short niche market and quality customer service. Customers do not care whether these players are internal or external, thus the shift towards strategic outsourcing of product development. Modern communication tools like the intra / internet and video conferences have obviated the need for outsourcing partners to be physically close [F, G].

2.5.1 Managing customer value perception:

Customer value perception is the value the customer puts on the service provided by the service provider. If the perception of value is higher than that of the competition, then the

service provider can charge a premium for his services which can be as high as 10% above his competitors. If it costs 2% more to create and deliver this customer perception of value which can justify a 10% price increase while the customer still feels that he is getting the bargain of his life, then why sell at the original price? [H]

When looking at the overall picture where strategies of how customer value perception in the market is created, new business developed and keeping ahead of the pack etc. are regularly published in company's annual reports, the question can be asked if this is not the real information (like creating customer value perception) companies need to protect, rather than just focussing on intellectual property?

2.6 Multi-client (shared) services.

Historically the value added advantages of outsourcing were exclusive to the large and rich companies who could afford the service provider's customisation cost for their particular requirements. Although it originally started with IT during the Y2K saga, recent years have seen a dramatic change towards sharing of services in outsourcing models which is also described as multi-client service agreements [G].

The White Paper [G] was specifically done on IT solutions that Deloitte & Touché are offering their clients, but the covered factors of consideration are just as applicable to a Project House servicing various Mining Houses. For example a Project House like Bateman or Hatch is at any moment busy executing projects and studies for various clients like De Beers, Impala Platinum, Amplats and Goldfields Each of them has different systems and reporting requirements, but if a single system platform can be used and the following advantages thereof will be shared by all.

2.6.1 Shared cost

The cost effectiveness of multi-client shared services platform makes it affordable for the smaller clients and more profitable for the large clients. The main platform is responsible for approximately 80% of the cost (with customisation responsible for only 20% of cost) which is now shared between various clients, thus reducing the cost per client. Alternatively higher quality products can be developed for the same cost to the client.

2.6.2 Use of proven end to end systems

The advantage of proven end to end services is created by adding additional components of BPO (business process outsourcing) onto an already proven base (also called platform) system thereby creating services of a higher value proportion without any increased risk (adding management to EPC scope).

In an end to end services model a sufficient amount of the service provider's cost is reduced due to re-engineering by basing the required outsourced delivery model on an existing platform. Savings come in the form of reduced learning curves, accelerated timelines as well as cost savings due to existing baseline services been utilised (not starting from scratch).

2.6.3 Shared specialist services / continuity of people

Shared BPO enables bundling of functions, their enabling technologies and key staffing for a particular business process into a total solution, covering various clients which is more cost effective and efficient than stand alone units.

The biggest advantage is however that a Project House servicing multi clients in a specialised field like diamond recovery can now afford to keep specialists on its books due to work continuity. Clients are getting the benefit of lessons learnt on other projects (from a different client) which can be implemented on their projects, saving them time and money, while knowledge is transferred to their staff.

The principles of multi-client shared services are well summarised in [G] by the following quote: *"Neither do outsourcing nor business partners need to be exclusive, but they must possess unquestionable ethics and irrefutable integrity".*

2.7 Conflict in Systems and Procedures

When Mining Houses decentralised, only a core of head office personnel remained, after the management responsibilities had been moved to the mines, which are now assessed as separate business units [1*l*]. The traditional hierarchical structures were replaced by knowledge based flat applications, meaning that the mines were now not only responsible for the complete business unit, but also required to manage and report their new responsibilities according to (then new and unfamiliar) ISO 9001 management procedures. The result was that material inventory and tracking systems like SAP were implemented at great cost [1j] as

mining operations were getting more complex and stock carrying was reduced to free up more running capital.

Because Mining Houses were starting to lose their capability of managing major contracts after the 1970's, the focus of these control and reporting systems were based on *material requirements for continuous mining operations* (like SAP) with the ability to handle the odd little expansion or change. Although these systems are brilliant and well proven for these continuous and repeated applications, they do not fulfil the requirements for once-off applications like plant construction and are not used by any major EPC company.

Project Houses (together with their software service providers) on the other hand developed their systems specifically for implementation of complex project in a fast-track environment where errors and time have substantial financial implications. They not only paid the school fees but also learned through their errors to keep it lean and simple. Examples of current, state of the art, systems used by Project Houses are VANTAGE PD (Intelligent P&ID engineering package from AVEVA), PDMS (3D modelling with integrated clash detection from Intergraph) and MARIAN (materials handling and tracking system from Intergraph) with electronic data transfer to eliminate human drafting (clashes and wrong connections) and counting errors (MTO's for bulk material like piping and structural steel) [H].

The quality and functionality of these software packages not only enable Project Houses to survive in a competitive LSTK market, but actually to grow and even improve their systems further. Therefore it paid them to get the best in the business. These systems are required to withstand the pressures and complexity of international procurement and logistics where material shortages must be air freighted in at great cost to limit delays and standing time. Remote construction sites in foreign countries (where no drafting error can be afforded due to rectification costs) together with time and cost implications of delays to fast track LSTK type contracts just add additional pressure for getting it right the first time round.

Although it should be clear after proper evaluation that the Project House systems are probably the best suited for project implementation, some Mining Houses still insist that the Project Houses must implement their systems. The systems most often insisted on in the South African Mining Industry are costing and procurement, document control and tracking and 3D drafting packages (Solid Edge).

Possible (although not fully tested) reasons for the Mining House's insisting on the use of their own systems are as follows:

- Over-management due to mistrust of the Project House
- Mining Houses want to remain in control and use their systems to stamp their authority. Using the Project House's systems is seen as a point of weakness. (Win – Lose mentality)
- Unwillingness to change or consider other options due to an egotistical attitude.
- Little interest in understanding the Project House's needs. This can also be interpreted as poor attention to the power of collaborated working approaches.

The downside of forcing the Project House to implement the Mining House systems is not limited to frustration due to new unknown systems, but also includes the following effects:

- It increases time to market (due to inefficiency of unfamiliar systems) while one of the main objectives of outsourcing is to reduce it.
- It adds considerably to the bottom line as the Project House will just pass on the cost while outsourcing is about reducing costs. The effect is even worse for reimbursable type contracts where the system must be implemented for the whole project structure.
- The Mining House still takes the risk if the system fails (for example a design change which is not passed onto the construction site) and does not share the risk as per outsourcing objectives.
- The simultaneous usage of various different systems (a Project House can easily run up to five relatively large projects at any given time) causes some confusion and risk of misinterpretation.

There can however also be good reasons for forcing their ownsystems on the Project House as the Project House may not have all the required systems in place, thereby exposing the Mining House to unnecessary risk. The end-user (Mining House's mine) gets the as-built information, operating and maintenance manuals eg. in the format and standard they are accustomed to and understand.

In summary with regards to systems and procedures, all may be agreed that the current situation is intolerable, but what is the solution? The answer not only calls for a total mind

shift in the Mining - Project House relationship, but also some grassroots changes which are discussed in more detail in chapter 5.

2.8 Conclusion – where do we want to be?

Probably the most important requirement for a successful outsourcing relationship is to create a win-win situation for both parties resulting in a true 'partnership'. The Mining House must benefit from the Project House's expertise, skill, knowledge of the task ahead, efficiency and time saved due to the expertise [1i] while the Project House wants to profit by gaining more expertise, improving its track record and adding to its bottom line.

Research studies [E] have shown that most large businesses are increasingly viewing their dealings with contractors, vendors and other outsourced service providers (like Project Houses) in a strategic light by focusing on greater profitability through enhanced integration and co-operation (BTO concept) rather than simply demanding lower prices. This change of attitude to collaboration and viewing contractors as strategic partners, rather than beating them up for the lowest possible prices, is changing the nature of the outsourcing game to the benefit of both parties.

Although the main purpose of outsourcing remains to cut costs and be more competitive (or by offering increased customer value at the same cost) and to obtain capabilities which are not available in-house, business transformation and concentrating on core business have become equal factors of consideration. This strategic change in mindset is only starting to filter through into the mining industry which is still battling to adapt to these latest changes for reasons previously discussed .

But having all the strategies in place does not guarantee the successful implementation at grassroots level – it also requires understanding and hard work at project implementation level. In chapter 3 the focus is on the nine most problematic areas with the most potential of inflicting damage on a project's successful outcome.

Chapter 3

NINE MOST COMMON PROBLEM AREAS AT PROJECT LEVEL

3.1 Introduction

Although every project is unique [14] with its own unique problems in the Mining - Project House relationship, there are certain issues and management problems that seem to be cropping up during every project. These items are discussed in general, together with relevant case studies listed from personal experience and research material. Although the author's personal experience is from the Project House's viewpoint, every attempt has been made to be as objective and open minded as possible.

These following nine problematic areas do not form the basis of a successful Mining - Project House relationship. That is, as in any marriage, mutual respect, commitment, trust, open communication and by giving the other party room / privacy. They are those little stones in the shoe that have the potential of ruining the relationship. However - if recognised and managed properly - they can also have the opposite effect, which is to strengthen the relationship to the advantage of both parties.

3.2 The cost of mineral processing plants

The cost of mineral processing plants escalated over the past few decades together with technology. When comparing costs for these plants paid in previous years, using historical data, Mining Houses feel that they are overpaying. Their experience is that they are taking all the risk while the Project House (contractor) is getting paid all the money, but not sharing the risk. A question frequently asked by Mining House project managers is "Why must they profit from something that I could be doing?" [1i]. The result is that the Project Houses are squeezed for the lowest possible price, while the expectations of a 'high technology' plant increases - hence the expression of "paying for a Volkswagen Beetle, but expecting a Rolls Royce".

Data of the actual capital cost spent on processing plants against plant capacity are scarce as the processes required for a gold recovery plant differ largely from that of a PMG (Platinum Metals Group) plant or even a relatively simply commodity like zinc, thus making worthwhile capital expenditure comparisons difficult.

Albert Rettermaier, Vice President of Black & Veatch did such a comparison for GTL projects [J] where he compared the cost per unit treated ($/BPD) with the overall plant capacity.

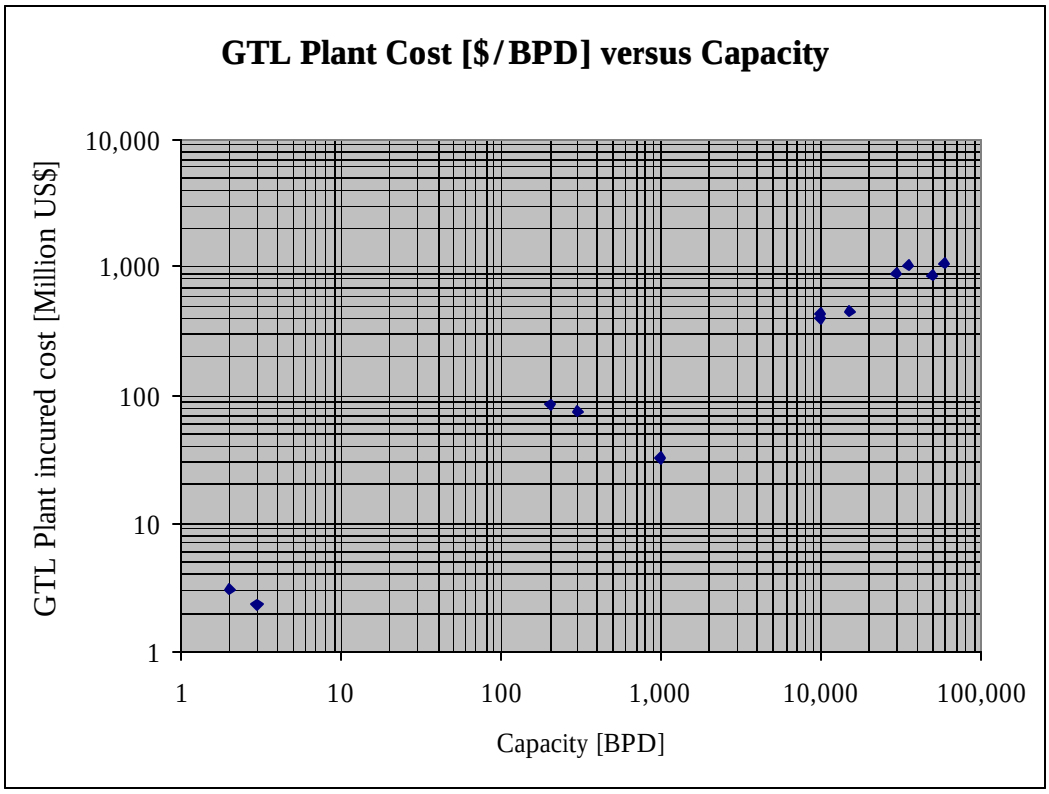

Figure 3.1: GTL plant cost (million US$/BPD) treated plotted against plant capacity [J]

Not surprisingly a straight line can be drawn through the points on a logarithmical scale indicating an exponentional growth in overall plant cost against capacity. Although the mineral processing plants and industry are not as well regulated as the petrochemical industry, the trends of capacity versus cost should be similar as both industries use the same resources (equipment, material, manpower and time).

Another factor coming into play is the remoteness of projects and the associated cost of creating an infrastructure. The list of economically viable projects which have become unviable due to the additional burden of creating an infrastructure, are endless because most new developments are taking place in remote areas and in developing countries.

> **Case Study:** The Skorpion Zinc project at Rosh Pinah (110 km north east of Oranjemund) in the southern part of Namibia can be considered as being relatively close to civilisation. A town with less than 200 permanent residents was swamped with up to 4500 construction workers for almost two years and 850 permanent operational personnel remained behind for the mine's lifetime. The end result was that the project was forced to expand the town to five times the original size and foot the bill for it [12].

3.3 Systems and procedures

Most Mining House systems and procedures were developed for ISO 9001 accreditation and management style, but were done when the project implementation skills were already lost due to outsourcing (1970 – 2000), with the result that these systems and procedures are focused on the Mining House core business which is to *operate* mines and mineral processing plants. Because the systems and procedures used during project management are determined at management level, the same factors discussed under section 2.7 are applicable and do not need any further discussion.

3.4 Mining House Specifications

When reviewing the typical Mining House technical specifications, it will be noted that the detail of specifications are still the same as those used when Mining Houses were doing their own project implementation in the 1950's to 1970's. Project Houses passed the Mining House specifications onto the vendors for the relevant projects (as per the contractual requirements), but to make things even worse, continued to use them even for those projects where such stringent specifications were not a requirement.

This standard of specifications were originally written during the 1950's to 1970's (when lots of new technology, equipment suppliers and ranges were coming onto the market) which was at a time of drastic changes due to the mechanisation of mineral processing plants and the cost-effectiveness of unreliability being realised (coming from the military after World War

II) but because very few proven designs were available, they served their purpose well. Since then (1970's to 2000) the processes and equipment designs have been proven in similar applications, designs were fine-tuned and optimised together with the mathematical calculations and industry standards (AGMA grading for gearboxes; ASME VIII and BS5500 for vessels, heat exchangers, etc; B10 bearings life criteria; API 620 & 650 for open top tank designs; etc) which grow to maturity and are currently widely used and accepted as a standard.

Although the results were not catastrophic, the effect on plant cost was only realised when Lump Sum Turn Key projects (LSTK) were introduced without any specifications other than a percentage of overall plant availability, reliability and performance. The cost of this over specified equipment could now be compared to the supplier's normal range of equipment proven in similar applications. The implication of this over-specified equipment was not limited to the additional cost, but also resulted in specially made equipment (which was not part of the Vendor's standard range) causing long lead times on spare orders and additional spare inventories for the Mining House.

The situation was getting so out of hand that some suppliers would even add an additional percentage to the price as soon as certain Mining House's names were associated with an enquiry, due to unrealistic specifications and paperwork requirements.

Not everybody shares this opinion as D. Botha from Exdin Engineering [1*l*] states *"The mining industry is being supplied with the lowest quality of goods and services. The suppliers are not held responsible and the mining industry bears the full risk"* Although this is true in some cases, especially from the 1950's to 1970's, personal experience has shown that current sub-standard equipment and services are mostly caused by commercial buyers at mines doing an engineers work by deciding whether equipment is technically acceptable or not, or base their decision solely on cost.

Many Mines (and Mining Houses) insist on the cheapest price irrespective of the quality resulting price overruling technical acceptability. It must be borne in mind that a vendor is only as good as the information given for selecting the equipment. Vendors also know that although they can be making larger profits by supplying substandard equipment and services, that will probably also be their last order for quite a while as the mining and mineral processing industry is small and bad news travels fast. The effects of sub-standard services

are well illustrated in the following case study which stems from the author's personal experience in the industry.

> **Case study:** Weir EnviroTech in South Africa was not meeting their delivery dates during the period 1998 to 2000. For various reasons, which may not all be due to internal problems; they had a reputation for late deliveries. The result was that they were not even invited to bid on fast track projects and conceded that market to Warman Africa, who took full advantage of it. Abnormally high penalties, which were sometimes double the industry standard, were imposed for late deliveries on the few orders which were awarded to Weir EnviroTech. Three years later Weir EnviroTech is still battling to get rid of this stigma and the question "What has changed to convince us that this delivery will not also be late?" is still frequently asked in tender adjudication meetings.

To get rid of this stigma of supplying inferior equipment and to get around onerous specifications, mining equipment suppliers developed (and are continuing to do so) special equipment ranges for the mining industry. This development process includes tests on mineral process plants involving personnel from the Mining House head offices down to plant operation and maintenance personnel. The supplier's incentive for getting the equipment approved is access to the Mining House's bidders list for approved equipment vendors.

This approach was so successful that almost all reputable vendors of mining equipment not only followed the same route, but also have up to date reference lists with contact details of plants (and operation personnel) where their equipment is used and performing as intended. These reference lists are classical examples of *customer value perception* and almost priceless from a supplier's view point. Fly-by-night suppliers can easily be eliminated by requesting a track record of similar successful projects

Thus, what is the optimum solution? The client (Mining or Project House) wants the best price and spares availability while the equipment suppliers still need to make a profit. The answer is straight forward and simple: use *standard equipment* which is *proven in similar applications* from *reputable suppliers* (who have some customer value perception to protect). Specification should be limited to the required duties and environment of the applications

and exclude prescribing to the supplier, who is a specialist in his own right, how to build the equipment.

By over-specifying equipment, clients (Mining and Project Houses) are actually taking the risk for equipment failures (not sharing the risk with suppliers as per the purpose of outsourcing) as the equipment supplier can simply advise that the equip ment supplied was built to the clients own specification and approved by themselves.

The correct and most economical ways of doing things is by specifying the required duties and environment of application such as site conditions and passing the responsibility to select the appropriate equipment to the vendor. The down side is that better technical adjudications are required to make sure that the equipment is capable and suited for the duties and proven in similar applications. Quality control systems like Quality Control Procedures (QCP's) with regular hold points and specified performance tests (both at the factory and on site) further reduce the risk of suppliers not delivering in accordance with their promises. The earlier a problem is identified, the less the cost and time delay to fix it.

3.5 Capital cost versus operating cost

Mining Houses are concentrating on their core businesses, namely the mining and processing of mineral ore bodies into metals that can be sold on the world market. Their cost consists of two main portions, namely the capital cost (also called capex from capital expenditure) of the mine and processing plant, including interest payable on it (immaterial if it is an own development, being purchased from someone else or even a combination of both) and the operating cost (also called opex or running cost) which consists mainly of labour, maintenance and consumables like electricity, explosives, fuel, etc.

Normally there is a trade-off area where the optimal solution between operating and capital costs over the remaining mine and processing plant lifespan are reached, thus resulting in better returns on investment. This trade-off 'area' is not a specific point, because it is not possible to define all costs and metal prices upfront required for making an informed decision [1s]. The run of the mill criteria is normally to reduce the capex and rather increase the opex in order to improve cash flow. This principle is put into practice by the Mining House project teams as their heads are on the block for possible capex overspending while savings can result in sizable bonuses.

Project Houses on the other hand are only interested in the capex portion as it determines how much they will be paid and how much it will cost them to construct the plant. Operating costs do not really feature in their value engineering or HAZOP sessions because it has little or no effect on their project success. The following case study, which also stems from own experience, is a classical example of where the reduction of capex would have been to the determent of the project and client.

> **Case Study:** When Anglo American was still involved in the Zambian Copper Belt (end 2001) a Project House was doing a bankable feasibility study (LSTK) for a Sulphuric Acid plant at the Kongola Copper Mine. Part of the scope was a demineralised water plant for the boilers which would have been supplying the adjacent plants with 20 bar of superheated steam.
>
> Water can be demineralised by either Cathodic-Anodic metal exchange or by Reverse Osmosis method. Cathodic-Anodic metal exchange is the more commonly used system due to less capital cost, but is more complex to construct and manage and uses chemicals which needed to be transported from South Africa at excessive costs (± 12 000,US$ per month). The Reverse Osmosis method, on the other hand, costs ±74,000 US$ more (higher capex) but is easier to construct and operate and does not require any chemicals for operation although it consumes 15% more power.
>
> The bottom line was either ± 12,000 US$ a month for 15 years or 74,000 US$ now which at an interest rate of 6% would be 1,422,000 US$ and 74,000 US$ respectively at the beginning of the plants 15 years lifespan (present value at day one). Although the Reverse Osmosis method would have been the correct option, a decision was never officially made because Anglo American decided to withdraw from the Zambian Copper Belt in February 2002.

Project Houses have the opportunity of creating *customer value perception* by giving Mining Houses, as their valued clients and partners, the option to invest the additional capital in cases like the above study. By not doing so the Mining House can rightly feel that the Project House is not considering their well-being and is only interested in making as much money as possible.

Options like the above case study are however regularly declined by Mining House project teams (mostly due to fear of overspending on capex budgets) and are seldom communicated beyond the Mining House's project team. This should however not discourage the Project House from continuing with the good service to its valued client, as the person declining it may be deciding which Project House the Mining House will partner with for the next project.

3.6 Management culture and style

One of the key requirements for a successful outsourcing relationship is compatible management styles and organisational strategies – something which closely resembles the company culture. Management culture and style are not only the aggregate of behaviours, thought, beliefs and symbols that are imbedded in employees, but are also ingrained in peoples minds and are therefore very difficult (and sometimes impossible) to change [4]. The reason for this is that management culture and style become a way of living for people and throwing them into a totally different system will upset the whole apple cart.

Although similar management cultures are not a requirement for a successful Mining - Project House relationship, it is definitely a key factor in smoothing a bumpy road. Understanding of and respect for each other's management culture and styles are however of cardinal importance. The good news is that differences in management styles can be managed relatively easily if the differences are realised upfront and systems are put in place at the beginning of the project to control and manage them.

3.7 Management levels

Management levels are not an exact science and therefore not easy to define [3; 5]. Even when proper reporting systems have been put in place at the beginning of the project, clients (and Mining House's for that matter) tend to get involved beyond their borders as the project progresses. Most of the time the Project House will endure this unwanted involvement in fear of worsening the already fragile project relationship rather than to manage their client - the Mining House.

The easiest way to understand the Mining House's actions is to look at what causes it and how the Mining House and their project team experience the situation (whether right or wrong). The following issues are listed in various references (most of which are confidential),

but have been generalised and expanded as items causing certain behaviour together with references and case studies where applicable.

3.7.1 Over management as a result of perceived abilities of doing project implementation in-house

Most of Mining Houses senior management still come from a time when Mining Houses were still doing their own project implementation therefore tend to get involved in detail beyond their management requirements. The down side is that not only did most of these managers lose track of modern project implementation trends (which changed vastly over the 15 years), but the new generation of managers also base their management style on them because they had them as mentors [3C]. Therefore they also try to manage micro detail and get involved in fields to which they have had very limited exposure and even less experience.

3.7.2 Over management due to mistrust of the Project House

Mining Houses have been overcharged and under serviced by Project Houses because they did not understand or manage the nature of their projects, risks and contract law. In other cases the Project Houses (which do not exist any more for this specific reason) just did not care how the client felt and were only interested in making a quick profit. As a result of this Mining House project teams are very sceptical towards Project Houses and do not always trust them. Some individuals even believe that 'If I do not watch this guy, he will do it again and it will probably cost me my job…'

This causes Mining House project teams to spend an inordinate amount of time policing the Project House, whereby they get bogged down with detail and venture far beyond their management responsibilities. There may be some good in it, but more often than not the end result is that the Mining House project team neglects their first responsibility which is to manage the project at a high level. Instead of the Mining House project team trying to police the Project House, independent audits, (which should highlight any problems) can be conducted which in turn will free up the Mining House project team to focus on managing the project.

Mining House project teams do however tend to limit independent audits in fear that it may also expose some shortcomings from their side. By making a mind shift and saying we (both Mining- and Project Houses) are in this together and must make it work for both parties. We must be transparent to each other and make use of independent audits to help both parties

keep on track (not using it as a whip). This should create a win –win situation and be to the benefit of both project teams [8].

3.7.3 Fear of losing control and authority

Most managers do not realise that one of the principles of outsourcing is to give someone else your problems to solve; hence they keep doing it themselves. Others consider involvement into low level detail as the only way of keeping control and authority. As a general statement the biggest problem managers progressing through the ranks are having , is to let go of detail and manage at the appropriate levels by trusting their second level of management to do their previous jobs [8].

The only reason this item features under the Mining House management problems is that they are the highest level of management in the Mining - Project House relationship.

3.7.4 Unwillingness to adapt to change.

Because the reporting structure is familiar and works relatively well there is an unwillingness to change The truth is that project level reports are high level roll-ups of what is actually happening at the coal face where the work is done. The financial, cash flow, progress, S-curves, etc, are just how information is presented and have nothing to do with what is actually happening, therefore it should not even be considered as a reason for not changing. Most Project House project managers categorically state that they will require less time to report according to their in-house structures and then present the information to the client (in their required format) than doing it from scratch, according to the client's format and standards because it is unfamiliar to them.

Some Mining Houses experience it as giving in (point of weakness) to consider the Project House (contractor's) systems and procedures. The truth is that the cost difference between these systems can be that crucial few percent off the bottom line, making a project economically viable.

3.7.5 Arrogance and a win–lose mentality.

Some old school Mining House managements still believe that the Project House is preying on their needs – after all - most of their key personnel and specialists came through (the Mining House's) training programs and therefore they unknowingly still treat them as juniors.

What this viewpoint fails to realise is that Project Houses are as specialised as Mining Houses and companies in their own right with highly specialised and skilled key personnel on project implementation. By attracting and keeping the best in a continuous shrinking resource pool they seem to have a competitive edge over the Mining House when it comes to project implementation.

One of the main purposes of outsourcing in the Mining and Mineral processing industry, is to share risks beyond the mother company which is the Mining House. If the plant fails to meet the required through-put the responsibility will be that of the Project House as per the principles of outsourcing. The opposite can however also be true – with the Mining House getting involved in the detail and instructing the Project House what to do next and how to do it, they are legally reclaiming the responsibility because they are giving the instructions. It is almost a case of the navigator telling the driver which road to take and then blaming the driver when they get lost.

Very few Project Houses will be willing to argue this issue in court due to the possibility of getting a bad name in the industry, but if the company's future is at risk, it may be a totally different kettle of fish. This principle has surfaced in various arbitration and court cases in the Australian Mining Industry signalling to Mining House project teams that care must be taken not to unknowingly take responsibility back [15].

When considering the Mining House involvement in the project management team the optimum solution for a Mining House will be to limit their involvement in the project implementation (by a Project House) to a high level of project management and controls. Regular combined exercises like design feasibility-, HAZOP's-, value engineering- and constructability- reviews as well as project risk assessment sessions, will give them more than enough detail exposure to know what is happening at ground level.

This way the Mining House is having the benefit of an overall picture of the progress, but with enough information to flag any possible new or higher than expected risk to the Mining House. There is an additional advantage as it frees the Mining House's management team to do what they are supposed to be doing in the first place, namely to manage the project being implemented by the Project House. The Project House has an impact on the success of this optimum relationship because they must also play open cards (within reason) with the Mining House's management team for the relationship to have any chance of success.

3.8 Mining House specialists involvement on projects

Most Mining House Specialists come from an operational background which means that they can add enormous value to a project when participating in plant operational studies (HAZOP, operability and control philosophy review) as well as simulations like SCADA testing. Their project management and implementation experience on the other hand, is normally limited to involvement on similar projects and are generally of quite a high level.

Their involvement however normally starts fairly late in the project life cycle, such as when most criteria have been fixed and signed off, plant layout fixed, civil construction almost completed and most process equipment ordered. This can cause friction if not managed properly as they tend to play devils advocate on what can possible go wrong. Because they will eventually take possession of the plant and run it, the Mining House project management team tends to take a step backwards and almost lets these specialists and operational staff run free. The Project Houses tend to get very frustrated because they must put up with these delays and additional cost (especially on LSTK projects) as well as possible penalties due to late completion.

The solution is simple – these plant operation specialists should be involved from the beginning and throughout the project life cycle which is from pre-feasibility and feasibility studies to fixing the project criteria (like redundancy) and project implementation, handover and performance testing. This way their input is captured early enough to prevent re-work (and associated cost and delays) while the original cost estimate will include any requirements missed by the original project team, thus the original budget will be more accurate.

3.9 Nominated subcontractors

It is not uncommon for Mining Houses to have certain suppliers with whom they have strategic relationships for various mining operations or a contract with niche technology suppliers required for the mineral extraction processes for instance Navoi with Biomin who supply the Bioxidation process package for the Kokpatas and Daugustau integrated project in Uzbekistan [S]. To ensure conformity these strategic partners will be referred to as nominated subcontractors. These strategic relationship agreements are normally in-place and working before the Project House even gets the opportunity to tender and generally form an integral part of the bidding requirements.

The bidding process is relatively painless as the nominated subcontractors form part of the client's project team. The real crunch comes with the project execution phase when the Project House is dependent on the nominated subcontractors for information and performance to ensure that the project remains on track. Lack of performance by the nominated subcontractors (whether true or not) is a contentious issue because it is seldom clearly defined who reports to who. The Project House does not have a contract with them, thus cannot issue instructions. The Mining House on the other hand, is not the party driving the project; hence they are not really in a position to be pro-active. Project Houses can use this grey area of so called non-performance by the client (if the Mining House is responsible for control over the nominated subcontractor) as a tool to prove non-performance and claim additional delays.

The other side of the coin is when the nominated subcontractor and the Project House can both be dedicated to servicing the Mining House who is the holder of the purse strings. By this combined efforts customer value perception can be created by providing a level of service which exceeds the Mining House's expectations. The following case study (again from personal experience) is a good example of how cooperation and commitment of both Project House and technology supplier result in excellent customer service.

Case Study: Biomin (from Goldfields) has entered into a technology agreement with Navoi Mining and Metallurgical Combinate to supply a BIOX technology package to enable Navoi to process sulphite gold ore from their Kokpatas and Daugustau mines in Uzbekistan. Bateman BV has been appointed as the Project House responsible for arranging financing, doing basic and detail engineering, procurement and supply of equipment and material to site and for the provision of technical expertise required for the construction and commissioning in a LSTK contract.

By working together as a team Bateman and Biomin were able to successfully optimise the process and plant layout to the benefit of Navoi (Mining House). Because the relationship is transparent and based on trust and mutual respect for each other's capabilities both the Project House and technology supplier (nominated subcontractor) benefit by gaining further experience and exposure to different options.

3.10 Communication

Very few situations can cause as much chaos on a project as when everybody on the one side is talking to everyone on the other and everybody is making decisions and giving instructions but nobody is keeping track of it and no one is exactly sure who is responsible for what. It is therefore no surprise that probably the biggest cause of confusion and frustration in the Mining - Project House relationship is lack of structured communication or adhering to approved authorities, lines of communication and responsibility matrixes.

Both Project and Mining Houses have burnt their fingers badly by relying on the other party's word. The result is that a Mining House wants all paperwork confirming and fixing the scope in place, before any decision is made and a contract awarded to a Project House, while a Project House will not touch any additional work if a change order is not signed off by the Mining House. This mutual distrust is not necessarily a bad thing as it forces both parties to get their own house in order and do the paperwork properly – something which engineers are traditionally very reluctant to do. It also prevents the employer (whether Mining or Project House) being held 'hostage' by an employee for increases or unrealistic bonuses, as all work is now properly documented and not in someone's head.

By clearly defining *levels of authority and approval* both sides know exactly who can make what decision and who needs to countersign what, thus once signed off by the correct person the work can start. Going hand in hand with levels of authority and approval are proper *lines of communication* [14]. All management issues between the two parties must be communicated between the project and assistant project managers and technical matters between the project engineers with the relevant specialists, like cost engineers and planners, being brought in as required [14]. Issues not discussed in these forums and minuted should be regarded as never said.

The third and last communication requirement is a proper *responsibility matrix* which clearly defines the responsibility of all parties involved [14]. The parties involved can be expanded to include the various Mining and Project House departments such as engineering, document control, procurement etc.

3.11 Conclusion

On their own none of the nine factors will necessarily cause a project to fail, but together they are a definite recipe for failure and can destroy a project. However by being aware of these factors and managing them properly, their positive effect on the project could be significant and to the benefit of all involved.

With both levels of outsourcing management having been addressed, the focus moves to the different phases of a typical mineral processing project and the different contracting models and their unique pitfalls, such as Project House selection criteria, which are discussed under the anatomy of mining projects and contracts in chapter 4.

Chapter 4

THE ANATOMY OF MINING PROJECTS AND CONTRACTS

4.1 Introduction

Mineral commodity projects will typically undergo several phases, stretching over a number of years, before production is reached. Due to the wide range of outsourcing skills and options available, the project will usually start with the exploration phase, followed by the pre-feasibility study, feasibility study, definite estimate (also called bankable feasibility) and finally the project execution phase [1q; 1w]. These phases are not unique to the mining industry, but due to the uncertainty of ore body reserves and the complex behaviour of the mined ore while being processed, they form an integral part of the pre-execution project life cycle. It is generally also a requirement from project financing institutions, governmental bodies for the issuing of mining licenses and for project shareholders to ensure transparency and minimise exposure to risk.

Although these phases follow a clear process and are each based on its predecessor, they can be (and are regularly) executed by different parties thus complicating the commercial terms and especially incentive schemes. Some companies only specialise in certain phases like exploration (SRK [Y]) or in financial models and audits (KPMG [Z]). Project Houses, on the other hand, tend to focus on their core business which is to execute projects including pre-feasibility and feasibility studies which form the basis of their contract price. Project Houses like Hatch [AA] are of the few Project Houses equipped to do exploration and drilling work while most other Project Houses tend to outsource this work to specialised drilling and exploration companies like SRK. To understand the process each phase is discussed separately.

4.2 Processes of Mining Projects

Of the four phases discussed, the first two (Pre-feasibility and Feasibility) are normally paid for by the Mining House which enables them to hand the information to another party for the next phase (or even use it to go out on open tender) if they choose to do so as the

information now belongs to them. This not only prevents the Mining House being held at ransom by the Project House, but also gives them access to more options such as reviews on the process model by the competition, which should highlight any possible discrepancies (also referred to as critical or fatal flaw analyses).

4.2.1 Pre-feasibility study

A pre-feasibility study typically consists of the following levels of activities [adapted from 1q]

- A conceptual process design is done to access the potential opportunity under consideration to an accuracy level of total price plus / minus 35% for at least three possible ore processing options [1q].
- The level of estimate description is relatively high with special attention to the ore body composite, reserves and mining model. It normally contains a broad description of the potential project with relatively low engineering input.
- Actual power costs are determined and indirect costs are calculated as a percentage of total costs. Historical data and actual costs from similar plants and projects play a mayor role in determining these costs and percentages.
- Most prices and budgets are based on assumptions and history from previous projects (tonnage of structural steel and rebar as well as m^3 concrete required for a mill building) with only major equipment (like mills) being priced by verbal enquiries or one page faxes.
- Broad based financial returns are normally considered for the financial model with a single cut-off point (like a gold price above US$ 300.00 per ounce) for submission to the board.

4.2.2 Feasibility Study

A feasibility study typically consists of the following levels of activities [adapted from 1q]

- A relatively detailed process design is done to access the potential opportunity under consideration to an accuracy level of total price plus/minus 20%. Possible ore processing options are reduced to one or two [1q].
- The estimate is based on a much more defined and detailed scope. It contains a detailed description of the potential project with basic engineering input as high as 60% (detail engineering 15%) and approximate 60% of conceptional general arrangement drawings (20-40% of detailed design drawings) done.

- Prices and budgets are based on proper written quotations for process equipment and material with assumptions and history from previous projects (like tonnage of structural steel and rebar as well as m^3 concrete required for a mill building) limited to the bill of materials.
- Project specifications and contracts are done together with high level construction schedules.
- Actual power costs are determined and indirect costs are calculated in detail before being presented as a percentage of total costs. History and actual costs from similar plants and projects roles are limited to a double check of these costs and percentages
- Financial returns and models are firmed up for various options with small windows (like a gold price between US$ 300 and 325, 325 to 350 etc.) for submission to the board. A bankable document may be a requirement.

4.2.3 Definite Estimate (also called bankable feasibility)

Definite estimates (or bankable feasibility studies as they are referred to in some cases) are normally done at the tenderer's risk and cost. This is where one Project House tries to distinguish itself from the rest of the pack by price, service and capabilities. Because the Mining House does not pay for the definite estimates, the content thereof remains confidential and the property of the tenderer, thus preventing the Mining House from disclosing an innovative proposal from one Project House to another.

A definite estimate or bankable feasibility typically consists of the following levels of activities [adapted from 1q]

- It is done for only one option, with two possibilities only in unique circumstances, to an accuracy level of price plus / minus 5% (accuracy level may vary from project to project such as minus 0 plus 5%)
- Detailed work breakdown is done with clear description of activities allowed on a project and limited assumptions are made or allowed. Organograms of responsibilities and reporting structures are done with possible key resources reviewed and selected.
- Scope is defined in detail with set battery limits and interfaces. Process engineering is done to detail mass balance levels and finalised.

- Basic engineering input as high as 90% (detail engineering 45%) and approximate 90% of conceptional general arrangement drawings (40 – 60 % of detailed design drawings) have to be done.
- Prices and budgets are based on proper written quotations for process equipment and material. MTO's like tonnage of structural steel and rebar as well as m^3 concrete required for a mill building are now calculated from drawings and revised prices obtained (not based on history and estimates as during feasibility study)
- Indirect and operating costs are based on actual percentages for similar projects.
- Escalation is applied where applicable while the financial analyses are expanded to include Internal Rate of Return (IRR's) and Net Present Value (NPV) for the different scenario's (like commodity prices and ROE)

4.2.4 Execution phase

The project execution phase is when the money is committed because it covers the 'visible' portion of the project like procurement and construction. During the execution phase the project normally follows 'best practice' phases [14 – PIMBOK is generic and not industry specific], although the points listed below are based on [1q].

- Work breakdown document is done.
- Team members are appointed and clearly briefed on their responsibilities.
- Location of various role players are identified and communication links set-up.
- Responsibility, authority and accountability are set-up and communicated.
- Organograms, project procedures and standards are set-up
- Schedules are done in detail
- Engineering, procurement and construction takes place
- Commissioning and hand-over

The execution phase is when most of the action is taking place and although this is when the money is actually spent, it does not have the biggest effect on the total project cost as the processes and conceptual designs are determined and approved during the feasibility and definite estimate phases (see figure 4.1 for a generic comparison of data adapted from [I] by adding actual money spent) which forms part of the contractual agreements of the execution contract.

Because all 'visible" work (like detail engineering and construction) and financial commitments (like procurement of equipment and material and construction services) are taking place during the execution phase, the major portion of money is being spent during this time.

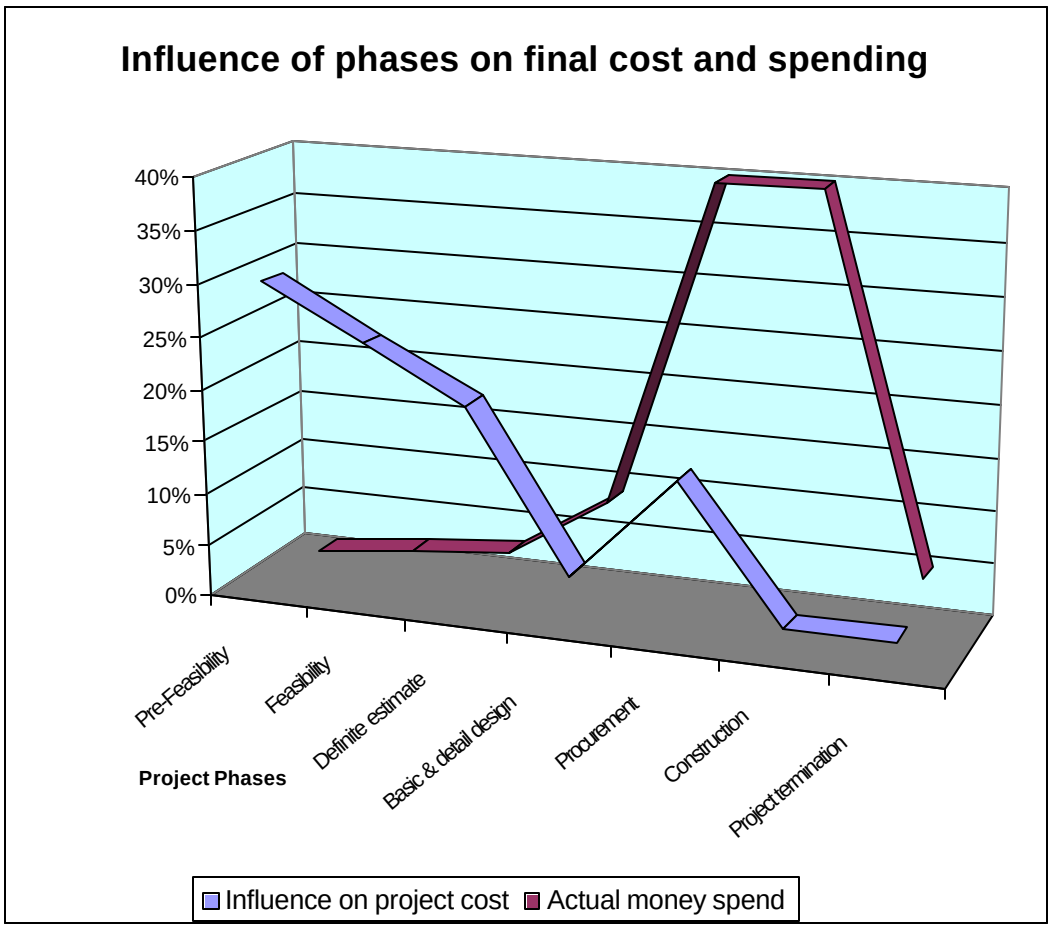

Figure 4.1: A generic comparison of influence on final cost together with actual money spent curve. [modified data from I by adding money spent]

4.3 Contract Types

Since the 1980's the norm has been for most Mining Houses to use Lump Sum Turn Key (also referred to as firm-fixed-price) contracting because the scope of work (including the price) can be defined relatively accurately at the time of contract award for an Engineering, Procurement, Construction and Management (EPCM) contract. On the other hand, some of the Mining Houses have primarily used reimbursable contracts, since the scope of work is

usually uncertain or still not fully defined, therefore reasonable prices can usually not be negotiated at the time of contract award or for major system development. [I].

Reimbursable contracts can also be the preferred way of contracting of the Mining House (like Amplats [AB]) rather than the LSTK format, as they are of the opinion that it gives them better control. Some Project Houses do however experience it as been used for a body shop which resulted in invitation to bid for reimbursable projects being declined. In a reimbursable format contract almost all risk still remains with the Mining House, therefore it is not outsourcing in the true sense of the definition which is to transfer risk and responsibility [section 1.5]. This principle can however also be described as outsourcing of additional manpower and infrastructure only (not design and responsibility) like Project Houses who are using Professional Employment Agencies to supply additional manpower.

Many people (including some references used for this thesis [1q]) are incorrectly referring to reimbursable type contracts as EPCM contracts. EPCM contracts mean **E**ngineering, **P**rocurement, **C**onstruction and **M**anagement which is describing the contract scope of work that can also be, and is regularly, covered and executed under LSTK format contracts. The most probable reason for this incorrect terminology is that when Mining Houses started to outsource (1960's to 1980's) and dismantle their project execution teams, EPCM scope was originally covered by reimbursable type contracts. In today's reference field it is however causing confusion and is generally considered as incorrect [1c].

4.3.1 LSTK Format Contracts

LSTK format contracts are used where the scope of work is known therefore reasonable fixed prices can be clearly defined at the time of contract award [1q; 1w; 9; I]. The main characteristics of this contract type and management thereof as listed below, are combined from the above references:

- The Project House submits a single price for a certain scope of work, but the full scope can be broken down into different areas. Prices do not need to be proved to the Mining House as it also includes the Project House's mark-up for risk, negative cash flow etc.
- All savings are to the Project House's benefit, hence the perception that Project Houses are cutting corners and delivering inferior equipment and designs. The reality is that designs are done much more optimally as there is always a trade-off between the

engineering cost (man-hours) and the saved cost due to a lighter construction (less material)

- The risk of covering the whole scope within the battery limits (borders of plant) and the plant being able to perform to the specified criteria rests with the Project House.
- Changes must be limited and tightly controlled. Changes can be very costly in both time and money – especially if the Project House does not want to do the change in a very advanced stage of the construction period.
- The decision regarding the number of installed units (like duty/standby redundancy) rests with the Project House if not clearly specified.
- Tension between the Mining and Project House is a reality of life (See chapter 3) due to the Mining House wanting to be involved down to micro management level as done with reimbursable type contracts.
- The Project House places the order for equipment and material under its name and takes a mark-up on it as well as engineering costs.
- Payment to the Project House is limited to clearly defined deliverables and is normally on delivery of process equipment. The result is that if the Project House has down payments to make on equipment, it will be footing the negative cash flow bill. Normally payment terms with major suppliers will be back-to-back with those of the Mining House to the Project House (lag by approximately 2 weeks) which can result in higher equipment prices.
- It can be more expensive than reimbursable contracts because the Project House is making provision for the risk it is taking plus the negative cash flow, but is normally more cash positive from the Mining House side than for a reimbursable type of contract.
- Double dipping takes place in certain areas like contingency allowances for price increases and unknown risk factors.
- Integration with nominated subcontractors can be difficult if interfaces are not clearly specified.
- If the contract from the Mining House does not stipulate what specifications and preferred vendors are to be used, those of the Project House will be used (Mining Houses may end up with Siemens electric motors whilst having a maintenance contract on 10 other plants close by with ABB)

- Client influences on final outcome is limited (they have limited say in execution after the contract has been placed)

4.3.2 Reimbursable Format Contracts

Reimbursable format contracts are used when the scope of work is uncertain, difficult to define in words and will possibly require a large number of changes [1q; 1w; 9; I]. The main characteristics of this contract type and management thereof, as per the above references, are as follows:

- The Project House submits rates and estimated man-hours for manpower. Cost of material and equipment is a percentage budget (normally minus 0, plus10%) and prices must be proved to the Mining House (also referred to as open book concept).
- Risk of possible cost overrun remains with the Mining House, thus there is no real incentive for the Project House to negotiate the best possible prices or optimise the design (like trade-off between additional man-hours for an optimised design and additional material cost).
- Shared risk in the sense that the Mining House takes the possible overrun risk, but the risk of not achieving the required performance, power usage e.g. normally remains with the Project House. Because Project Houses are paid for 'manpower only' their experience is that they are expected to take responsibility for certain risks without being compensated for it, thus a tendency to play safe and over design. (or decline to tender / do the work)
- The Project House is in partnership with the Mining House to achieve a common objective thus reducing possibility of conflict. The main cause of conflict is normally the amount of man-hours taken to complete a certain task (like the design of a mill building 's structural steel).
- Purchase orders are placed on behalf of the Mining House and the Project House does not take any percentage mark-up.
- Mining Houses have a say in systems and procedures used and detail costing comparisons.
- Higher levels of management involvement are required as the control of costs reduces the Mining House risk of possible over expenditure. The down side is larger Mining House management teams which results in additional costs allocated against the project

- Integration with nominated sub-contractors is much less painful as the Mining House team is always at hand to diffuse any friction, reducing the risk of one playing itself off against the other.
- The Mining House has a continuous input (if so desired) in the project execution, but can also restrict the Project House with delayed decisions (due to bureaucracy) which causes friction.

Methven [1q] reckons that reimbursable type of contracting fosters long term relationships. Although this statement may be true in some cases, this characteristic is not unique to reimbursable type contracts and seems to be more dependent on interpersonal and inter-company relationships for fostering long term relationships. Industry experience has shown that although a Project House's project manager may be brilliant, resulting in the reimbursable format project done within time and cost, but because of bad interpersonal skills it may also be the last project the Project House will do for the specific Mining House in the foreseeable future.

The question of what the Mining House is willing to pay for the shared risk (by the Project House) and whether the Mining House trusts the Project House sufficiently to give the Project House full responsibility and ownership of their project, seems to be some of the major criteria for deciding which model to be used. If the answer is yes to the above questions, then history has proven that LSTK contracts and relationships can be just as successful and long term as reimbursable contracts.

4.4 Evaluating contract options

In exploring ways to expedite the contracting process, the following specific issues have been identified for review: types of contracts, contracting models and methods, the turnkey approach, contracting strategies, contractor pools and joint ventures and third-party liability indemnification and construction bonds [1v; 5; 7; I;.J]. In the mining industry Mining Houses have long been using Project Houses as outsourcing contractors for traditional engineering design and construction work. In some cases Mining Houses are wrongfully under the impression that they are outsourcing (and sharing the risk) while they are only using the Project House to supply additional labour and infrastructure. The use of Project Houses however allows the Mining House to accomplish time consuming long-lead

administrative items within relatively short lead times (One of the reasons for outsourcing being short time to market [6])

There are three options for Mining Houses using Project Houses to cover all of the phases of a project cycle (Pre-feasibility, feasibility, definite estimate and execution phase). The first option is to appoint a Project House for each phase. The second option is to appoint a Project House that can perform all phases of the project cycle and the subsequent operations and maintenance work. The last option is a hybrid of these two options.

4.5 Contracting Models

Some references refer to two different contracting models for project work namely the construction model and the service model [section 4.3]. The major difference between the two models is that under the construction model, the clients generally change Project Houses (and contractors) between stages of the work, while under the service model changing of the Project House (and contractors) is not required. These two contract types are generally in line with the thinking of LSTK (construction) and reimbursable (services) contracts. It must however be considered that very few construction companies exist with good and large enough in-house design capabilities to do large projects alone [I]. South African Project Houses (and most of those from the rest of the world) in turn subcontract construction work to specialised construction companies as part of LSTK contracts, but will, from a Mining House point of view, remain responsible for the overall project.

Although Vishwanath [I] reasons that the construction model generally forces a separation between design and construction work (in India), experience and various references [11; 12] in the South African mining industry have proven that it is actually more the case for service contracts where orders (including construction contracts) are placed by the Project House on behalf of the Mining House (on the Mining House's letter heads). The Project House is now responsible for the design and engineering while the subcontractor, with whom the Mining House (or his nominated representative) placed the construction order, is responsible for the construction. There is no contract between the Project House and the construction contractor.

The turnkey approach, allows one responsible party (which is normally the Project House) to manage the project and construction from start to finish [1q]. The idea is to package all

possible requirements up front, so that the potential contractors can bid on the entire project scope. This approach may reduce the number of contractors competing since only a limited number of large companies possess the full range of skills to perform the work. Allowing smaller companies to team up could alleviate this shortcoming. To fully achieve the benefits of a turnkey approach may not only require changing the orientation of contracting personnel, but also develop an experienced, specialised contracting force for repeating projects. To open the competitive process for the various engineering specialities and technologies and encourage BEE it may be necessary to encourage or require joint ventures and/or teaming up arrangements.

4.6 Various modes of procurement and bid evaluation from a Mining House's perspective

The choice of Project House (and other Joint Venture partners) is not always determined by price, capability and previous working relationships. Availability of technology like Pechiney / Alcan aluminium smelting technology for the Coega project near Port Elizabeth (South Africa) or shareholding in the project by the Project House holding company or even by the Mining House in a Project House, can overrule all other factors in the Project House selection criteria. The selection of a specific Project House can even be a pre-qualification for financing by the Project House holding company. These scenarios are generally described as 'negotiated' projects and an enquiry does not go out on tender in the market. Alternatively the preferred Project House may have a tender preference to keep profits within the group (for example a 10% tender preference above the rest).

Certain specialist capabilities of the Project House can also rule out any open tenders. For example BatemanBV, which is owned by the Steynmetz financial group, not only has the facility to arrange project financing from various Export / Import Credit Agencies on behalf of the client, but also has an excellent track record of executing projects within the constraints of such financing agreements. In fact BatemanBV was so successful by adding this service to their portfolio (creating customer value perception) that they were the tenth largest user of American EXIM financing in 2001.

The above circumstances (and various others which may arise from time to time) have an impact in the selection and appointment of the preferred Project House, but for a large

percentage of projects the criteria has not changed and conventional bidding principles and methods still apply.

4.6.1 Limited international bidding

There are circumstances where international competitive bidding would not be the most economic and efficient method of procurement or where other methods are deemed more appropriate.

Limited international bidding is essentially international competitive bidding by direct invitation without open advertisement. It may be an appropriate method of procurement where the contract values are small; there are only a limited number of Project Houses with a proven track record or other exceptional reasons that may justify departure from full international competitive bidding procedures. Under limited international bidding Mining Houses seek bids from a list of potential Project Houses broad enough to assure competitive prices. Domestic preferences are not applicable in the evaluation of bids under limited international bidding. In all respects, other than advertisement and preferences international, competitive bidding procedures apply.

4.6.2 National competitive bidding

National competitive bidding is the competitive bidding procedure normally used for local public procurement and may be the most efficient and economical way of procuring services and goods which, by their nature or scope, are unlikely to attract foreign competition because the contract values are small; services are scattered geographically or spread over time, the work is labour intensive or the goods are available locally at prices below the international market. The procedures are reviewed and modified as necessary to assure economy, efficiency, transparency and broad consistency with the provisions. National competitive bidding procedures may also be used where the advantages of international competitive bidding are clearly outweighed by the administrative or financial burden involved during the project execution

4.7 Other factors affecting Project House selection

The factors affecting the decision of awarding a project to a specific Project House are not limited to the contracting models or bidding processes. There are various other criteria

affecting the award that must be taken into consideration [3; 7; G; I; J]. The following points are a summary of information from theses references.

4.7.1 Direct Contracting

Direct contracting without competition (single source) may be an appropriate method under the following circumstances:

- An existing contract for goods or works, awarded in accordance with procedures, may be extended for additional services or goods of a similar nature.
- Standardisation of equipment or spare parts to be compatible with existing equipment, may justify additional purchases from the original supplier.
- The required equipment is proprietary and obtainable from one source only.
- The Project House responsible for a process design requires the purchase of critical items from a particular supplier as a condition of a performance guarantee.
- In exceptional cases, such as in response to natural disasters.

4.7.2 Force Account

Force account, that is, construction by the use of the client's own personnel and equipment, may be the only practical method for constructing some kinds of works. The use of force account may be justified where:

- quantities of work involved cannot be defined in advance;
- works are small and scattered or in remote locations for which qualified construction firms are unlikely to bid at reasonable prices
- work is required to be carried out without disrupting ongoing operations;
- risks of unavoidable work interruption are better borne by the client than by a contractor
- there are emergencies needing prompt attention

4.7.3 Procurement for Export Credit Agency financed contracts

The purpose of Export Credit Agencies is to stimulate growth in the local economy and also to generate foreign exchange earnings for its country by promoting the export of capital goods and related services. In essence these mostly government owned agencies provide interest rate support for loans from commercial banks and selected development finance

institutions to ensure that products and services are purchased locally for foreign executed projects. They also provide political and commercial credit insurance cover against risks in the country where the project is executed. Yearly interest support budgets for the Export Credit Agencies are set by their respective national treasuries, and credit insurance limits (ceilings) for loans to specific countries are based on the perceived repayment risk of the "borrowing" country which is influenced by political, economical and other relevant factors in that country.

Although the various incentives which apply will differ from country to country, they are to some extent standardised and monitored by institutions such as the Berne Union and the Organisation for Economic Co-operation and Development (OECD). The guidelines of these institutions are flexible enough to allow that unique terms and conditions can apply to suit the requirements of specific projects. For example, EXIM (USA) will generally require up to 100% local (USA) content and insist that the goods leave the county on an American flag carrier.

Hermes (Germany), on the other hand, does not have very restrictive shipping requirements, but do sometimes distinguish between the incentives offered in respect of exports from West- and East-Germany as part of their briefing to boost the 'old' East-German economy. Normally the order must be placed by a local company on another local company, thereby forcing the Project / Mining House to have local representation and investment as 'post office' offices are not acceptable.

These credits are usually repaid in equal half-yearly instalments over periods of between two and ten years, starting six months after commissioning with coinciding interest payments. In terms of OECD guidelines interest is usually charged at the Commercial Interest Reference Rates (CIRR) for each currency, or a similar cost. This field is very difficult to navigate and great care must be taken when venturing into these new waters. For example, the utilisation of EXIM finance from the USA may result in Caterpillar earthmoving equipment being purchased which may not necessary be the cheapest. If the finance were of Japanese origin (J-EXIM), cheaper Komatsu equipment would have been an option while Korea's Daewoo (which would probably be the cheapest) could have been purchased if own or EXIM Korea funding was available.

4.7.4 Procurement from United Nations Agencies

There may be situations in which procurement from specialised agencies of the United Nations (UN), acting as suppliers, pursuant to their own procedures, may be the most economical and efficient way of procuring small quantities of off-the-shelf goods, primarily in the fields of education, health and rural water supply and sanitation. Although it can be argued that the above has nothing to do with Project- or Mining Houses, this becomes a very important factor in developing countries under UN supervision and aid

4.7.5 Procurement Agents

Where the Mining House lacks the necessary organisation, resources and experience, they may wish to employ a Project House with experience in handling international procurement, as their agent. The Project House will then follow all the procurement procedures outlined in the agreement as per the normal Mining House procedures.

Project Houses can even fill the role of local representation as required by Export / Import Credit Agencies.

4.7.6 Procurement under BOO / BOOT and similar private sector arrangements

Where the cost of a project is procured under a BOO/BOT/BOOT (built, operate (own) and transfer) or similar type of private sector arrangements, any in-house or project specific procurement procedures can be used.

4.7.7 Community participation in procurement

Where, in the interest of project sustainability, or to achieve certain specific social objectives of the project, it is desirable in selected project components to call for the participation of local communities and/or non-governmental organisations to increase the utilisation of local know-how and materials, or employ labour-intensive and other appropriate technologies, the procurement procedures, specifications, and contract packaging shall be suitably adapted to reflect these considerations, provided they are efficient.

4.8 Selection Criteria for Project Houses

Service provider selection criteria are not industry or client specific. When comparing the criteria from the financial and banking sector [C; E; L] with that of the mining sector [1a; 1c;

1i; 1w] it more or less remains the same. The following selection criteria are a combination from the above references:

- Quality of service sought.
- Competitive and "Value Added" capabilities.
- Proven track record and references.
- Good financial standing.
- Quality Processes (ISO 9000, TL 9000 or equivalent).
- EDI or E-commerce compliant for product purchases & payments.
- Understanding of Mining House's business.
- Ability to market Project House aggressively.
- Ability to provide multiple services and serve multiple Mining Houses.
- Technological capabilities.
- Compliance with safety standards for products and services.

On top of this the Mining House has certain unwritten expectations of behaviour, which can also be described as code of business conduct, they expect / require from the Project House. The list below is by no means comprehensive, nor is it unique, as it occurs in various other forms in a number of references [E; K; L; M]

- Protect Mining House property and information.
- Avoid conflict of interest.
- Provide equal opportunity without discrimination.
- Maintain complete and accurate records.
- Protect Mining House's reputation.

4.9 JV / Consortium approach in EPCM projects

In an EPCM scope of contract, the complexity of activities sometimes necessitate a few companies with strong backgrounds in their respective fields to come together and bid jointly [I]. They form a consortium, since the client is interested in placing a single point responsibility on one contractor. This is not uncommon for the mining industry as no Project House can afford to tie down all its resources into a single project for 18 months. The most recent local example is when Bateman BV and SNC Lavalin formed the Skorpion

Project Joint Venture (SPJV) for the R 3.5 Billion (approximately US$ 454 million) Skorpion project executed on behalf of Anglo-American Base Metals division and its local Namibian subsidiary.

4.9.1 Advantages of consortium approach in EPCM projects

In a JV /Consortium approach different players come together to bid for a tender. Each partner has his own strengths in one or more of the key areas of the tender scope. On their own, they typically cannot qualify as per the tender requirements, but when they come together, their joint experience carries them successfully in qualifying for the bidding purpose [I]. One partner may be strong in one of the technical portions while the other may be strong commercially and the third or fourth partners may be strong in construction.

In such an approach, more than one partner/company come together to form the consortium. The ideal number of partners is 3 to 4, but bids have been submitted by consortiums of 8 to 10 partners. Having a large group of partners, makes the process very complicated - like deciding the scope of work for each partner, responsibilities, costs sharing, etc. At the same time, having a small group such as two partners also complicate matters with respect to who should lead, cost-sharing, etc.

4.9.2 Pitfalls of consortium approach in EPCM projects

It has often been observed that some of the partners do not play by the rules of the game. They do not look for the long-term gains, but rather go for short-term benefits. On one hand, they tie up with each other for one tender and simultaneously, on the other hand try to compete with each other in another tender. They use the data and information collected about each other in the consortium approach against each other in the other tender. This leads to bitterness and can become the main reason for that project's failure. [I]

Also in such an approach, even if one of the partners becomes insolvent / bankrupt, the whole consortium is jeopardised , thereby putting the project at risk.

4.9.3 Formula for success in EPCM projects

If any consortium approach aims to succeed then the team leader has to have a strong hand in making sure that the following gets done [I]:

- Sharing of responsibilities - The team leader must formulate the scope of work of each team member before submitting the bid.
- Sharing of costs - The various costs, including pre-bid costs, post-bid costs, liaison costs, agency commissions, etc. must be properly identified and each team member committed to carry their portion and take the responsibility for such costs.
- Sharing of risks - The team leader must list all the risks involved, such as professional indemnity, insurance, cost & time over-runs, quality failures, performance guarantees, etc. The responsibilities should accordingly be shared between the individual team members.
- Working methodology - The working methodology should be broadly elaborated during the bidding stage and all team members should give their concurrence. Any change should be informed to all concerned.
- Reporting methodology - The types of reports and the frequency of reporting should be recorded to include the recipients and the compilers of the reports.
- Communication matrix - The communication matrix should be identified as to who should contact whom, what frequency, etc. It is also mandatory as to who should talk to the client, contractor, etc.
- Payment terms - Consortia can break up midway during the project execution stage as the partners fight over monetary matters. It is therefore mandatory to make the payment terms clear right from the start, bearing in mind the overall tender terms with the client. Members should also state who is responsible to recover the payment from the client, make payment to the members after receipt from the client, etc.
- Validity of the consortia agreement - Members must agree to a minimum validity period which should be at least the project period. Members can also, by consensus, add a clause that the members will not participate in any similar tenders individually.
- Arbitration -In the worst case, if there happens to be any grievance amongst the members, how to resolve it in an amicable manner & who should act as arbitrator, etc. should be enlisted in the agreement.

There is probably various other issues, which the team members may deem fit to include in the agreement. This will set the right atmosphere to work in a team spirit. The single point all team members must remember is that the consortia approach is for the benefit of all. The

team's success is everyone's success and vice versa, hence all the members must strive to co-operate for their and the project's success.

4.10 Conclusion

Although there are various options for project phases, scopes, responsibility and methods and contracting models (including evaluation criteria) the Mining House can actually use when outsourcing to the Project House, the reality is that most money is spent in the execution phase while the budget is determined during the bankable feasibility phase. Because these two phases are regularly executed by different Project Houses, the responsibility for budget overruns becomes a cause of much conflict with the end result that the Project House responsible for the project execution phase management team spends more time on delegating the blame for cost overruns, to the party who did the bankable feasibility, than actually doing the work.

By considering their full hand of cards and managing the situation properly, Mining Houses can reduce their risk considerably by selecting the most appropriate model for their specific situation as they now should have the full picture. This does not relieve the Mining House from the lengthy process of tendering and appointing a Project House (or joint venture partners) for the execution phase or going through the same problem of setting up the agreements and systems required for successful project execution.

In the following chapter the focus is on the different levels of outsourcing which are then compared with various Mining- Project House situations for possible solutions to project requirements. A large portion is dedicated to business transformation outsourcing and the role that visibility versus control and metrics and incentives plays in a BTO relationship.

Chapter 5

THE ULTIMATE PRIZE: BUSINESS TRANSFORMATION OUTSOURCING:

5.1 Introduction

To create a win-win situation for both the Mining- and Project House, most of the issues discussed in the previous four chapters must be addressed and a mutually acceptable agreement reached by obtaining the best of both worlds. The focus is now shifting from problems experienced to the solutions for the problems discussed in the previous chapters, together with the strategies on how to manage them effectively.

Due to lack of examples in the South African mining and mineral commodity industry, the focus is on success models of other service and supply industries like IT, banking (for service) and car manufacturers (for supply) – from there a number of generic discussions of possible options and models.

5.2 Strategic Business Transformation Outsourcing

Many organisations, but very few Mining Houses if any, have pushed outsourcing beyond a conventional relationship. A few bold leaders in other industries have however gone even further - they are using outsourcing to transform their businesses [K]. Companies undertaking business transformation outsourcing (BTO) seek radical change that can rock an industry (see table 5.1 for comparison between different stages of outsourcing). It requires unflinching commitment to an outcome that may be years away and a partner to share the journey. Although the potential rewards are big, unexpected shifts in technology or the competitive landscape could require mid-course corrections at any moment. To be successful in it both Project- and Mining House executives will need to forge strong relationships to see them through these turbulent waters. Quotes like "I work side by side with my counterpart in the partner firm to ensure that we anticipate and confront change as it happens", should be the order of the day [K].

	Conventional Outsourcing	Collaborative outsourcing	Business Transformation Outsourcing
What's at stake?	Risk of Disrupting Operations	Risk of wasting scarce resources and disruption	Risk of imperilling strategic agenda
	Little value-add on the topside	Upside opportunity to delight customers, exceed objectives	Upside opportunity to drive dramatic business improvement
How difficult is it to specify the outcome required?	**Easy:** • Well Understood Processes • Easily measured outputs • Clear link between outputs and benefits • Simple interface to non-outsourced activities	**Difficult:** • Outputs and desired behaviours not easily specified or measured. • Close and poorly defined linkage to non-outsourced activities. • Excellence involves art as well as science.	**Almost Impossible:** • Effective behaviours and outputs only assessable by outcome. • Activities inextricably linked to non-outsourced work. • Excellence requires industry-leading innovation
How much flexibility do you need?	Little: Annual benchmarking suffices	Moderate: Must adjust to changes in business requirements	Extensive: Must anticipate and respond to dynamic competitive environment
Power balance?	Could replace the vendor for a better deal; unpleasant transition	Could replace the vendor for non-performance; difficult transition	Could not replace vendor

Table 5 1 Main differences between conventional, collaborate and business transformation outsourcing (BTO) [K]

If a conventional relationship gets what is asked for, and a collaborative one gets what is wanted, a transformational relationship ensures acquirement of what is needed [K]. Business transformation requires commitment because it's everything or nothing and both Mining- and Project Houses will have to forsake the comfort and security of clear scope of work, defined outputs, structured roles and responsibilities to pursue dramatic improvements in enterprise performance as they venture into these uncharted waters. They can use metrics and incentives to keep their interests tightly aligned and to support deep, continuing commitment on both sides to reach their aspirations. This is a whole new game played with very few clear-cut rules and may mean establishing some new enterprise level metrics, crafting a gripping new set of incentives and changing the way lower-level metrics are used [N].

BTO demands new metrics because the goal is business transformation and the only relevant metric is *business value created* (what you need). Architects of BTO relationships measure *enterprise-level outcomes* and they have set their sights on dramatic improvements in business value. Companies aim to double revenue, achieve market dominance or completely reposition the firm. For example, Archer Financial Group (a global financial services firm) doubled both operating margins and stock price through business transformation outsourcing [N]. These goals must be valid for both partners and unlike more conventional outsourcing arrangements, BTO must create enterprise-level value for the Mining House as well as the Project House. If this is not the case it wouldn't be worth the risk [K].

Many Mining Houses restrict themselves to the use of a narrow set of financial incentives, such as bonuses, penalties as well as gain-, pain- and risk sharing, to motivate the Project Houses during conventional and collaborative outsourcing relationships. In a BTO relationship, the participants need more than motivation - they need inspiration. This means incentives that touch executive management and people emotionally as per the following examples from Linder [N]

- Executives must be willing to put their names on the line as committed partners by announcing their intentions and staking their reputations publicly on their ability to deliver the results they project. A board presentation statement like "If this doesn't pay off, I'll never work again in this industry - and neither will our partner." should not be far-fetched

- Committed partners have thrown in their lot together and are willing to bet their money on the outcome. Shared ownership reflects the essence of the relationship better than any other kind of incentive scheme. Both partners put resources at risk and both share the benefits when the strategy pays off. For example, the joint venture can create expertise and services that can be sold to third parties and the partners will split the profits 50/50.

- BTO have the ability to invoke the full power of both partners' incentive structures to deliver individual rewards. The entire weight of both companies can be combined behind these deals by linking BTO performance to bonuses, raises, promotions, and recognition for the individuals involved. For example, a Financial Group's outsource partner priced the deal by establishing the margin they'd earn on the work. Partners

> structured the formula so that if they produced ordinary results, they'd earn a margin that would rate them below average in comparison to their colleagues at the firm. If they delivered outstanding results, they'd earn enough additional margins to be heroes back home [N].

Supporting a business transformation outsourcing relationship requires more than new, outcome-oriented metrics and incentives. Partners can also use more conventional measures, but in an entirely new way, because the focus changes from hitting the baseline target to turning in the best possible performance. While many companies set optimum targets as well as minimum service levels in collaborative outsourcing deals, aspirational goals take centre stage in a BTO program [K].

BTO doesn't mean stop targeting basic service levels, but rather handing these responsibilities to the outsource vendor / supplier. Collecting detailed statistics in areas like customer satisfaction, earned value and progress (S-curves) allow partners to assess their own performance relative to the targets and report successes / failures including remedial actions (if required) to each other. This structure gives operational metrics just the right emphasis worth measuring, but it is not the central focus of executive management's attention [N].

In keeping up with this emphasis, the purpose is not to have money changing hands based on all the conventional metrics, as it can distract both sides from their real agenda. Instead of paying bonuses for hitting project milestones and cutting costs wherever possible, just share the revenue that results between the project stakeholders. This inspires both partners (and all other stakeholders who may be involved) to take responsibility for making sure the joint product or service fills a market need at an affordable price. Holding payment on a service intensive project until the product or service is "ready for revenue" shares the risk and places the burden of cost control on the shoulders of the outsource firm / Project House.

In the high stakes BTO game, partners sign up together for goals they can't guarantee with organisations they don't control and they bet their careers on the outcome (see table 5.2). When facing this challenge, metrics and incentives can be used deliberately to support an aggressive agenda. The following goals are the building blocks for the successful BTO strategy and are therefore essential for the successful implementation thereof. This information is a consolidation of various references [C; E; F; K]:

- Establish shared convictions that inspire from top to bottom. Rather than create principles that set the tone for their relationship, both sides must agree to deep-seated convictions that resonate throughout every facet of their business activities and corporate cultures. A strong conviction should also be earthquake-proof, being able to weather cyclical markets and changes in leadership that might try to overturn a collaborative deal. Joint equity deals in which all the partners / stakeholders share ownership can be the one vehicle for bringing such convictions to life.

- Set the direction and actions for events and fix the aspirations by the use of scenario planning (also referred to as a sensitivity analysis). In business transformation outsourcing the strategy is the responsibility of all stakeholders, but the client (Mining House) should take the lead / responsibility to ensure the process remains on track. Leading stakeholders can join in scenario planning workshops that explore a range of possible futures in order to craft the sturdiest action plans. In order to take advantage of the partner's unique skills and perspectives special care must be taken that their specialists, thought-leaders and experts are invited to participate.

- Substitute control with visibility. In an environment where accountability runs high, control tends to be elusive therefore BTO leaders tend to substitute control with visibility. Companies open their books so their BTO partners can see their costs and margins. They open their boardrooms so partners can see, influence and contribute to their strategies. This works both ways as a firm that signs up for BTO want to know that the partner, on whom he is utterly dependent, has a solid (financial) future.

- Replace traditional milestones with new processes that refresh commitment along the way. No matter how effectively both parties articulate their vision at the outset, the situation can get cloudy really fast. Both partners will need a way to crystallise and communicate the progress they've made as they move along. Creating a series of case studies that periodically capture the rich context of the program as well as the accomplishments can be invaluable. These not only document the headway firms are making, but provide a way to highlight roadblocks, rally support for course corrections, and refocus on the ultimate objective. Although these new processes may not encourage any specific behaviour; they help individuals on both sides remember why they started on this path in the first place and thereby reinforce a broad commitment to keep going [K].

The nature of conventional outsourcing encourages a strategic approach to metrics and incentives - get them right in the contract and then live (and die) with them. In business transformation outsourcing, the opposite is true as the relationship is designed to be dynamic. Enterprise-level outcome targets and deepens commitment to provide a broad, flexible framework for doing whatever it takes in the current context (notwithstanding what has changed since the deal was struck) to ensure the desired business outcomes.

	Conventional Outsourcing	**Collaborative Outsourcing**	**Business Transformation Outsourcing**
High Level Business outcomes			• Link payoffs to internal incentives of both partner firms • Share ownership through equity • Maintain transparent books
Subjective goals		• Articulate shared principles • Set specifications jointly • Share percentage of savings • Monitor interim milestones and deliverables • Set early-warning alerts • Maintain audible books	• Articulate shared convictions • Set agenda jointly • Use shared revenue to motivate delivery • Use reality checks to stay on track
Objective output measures	• Set clear targets • Use bonuses and penalties to reward hitting them • Translate results into cash	• Set Clear targets • Use results to diagnose issues and plan improvements • Allow for vendor to recover before changing penalties	• Set clear targets • Use point system to keep score • Ask outsourcer to self-monitor, report issues and manage improvements

Table 5 2 Main differences in metrics between conventional, collaborate and business transformation outsourcing (BTO) [K]

5.3 Practising strategic business transformation outsourcing

The important question of how an executive strategy of business transformation outsourcing can be implemented in practice, still remains. Unfortunately there is no one-size-fits-all

prescription for any level of outsourcing or for the metrics and incentives that keep these important relationships on track. Although the three broad categories of outsourcing relationships (conventional, collaborative, and business transformational) can point towards the right framework, each situation is ultimately unique.

The onus is now on executives and project management to roll up their sleeves and do the careful up-front work to make sure the means support the ends. The work does not start with a detailed list of performance measures, but with the appropriate mindset like deciding whether the outsourcer is required to act like a supplier, a colleague or a trusted friend in order to accomplish the required goals. Metrics and incentives can be added to help shape the required relationship – not to determine it.

This approach does not mean letting a lawyer or outsource facilitator take the lead and determine the relationship - they can only provide a framework and the relevant options needed to point towards a course for success. Because the success of the BTO relationship is still determined by the same building blocks described previously, namely mutual respect, trust, etc. the involvement of the actual project teams in drafting the relationship is of the utmost importance as the formal agreement will form the foundation of their future working relationship.

When informally posting the question "What is your outsourcing project execution strategy over the next five years" to Mining House executives, the answers are based around the following outcomes: (in order of importance)

- Reduce cost of plant.
- Reduce Mining House exposure to risk.
- Decrease the time from project initiation to completion.
- Having a relationship of mutual respect and trust with Project Houses. (as we are dependent on them)

When informally asking the question "What is your strategy for accepting outsourcing of project execution over the next five years" to Project House executives, the answers are based around the following outcomes: (in order of importance)

- Having a fair contract (with the Mining House) granting me a reasonable profit.

- Mining House giving all the information (like nominated vendors and preferred equipment) and input required at the beginning of the projects, thus preventing re-work.
- To get paid for the risk asked (but mostly instructed) to take.
- Being allowed to do the work with minimal interference to Project House team and systems.
- Mining Houses respecting the rules of the contract and not trying to bully Project House into changes.

Although these strategies seem to differ totally from one another, there is also some similarity and sanity in them. A BTO strategy can incorporate both Mining -and Project House objectives and outcomes into a common relationship strategy, which is then expanded into a project specific execution strategy. To date, only one of the South African Mining and Project Houses has been bold enough to implement it on a commercial scale (De Beers and BatemanBV announced their intention on 23 October 2003 – see appendix A).

The European and USA motor industries (including limited mining and mineral processing reference cases) historical data produced impressive results - both from the point of view of safety, speed of construction, quality and probably the most important of all, significant financial savings [K; N].

5.4 Visibility versus control - a strategic approach of using metrics and incentives in outsourcing

Before the use of metrics and incentives can be compared, the definitions thereof must first be clarified to ensure conformity [N]:

- Metrics are measurements used to evaluate progress in achieving a goal.
- Incentives are reward and penalty structures used to encourage behaviour that supports a desired outcome.

Metrics and incentives have always been an important component of outsourcing relationships, but as management starts to use outsourcing more strategically, it is becoming more critical than ever. Research found that, to some extent, each type of outsourcing relationship calls for different metrics and incentives [F; N]. More importantly the same

metrics and incentives can be used in different ways to shape the required outsourcing relationship [N].

Tapping new sources of value means sharing ownership for results with an outsource partner. *The more transformational the outsourcing agenda is, the more blurred the lines of accountability and control become* [K]. Management and executives who operate successfully at these cutting edge deals have loosened their white-knuckle grip on control and are using metrics and incentives to foster the required commitment [N]. Under normal circumstances it would be easy for the Mining House to drive the outsource relationship by laying out clear performance measures and awarding the Project House cash bonuses for hitting them, but the scope is seldom black and white, which makes it impossible to be defined accurately.

Conventional outsourcing can't generate incremental savings forever. Despite rigorous measurement and tough penalties for failure, the stream of incremental savings that conventional outsourcing delivers ultimately reaches its ceiling. Driving additional value means moving toward a more sophisticated relationship, therefore many firms migrated toward a more collaborative outsourcing relationship in order to create value beyond simple cost cutting exercises [K]. Tapping these new sources of value means sharing ownership for results with an outsource partner – a direct outcome of relaxation of the tight linkage between accountability and control.

5.4.1 Conventional outsourcing - metrics and incentives drive incremental savings to a point

Metrics and incentives are staples of today's large-scale outsourcing relationships. Although the Mining House's project managers can pick from a broad menu of metrics, conventional outsourcing relationships generally rely on a short list of approaches. Most contracts spell out the required service levels and the Project House's / vendors are compensated by fixed fees for services, deliverables and process equipments provided. Project House's / vendors can now (depending on the contractual arrangements) be penalised for missing contractual delivery dates or performances guarantees and, in some cases, receive bonuses for early completion and beating savings[K; Q: E].

Over time, as both Mining- and Project Houses gained outsourcing experience, they started to learn what works and what doesn't and by continuously revisiting their initial sets of metrics, made adjustments that optimised performance. Best practices identified include

making sure objectives are clear at the outset, reducing the performance measures to a small number of critical ones, shifting from input to output metrics where possible and making sure that the metrics are developed early in the relationship.

Armed with these best practices, executives do achieve cost savings from conventional outsourcing to a point; however the results they achieve depend heavily on the efficiency of the initial operation baseline to start with [E]. Because the EPCM of mineral processing plants have been outsourced for a few decades, it has been tuned up to be the industry's standard performance criteria, thereby the ability to generate substantial cost improvements by outsourcing almost totally disappeared.

The only question now is what can Mining Houses do to keep up the momentum? Some Mining Houses keep multiple Project Houses in the mix to foster better performance through competition. A Mining House may have four or five main Project Houses they deal with and if a specific Project House demonstrates good service at the ground level, they are more likely to get follow-on work. The following points and discussions on metrics and incentives can help the Mining Houses to achieving the optimum savings *via conventional outsourcing* methods [N]. (This is however not the optional solution as collaborative and business transformation outsourcing are needed to achieve that)

- Clarify objectives at the start of the relationship to align it for success. Many companies learned the hard way that they had to understand their own objectives before they could invite an outsourcer to the party. Communicating own goals broadly throughout the organisation helps set clear expectations. For example, division managers in the client's receiving divisions (like mining operations for Mining Houses) may think that they will be getting improved service, but the service division (like project implementation department) who normally supply this service may sacrifice the possible improved service for a reduced price. The result will not be pretty and the Project House sits in the middle while he is totally innocent.

- Choose fewer metrics with higher stakes. Experienced outsourcing managers have significantly narrowed the number of metrics they track over time and increased the accompanying rewards and penalties in order to boost focus, minimise administrative demands and improve their relationships. The metrics first to go were those that proved too difficult and time-consuming to measure. For example, the senior vice

president of procurement at a UK transportation equipment firm removed engineering efficiency from his outsourcer's list of target metrics for business process improvement because it simply proved impossible to quantify the result. The pitfall of too many and immeasurable metric's are that the outsource service provider will spend three days of the week trying to measure progress and have only two days to actually do some work.

- Shift from input to output metrics wherever possible. Instead of counting how many hours it took to complete each order, a photographic firm asked its outsourcer to count how many successful orders it completed each hour. This small change in the way they kept score helped the vendor to focus on speeding up throughput.

- Define metrics early in the relationship. Some firms signed their outsourcing contracts long before they identified the metrics they need to track and manage performance. Statements like "It took us more than a year to build the set of metrics we would use to evaluate performance. Things would have gone much more smoothly if those were in place sooner" is repeated in almost every lessons-learnt session.

5.4.2 Collaborative outsourcing - getting what's wanted

A conventional outsourcing relationship gets what was asked for; collaboration gets what's wanted. Companies (and Mining Houses) are looking for more value from their outsourced business processes (from supply chain management to human resources) and achieve it by setting up collaborative outsourcing relationships. Unlike conventional outsourcing relationships, collaborative outsourcing relationships can offer significant upside in the form of customer satisfaction or a competitive edge in efficiency. However, the opportunity for increased business impact carries a hefty price tag - it creates ambiguities, muddies the lines of authority, and obscures accountability for results [3].

Higher aims for outsourcing introduce problems. Conventional business wisdom states that good managers match accountability with control [3; 8]. What's neater than being able to measure and reward someone for the results you've asked them to produce? With conventional outsourcing, this works just fine. An experienced firm can easily establish a performance baseline, clearly articulate the cost savings and service levels they want and anticipate the journey in between. Sometimes the outsourcing service provider (like the Project House on an urgent fast track project) oversees a discrete activity, therefore accountability and control thereof have to be defined.

Reality is that collaborative outsourcing relationships aren't so simple. As senior management target higher value opportunities with collaborative outsourcing, they are facing a host of new challenges with metrics and incentives such as these listed below [F; N]:

- They don't have mastery over the outsourced process at the start. Simply establishing a baseline can take months.
- Business process dependencies complicate matters. In more complex outsourcing relationships, the Project House's domain isn't a discrete and independent component of the organisation.
- Monitoring quality and satisfaction in addition to cost.
- The need for flexibility interferes with simple metrics.

In the best of all worlds, a company will use outsourcing to support its business aims. Now the neat package of accountability and control, tied up with metrics and incentives are starting to unravel as firms use collaborative outsourcing for more complicated processes and higher stake objectives. To manage their collaborative relationships effectively, participants are forced to use metrics and incentives differently, such as to motivate and measure excellence [N]:

- Setting metrics and incentives to tap the upside. Rather than protecting a client (Mining House) against the risk of failure, collaborative relationships succeed by incentivising the partners to reach for a deal's significant upside. They shared fees by sharing the benefit from improvements achieved wherever possible and to escape the tyranny of volatile transaction volumes they adopt a "pay as you use" pricing. [N]

- Using operational measures to diagnose problems and not to punish the service provider or Project House. Metrics indicate where to look to make things better therefore they should not be treated as positives or negatives, but rather as information. For a Mining House with collaborative relationships, the Project House earns service debits when performance falls short of targets but these can be cancelled out by making up for the lapse in the next month [M].

- Many Mining Houses favour using a balance of productivity, quality and client satisfaction metrics to ensure the softer goals get just as much attention as the cost-oriented ones. With so much riding on fuzzy measures, firms often add an early

warning system to detect issues that can put a spanner in the works well in advance. They even set fail-safe points at which either side can call a halt if projects are running off the rails.

- Encouraging healthy behaviour. Firms in collaborative relationships believe that relying on metrics alone can undermine their intentions as metrics can drive perverse behaviours. People primarily tend to do the things that they're measured on, and sometimes they actively fool the system.

- The complexity of the work in collaborative relationships almost always means that Project Houses don't have complete control over their ability to meet their promises. The Mining House has to hold up its end of the bargain, too. One petroleum company admits that the success of outsourcing its accounts payable, depends largely on the ability of its own business units to submit invoices on time together with approvals and the correct codes. No matter how well the Project House performs, they'll miss their target if the Mining House doesn't do their part, therefore Mining Houses need to consider how to modify their own practices to enable joint success [F].

Outsourcing complex processes with substantial upside potential means using metrics and incentives to promote collaboration. In the absence of tight controls on performance, parties in these deals go one step further. They create and document shared principles that will guide the way they deal with each other and are sometimes referred to as "a constitution" and not a contract. These principles not only set forth the work strategy, but also capture the key business goals and thought processes behind it, together with the methodology for achieving it [K; F].

The goal is to ensure the principles set the correct tone for the relationship as it evolves beyond the individuals involved at any time. The original parties can help the relationship succeed over time thereby giving later participants the gift of context.

5.4.3 Business transformation outsourcing - getting what's needed

The most important thing for organisations to realise about business transformation outsourcing (BTO) is that it is not a fly by night idea. Instead, BTO has emerged as a critical response to economic crisis's experienced in an increasingly borderless world of globalisation and e-commerce. Companies that back away from formulating and executing a BTO

strategy with the right provider, risk falling behind the competition who is already applying BTO to transform the way they are doing business.

BTO can help both Mining- and Project Houses to become performance leaders again, but requires senior management to rethink their business models and focus only on those products and processes that deliver growth, productivity and shareholder value. In tough times, when the competition is fiercer and customers and investors are more selective, it is vital to invest more in the functions that drive market success and less on non-distinctive areas that can be executed better and cheaper externally.

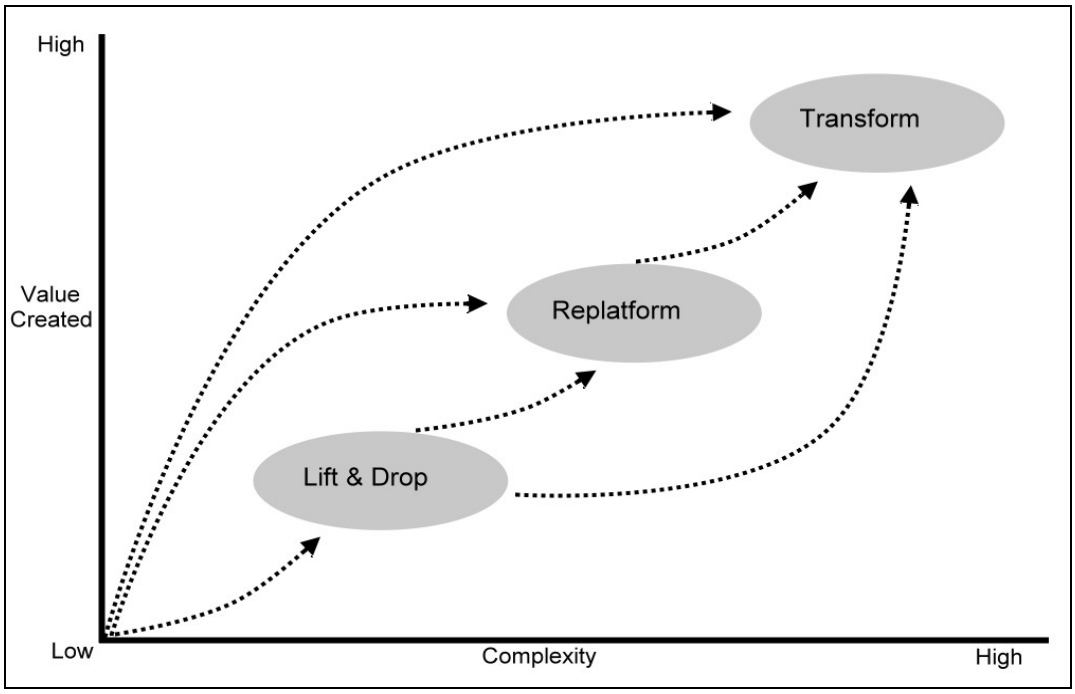

Figure 5.1 Creating shareholder value versus outsourcing relationship complexity [L]

Yet while executives rightly view BTO as a valuable cost reduction solution, an increasing number also recognise it as a catalyst that can ultimately spur business transformation. In a sense, the demand emphasis for BTO is shifting from a purely financial to a more strategic approach. In so doing, it is prompting more and more executives into step-by-step re-examinations of the structure, efficiency and effectiveness of their business models. Often stereotypically conservative and with a cultural bias for control, most Mining -and Project Houses have been late and reluctant embracers of BTO. However the array of challenges confronting the industry makes control for control's sake a costly indulgence. The early movers are starting to push ahead by shoving costs out the door and transforming their

organisations into leaner, more competitive machines. The rest of the industry has only to decide how far behind it is willing to fall before it starts to play catch-up.

If a conventional relationship gets what's asked for and a collaborative one gets what's wanted, then a transformational relationship delivers what's needed. Business transformation requires commitment because it's everything or nothing. In it, both parties forsake the comfort and security of clear scope of work, defined outputs, structured roles and responsibilities to pursue dramatic improvements in enterprise performance. This is a whole new game with few rules which means establishing some new enterprise level metrics, crafting a gripping new set of incentives, and changing the way lower-level metrics are used. When the goal is business transformation, the only relevant metric is business value created. Architects of BTO relationships must measure enterprise-level outcomes. Therefore they've set their sights on dramatic improvements in business value. Companies aim to double revenue, achieve market dominance or even completely reposition the firm.

Unlike more conventional outsourcing arrangements, BTO must create enterprise-level value for the Project House as well as the Mining House; otherwise it wouldn't be worth the risk. In the high stakes BTO game, partners sign up together for goals they can't guarantee with organisations they don't control, and they bet their careers on the outcome. Conventional outsourcing advises a static approach to metrics and incentives, gets them right in the contract and then lives with them. In business transformation outsourcing, the opposite is true - the relationship is designed to be utterly dynamic. Enterprise-level outcomes rely on deep commitment to provide a broad, flexible framework for doing whatever it takes in the current context, no matter what has changed since the deal was struck, to ensure successful enterprise-level outcomes which is valid for both partners.

5.4.4 Targets and goals

The requirement is simple: one project – one goal. The Mining House project manager can do whatever he wants – without the Project House's project execution team's co-operation both he and his team's hands are tied because they will ruin both his budget and program. The opposite is even closer to home – without the Mining House's money and mineral deposits there is no project (or purpose in life) for the Project House.

Good projects become great projects when all role players play with aligned interests and goals. This enables them to be flexible, operate as a unit and turn obstacles thrown at them by external factors, like the world economy, rate of exchange etc. into opportunities.

5.4.5 People Management

Although engineers have always been notorious for their bad people management and interpersonal skills, they still end up as senior project management staff (if not the project manager) because of their excellent technical background and wide exposure. Due to this lack of good interpersonal skills from the project management team's side, it is sometimes necessary to bring in an independent 'alliance / team' facilitator to improve communication and mould all parties together in one team. Senior management of most companies in the mining and mineral processing industry, unfortunately are also engineers and with their typical engineering attitude of "we have always done it this way" or "it works – so don't fix it" are reluctant to spend 'money' on independent facilitators and team building.

Today's employees are fed-up of being mistreated and are not only becoming more and more critical of their workplace and employer, but demand fair treatment and are even willing to change employer to address these issues. This is especially true in the current employer's environment (due to skill shortages) and can easily result in the project being stuck with below par workers who nobody else wants. Worldwide surveys have shown that the most important criteria for workers are (in steps of importance) [8]:

- being valued at work,
- acceptable working conditions and environment (including management),
- a fair salary,

therefore even paying above average wages, will not necessarily correct the situation

A large percentage of the South African and UK engineering workforce are, unlike the rest of the world, hourly paid contract workers who have very little loyalty towards a project or company. Even for this traditionally money-orientated workforce (like draftsmen) money has been replaced as the most important factor of job evaluation and resignations, due to soft engineering issues, like bad people management, for another less paying position, is not uncommon.

To summarise – the importance of a well-trained and experienced workforce cannot be underestimated. This is valid for both the Mining- and Project House and whatever money

needs to be spent to ensure a good well-managed team (whether independent facilitator's or team building sessions) will be recovered with interest.

5.4.6 Continuity of people

History has shown time and time again that continuity of personnel throughout a project lifecycle is of the utmost importance for the project's success. It is also a fact of life that due to globalisation and other modern economic trends, jobs for life and job-security is something of the past so personnel (who have been appointed for the project's duration) tend to start looking for other employment opportunities as soon as the project nears the end of the execution phase. Alternatively the last bits and pieces are stretched out (if there is no other work in the industry) to the extent that some companies have resorted to employing specialised project closure teams to tidy up the last bits and pieces like archiving.

The few options available to ensure that people stay on until they are decommissioned is a project completion bonus (average month's package), absorption into the company (open end or three year contract) or transfer to other projects etc. The crunch is good communication in advance so that the employee knows exactly where he/she stands [18].

Lanham [7] quite correctly takes continuity of people a step further by saying that continuity of personnel stretches beyond a single project into the next. This strategy ensures that the same errors are not repeated on the next project by re-employing certain key personnel. (Do note that some project personnel are decommissioned earlier than others, therefore a full team can seldom be transferred to the next project.)

A good example of the importance of the continuation of personnel was when a Mining House was willing to pay a Project House to keep a specific core project team on their books for nine months during a period of low project activity.

5.4.7 Transfer of knowledge

The transfer of knowledge has always been and will always be a contentious issue as long as people value intellectual property more than customer value perception. In the consulting engineering industry (where consulting companies regularly form a joint venture with a contractor) the consulting company will pay half of a young engineer's salary for a number of years while he/she is working for the contractor, to gain valuable practical experience. Because the consulting company can only sell man-hours, they have realised the importance

of good practical experience and take all the necessary actions to ensure the transfer of knowledge. The contractor also gains from this agreement – not only does the labour comes at half price, but the engineer understands and trusts their modus operandi and consequently recommends them in future. Practical exposure enables the inexperienced engineer not to expect miracles (impractical or impossible tasks) from the contractor and to select the most economical option.

By working together Mining- and Project Houses can have a similar relationship whereby Mining House personnel will gain a better understanding of the demands and frustrations of project execution and become more proactive when they are compiling a project together. From the Project House's viewpoint the Mining House employee will understand and trust the Project House's systems and should have little or no problem in using it.

5.4.8 Project team member incentive schemes

Although money is only third on the list of important factors of employment, none of the other two (being valued at work and an acceptable working environment) give an employee and their family food in their mouths or a roof over their heads. Money is also probably the easiest way to correct and individualise because all personnel (the good and not-so-good) share the same office environment and everybody's efforts need to be acknowledged from time to time.

While almost all Project- and Mining Houses say that they have incentive schemes. In practice very few, if any, project specific incentive schemes exist in the Project House environment. The advantage of a project specific incentive scheme is that it aligns everybody's focus on the project goals and therefore the whole team will make every effort to minimise re-work, cut cost, reduce time and lighten their college's burden. The importance is that the whole team share from the same pool which should be a percentage of the overall project bonus. The following factors should be considered when discussing such a scheme [8; D]:

- Make the rules clear so that everyone knows how the system will work.
- Make the goals specific and, if possible, quantifiable.
- Make the reward visible, so that everyone knows that each person on the team gets a share.

- Make it matter. The reward has to be worthwhile and commensurate with the effort involved.
- Make it fair so that people believe their reward is correctly calculated (based on time spent on the project and level of responsibility).
- Make it realistic and link it to the overall project successes and incentive scheme. If targets are set too high no-one will try to achieve them
- Make it happen quickly with rewards as soon as possible after project closure (or project bonus milestones).

This approach is not unique and has been implemented with great success in other industries like software development (Microsoft and IBM) as well as the motor industry. The importance is that it must be linked to the overall project incentive scheme and what goes for the goose, goes for the gander [8].

5.4.9 Cross-cultural differences and the management thereof

Dealing with different cultures should not be about trying to eliminate or denigrate what is different between the majority and minority cultures, but rather seen as an opportunity for the reconsolidation of the strength of each of the cultures into a stronger and better project team culture [8]. This positive approach does not only let all culture members feel valued for their strengths, but also that they are given the opportunity to learn from others and improve themselves. Keep in mind that although the project team works as a team, the reward system recognises the individuals' performance and also cultural needs.

Notwithstanding the above, at no time must one culture be allowed to disrespect another or the project held hostage by one culture. Mutual respect between the different cultures and allowing adequate space for each other to live to their cultural requirements normally form the basis of a safe balance. Dilemmas like cultural clashes and possible overspill of emotions are inevitable, due to the high stakes of the project environment, but should be addressed immediately as and when they occur. [8]

5.4.10 Systems and procedures

Systems and procedures have been discussed in sufficient detail in section 3.3 together with the different possibilities. The questions which still remain are "who are going to use it?" and "what is in the best interest of the project?" Once these have been answered and the best suited system for the task ahead been identified (which can be a combination of the Mining

and Project House's systems) the answer should be relatively easy – use what is in the best interest of the project.

Double systems are a no-no as it not only complicates matters and confuses everybody, but also requires large amounts of double work, resulting in unnecessary costs. Double systems are normally applicable to the project services disciplines like costing, accounting, time control, procurement and planning and not engineering. But it is even more difficult to find experienced people for these project support skills than finding engineers which mean that it is of the most expensive resources on a project.

5.5 One Management structure: Subcontractors and vendors

It has always been and will always be an issue of who are actually 'project stake holders'. The conventional method of thinking has always been that it should be limited to those who are investing money in the project [14] (also sometimes referred to as the project equity holders), but who are actually doing the physical work on site? It is not the `Mining- or Project Houses, but the vendors and subcontractors. Their reputation is just as much at stake as the Mining / Project House's because the responsibility stops with them and they are often blamed (correctly or incorrectly) for late project completion. Mining- and Project Houses are starting to realise that without the subcontractors and vendors there will be no projects because there will be no-one who will build it.

As much as the Mining House is dependent on the Project House's project team , to the same extend the Project House's project team depends on the vendors and subcontractors. All Mining House - Project House relationship factors are just as applicable to the Mining / Project House and vendors / subcontractors relationship and although being unreasonable and fighting may win the battle, there is a good chance that the war will be lost.

Subcontractors and vendors are (quite correctly) expected to guarantee the performance of their process equipment as they designed it. In order for them to honour this guarantee, they will scrutinise the associated utilities and services required / supplied. Sometimes they will even do the design thereof (to double check it) because it affects the performance of their equipment and it's in their interest to get it right. These design and selection services are normally available at no extra (or very limited) cost to the project but most project management teams still prefer to do it themselves and consequently accumulate unnecessary

costs. A further advantage of involving the vendors and subcontractors early in the design phase is that they can immediately tell the design team which is the most economical option (time and cost) from a construction point of view.

5.6 Project Incentive model

Traditionally the Mining House's project team incentives are linked to the capex (capital expenditure) while the plant opex (operating expenditure) has very little, if any, affect on it. The Project House's incentive and bonuses are limited to early completion (with penalties for late completion) and their project team's incentive (if any) is linked to the profits the Project House makes during the project execution phase. Main vendors' and sub-contractors' incentives are the profit margin on their portion of work like construction, supply of equipment, material and services which all come from capex budget.

These vendors and sub-contractors project teams' incentives are in turn linked to what profits their companies make on the project, therefore they will try to claim every possible delay or extra cost to improve the company profit and increase their bonuses. With three clashing incentive schemes on a single project, it is no wonder that the project execution phase regularly ends up in a 'free for all punch-up' as everyone is looking after their own interest.

Because the sub-contracts team's incentives are so different, it is a major cause of conflict and friction between various vendors and contractors (like civil contractor versus structural or piping versus E&I) and tends to force the remaining project team to choose sides. The other reality is that, except for spare parts, all of these costs come from the capex budget and as the Mining House's project team is the only party having an incentive to keep it low, they normally end up fighting a losing battle trying to keep it within the budget. By having a single project incentive system all are united by a common goal and are focusing on the same target.

5.7 Sharing Risk

Mining Houses and owners in general have become increasingly aware of risks and sudden market changes, consequently the 1999 FIDIC contract changes place more risk onto the Project House (contractor). This increased risk together with skill shortages and the upswing in the construction industry, make contracts volatile areas, ripe for conflict and dispute. The

risks listed below are not comprehensive, but include most typical inherent, management and associated risk, encountered during project execution [various confidential project documentation such as lesions learnt exercises].

- Accuracy of work scope definition
- Proven process technology
- Plant performance – guarantees and liabilities
- Hazard Analyses
- Intellectual property – patents and confidentiality agreements
- Engineering (risk due running sections / disciplines in parallel)
- Possible process design errors
- Geo-cultural conditions
- Special needs for feasibility studies
- Plant operating costs (opex)
- Site conditions
- Logistics including transportation to site
- Procurement restrictions / pricing
- Project schedule
- Financial considerations
- Post commissioning considerations
- Legal / contractual issues

5.7.1 LSTK Project Risks

Project Houses have quite sophisticated risk analysis and assessment mechanisms, enabling them to define their associated risk within the scope of work, which normally forms part of the corporate management such as a price fix exercise before a LSTK tender is submitted. Unfortunately very little attention is normally given to the parallel identification and management of opportunities and risk as per the King Report (2002) and specification BS 6079-3 because the only options the Project House has, is either to *list unacceptable risk under exclusions from scope of work* (which will get the Mining House up in arms) or *make adequate financial allowance to cover the possible risk* which in turn will increase the price.

Risks originally excluded are regularly unilaterally imposed on the Project House by the Mining House's attitude of either accept the risks at no extra cost or stand a chance to lose the project because of it. The Project Houses are now forced to make ample allowance for these unforeseen risks, which they are not fully equipped to manage, resulting in another price increase

5.7.2 Reimbursable Contract Risks

Reimbursable contracts are a totally different kettle of fish – the Mining House pays the Project House for his manpower booked to the project based on tendered / agreed hourly rates. The Project House does not get any mark-up on the orders placed as it's done on the mining House's behalf and under their name – so where does the risk allowance come from and how is the Project House compensated for it? Sometimes even the management fee is included in the man-hour rates.

> **Case study:** When a process engineer spends 400 hours doing an evaluation on an existing process plant de-bottlenecking exercise and his recommendations to fix it cost R40 million (5 million US$), the Project House must guarantee the corrective actions success under their professional indemnity clause while the fresh-hold of R2.5 million will be coming out of his pocket if the corrective actions are unsuccessful. The Project House tries to reduce his risk by double checking the design twice more (by two other process engineers) resulting in a further 400 man-hours. In total the Project House has now spend 800 man-hours on a job at a lenient rate of R 800.00 / hour totalling to a value of R 640 000.00 (± 80 000.00 US$).
>
> The reality is that it can cost the Project House R2.5 million (± 0.318 million US$) for the professional indemnity fresh-hold if the modifications fail because certain limitations were not noticed during the site inspections, nor was the question posed to the operations personnel who may well have been aware of the condition, but did not think it was important. Alternatively the Project House can end up with a R 20 million (2.5 million US$) claim against them for over-engineering like under the Australian law depending under which country's law the contract is executed.

From a Project House point of view risks, which are impossible to cover under a rates agreement, should be a separate billable item. Mining Houses on the other hand experience it as just another trick from the Project Houses to get some more money out of them.

5.7.3 Conclusion on project risk

In managing risk, the ability to understand the nature of projects by anticipating problems before they could arise and plan an appropriate response to manage the risks should these problems occur, is the essence of good project management. Lanham [7] defined the problem quite well when he stated that the Mining House should take the lead in contract strategies to ensure that the risk is carried by *the party the best equipped* for it. Risks should not be unilaterally imposed by one party onto the other, but must either be assumed by one of the parties or agreed to be shared in a negotiation process during project set-up and captured in a *risk responsibility matrix*.

5.8 Project House remuneration

Project Houses need to make their profits (or at least part of it) one way or the other during project execution or they will be out of business. Although no Project House will expect a Mining House to pay more than what they consider a plant's value (customer value perception), they are entitled to a fair price for the work to be done and the portion of risks they are expected to take.

Probably the easiest way of ensuring that a company (whether a Project House, vendor or subcontractor) loses interest in a project (or task at hand) is not to pay them on time and when they are losing money. When a price (or rates for that matter) and payment terms are negotiated, both parties must feel that they are being treated fairly and are given the opportunity to make a reasonable living. This does not mean that negotiations cannot be aggressive, but when a forced acceptance of a reasonable size discount is expected the submitted price will not be the best price

Although demanding discounts and getting it may impress management, it does not necessarily reduce the price because it is regularly claimed back somewhere else, like additional man-hours on a reimbursable contract. The only way round this situation is for the Mining House is to trust the Project House for their best price (and make it clear in advance) and for the Project House to really submit their best price. This approach requires senior management (from both the Mining- and Project House) involvement and approval in principle to have any chance of success.

5.9 Conclusion

It seems that there is currently sufficient available work in the South African mining industry for the Project Houses and therefore prices are sometimes unrealistically high and this leads to conflict and claims [7]. These conflicts and claims have the nasty habit of surfacing at the most inappropriate times namely at project closeout such as during mechanical completion, cold- and hot commissioning. The last thing an employer (Mining House) then wants is a de-motivated Project House (contractor) who is losing money (and interest on the project for that matter) and is forced to reduce manpower (which is sometimes key resources) due to financial constraints.

With business transformation outsourcing the Project House knows that they are part of the equation – whether lean times (not much work around) or times of abundance (when there is too much work). This sense of security will enable the Project House to minimise the effect of the changing markets on their price and keep it relatively constant. The Project House knows that should market conditions change drastically (for better or worse) they can talk to the Mining House about it because there is an open relationship based onmutual trust.

Up to now detailed knowledge of outsourcing in the Mining – Project House relationship, together with the problems experienced and the solutions thereof have been gained, but outsourcing is a journey, not a destination. Because this relationship, like any other relationship, needs continued attention, it must therefore be managed properly. The attention now shifts to guidelines for changing and improving outsourcing relationships, managing sole outsourcing, life after signing a long term agreement and is summarised under the impact of best practices on outsourcing arrangements.

Chapter 6

MANAGING THE BUSINESS TRANSFORMATION OUTSOURCING RELATIONSHIP

6.1 Introduction

A business transformation outsourcing relationship is not fixed, cast in stone or immune against the changes the world economy will throw at it. In fact the major strength of BTO is its ability to adapt to these changes and ride out the storms. Another myth is that BTO lasts as long as the respective companies exist. A BTO relationship can be ended prematurely, but the determining factor is that both parties agree to it and that it happens in a good spirit. First prize will always be that the situation has been addressed by changing the BTO relationship to comply with the requirements and expectations of both the Mining- and Project Houses. There should be no difference in addressing original-, misunderstood- or new challenges. This chapter addresses this by focusing on managing a business transformation outsourcing relationship strategy and most important of all, managing it.

6.2 Guidelines for Changing and Improving Outsourcing Relationships

As in a marriage or friendship, not all outsourcing relationships work well [8]. People tend to enter relationships with preconceived expectations of the other party's behaviour and commitment. If an outsourcing relationship is not crafted well from the outset, it will fail to achieve the Mining House's desired results and will be unsatisfactory for both parties. In that event, the Mining House may decide to terminate the relationship even before the contract term is completed, resulting in the Mining House having to search for another Project House or taking the process back as an in-house operation. The latter is not considered as a viable option because taking an outsourced process back in-house (sometimes referred to as back sourcing) [3] is a very costly proposition from both time and money perspectives. Most outsourcing contracts do have early termination fees built into them or switching costs are buried in the Project House's price.

Although various conventional outsourcing relationships seem to be acceptable and are surviving, they tend to fail when the need for a deeper level of co-operation or collaboration like BTO arises [K]. As the relationship begins to deteriorate – or never seems to be able to full-fill the original expectations – the Project House doesn't have to be vilified or banished. The relationship can be restructured by altering the parties' involvement and co-operation. Just as it is the Mining House's responsibility to make their objectives, desired results and required service level specifications known upfront so that the Project House can clearly understand how to craft its services and leverage its assets, it is the Mining House who must take responsibility for setting in motion a process to alter and improve a less-than satisfactory relationship. In this instance it's important for the Mining House to have originally selected a partner with whom they felt a high level of communication and commitment could exist and are therefore willing to proceed notwithstanding the differences [F].

Outsourcing relationships (and objectives) are complex arrangements. Success depends on working out the details in advance of contract signing so that both parties understand the goals, their responsibilities and how to handle difficult challenges together. Success in creating and sustaining real value through business transformation outsourcing depends on far more than selecting a Project House with the best capabilities and best price. However, there are many Mining House managers who learn this the hard way. As in a marriage, where the partners blame each other for their difficulties, they may end up terminating the relationship. A better way is to use the following guidelines to re-create the relationship, focusing on realigning interests and all the good points that were there in the first place {L].

The Mining House's needs to take the lead and <u>both</u> parties should accept responsibility for not having structured the relationship effectively

In an unhappy relationship, it is common to find partners who blame each other for the troubles experienced. The reality is that the culprit is a person's expectations of how the other person in a relationship will or should behave. Unless an outsourcing relationship truly is troubled or unsatisfactory because the Project House's performance is below the specified service levels, the root cause of the parties' troubles will most likely be found in the fact that both parties fail to adequately structure the relationship to produce the desired results.

In a BTO relationship, it is the Mining House's responsibility to make those expectations and desires for the end results known to the Project House upfront [L; M]. It should occur first in the request for proposal or request for quote so that the Project House knows how to craft its business solution in a manner that will bring forth the desired results. This upfront structuring of an outsourcing relationship forms the seeds from which a productive relationship can grow and value be created. These seeds, or foundational principles for success, should at least include the following [L; M]:

- Clearly define the scope of services required and matrixes that will be used for measuring the most important outcomes of the desired end results.
- Clearly define the roles and responsibilities of each task, and whose responsibility it is in a responsibility matrix. Responsibility can be Mining, Project House, project team or any other stakeholder.
- Clearly define the goals and objectives required to meet the desired end results.
- Structure the contract to allow flexibility for changing to suit business needs, changes in the marketplace or technology over time.
- A fair price for the Project House's services.
- Adequate incentives to keep the parties' joint interests aligned.

6.2.1 The starting point

Solving problems and changing outcomes are not possible without first defining both the problem and the desired outcome. Tip-toeing through a minefield while keeping up the illusion of a good relationship is not the best starting point. Neither is building walls or blaming the other party. It must begin with open and honest communication and agreement on the need for a change. The one needs to be informed about the other's feelings. The Mining House needs to approach this communication with the statement that they do not desire terminating the relationship but, rather wish to make alterations to it. The Project House should then contribute by saying how they feel about the relationship and what ideas they have about improving the relationship.

Both parties must agree to commit their efforts to a future orientation and solution, rather than the past. Neither party has to come up with answers at this point as they may decide to hire a consultant who specialises in relationship repair to guide them through the process. The starting point is for both parties to be willing to be part of the solution.

6.2.2 Redirecting the focus

Recognising that the illusions are gone and the status quo no longer exists feels almost like embarking on a risky journey without a map. Change scares people, so altering the relationship will require carefully conceived plans and clear focus. Even when both parties are willing to find a better way to do business, they must learn to redirect their energies [M].

Instead of blaming each other, both parties should rather focus on possible solutions which can include shrugging off their "bookkeeping / scorekeeping" attitudes the obstacle to working together towards mutual goals. They need to develop a supportive atmosphere that encourages insight, energy, harmony and trust and realise that indecision, tradition, excuses, procrastination, complaining, not listening, dishonesty, and even a lukewarm approach will break momentum for creating new opportunities for a successful relationship. The solution may even require that one or both parties acquire new competencies and habits or even a culture change (no matter how difficult it may be) [E; L].

6.2.3 Focus on the problem at hand

With or without outside consulting assistance, the Mining- and Project House should determine together how to alter their BTO relationship which could result in partnering at a different level than what has been the case up to now. The process should be focused on the following steps [L; M]:

- Communicate openly with honest self-disclosure and feedback to gain a clear understanding of what counts the most to both parties.
- Both parties must work together to find the potential value of their relationship (that lies beyond what is in the contract) in what will be of mutual benefit.
- Once they find the potential value that can be created, the Mining House and Project House need to work together to form joint objectives. Both parties must buy into a mutual vision, mission and strategy to achieve these joint objectives.
- They need to create incentives that align their interests and motivate them to work together in their effort to achieve their joint objectives. This can be done quite successfully by creating a win-win strategy.
- A new joint culture needs to be created that will determine how the parties behave and respond to new challenges and how they influence the success of the partnership. This joint culture should include structuring the way the parties communicate.

- Both parties must be flexible enough to do whatever is required to make it work - even if it's not their preferred option.

The results of the restructuring efforts in case studies have created stronger relationships that operate from a standpoint of trust, collaboration and teamwork [L]. Both parties now work together in a win-win environment and focus on resolving concerns about their relationships or service performance, rather than separately focusing their efforts on trying to protect their share.

When an outsourcing relationship has reached the point of being unsatisfactory to either or both parties, their mode of operation will become more reactive to problems (past and future) instead of being proactive toward reaching their joint goals. A mindset of both companies taking responsibility for ensuring success will result in creative solutions which often exceed the desired end result. With this mindset, the parties develop a high level of trust between their respective organisations and their discussions become solution oriented [L].

Continuous improvement is also fostered in an environment of working for common purposes and making contributions toward collective success. By following the guidelines outlined, both Mining- and Project Houses in less-than-satisfactory relationships will be able to reshape their relationships with a new perspective and focus on working together to achieve their mutual goals. In doing so, they create more value for both organisations through BTO.

6.3 Sole Outsourcing in a business transformation outsourcing relationship

Sole sourcing is the practice of working with a single service provider (Project House in this case) to define, negotiate, and purchase services. Traditionally sole sourcing is used to deliver a simplified, faster service acquisition process because it entails fewer of the difficulties of staging and reviewing a multi-service provider process. Sole sourcing can deliver significant potential efficiencies over multi provider outsourcing efforts in terms of cost and time for completing the tender and adjudication process [O].

6.3.1 Generic reasons for sole sourcing

Buyers of outsourcing services may select either a sole source or multi-supplier approach for a wide range of reasons as indicated in table 6.1. In many cases, the buyer has a pre-existing

relationship with the supplier, either through consulting efforts or existing outsourcing relationships. Indeed, it is rare that a buyer elects to pursue a sole source approach without having already entered into some form of dialogue or relationship with a potential supplier.

Sole Source	**Multi Source**
• Speedy process is critical • Reputation of supplier is critical • Supplier has unique capabilities; in some cases offering unique business cases (e.g., drive top-line in addition to efficiencies) or helping transform processes in a manner that delivers business value • Complexity of the potential arrangement - typically driven by the size of the deal, interdependencies with other processes, or strategic importance • Existing "entangling" alliances (e.g., supplier owns critical software or exclusivity rights) • High degree of trust between buyer and supplier in the form of pre-existing relationships, either institutional or personal; often based upon proven ability of supplier to deliver results • Corporate culture favours collaborative sole source approach • Opportunity for a broader buyer-supplier alliance (e.g., cross-selling of products, managing sales channels, or providing access to technology or research capabilities)	• Services in scope are well-defined within the marketplace • Focus on achieving lowest price over broader measures of value • Multiple solutions based on differing supplier strengths need to be evaluated due to insufficient ability to perform rigorous internal analysis of options • No dominant pre-existing relationship guides the selection • Corporate guidelines, governmental policies, or culture dictate multi-vendor approach • Change management and implementation challenges are minor • Organisation is highly sceptical of any sole source approach, thereby slowing up decisions and undermining the credibility of the process

Table 6 1 Reasons for buyers electing either sole source or multi-supplier approaches [O]

An Outsourcing Centre poll [O] revealed that existing relationships and a desire for a speedy process are the two largest factors influencing a company to consider a sole source approach – together accounting for almost half of the decisions to consider a sole source approach (figure 6.1).

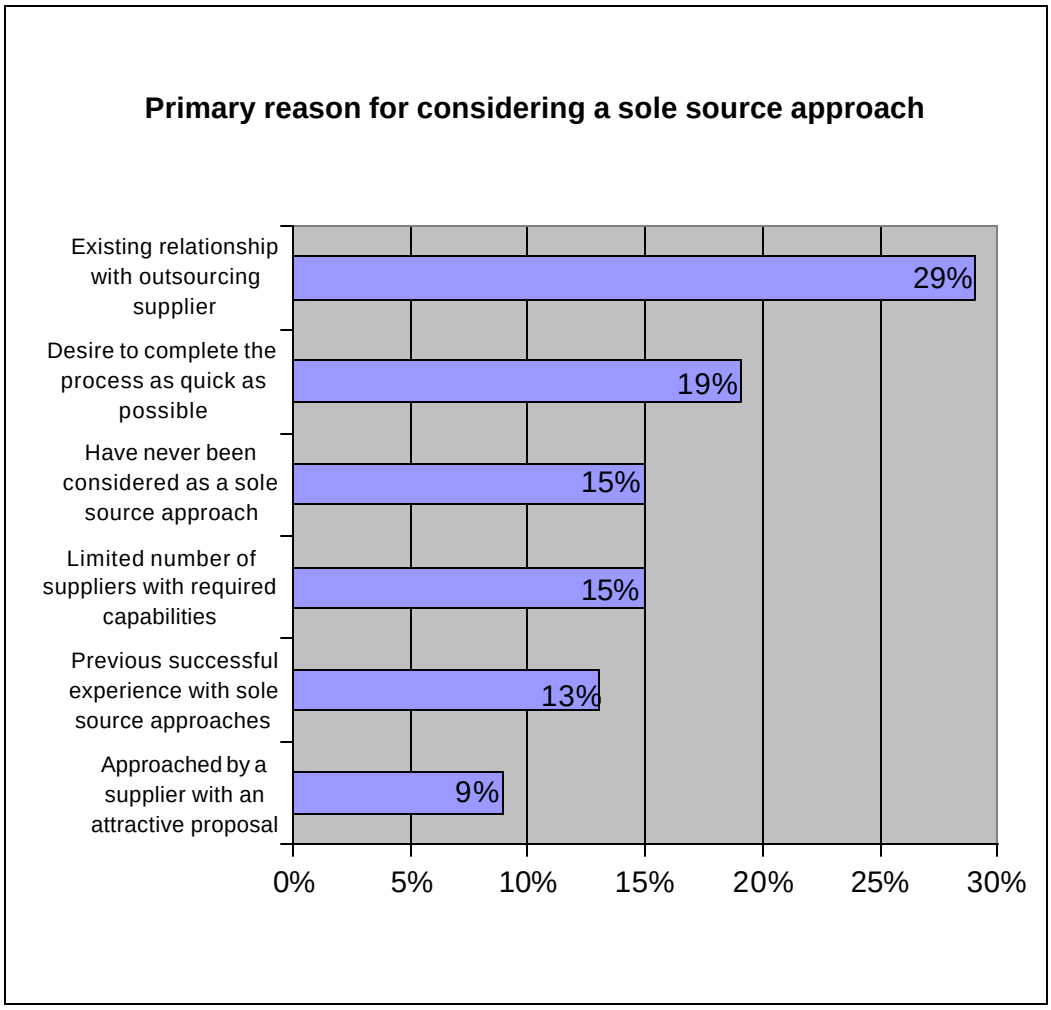

Figure 6.1: Primary reason for considering a sole source approach [O]

Interestingly for outsourcing suppliers, buyers disclosed that a supplier approaching them with an attractive proposal was the least likely reason to consider a sole source approach. Given the high switching costs of outsourcing arrangements, building upon existing relationships seems to be the natural choice for sole source approach reasoning, but that alone does not necessarily ensure success.

6.4 BTO and sole outsourcing – a generic approach

In the early 1990s, sole source approaches to outsourcing were taken for many larger information technology outsourcing transactions, requiring either complicated or rare sets of capabilities. Because suppliers with such capabilities and geographic presence were scarce, buyers were faced with a limited selection of those capable of delivering the required services [P]. More recently, as business process outsourcing (BPO) has become an accepted alternative, buyers are choosing sole source approaches with suppliers with whom they currently have a relationship or suppliers who have unique capabilities [O].

The approach to tap existing BPO relationships for sole outsourcing was often pragmatic. Firstly, in the early days of sole outsourcing, few suppliers had proven capabilities for delivering the processes under consideration. Secondly, by entering into a sole source relationship, the buyer taps existing strong relationships as well as simplifies the intermingling of current information technology outsourcing services that often serve as the foundation of existing BPO processes. Finally, existing relationships can shorten the negotiating curve at a time when economic pressures dictate a need for speed.

Another poll [O] indicated that 50% of organisations are more likely to consider a sole sourcing approach for BPO in the information technology environment (Figure 6.2). Conversely, 33% are less likely to consider sole source approaches for BPO. Surprisingly, only 17% of respondents indicated that the difference between BPO and ITO has no impact on their sourcing approach. Clearly, BPO is driving a change in how organisations think about their outsourcing approaches – both towards and away from sole source approaches.

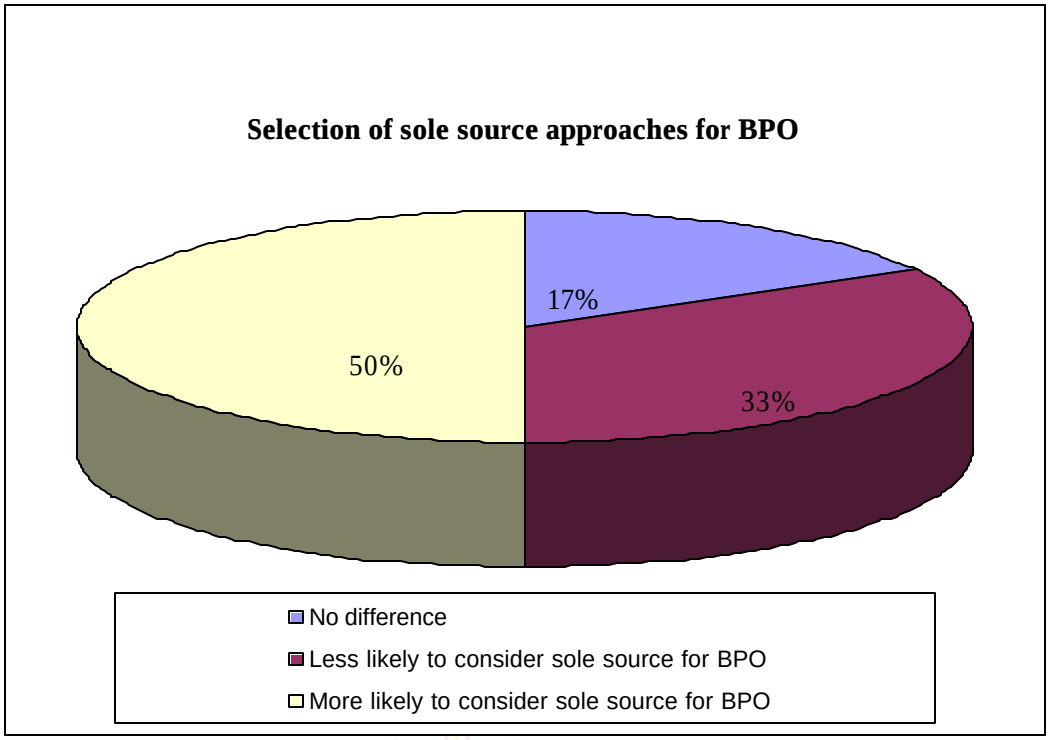

Figure 6.1: Selection of sole source approaches for BPO [O]

6.4.1 The hidden costs of multi-vendor sourcing:

A final factor has also contributed to the consideration of sole source approaches: buyers experience in multi-vendor outsourcing arrangements has recognised the less obvious limitations that multi-vendor approaches face. The hidden costs of multi-vendor sourcing can dramatically influence the ability of the buyer to build a relationship with the right supplier.

- **Longer, more taxing procurement process**

  In a multi-vendor case the multi-bid process, requests for proposals must be solicited, then delivered, reviewed, and allocated. This lengthy process typically delays the project program due to outstanding certified information. It also adds up the buyer's and the supplier's incurred costs to the overall price. Further, the burden of simply engaging with more than one supplier may strain existing resources within the organisation.

- **"Over-promising" by a supplier**

  In an effort to win in a multi-vendor situation, suppliers occasionally commit to deals that they cannot deliver in time or at the tendered price resulting in 'short-cuts' being taken. Such commitments lead to poor solutions or solutions that cannot be reasonably implemented and may even result in a multibillion dollar project been delayed for months while waiting for rectification of critical equipment worth only a few thousand dollars.

- **Lack of attention**

  Small to medium size clients in a multi-vendor process may struggle to gain the full attention of suppliers. The result is fewer "pursuit dollars" being allocated to the supplier's sales efforts, thereby limiting the degree to which the supplier can tailor its solution to match the client's unique needs (or even pursue the opportunity at all).

6.5 Sole outsourcing versus BTO in a Mining- Project House relationship

As Mining Houses attempt to streamline the outsourcing process, a range of reasons may make sole business transformation outsourcing a viable, cost- and timesaving option if applied wisely. Although references list various arguments in an attempt to determine which of BTO (business transformation outsourcing) and sole outsourcing was the first, and they do have an argument for each case, the outcome is of purely academic value as both options form an integral part of modern business transaction models in the Mining- Project House relationship [3; O].

The BTO and sole outsourcing relationship in the mineral commodity industry (including the Mining- Project House relationship) can probably be best described as a chicken and egg situation – the one grows from the other depending from what side of the line it's viewed. In the IT and services industry (like call centres) the BTO model grew from the sole outsourcing model [P]. In the slow adapting business models of the mining and metallurgical processing industry and especially the Mining- Project House relationship, both sole outsourcing and BTO are only starting to become a reality.

In the Mining- Project House relationship sole outsourcing is a natural outcome of the existing outsourcing processes (irrespective if it's conventional; collaborative or transformational outsourcing) because it stems from the trust that already exists in the

current relationship. A sole source approach can however be susceptible; therefore Mining- and Project House executives must address the mutual objectives and strategy early in the process. By doing so they will dramatically increase the chance that sole BTO initiatives will suit both the Mining- and Project House's objectives and grow into a prosperous long term relationship [P]. The key is for the Mining House to take responsibility for ensuring that the sole source BTO approach is disciplined and rigorous [P].

6.6 How sole outsource approaches can derail

While sole outsourcing approaches can help to streamline the process, it can also create un-anticipated stumbling blocks. The decision to undertake a sole outsourcing arrangement can also be just the beginning of a long and expensive process, therefore it is important to understand how a sole outsource process can unravel if not carefully managed.

It starts with the potential difference in Mining- and Project House goals - the Mining House wants a solution tailored to meet their specific needs while the Project House wants to develop a solution that compliments its capabilities and infrastructure. Sometimes the Project Houses even make service and delivery promises in order to create an emotional commitment and trust that will prevent the Mining House from declining the contract or award it to the opposition.

Regularly one of the parties (either Project- or Mining House) tries to move quickly through the initial stages in order to expedite the signing of a 'loosely defined' contract which will result in an agreement that better serves their own needs than those of the other and more specifically the project or BTO arrangement. These rushed commitments lack the appropriate details in the following three key areas [P]:

- The scope and nature of the arrangement.
- Guaranteed levels of services to be provided.
- The nature of how the Project- and Mining House will share in the value created by the Project House's solution to unlock the Mining House's mineral resources.

In these cases, one party has negotiated for terms more favourable, easier to deliver and less demanding on them – regardless of whether the terms and deliverables fully suit the other stakeholder, unique project needs or the BTO arrangement. Ultimately, the other party finds

themselves locked into the agreement and are reluctant to re-open the discussions to address any perceived shortcomings due to possible high level political implications [O].

Once realised by executives, such negotiations may bog down as both Mining- and Project Houses attempt to inject their goals and motives into the agreement. This can dramatically slow the project initiation process, often resulting in one party enjoying perceived negotiating power in its favour while the other becomes increasingly concerned with facilitating a speedy closure to the arrangement. If negotiations do slow down significantly, two additional challenges are prone to emerge.

First, any slowing of the negotiations can lead to a respective wandering of focus and attention by either (or both) Mining- and Project Houses. The Mining House loss of focus can result in a re-interpreting of the desired objectives and scope. This leads to a moving target, which changes the nature of the Project House's point of view and due to the Mining House's opposition the Project House then finds an opportunity to build barriers to the arrangement resulting in consensus regarding the project's scope and objectives been undermined [O].

Second, idle time during the negotiation phase can lead to the introduction of additional processes by the Project House to broaden the scope of the initiative and inclusion of mechanisms to limit their risk. Just as the Mining House often senses a lack of firm scope to the agreement, the Project House's own internal risk mitigation will seek to insert additional protections into the agreement's terms and conditions to protect them from perceived financial risk associated with a poorly defined scope or unclear Mining House expectations.

To avoid these types of issues in a sole source situation (or any other situation for that matter) the process must be carefully designed by both the Mining- and Project House. In order to present an option that is credible to internal managers and decision makers, the Mining House must guide the sole source selection process on the base of the BTO relationship. This prevents any inappropriate influence by the Project House and ensures that the decision was made according to the Mining House's specific needs [P].

6.7 Managing a sole BTO process

Although a poorly managed sole BTO approach can fail to meet the Mining House's expectations, those organisations that take time to develop and lead a thoughtful approach

can attain all the desired benefits of a sole BTO approach. Five factors come to bear in creating a successful sole BTO approach versus conventional outsourcing. Although several of these factors are considered as important in multi-supplier approaches, they take on additional importance and increased opportunity in a sole BTO situation.

6.7.1 Develop the relationship

The significant costs associated with entering into an outsourcing relationship dictate that the Mining- and Project House nurture and maintain a healthy relationship. A healthy relationship displays many attributes, including: mutual respect, desire to align interests as best as possible, commitment and ability to work out differences, and trust in the other party's intentions. In short, in a BTO outsourcing context, Project Houses should be much more than mere service providers. Accordingly, one objective of a sole BTO approach should be to advance the relationship as much as possible.

In a sole BTO situation, both the available time and the process used to develop the solution can be designed to provide opportunities to strengthen the relationship beyond what is possible in a multi-vendor (Project House) approach. Additionally, the approach to negotiations provides an opportunity to lay the foundation for an enduring relationship. Both parties should adopt a solution development and negotiation philosophy that builds a relationship between Mining- and Project Houses, versus a positional-based spec and bid process that tends to agitate differences.

An "interest based" approach to negotiating can be used to help focus the relationship on the most important principles and identify common interests, which in turn increase the chance that the relationship will endure over time. The ability of the Mining- and Project Houses to work more closely together in a sole BTO approach often better facilitates this process than would a multi-Project House outsourcing approach.

6.7.2 Engage senior leadership

Senior executives from both the Mining- and Project Houses must view the engagement as a broad problem-solving endeavour versus a mere review and supplier evaluation. Successful sole BTO is built upon trust and goodwill. While rank-and-file employees might carry the day-to-day activities between Mining- and Project Houses, sole BTO relies more extensively on trust at the highest levels of the organisations [P].

This is important for several reasons. Specific solutions often are highly tailored to the individual Mining House and projects needs - both in terms of the actual services delivered and commercial terms of the arrangement. As a result, these decisions require authority and buy-in from the highest levels of management from both the Mining- and Project Houses together with meaningful engagement in the details of the agreement. The natural tendency of senior management to delegate the accountability for the process to lower levels within the organisation, often spells trouble because it leaves them a backdoor open [P].

Also, without senior management setting a strong course and accepting accountability for the decisions, lower-level managers will tend to evolve sole BTO processes into an unending benchmarking exercise (such as a "see if we are getting a fair deal" attitude). This typically leads to cloudy conclusions that do not reflect the limits of benchmarking and often result in a breakdown in the much-needed trust between the two organisations.

6.7.3 Board and senior management involvement

Different companies have different internal governance guidelines for reporting programs of particular sizes, scope, or impact. Depending on the size and impact of the transaction, the Board of Directors might need to be informed and educated about the project in order to understand, agree to, and, if necessary, sign off on the sole BTO approach. Preferably, this should be done at the earliest stages of the process. It is often not enough to have senior executive knowledge and buy-in for a sole BTO arrangement to work. Such acceptance must permeate to the board level due to the significant economic impact under consideration [P].

By their very nature, sole source approaches are easy to criticise for lacking options – ranging from Project House to scope, solutions and pricing. These approaches may also be criticised internally for lack of objectivity, appearing that the organisation not only incorporated an outside opinion, but relied solely on these preconceived needs and expectations in determining the outcome of the solution. In short, a sole source approach often appears to offer only one choice. However, this conclusion does not acknowledge the intense time and concerted effort that can be spent with a single supplier designing a solution tailored to a Mining House's specific needs. Such customisation typically works through a range of alternative solutions, to identify which creates the greatest mutual benefit [K; O].

Not many boards of directors or senior management have experience with sole sourcing approaches, therefore when a board is presented for the first time with a sole source situation

for which it has little or no background; the typical reaction is to question the legitimacy of the approach. Concerns can range from whether all options have been considered to whether it is the most cost-effective solution for the Mining House [O]. This typically results in additional fact gathering and potential redesign of the process to attain proposals from additional Project Houses. The inevitable impact is that additional time, effort, and resources are invested in the sole BTO process.

While the Board might eventually come to the same conclusion that was originally presented (i.e., that sole sourcing is a viable approach for the given situation), quite frequently more time and money are ultimately spent than if the organisation had pursued a multi-vendor approach. This can be avoided by taking any proposed sole BTO approach to the board early in the process (even before the process begins) to attain buy-in and provide an opportunity for the board to influence – or at least feel integrally involved in the design of the process.

6.7.4 Customer value by comparison

Both Mining- and Project Houses must adopt a sophisticated external comparative analysis process to ensure fairness of value sharing. It is essential that the Mining House be intimately involved in the development and ongoing refinement of the scope of services to be delivered. To do so, the Mining House must know what they are expecting from the Project House's services and how such services will help the Mining House achieve their strategic goals. Working in tandem, both Mining- and Project Houses must agree on and set specific targets for the Project House, which requires the Mining House to complete analyses of what would not be required if the Mining House had alternative solutions for comparison.

By comparing each component of the potential solution, the Project House is effectively continuing to compete for the deal. The possibility of pulling some or all of the services out of the scope of the agreement provides incentive to ensure the Project House provides the best possible solution at a fair price. The Mining House must set out unequivocally from the beginning that if goals are not achieved, the process may become multi-Project House again at any time.

6.7.5 How specific to be

The Mining House must specify the process by which the problem-solving analysis and solution evaluation will take place. This requires the Mining House to take ownership of the

engagement process with the goal of setting specific milestones and end goals which will allow them to maintain control of the decision- and problem-solving involved in reaching the deal. This will avoid having a deal on the table with significant questions surrounding the validity and competitiveness of the solution.

Additionally, the Mining House's objective in specifying the process is to build a framework by which both parties will be aware of prescribed milestones and goals, and ultimately realise when a fair deal – and its defined principles – has been achieved. In addition to setting the timing and objectives for the process, Mining Houses should set guidelines for the level of detail for the scope and metrics used to measure the success of the BTO relationship.

Although most Mining Houses believe that they provide these inputs to the Project House, the level of detail and thought given to Project Houses is often in order of magnitude less than what is actually required. The scope targets must be set to define which processes are in-scope. This should be initiated by the Mining House's with the Project House offering alternatives through the appropriate mechanisms.

In addition the Mining House specifies the level of precision the Project House must use to establish the roles and responsibilities in the BTO process for the proposed pricing. For example, the Project House can develop a responsibility matrix for the proposed solution to delineate the critical responsibilities of both the Mining- and Project Houses, thereby allowing the Mining House to understand which activities it would retain or lose and the financial impact of each (like risk allowances). These responsibility matrixes can even form part of the final contract.

Additionally, the Mining House must insist that the Project House's proposal detail the metrics that would be used to measure the success of the proposed solution. Forcing both parties to discuss and agree upon the specific metrics provides clarity that bypasses any pleasant, but non-accountable behaviour.

6.7.6 Conclusion on managing sole BTO relationships

Although a sole BTO approach will not be the best solution for every organisation, it remains a viable approach for the right situation. Many factors must be weighed, including the Project House's ability to meet the Mining House's specific needs, either with an off the shelf service or a custom-tailored solution. Other factors include existence and strength of current BTO relationships, the scope of the required services and the ability of the Project

House to adapt and provide new services over time and acceptance of sole BTO across both organisations.

If a sole BTO approach is selected, the chance of success is increased by using the existing outsourcing environment to begin building or deepening the Mining- Project House relationship by meaningfully engaging senior leadership, involving the Board early in the process, comparing the Project House's solution to external measures and being specific about what is expected of the Project House during the process. Carefully designing and executing a sole BTO process can capture the desired benefits like a more streamlined process to contract signing, leading to quicker realisation of intended benefits and a stronger relationship.

6.8 Contracting for change

Whatever the current trend in project implementation and business transformation outsourcing, the key issue confronting the persons representing Mining- and Project Houses remains the same - how to allocate the costs and benefits that result from changes to the project and the BTO agreement over time. Few Mining Houses realise the potentially snowballing impact of late changes on project cost and time as well as the associated outsourcing relationship [L].

The scope and volume of the services the Mining House requires are affected by many factors beyond the Mining House's control – something which Project Houses generally fail to realise and take into consideration. Each of these changes listed below affects the Mining House's requirements while also having a potential impact on the Project House's costs.

- Changes in demand (and associated price) for the Mining House's product or mineral commodity.
- Changes in the technology or business processes the Mining House uses or is forced to use due to changes in ore bodies (e.g. from oxide based to sulphite based gold ore).
- Changes to the regulatory environment in which the Mining House operates (like environmental laws).
- Changes to the Mining House operations resulting from one-time events such as the purchase or sale of reserves.
- Changes to the technology used by the technology provider.

- Changes to the technology provider's service delivery model.

While some changes will cause the Project House to incur additional costs, others may enable the Project House to reduce the amount they spend in providing the agreed services. Moreover, changes that impact the Project House's costs often give rise to controversy as the Project House wants to be compensated for the additional costs, while the Mining House wants to realise the benefit of the Project House's savings.

This issue is especially challenging because at the time the parties are negotiating the BTO agreement, the nature, timing, and magnitude of the changes that will occur, are unpredictable. Given these circumstances, it is futile for the parties to attempt to anticipate the specific changes they will confront during the life of the agreement, estimate the costs or benefits arising from such changes, or allocate such estimated costs or benefits [N]. To the contrary, well-represented parties should instead develop broad principles for inclusion in the outsourcing agreement that they can apply to allocate the costs and benefits when change occurs. Five of these broad principles are listed below [M; N].

6.8.1 Non-material changes should not generate additional charges

The first principle upon which the parties should agree is that, no matter the cause, non-material (which includes manpower and time extensions) changes should not have any cost implication. The principle is simple – no additional or re-work (only substituting one option with another) no additional cost. For example, if the Project House does an Scurve indicating progress for internal reporting structures, it would be unreasonable to charge the Mining House to include it in their monthly report. Changes are not an excuse for the Project House to make additional profit!

At the same time, the agreement should state that performance of functions and the assumption of responsibilities that are materially different to those described in the agreement, will require an adjustment to pricing. Extension of time can be even more contentious than cost and must therefore be motivated and managed carefully.

6.8.2 Increases must be calculated on a price net basis

Any additional Project House' charges should be determined on a net basis. In other words, any increase in price should reflect the additional costs incurred by the Project House, net of any costs that may be eliminated by the change. For example, the provision of a new function

may render another function unnecessary. The Project House should reduce the additional charges to reflect the costs the Project House can save by no longer performing that unnecessary function.

The rationale behind this approach is that for a services arrangement to survive on a long-term basis, each party must believe that the other is dealing with it on a fair and equitable basis.[M] The BTO agreement can reflect this principle by requiring that Project House quotes for new services equal the sum of: (the Project House's best estimate of the additional costs it will incur to provide the new service) + (a reasonable margin thereon) minus (the Project House's best estimate of the costs it will be able to eliminate by virtue of the change + a reasonable margin thereon).

To give effect to this statement, Mining Houses sometimes require from the Project House to share the basis for its cost estimates with them. This can be very difficult to negotiate since the estimate is likely to be based at least in part on actual historical costs. Project Houses generally are reluctant to share information about their costs, notwithstanding the view that an open and transparent relationship is more likely to withstand the test of time than one based on a black box agreement. This is probably the reason why some Mining Houses insist on reimbursable type contracts and are not willing to consider LSTK type contracts.

6.8.3 Use price adjustments, not price increases

Adjustments to pricing should not be a one-way street. If a change results in a reduction in the Project House's costs, a reduction in the Project House's charges should follow. In other words, price adjustments may be in the Project House's or the Mining House's favour.

6.8.4 Develop consumption-based unit pricing

The parties should develop and agree upon pricing algorithms that will accommodate changes in the volume of services consumed by the Mining House. On the other hand the Project House must be compensated for the fixed cost of any infrastructure the Project House deploys to provide the services. Notwithstanding the above the Project House should be compensated for variable costs only as the services are consumed by the Mining House.

Project House can implement this principle by providing a fixed monthly charge that reflects its fixed costs and monthly unit charges for each unit of service the Mining House consumes. The Project House should reflect economies of scale, if any, in the unit rates. Actual

algorithms may be more complicated if additional fixed infrastructure is required to support higher volumes of service.

6.8.5 Plan for significant one-time events

In the case of a significant non-recurring event, the parties should review and, if appropriate, adjust their pricing. For this purpose, the term *significant non-recurring event* refers to an event in the lifecycle of the Mining House that is generally not part of the ordinary course of the Mining House's business (e.g., an acquisition or disposition of a major line of business) that causes a significant (for example, more than a 25 percent) change in the volume of services consumed by the Mining House under circumstances in which such change in consumption is expected to last for a reasonable time

The rationale behind this rule is simple. Following a significant non-recurring event, the pricing model reflected in the agreement may no longer serve to provide fair and equitable pricing. Moreover, while it is possible to anticipate that the pricing model may no longer work, it is impossible to predict which party will be disadvantaged therefore a pricing review is the appropriate action.

The contract provision reflecting this principle should provide that if there is a significant non-recurring event, the parties will meet to review the Project House's charges and to consider appropriate changes. The provision should further provide that if those discussions do not produce agreement between the parties, the pricing will be equitably adjusted. The reason behind this approach is that both parties are placed at risk when pricing is put into the hands of a third party. Under these circumstances the parties have a strong incentive to make the decisions and compromises required to reach agreement.

6.9 Life after signing a Long term Outsourcing Contract

The fact is, when cost reduction is the primary objective like in a conventional outsourcing initiative, the Project House (service provider) often achieves that goal within the first two years. But BTO is also a long-term arrangement and many projects / contracts have a five-, seven- or even ten-year term.

More and more Mining Houses are realising and recognising that outsourcing is a strategic solution and ensure their arrangement is designed to create continued value over the life of the contract. But what about those long-term contracts signed more than a decade ago?

While some clients put their work out for re-bid in a competitive marketplace at the end of the contractual term or for each new project, others are happy with their service providers and just need some contractual fine tuning to make it more effective in today's environment. The fact is that once the decision to outsource has been made, it becomes incumbent to manage the process over time in order to make it better and more cost-effective.

Although outsourcing of project implementation and construction management was primarily cost driven, it's moving towards resources for continuity of business, a fixed-cost structure and value creation. Good service is more than looking for dust in the corners of the garages, but often Project Houses are inflexible and don't place high value on the Mining Project house relationship itself [N].

Mining Houses know that cost scenarios changed over the ensuing decades and that their outsourcing arrangement could be made more effective from a customer value point therefore new contracts tend to include incentive pricing components. This gain-sharing strategy encourages the Project House's value engineering on capital projects (bidding the whole project out before awarding a contract) and ensuring the ability to self-perform, rather than subcontracting out to a third party for peak or infrequent requirements. Even if the self-performing requires the Project House to take on additional contract staff, it may still be more cost-effective [K; N].

6.10 Conclusion

When looking at business transformation outsourcing relationships it's clear that managing it is not an easy task by any standard. Adopting strategies like sole vendors etc. complicates the situation rather than simplifying it. Although the main objective remains to comply with the requirements and expectations of both the Mining- and Project Houses, the road does become more uncertain with very little directions.

The requirement now is for senior management to get involved, do more work upfront (like risk matrix) and then allow the project team to take the project and run with it. Managing the project will be more difficult as a culture of *taking ownership of the risk and manage it* rather that the conventional approach of passing the buck must be created.

There should be no difference in addressing original-, misunderstood- or new challenges. One of the best guidelines for managing the BTO agreement is possible outsourcing best practices [E] which have been slightly adapted for the specific environment.

6.11 The impact of best practices on outsourcing arrangements [E]

Notwithstanding the level of outsourcing or the maturity of the outsourcing relationship, all outsourcing relationships have to go through the different phases of contract negotiation, portfolio governance and relationship management, performance monitoring and contract termination. Although each of these phases has different factors impacting it, there is some common ground between the phases and instead of repeating it, these common factors are described under general.

6.11.1 General

The following factors are applicable throughout the outsourcing life cycle:

- **Service provider assessment is a two-way activity**

  Focus is not only on evaluating the ability of the Project House to deliver as per its commitments, but also on jointly exploring possible challenges of working together and incorporating the Project House's input on what the Mining House could do to ensure a more successful partnership.

- **Project House selection is based on multiple factors**

  Project Houses are evaluated and selected not only on the basis of price, but also on their ability to work as outsourcing partners, quality of service, integrity and governing procedures.

- **Protocols clarify how Mining House business unit managers and corporate sourcing should interact with the Project House during the outsourcing relationship**

  Procedures must be clear on who is responsible for doing what, who has the authority to make which decisions, and who needs to be consulted for their input on which issues and decisions.

6.11.2 Negotiation phase

The following factors are affecting the negotiation phase of outsourcing arrangements:

- **Project House negotiations are managed as a collaborative process**

  Focus is on maximising value for both sides (creating a win – win situation), while coercive tactics such as squeezing the last buck out of the Project House, must be avoided. Remember the quickest way for a Project House to lose interest in a relationship is if he is losing money.

- **Negotiation is used as an opportunity to build a strong foundation for a good working relationship**

  Focus is as much on setting the stage for working together effectively once a deal is signed as it is on arriving at specific contract terms. The involvement of the actual teams who will be doing the work is therefore of the utmost importance.

- **Negotiators are assessed and compensated based on overall quality of the deal**

  Assessments and incentives are based on multiple dimensions and not just price. Factors to include should be total value created, positive or negative impact on the relationship, value created for the supplier, and the like.

- **Formal hand-over and kick-off activities are conducted when new Project House relationships are established**

  Hand-over and kick-off activities should also include anticipating and jointly planning for challenges, agreeing on decision-making, escalation and arbitration procedures (for when disagreement or conflict arises) and jointly defining shared performance and relationship health metrics. Joint launch events and press releases may also occur when major new contracts are signed.

6.11.3 Portfolio governance and relationship management

The following factors form part of portfolio governance and relationship management of outsourcing arrangements:

- **Relationships with Project House who work with multiple Mining House business units are managed in a coordinated fashion**

  Communication and decision-making procedures are developed and implemented to ensure effective internal and external co-ordination between Project Houses and Mining Houses. The principle is to keep the Project House informed and to co-ordinate demand to ensure as continuous demand as possible for the Project House's services.

- **Project Houses are encouraged to share innovations**

  A mechanism exists to encourage product or process innovations and the Project House receives an incentive (either money or shares in the product line) for doing so.

- **A relationship manager is dedicated to each strategic Project House relationship**

  Dedicated client relationship managers act as internal advocates for Project Houses and serve as a resource and communication point for Project Houses such as facilitating co-ordination among different internal groups who interact with a given Project House. This can also be the case for Mining Houses and/or channels, and/or alliance partners.

- **A formal mechanism enables joint strategic planning with Project Houses which is aimed at creating and preserving long-term relationships**

  Such a mechanism enables Mining Houses and their key Project Houses to share information about their respective strategies, find ways to help each other meet important goals, and better align long-term plans. Such a focus ensures companies maximise the value of client – service provider relationships. A long- term time horizon is critical to facilitating joint planning and investment.

- **Mining- Project House relationships are segmented into relevant tiers**

  Tiers are based on clearly defined criteria such as strategic importance and the cost of switching Project Houses. A mechanism is created to help determine which tier Project Houses fall into and help determine how different Project Houses should be managed (depending on tier).

6.11.4 Performance Monitoring

Performance monitoring of outsourcing relationship is highly affected by the following principles

- **Regular Mining- Project Houses relationship assessments are conducted**

  Two way assessments are conducted against metrics for business performance and the health and quality of the working relationship.

- **Relationship assessments are two-way**

  Focus is not only on Project House's performance, but also on assessing whether the Mining House has met its obligations and on diagnosing problems jointly and finding opportunities for mutual gain.

- **Assessment data is reviewed and analysed systematically and jointly with Project Houses**

  A combined formal mechanism exists to ensure that problems or opportunities uncovered by performance assessments are acted upon.

6.11.5 Relationship termination

The following best practices are used to bring about the best possible solutions when terminating outsourcing relationships:

- **Termination based on changes in strategy or business needs to occurs in such a way that minimizes negative impact on Mining- and Project House**

  Such termination decisions are made in consultation with Project House with significant advance warning, and with efforts to mitigate impact to both parties.

- **Termination decisions are negotiated and communicated in a respectful, collaborative manner**

  Termination of Project House relationships is conducted in a way that preserves the potential for the parties to work together in the future, and minimises potential for damage to the reputation of both companies.

Chapter 7

CASE STUDY: COMPARING THE DE BEERS - BATEMAN MINERALS RELATIONSHIP WITH THE BTO MODEL

7.1 Introduction: Background of the De Beers – Bateman Minerals relationship

Up to 1999 De Beers was part of the Anglo American group with access to and utilising the Anglo American project execution office (AATS – Anglo American Technical Services) for project implementation. The unbundling of the Anglo American group and subsequent sell-off of shares to the Botswana Government and the Openheimer family left De Beers without a project implementation office and made the successful implementation of any new projects highly unlikely as no other in-house project implementation capabilities existed. Subsequently a Strategic Project Office (SPO) was established with the mission of being "a catalyst for change and growth within De Beers by creating a mature project implementation capability".

7.2 De Beers' strategic decision to outsource their project implementation capabilities

Instead of using one of the three conventional options listed in section 1.2 and grows into a big department, De Beers made a strategic decision to rather outsource their project implementation requirement. The strategy is form alliances with various service providers such as Project Houses (Bateman Minerals) who are capable of supplying De Beers with the required project implementation services, and have a proven track record in the diamond industry.

This outsourcing strategy had all the advantages listed as the objectives of outsourcing in section 1.4, but the following key points are believed to have played a vital role in the decision:

- The De Beers management could concentrate on core business while only paying for those services used (no capital investments, high overheads or management demands).

- Immediate access to project implementation capabilities with new project implementation seriously lacking behind schedule (reduced time to market).
- Service provider had a proven track record in required field of expertise (improved end user satisfaction).
- By using one Project House for the next five years projects De Beers will not only benefit from an experienced team, but the continuity of personnel will ensure that new developments are implemented on all new projects and limit repeating of mistakes.

Although the possible benefits to De Beers was taken into account in setting up the SPO and incorporated the outsourcing strategy in the company's overall strategy, that alone do not guarantee successful project implementation or a beneficial outsourcing relationship. While only time will tell how successful the relationship really was, that is not the purpose of this case study.

7.3 Analysing the De Beers – Bateman Minerals relationship

The purpose of a case study is to analyse something by either compare it to known factors or theory and thereby testing the accuracy of the experiment or to use known practical evidence to confirm a new theory. Analysing the De Beers – Bateman Minerals outsourcing relationship is a bit of both because, although the factors against which the relationship will be measured are new, it is well proven in similar applications but different industries.

The strategy for analysing the relationship is to compare it to the different outsourcing levels and the factors discussed in Chapter 2 (Managing Outsourcing: strategic management issues in the Mining - Project House relationship) and to a lesser extend Chapter 3 (Most common problem areas at Project level) before listing those areas highlighted in this dissertation, but not featuring in the relationship launch presentation.

Current De Beers estimations are that the Mining Project House outsourcing relationship is between levels 2 and 3 on the De Beers scale, which means that it is approaching the collaborative outsourcing level. Once all factors are discussed the relationship will be re-evaluated and the real outsourcing relationship level determined. It must be noted that this presentation is a high level launch presentation and not a detail strategy or a legal contract, therefore detail is limited.

7.3.1 Outsourcing levels

Other than in this dissertation where three levels of outsourcing (conventional, collaborative and BTO) were used (section 5.4.1 to 5.4.3) five levels of outsourcing have been used by De Beers. In comparison can Conventional outsourcing be described as level 1; Collaborative outsourcing as level 3 and BTO as level 5 on the De Beers scale. Levels 2 and 4 are the transition phases between conventional and collaborative outsourcing (level 2) and collaborative outsourcing and BTO (level 4).

Level I – Initial level

The initial levels are hampered by inconsistent management; ad hoc practices, reinvention of the wheel and therefore can't be managed properly. As a result of all this confusion engineering and quality suffers. Performance depends largely on individual knowledge and efforts therefore the success possibility is rated at less than 40%.

Level II – Repeatable level

The practices are planned, tracked and performance is verified according to standards (governance), but the different mines and business unit managers still operate separately. Measurement monitors some processes, but again is limited as no objective scale exists. Attempts to control the Project House still rules the strategy and management approach.

Level III – Defined level

Well defined and standardised best practices prevail. Organisation wide standards exist and common procedures are applied. The cost of control for the sake of control is realised, but not relaxed or replaced by visibility. Metrics and incentives are starting to play a role, but is still defined at conventional outsourcing level (punish and reward system) Win-win relationship is still lacking.

Level IV – Quantitatively managed

Measures of performance are collected, integrated and analysed. Performance is objectively managed and the quality is guaranteed. The success possibility is rated as > 70%. The uncompromising grip on control is relaxed as the value of visibility is realised and mutual relationships of trust are developing. Individual bonus systems still exist causing conflict of interests.

Level V – Optimised

Quantitative performance goals are based on business goals. Both parties are able to continuously improve the process and gather information through innovation and experimentation. Control is sacrificed for visibility with the only metric being business value created. Integrated team and reward system exists.

7.3.2 Industry uncertainty and changes

Although the diamond industry market seems to be relatively stable, a large portion of De Beers' mines are located in South Africa and Botswana where expenses are ZAR and Pula based while the income from the international diamond market is in US$. The combination of the weak US$ and strong ZAR and Pula have been putting pressure on the De Beers company profits. This, together the fact that no new mine developments have been taking place since 1999, when access to a project implementation office was lost, inserted even more pressure on De Beers' future capability to remain competitive in the diamond mining industry.

To survive and remain competitive De Beers needed immediate access to a project implementation office to be able to develop US$ based mines and benefit from the weak US$ while aligning themselves to make use of opportunities which may arise from any changes in the ZAR – US$ ROE. By forming an alliance like this both parties will be able to benefit form the contingency of work and be ready to profit from opportunities as they arise.

7.3.3 Intellectual property versus customer value perception

Both parties realise that there is very little confidential intellectual property in the mining industry. What the agreement does take into account is that by working smarter (well defined and standard best practices) and utilising lessons learnt on previous projects, substantial savings can be created on new projects. These savings can be in the form of capital cost or better applications for the same cost like reduced time to market (cost of money), less maintenance (reduced opex), higher probability of project success or a combination of these factors.

The targets for and strategy of how the customer value perception will be created are well defined in the presentation with factors like business integration, measurements and manageable processes to drive out waste, free up innovation, create synergies, continuity and built capacity. Creating customer value perception is probably the best defined factor in the

presentation and for a good reason because the success of the relationships will be be measured against it.

7.3.4 Use of proven end to end systems / Conflict in systems and Procedures

Very little attention was given to systems and procedures because it is to be determined as the relationship grows through the various levels of outsourcing. Where conventional outsourcing agreements tents to insist on Mining House systems and procedures, BTO relationships focus on what is required to make the system work and how much value is added to the final product.

7.3.5 Shared specialists

Due to the limited resource pool in the industry, specialists' time is in high demand and therefore costly. Sharing of specialists will not only relieve some of the pressure on these specialists, but also improve interaction with other people and thereby enable upcoming specialists to gain exposure quicker and accelerate their learning curves and career paths.

7.3.6 Personal relationships

The values foreseen for the relationship are integrity, valuing people for themselves, professionalism and trustworthiness (Page A16) which in turn should create the atmosphere for collaboration and passion for the projects / relationship as individual behavioural factors.

The effect of personal relationships and team dynamics cannot be underestimated because middle management (project management level) will eventually determine the success of the relationship. It is therefore of the utmost importance that teams from both sides are put together with personalities and team dynamics in mind as it can and probably will cause the relationship to fail if ignored.

7.4 Areas not properly defined or missed

Because the presentation is about informing all stakeholders (both De Beers and Bateman Minerals management and employees) as to how the business model was put together and the strategy of how it will be implemented and not a contract, no detail is given about service levels, contract types, Project House remuneration, etc. There are however a few factors that are not addressed or mentioned.

7.4.1 Risk responsibilities

Although all phases of project implementation (section 4.2) are covered under the agreement, the risk management responsibilities or cost allowances for each risk are not addressed. This can be a cause of conflict if no clear split of responsibilities is negotiated early in the agreement. The spilt of risks and responsibilities can also be determined on a project to project basis as every project is ultimately unique.

7.4.2 Visibility versus control

The presentation gives hardly any detail about the envisaged control procedures except for the envisaged De Beers financial benefits. For a BTO relationship to be really effective control must be replaced with visibility (section 5.4) which requires a total cultural change as both party's management have historically relied on control for success.

Even if the Bateman Mineral project implementation procedures are used, the De Beers tendency still seems to favour reimbursable formant contracts which favour control and not visibility.

7.4.3 Relations management

Although the cooperation strategy indicates a specific growth from now to 2010 for achieving BTO, there is no indication of nominating official relationship managers from both parties (section 6.11.3) nor continued evaluation and repositioning as per the best practices of outsourcing arrangements (section 6.11).

The future management of the relationship during the envisaged growth period (up to 2010) as well as repositioning due to the effect of market changes (section 6.8 to 6.11) are also unclear and need further clarification. A large percentage of questions asked after the presentation was around the future relationship management.

7.5 The De Beers presentation

The presentation (appendix A) was aimed at informing all stakeholders (both De Beers and Bateman Minerals management, shareholders and employees) as to how the business model was put together and the strategy of how it will be implemented. The signed agreement is not the contractual agreement, but merely a document expressing intentions of future collaboration via a possible BTO outsourcing relationship. The journey ahead is broken down into phases that tie up with the De Beers levels of outsourcing and are well defined for

both people and processes. Goals for each phase are well set and defined and although at a very high level, give clear targets of wasted / cost reduction and turning knowledge into intellectual capital - not intellectual property.

The presentation acknowledges that the current level of co-operation (in the outsourcing relationship) is between levels 2 and 3, but spells out clear growth targets to accomplish full BTO by 2010. By basing the future (sole) BTO relationship on an existing relationship which then grows into a full BTO relationship is inline with section 5.4. Most factors highlighted in the dissertation – especially chapter 5 - are addressed either directly or indirectly in the presentation.

7.6 Conclusion on De Beers presentation

The spirit of the De Beers presentation is certainly a step in the right direction for a possible successful BTO relationship. It not only realises the problems experienced at corporate management level (Chapter 2 – Managing outsourcing – Strategic management issues in the Mining– Project House relationship) but also at project level (chapter 3 – Nine common problem areas at project level). Most of the requirements of BTO (chapter 5 – The ultimate prize – Business Transformation Outsourcing) are also addressed and, although at a relatively high level, it makes the intentions of the agreement clear.

The statement that the relationship has reached level 2 to 3 on the De Beers scale (approaching collaborative outsourcing) can be questioned as it is still very control-orientated with the benefits of the presentation focussing on a single party. Although the goals are set for BTO, that in itself is a journey and not a destiny. Because of the control orientation and lack of relationship management (which should occur even at conventional outsourcing level), level 2 on the De Beers scale, or between conventional and collaborative outsourcing seems to be a more realistic indication of the progress.

Chapter 8

CONCLUSION

8.1 Conclusion

Outsourcing has no clear-cut or one fits all solution. It not only has various levels of consideration, but also numerous options within each level - each a factor which can have a crippling effect on the success of the outsourcing relationship if started off wrongly. Although Business Transformation Outsourcing is the ultimate prize for outsourcing relationships, it may not always be the best solution for the problem at hand.

The success of the outsourcing agreement between Mining- and Project Houses is not determining the relationship between them, but is actually 'the' relationship. Therefore managers from both sides must clearly understand of the different options available to them and be skilled personnel and relationship managers with good interpersonal skills.

The various outsourcing factors affecting the Mining- Project House relationship and problems experienced (chapter 3) is not unique to the mining and mineral commodity industry or cast in stone. It will keep on changing to suit the Mining House requirements which in turn follow the change market demands. Project Houses, as outsourcing service providers, must be more aware of these changes in market demands and continuously adjust their service / products to satisfy their clients (Mining Houses) or risk becoming redundant.

The biggest cause of unsatisfactory outsourcing relationships is that people tend to relax once the agreements are in place and forget that, like any other relationship, it needs continuous attention and re-aligning. The problems experienced and highlighted in this dissertation are mostly the symptoms of lack of continued attention to the agreement or lack of interpersonal skills in addressing it. If something stops growing, it will stagnate and eventually die. The same is applicable to the Mining – Project House outsourcing agreement, but by maintaining it on a regular basis the relationship will be to the benefit of all involved with the possibility to grow into the ultimate prize – Business Transformation Outsourcing.

Lack of initiatives from the Project Houses to improve customer value perception will result in the relationship becoming stagnant and it will eventually die a natural death thereby making Project Houses redundant, but this will also create new opportunities for others. By being pro-active and contributing positively to the outsourcing relationship between Mining- and Project Houses, Project Houses can keep the relationship alive and growing to the benefit of both parties. Although the Mining Houses are ultimately responsible for managing the relationship [L], the onus is on the Project Houses to up their customer service levels and create better customer value.

The case study on the De Beers presentation (Chapter 7) in which many man-years of hard word had gone, is a classical proof that success in outsourcing relationships does not come easy or quickly. It is like planting an apple tree today and being prepared to look after it for a number of years with the realisation that the fruit will only be available many years later.

It is also clear from the case study that outsourcing relationships will put more pressure on senior and middle management levels to ensure that they do it right from the beginning. The focus will also be on the quality of personnel employed, because engineers will now be required to manage strategically important relationships – a discipline notorious for their bad interpersonal skills.

8.2 Objective of dissertation

The objectives of this dissertation are to empower the responsible managers to make informed decisions by selecting the best possible model for their specific situation and manage their specific relationship optimally. By creating a good understanding of the relevant levels of outsourcing (chapter 2), the problems regularly experienced (chapter 3), the structure of projects (chapter 4) and how to manage it optimally (chapter 6) these objectives can be achieved.

By highlighting the possibilities of the outsourcing agreements (like BTO) in chapter 5 and sole business transformational outsourcing (section 6.3 and 6.4) the relevant managers have been given a target to aim at for future growth. With all the criteria and factors used to describe the differences between metrics and incentives at the three different outsourcing levels (Conventional-, Collaborative- and BTO) as well as the different types of contract, managers can now select a contract formant for their situation. Together with the other

party they can draw up a set of matrixes and incentives suiting both parties for their specific situation. Best practices in Chapter 6 empower managers responsible for the day to day management of the agreement throughout its various stages.

Based in the above tools and information as well as the De Beers – Bateman Minerals case study, responsible managers working in the Mining- and Project House environment will not only be able to understand the other party's problem and make informed decisions, but also come to a mutually acceptable situation and thereby create a win-win situation. Because of this it can be said that the objectives of the dissertation has been met.

Real wisdom does not come in knowing how to change what, or how to bear with those things that cannot be changed, but to know the difference between those items that can be changed and those that cannot be changed.

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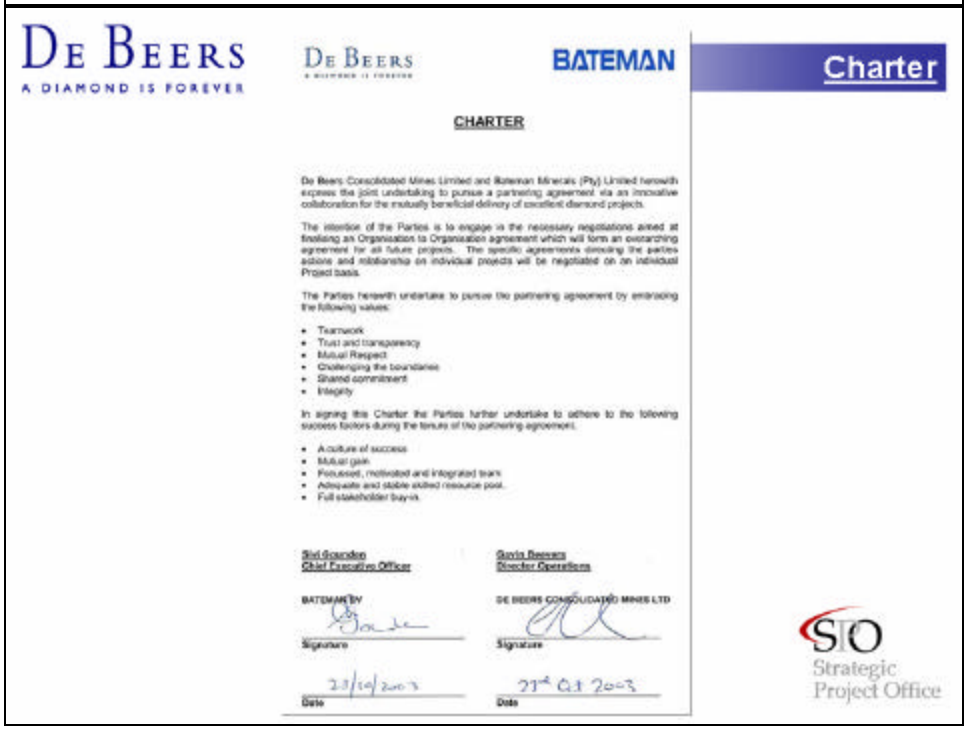
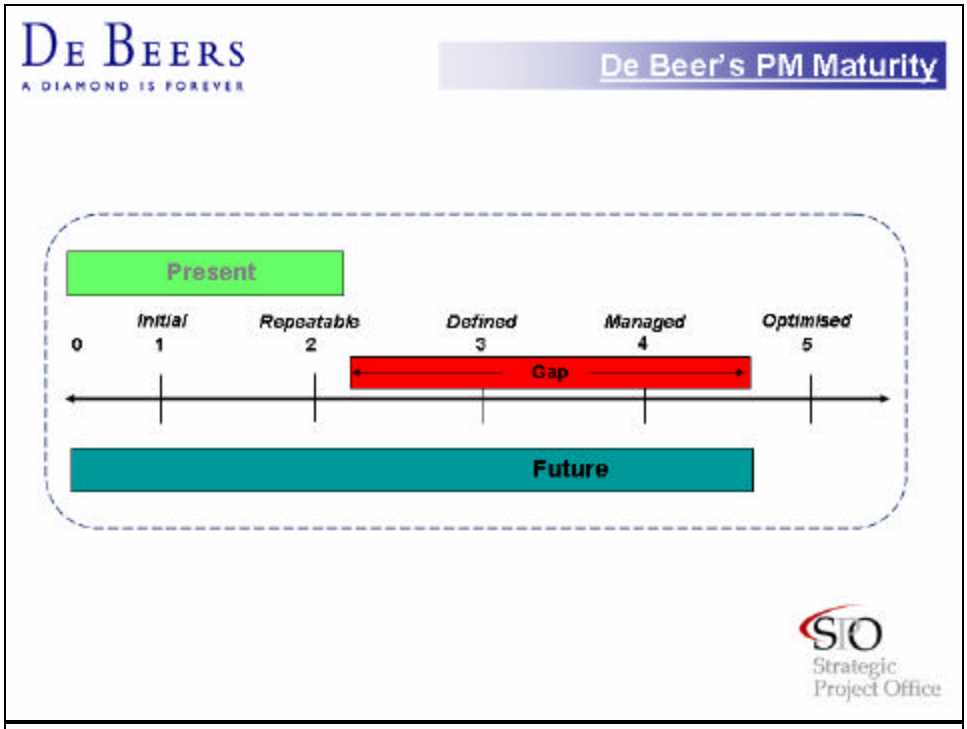
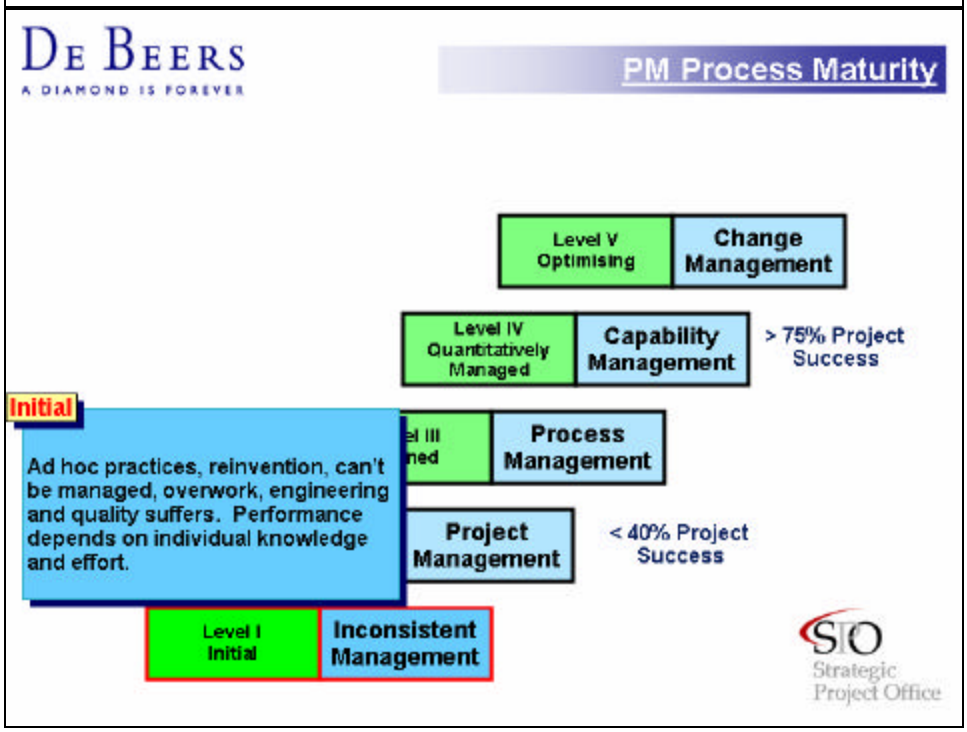
Appendix 1

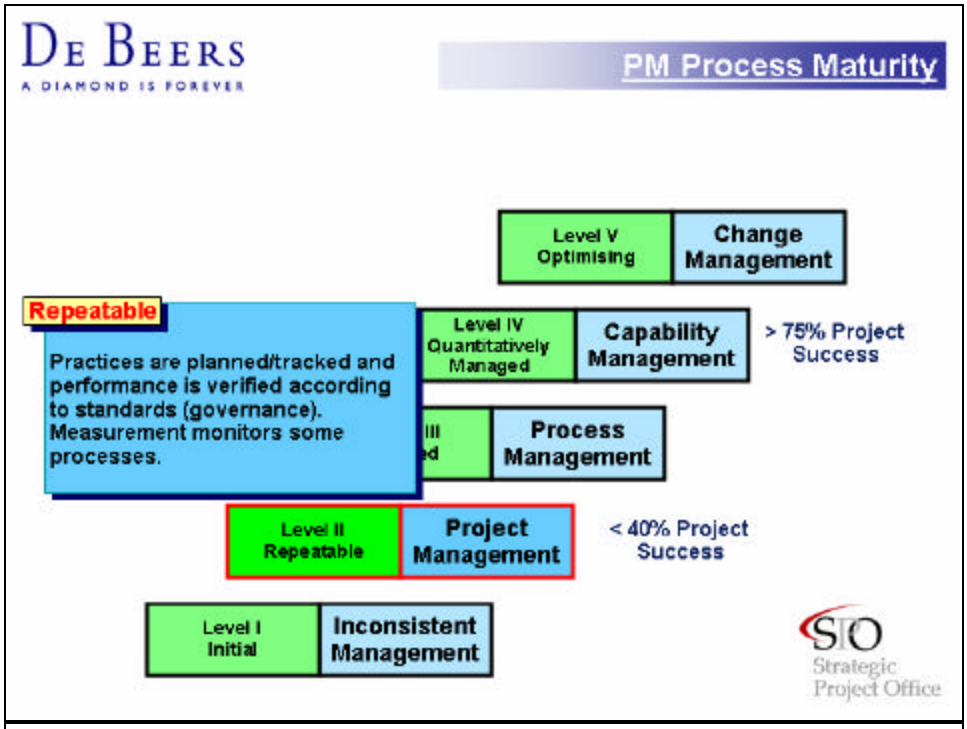
BATEMAN MINERALS – DE BEERS STRATEGIC PROJECT OFFICE RELATIONSHIP PRESENTATION

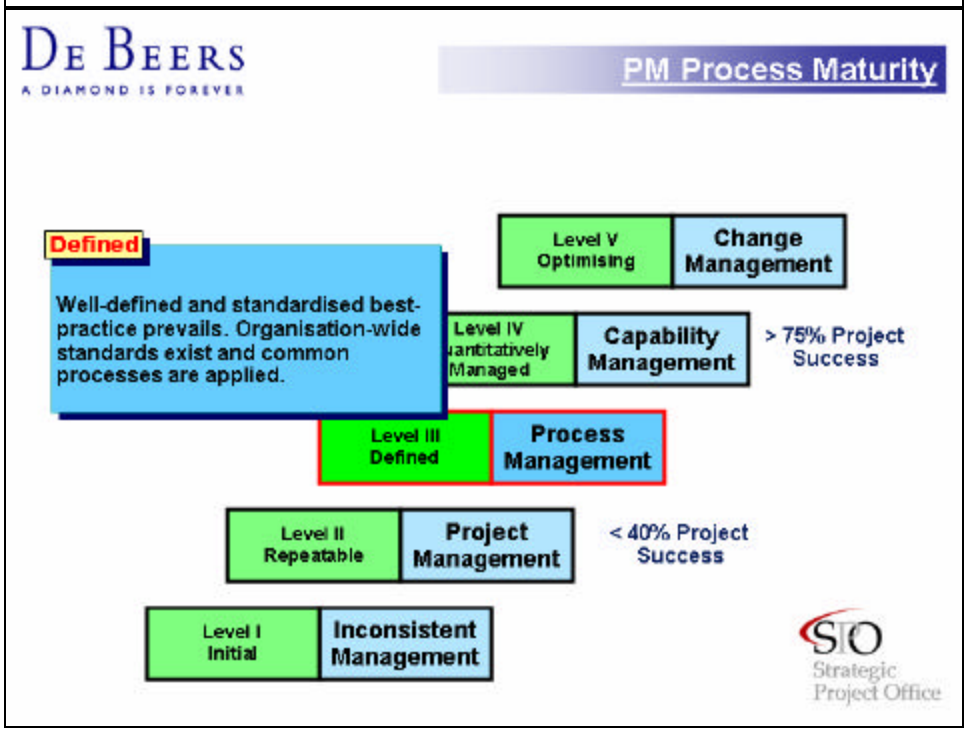
(Done by De Beers)

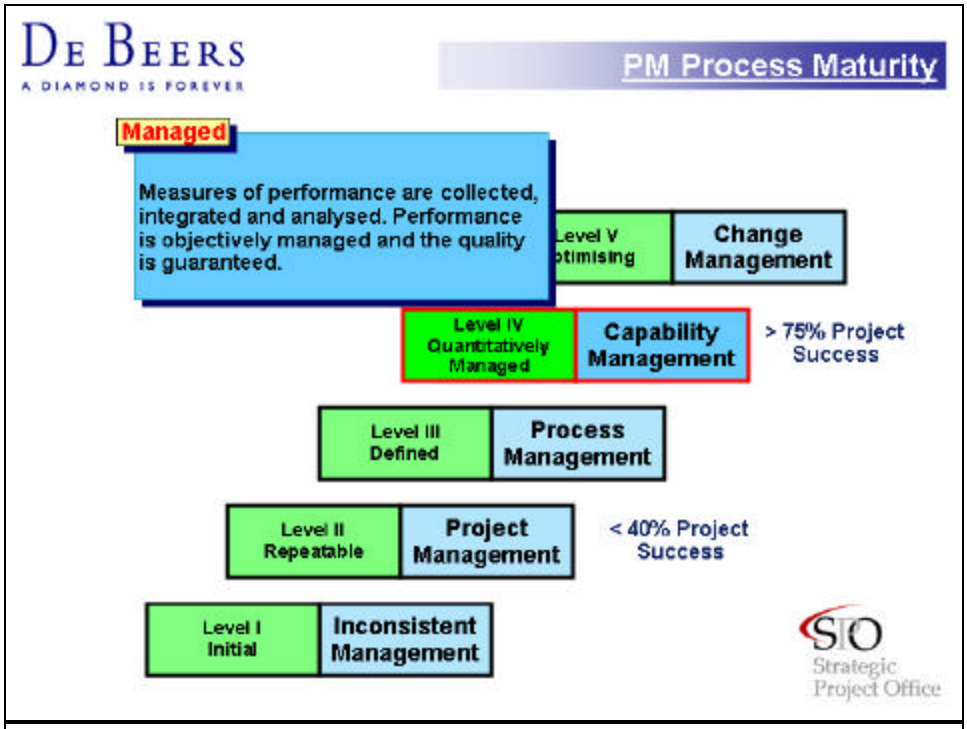


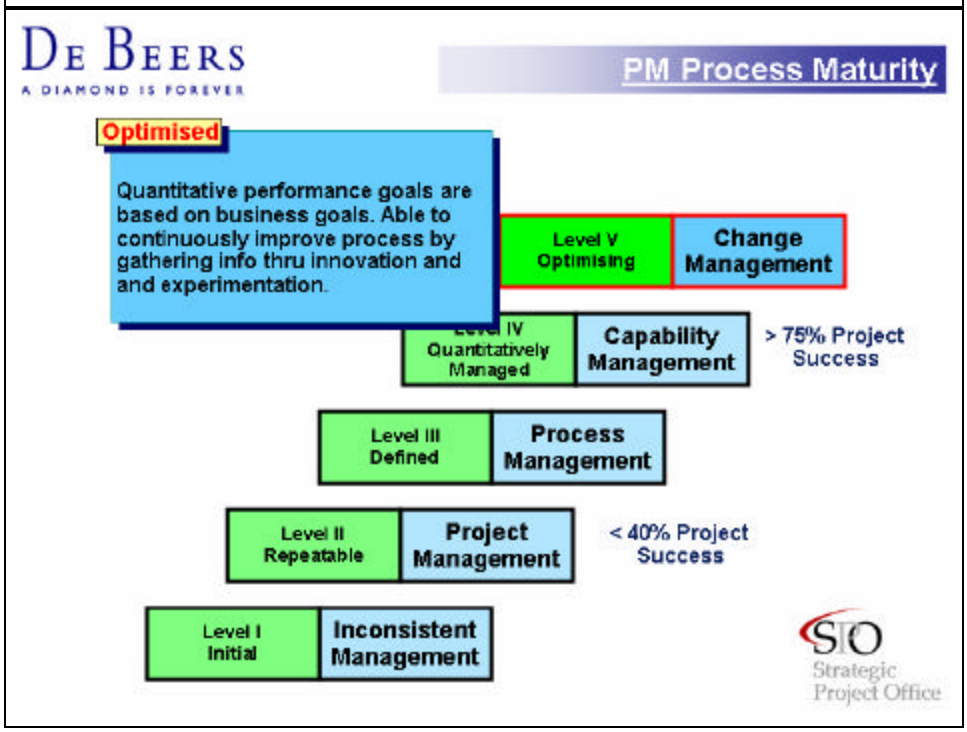


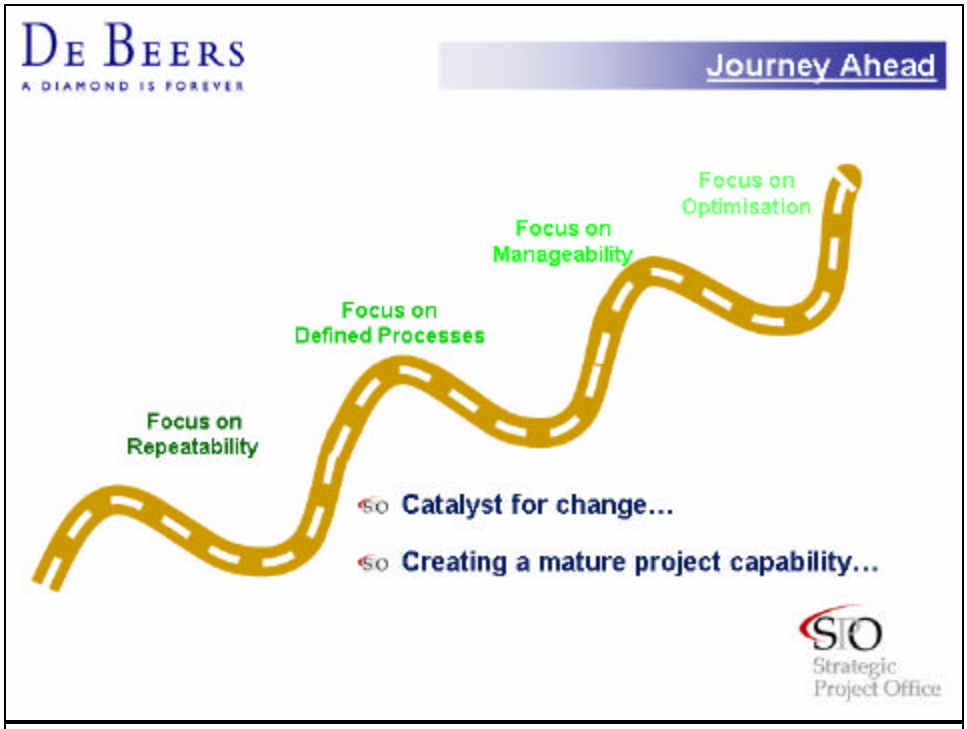


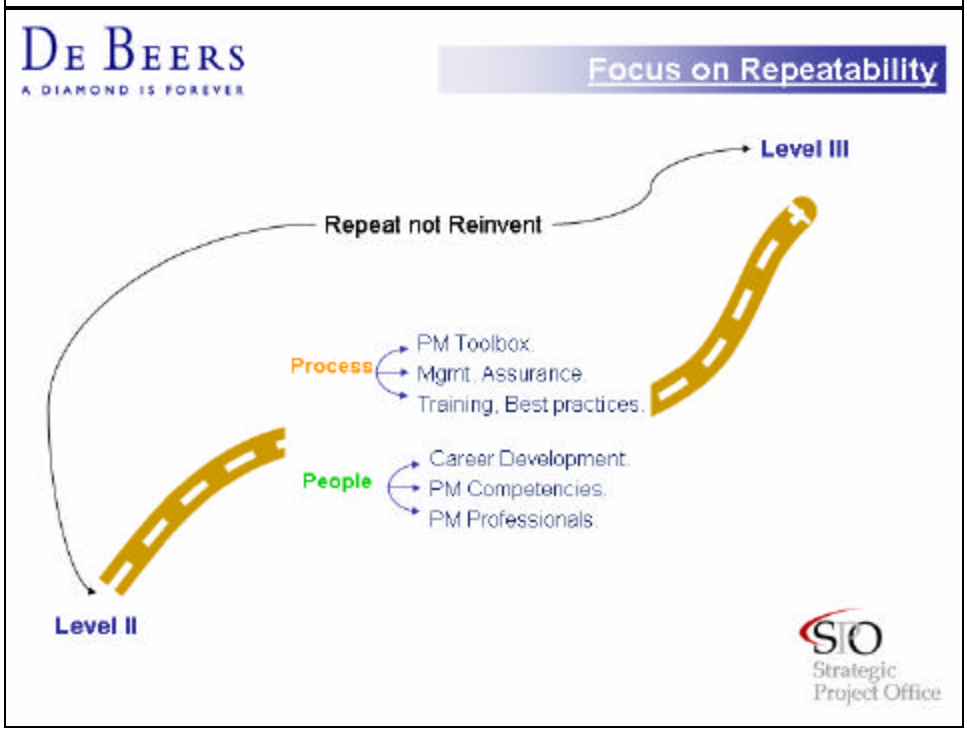


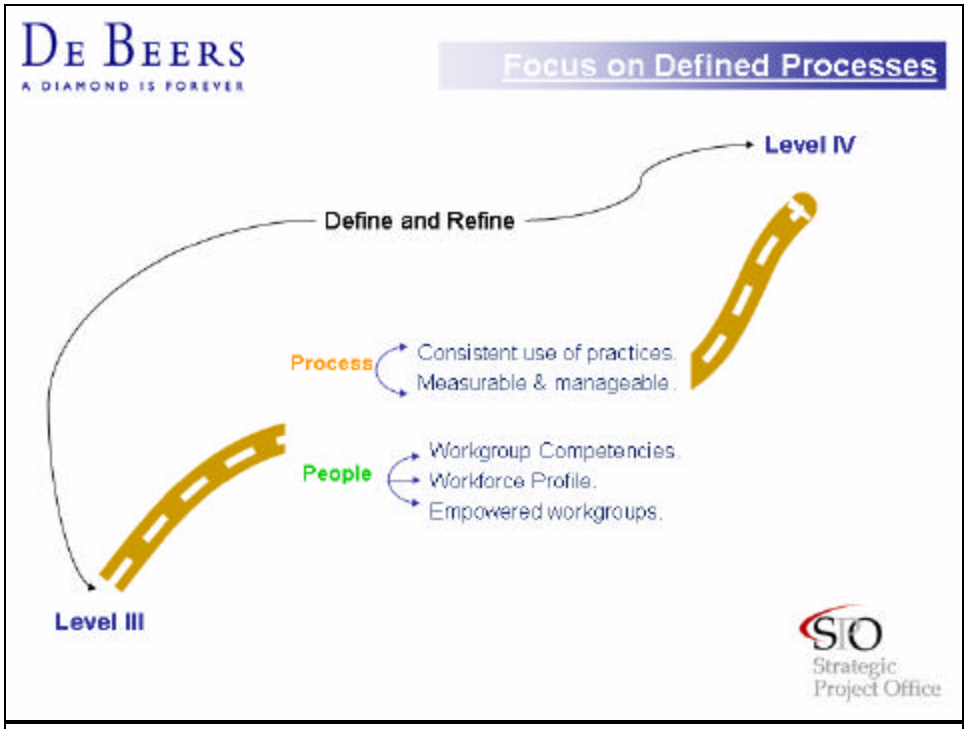


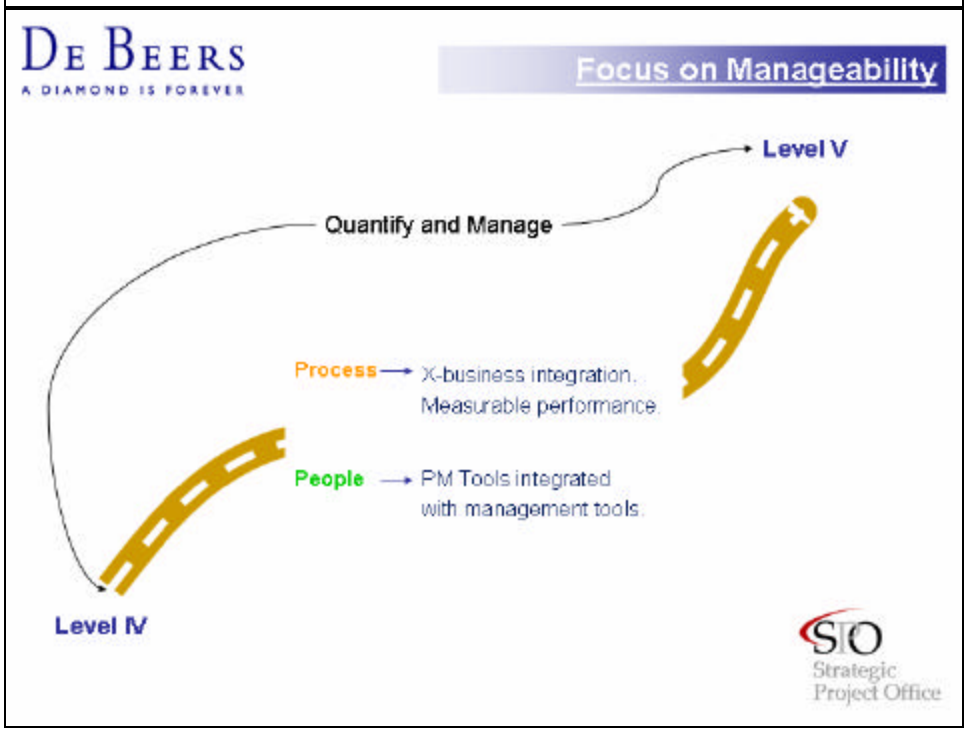


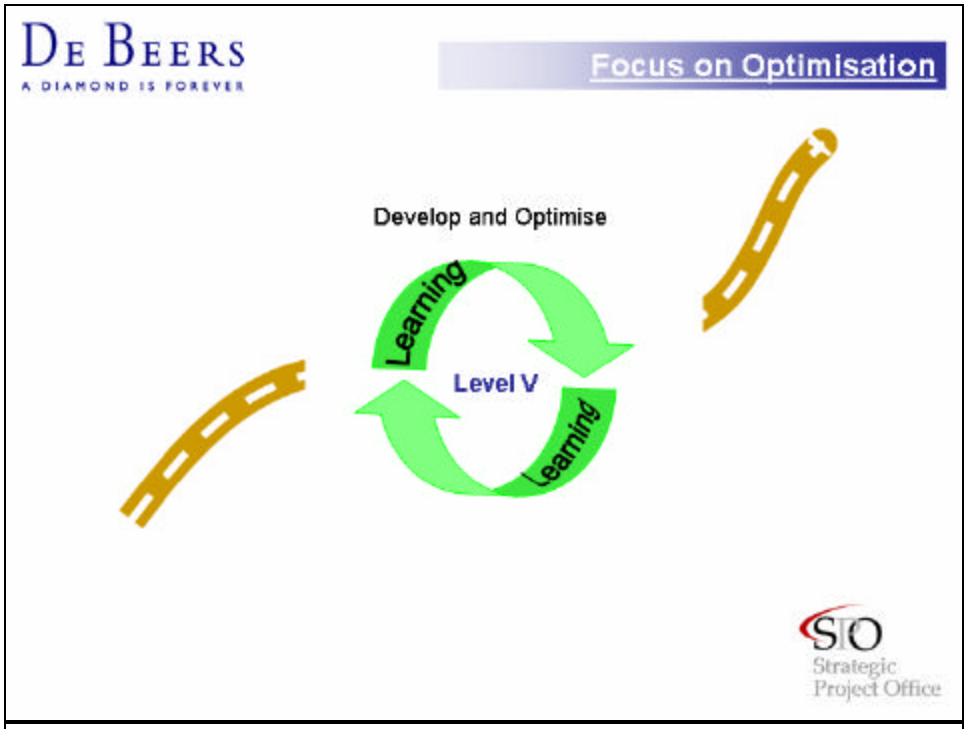


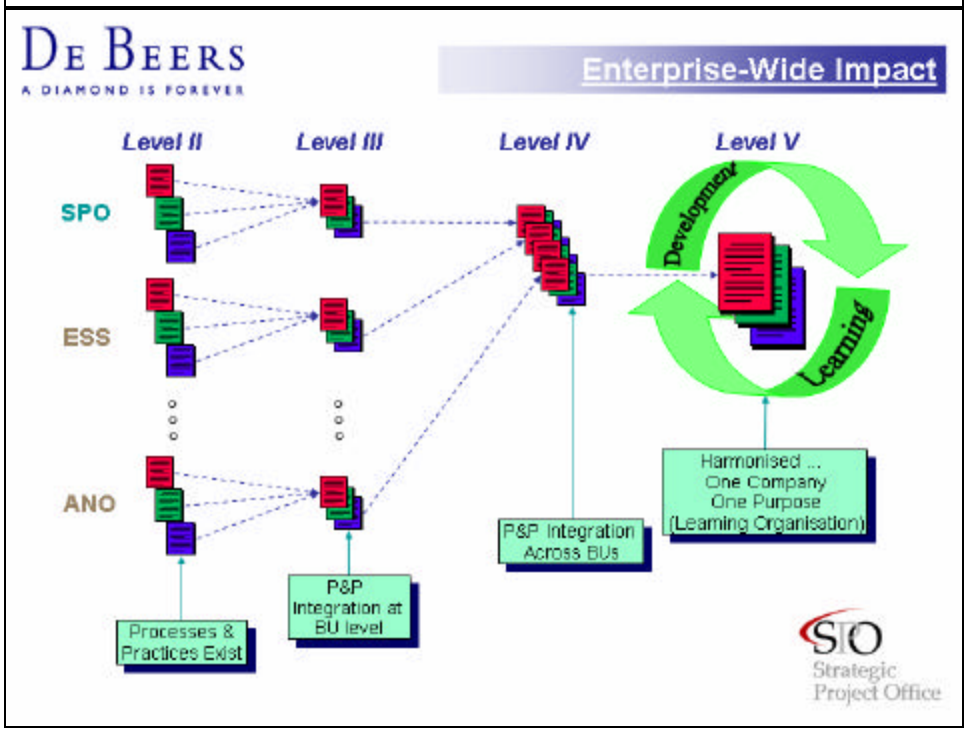


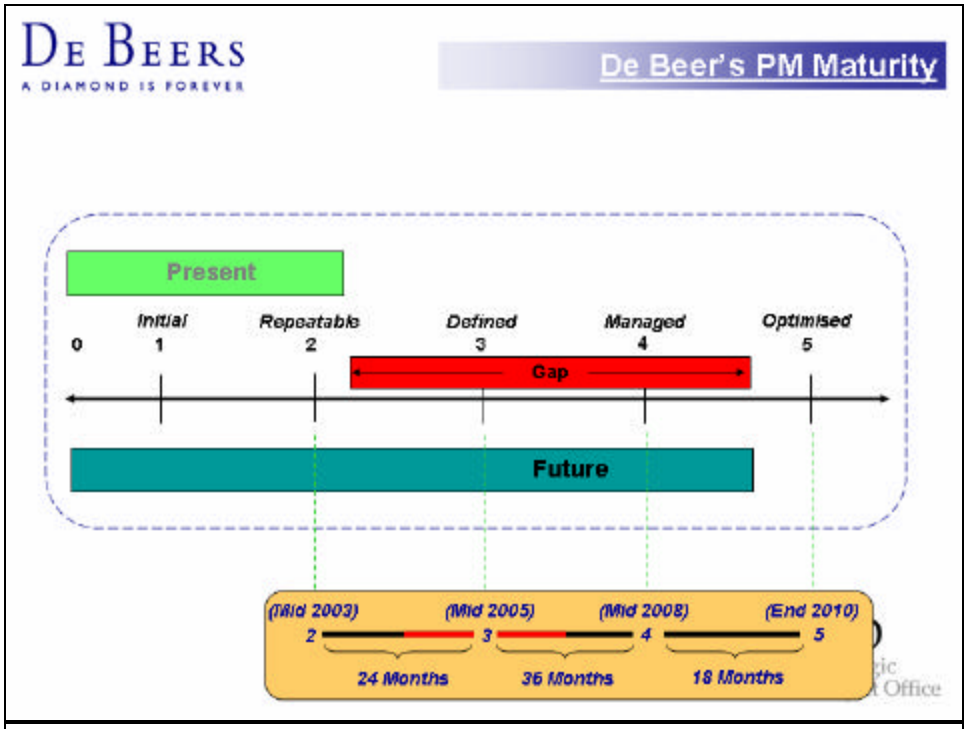


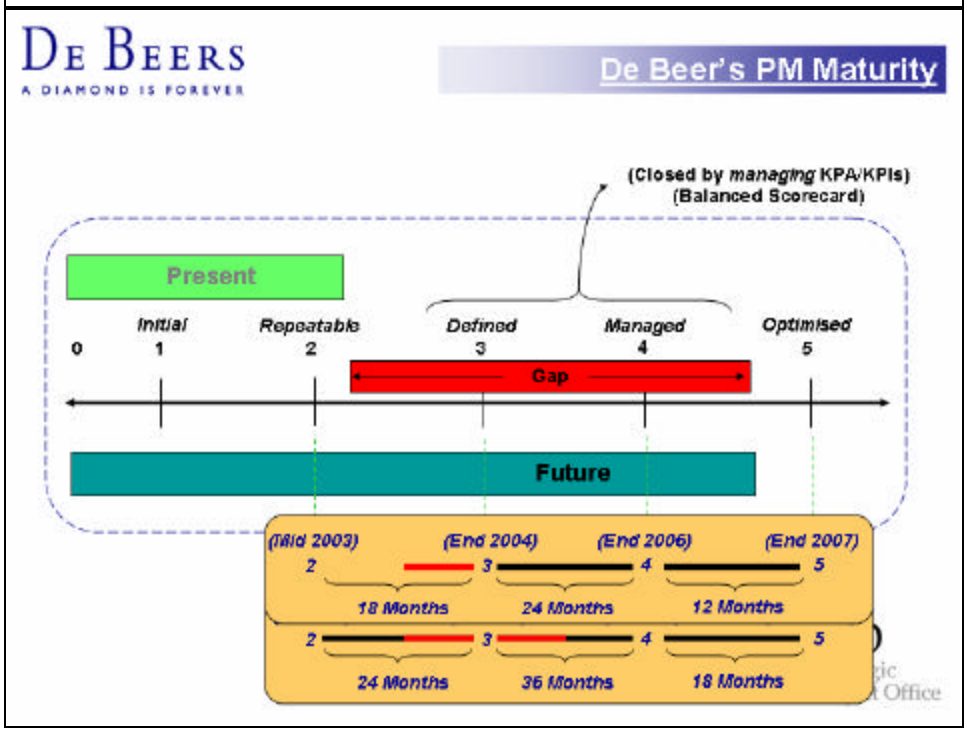












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Presentation Overview

- Introduction – Vision, Mission, Business Model and Service Delivery
- Capability Maturity Model (CMM)
- **Partnering Relationships – Collaborative Value Adding**

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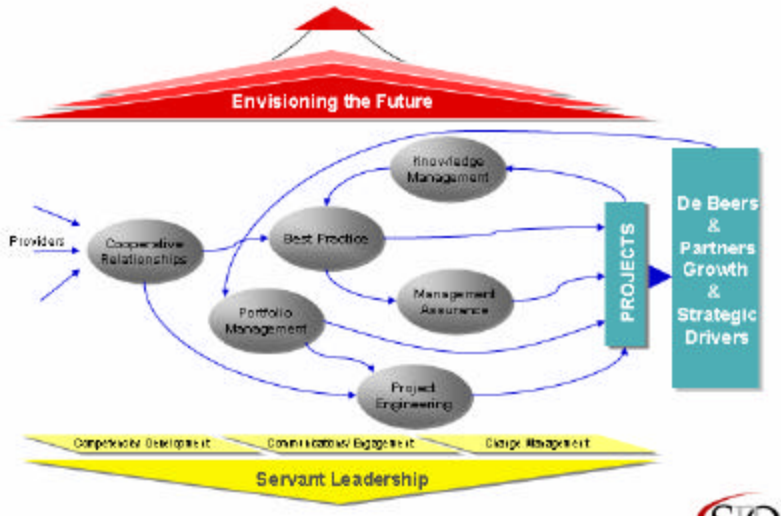
Business Model



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Strategy

- **Identify world class Partners**
  - Technical skills
  - Integrated project management systems
  - Congruent culture, values and vision

  Relational, rather than contractual, competence
- **Become the partner of choice**
- **Create alignment and new relationships**
  - Co-destiny
- **Leverage relationships to drive out value for both parties**
  - Drive out waste
  - Free up innovation
  - Create synergies
  - Continuity
  - Build capability

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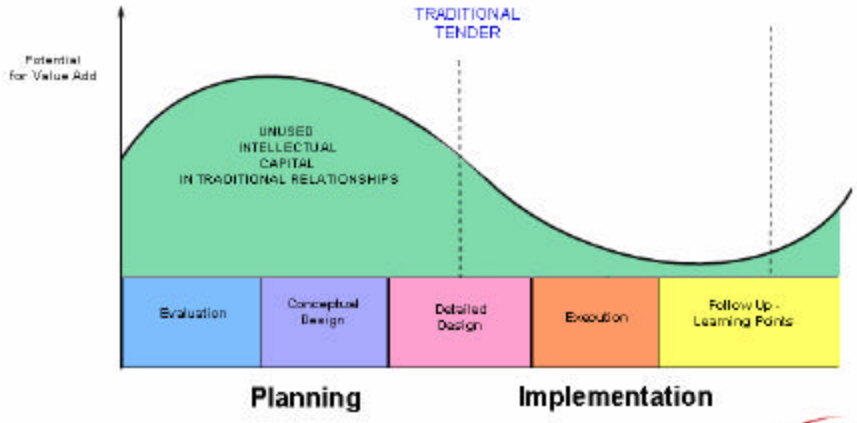
Power of Early Involvement



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Modes

- **Project Partner**
  - on an individual project basis, creating value
- **Organisation to Organisation Partner**
  - at an organisational level, driving longer term benefits beyond individual projects
- **Capability Maturity Model (CMM) Partner**
  - driving capability across the business

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Project Partnering

- **Built around a specific project and a partner's expertise**
- **Collaboration, developing a strong team**
- **Relationship workshop**
  - charter with vision and values
- **Agreement developed through negotiation**
  - costing structures – rates and incentives
- **Innovation - design , processes**
- **Time - revenue generation**
- **Cost - drive out waste**

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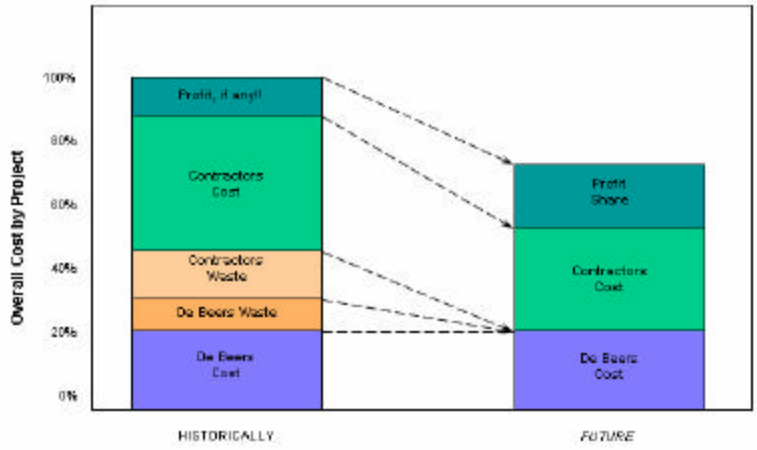
Waste/ Cost Reduction



Old Way = Win4ose Negotiations, "buying the business"
tenders, adversarial relationships
poor planning, variations, claims, etc.

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O to O

- Develop long term relationships at organisational level
- Across geographies and mine boundaries
- Our project portfolio as a base
- Matrix along functionality and size lines
- 4 or 5 potential partners
- Over arching agreement
- Underpinning business model
- Measures
- Drive out Intellectual Capital and sustainable benefits

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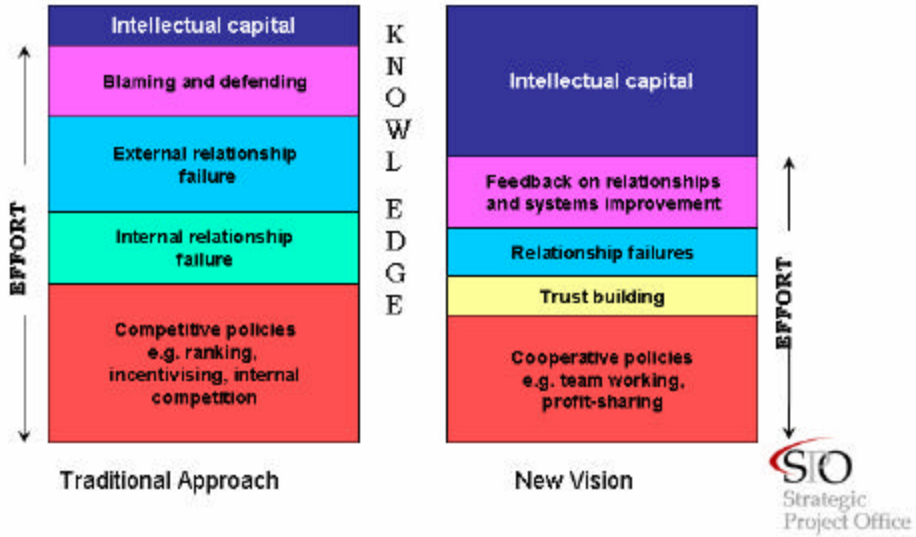
REAL Opportunity

The REAL Opportunity with cooperation. Turning knowledge into Intellectual Capital!



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O to O Opportunities

- Design improvements, up-front value add
- Innovation and creativity
- Continuity and transfer of skills
- Development of skills
- Work processes and systems
- Supply chain integration
- Assurance provider
- National development
- Sustainable investment

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Partnering Progress

- **Project partnering**
  - E Bay
  - Venetia crusher
  - Dump treatment (Finsch & Kimberley)
- **O to O**
  - Bateman internal preparation workshops
  - De Beers' in progress
  - Charter signed
- **Consultation with stakeholders**
  - Presentation to Bateman
  - Need similar interaction with De Beers stakeholders

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PM Process Maturity

Business seeks to optimise performance …

(Level V) … but performance can't be optimised if it is not being measured and managed …

(Level IV) … and it can't be measured and managed if the supporting processes & practices have not been identified and defined …

(Level III) … and supporting processes can't be adequately defined until they are being performed consistently and repeatedly …

(Level II) … if practices or processes can't be performed repeatedly it's because they are poorly understood (value is unknown) …

(Level I) … organisations that apply workplace practices inconsistently are wasteful and ineffective.

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Vision & Mission

VISION:

Growth Through Brilliant Projects

Project Partner Of Choice

MISSION:

The Strategic Project Office Will Be A Catalyst For Change And Growth Within De Beers Creating A Mature Project Capability.

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Values & Behaviours

Values:

- Integrity
- Valuing people for themselves
- Professionalism
- Trustworthiness

Behaviours:

- Win
- Collaboration
- Driven to deliver
- Passion for projects

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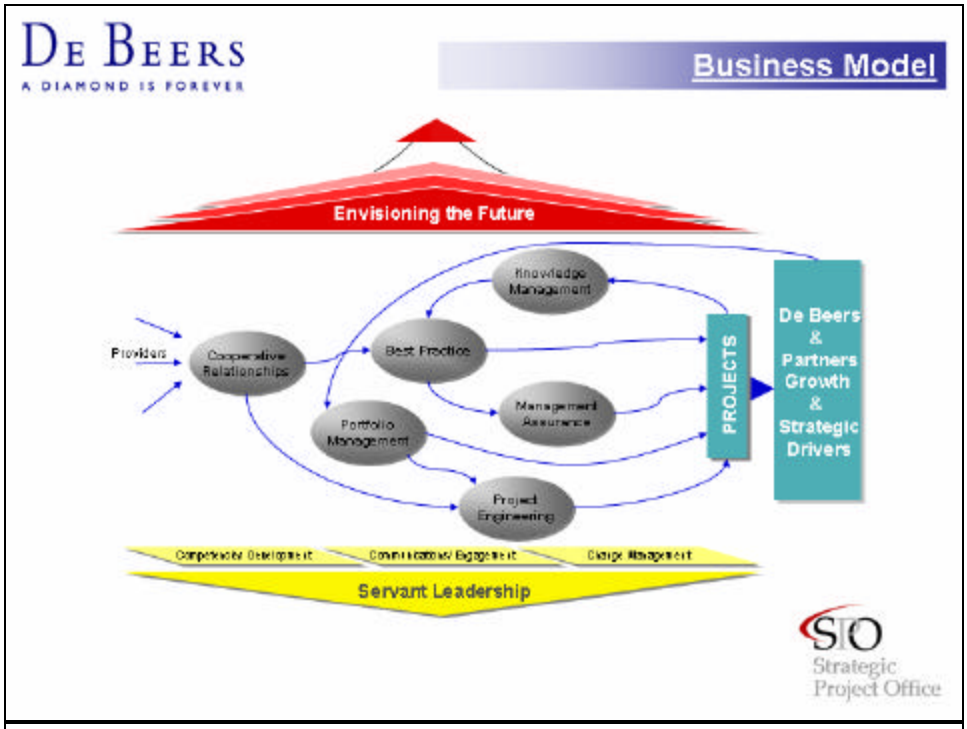

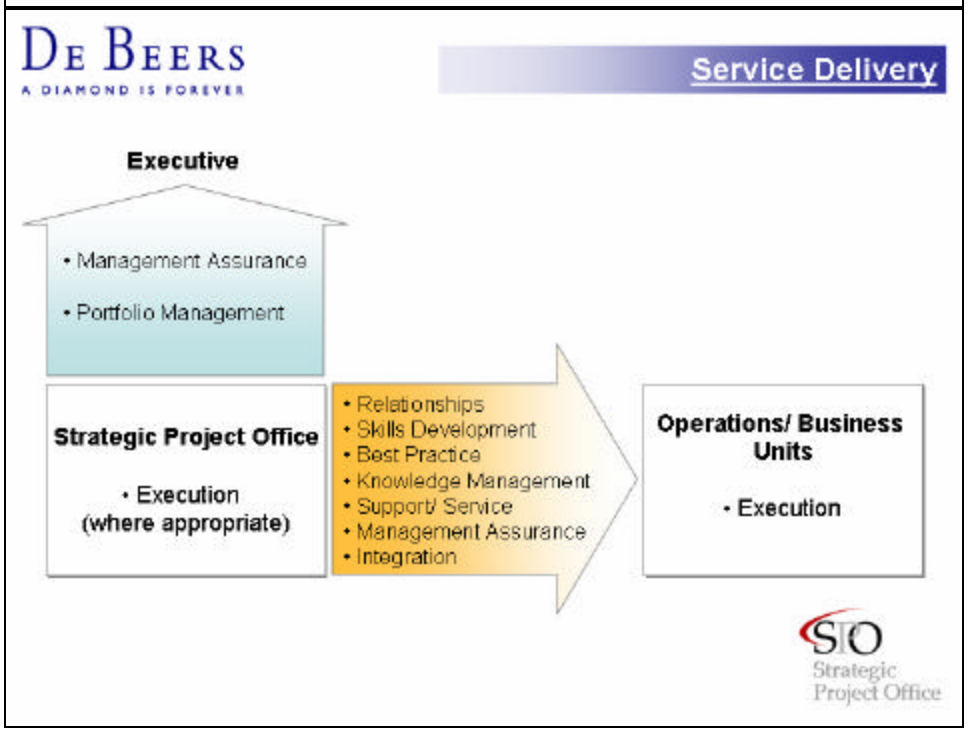

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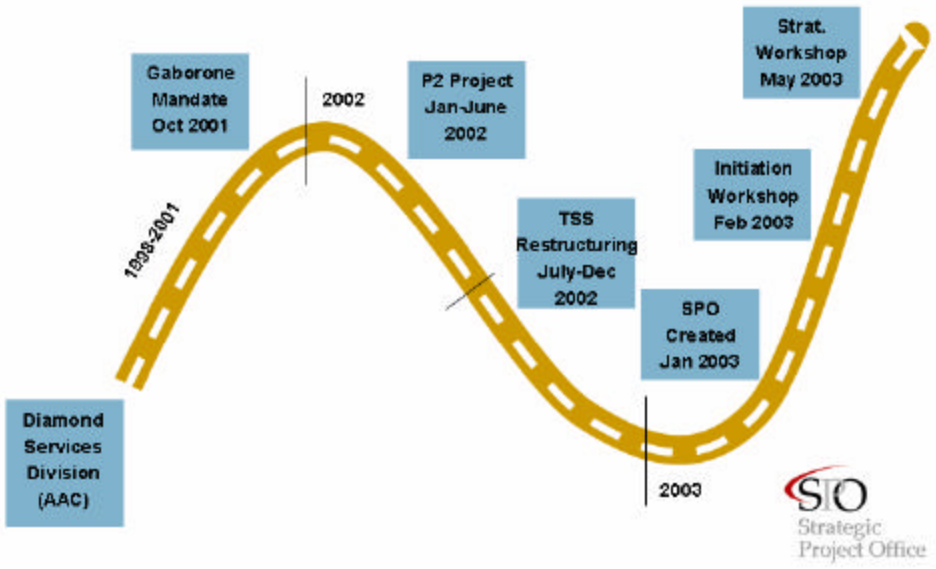
Journey to Date



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