STRATEGIC DECISION MAKING IN THE MINING INDUSTRY WHEN PRESENTED WITH DILEMMAS

Malathee Padayachy

97152049

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ABSTRACT

This research report sets out to understand how senior managers in mining companies actually make strategic decisions when situations are classified as a dilemma.

This is of relevance because even though all organisations and all levels within an organisation are faced with decision making, the individual approach to reaching the decision varies. This is compounded by the nature of strategic decisions, technological advancements and the problem of bounded rationality. The concept of individual differences includes how much of human behaviour and the decisions people make is influenced by the person as opposed to the situation. The importance of individual differences in decision making and the approach followed escalates when the decision is of a strategic level as strategic decisions have cross-functional implications within the organisation, requires capital investment and has significant long term implications for the organisation. These implications become more critical when one considers the challenges facing the mining industry, which is characterised by volatility and falling demand and prices.

The research explored the types of dilemmas experienced by senior managers in the selected mining company and the approach followed to resolve the dilemma, views on the utility attached as well as factors that support good decision making culminating in the decision taken. To this end, a qualitative study with an explorative design was conducted with thirteen senior managers. The insights from these individual depth interviews formed the basis of the data that was analysed to produce the research findings

The research revealed that a dual approach is favoured with rational and quantitative styles dominating. The approach was linked to the impact of contextual variables such as the top management team and firm characteristics. This was found to also create implications relating to conflicts within the individual between the personal approach and the company required approach.

The research found that dilemmas relating to licence to mine and supporting or enabling the company strategy were dominant in the mining industry and resulted in key trade-offs of whether to manage for today versus manage for tomorrow and whether to maximise profit against creating value for a broader range of stakeholders.

KEY WORDS

Dilemma

Trade-off

Strategic decision making

Rational decision making

Intuitive decision making

Bounded rationality

DECLARATION

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Masters of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

Malathee Padayachy

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Name

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Signature

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Date

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DEDICATION

This research is simply dedicated to my father and mother. Everything I have achieved and continue to achieve in life is because of you and for you.

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1 Definition of the Problem and Purpose of the Research

The purpose of this research was to investigate the strategic decision making approach taken by senior management when presented with situations that can be classified as a dilemma.

1.1 Why this problem?

Individual differences in decision making, continues to be a topic of interest (Appelt, Milch, Handgraaf, & Weber, 2011). Included in the concept of individual differences is how much of human behaviour and the decisions people make is influenced by the person as opposed to the situation (Appelt et al., 2011). Glöckner and Witteman (2010) state that a multitude of decisions of varying levels of complexity and importance are made daily, how these decisions are made continues to attract research interest.

Simon (1960) in French, Maule & Papamichail (2009), associates strategic decisions with unstructured and non-programmed problems, which rarely contain a straight choice between them. This view is still prevalent because the nature of strategic decisions is still triggered by a burning need relating to the organisation's future followed by formulating strategies before senior managers reach a point where there is a decision to be made, indicating that structure needs to be added. According to Eiselta and Marianovb (2014), decision-making problems that are viewed as being of high importance to the organization are prone to being ill defined with multiple decision makers, multiple objectives and/or criteria, and feature many uncertain outcomes. Shepherd and Rudd (2014) also support this view of strategic decisions being ill-structured and uncertain and further add the elements of it being non-routine and pervasive.

This means that over time the nature of strategic decisions has persisted. We know that it is of critical importance to the survival of the company however, it is faced with complexity, uncertainty and a lack of structure. The many factors that impact on decision making both inherent in the decision maker and the situation mean that the approach to decision making will always vary and will thus always be a source of interest for researchers.

Organisations experience widespread competing demands and in the more recent context of increasing complexity and global environments leaders are forced to address multiple, competing strategic demands (Smith, 2014). These contradictory demands become more prominent and persistent as environments become increasingly global, rapid and competitive and the internal processes within the organisation become more complex (Lewis, 2000). These competing demands create tensions and a dilemma represents a tension which

recognises decisions as having competing choices that contain both pros and cons which need to be weighed in order to resolve the dilemma (Smith & Lewis, 2011). This is of particular relevance as strategic tensions are viewed as being a particular challenge for management in that the success of the organisation is contingent on making clear and consistent decisions between these competing alternative strategies and the way in which top management deals with this type of decision situation is relatively unexplored (Smith, 2014).

Strategic decisions are concerned with the survival of the organisation and has a future orientation and as the focus of this research is on the mining industry, one needs to understand the strategic dilemmas that this industry is presented with. The Mining Industry is currently facing what has been termed a "delicate make-or-break phase" (Creamer, 2015). This delicate situation is a result of a combination of effects including a lack of convergence and shared value between labour, shareholders, communities and government (Creamer, 2015). In the article "South African mining's delicate make-or-break phase outlined", Credit de Suisse South Africa chairperson Rick Menell also pointed out that the industry has become out of touch with current times after operating in a slow changing environment for 100 years. This combined with the current economic and commodity price slump creates a unique and complex operating environment. The implication is that after operating in a relatively stable environment for years the complexity and uncertainty that this industry faces forces it to ask game changing questions that it has not faced before. The question is then, what approach does it take to addressing these questions and will this approach result in successful decision outcomes.

According to Eisenhardt and Zbaracki (1992), Mintzberg et al. (1976) and Shrivastava and Grant (1985) in Shepherd & Rudd (2014), strategic decisions have cross-functional implications within the organisation, requires capital investment and has significant long term implications for the organisation. This makes it important that the process of making these decisions is robust, inclusive and based on sound principles that would contribute to the quality and success of the outcome.

It is therefore proposed that research be conducted to understand how senior managers in mining companies actually make strategic decisions when presented with dilemma situations. This is important for many reasons including as Hoy and Tarter (2010) in Bowen & Bowen (2016) put it, the process of decision making is constrained by time and revisiting a decision is a bounded process also constrained. The insights gained from understanding the decision making approach can help to improve the quality of strategic decisions and contribute to the organisation's success (Shepherd & Rudd, 2014). The current challenges

facing the industry and that resources (capital time, labour) can no longer be committed to ill-fated decisions.

1.2   Evidence of the problem

According to Jaques (1989) in French, Maule and Papamichail (2009) decision making and tasks carried out at different organisational levels are characterised by the longest time span of discretion required by the roles. These spans of discretion are consistent with limits of ability to visualize the future. In his studies, he distinguished between four domains of activity with the corporate strategic domain, which sets the value, vision and strategy, being of interest to this research.

Shepherd and Rudd (2014) state that strategic decisions lack structure, are concerned with uncertainties and are non-routine. Given these characteristics, studies on strategic decision making is essential to provide learning and support to executives to help improve the quality of the decision making process and ensure successful outcomes (Shepherd & Rudd, 2014).

The study of strategic decision making either in the form of content research or process research has always been of interest to scholars and executives (Elbanna, 2006). While content research deals with issues of the content of strategy or what makes up strategy, process research deals with the approach followed in making strategic decisions. This study is based on process research.

Studies on how individuals process information and make decisions given that they are bounded in their rationality remain salient (Van Knippenberg, Dahlander, & Haas, 2015). The study by Van Knippenberg et al. (2015) prompts the rethinking and refreshing of theoretical frameworks and assumptions around rationality and information processing in the new context of the information age. The challenge is no longer making a decision under information scarcity, it is making a decision under information overload and this is compounded by the fact that information consumes attention, which is considered a scarce resource (Van Knippenberg et al., 2015).

Anderson (2000) and Grant (2003) in Meissner (2014), suggest that instead of questioning the necessity of the strategic planning process or evaluating the schematic analysis of the strategic decision making process one should seek to understand the process related characteristics and ask how should the process be designed to achieve the desired outcomes. This supports the view that there is value to be gained by understanding the underlying approach to strategic decision making.

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Elbanna (2006) presents two perspectives on the literature covering the strategic decision making process. These are synoptic formalism which is considered an extension of the traditional rational decision making model and political incrementalism coined by Meuller (1998) which clarifies the way in which decisions are actually made (Elbanna, 2006). Political incrementalism is of particular interest and this is supported by Butler (2002) who found more recent research pointing out that in reality executives make decisions that incorporates intuitive and political processes as well as rational approaches. Elbanna (2006) findings were that organisations make decisions based on many processes. It is the aim of this study to understand the processes/approaches/systems that senior decision makers in the mining industry use when faced with dilemmas.

According to Kahneman (2011) and Salas et al. (2010) in Kaufmann, Meschnig, & Reimann (2014), two systems that are invariably separate, form the basis of decision making. These are intuitive and rational decision making systems or approaches. Salas et al. (2010) and Evans (2008) in Kaufmann, Meschnig, & Reimann (2014) state that the two systems differ on the basis of four dimensions: consciousness, evolutionary development, terms of function and individual differences. But while they differ Evans (2008) and Salas et al. (2010) in Kaufmann et al. (2014) state that both systems offer value and if combined can increase the quality of decisions. This due to the ability of the two approaches to function in parallel in interact (Kaufmann, Meschnig, & Reimann, 2014).

Studies have been conducted to determine which of the two approaches, rational or intuitive, is preferred. In one such study by Laing (2013), the rational decision making model and its effect on an outsourcing decision was tested. The author found that the framing of the problem, positive or negative, had an influence on whether there was a difference in the decisions taken by rational as opposed to intuitive decision makers (Laing, 2013).

Researchers seek to understand the factors that influence decision making. The study by Shepherd and Rudd (2014), aimed to determine the influence of context on strategic decision making. Four contextual variables were identified (the management team; strategic decision specific categories; the external environment and firm characteristics) and evaluated the influence that they have on the strategic decision making process. The authors highlighted themes and issues that exist in the literature and provided suggestions for future research based on the limitations experienced, these include the need for fewer constructs given that current literature is hindered by invention of language and to include additional categories of contextual variables supported by theorethical rationale. This then creates an opportunity for exploring what additional categories are employed by strategic decision makers.

From the above it is clear that there is a need to understand the process of strategic decision making. Even though there have been numerous studies over time, one finds an ongoing debate regarding the use of rational versus intuitive decision making and the contextual variables that influence the approach. The current age is abundant with sources of information (the internet, big data, crowd sourcing, social media, etc.) and this has changed the way individuals, groups, organisations and industries work (Van Knippenberg, Dahlander, & Haas, 2015). Even with technological advancements, the problem of bounded rationality still exists in that people have limited attention and processing capabilities.

1.3   Relevance to South African business

The world is looking towards Africa's resources to sustain its growth and this has contributed to it being viewed as an emerging market of growing opportunities with the primary drivers of growth being in consumer markets, regional economic integration, investment in infrastructure, radical technological innovation, and the opening up of new markets (George, Corbishley, Khayesi, Haas, & Tihanyi, 2016). However, Africa is not without challenges with global warming and drought creating challenges for food and water supply (George et al., 2016).

The shift towards Africa creates a need for understanding the African context and phenomena and its impact on management research, which has largely focused on the Western and Eastern economies (George et al., 2016).

Three challenges suggested as part of the African management context include: 1) gaps in institutional frameworks, 2) building capabilities and 3) enabling opportunities. The implication of these challenges are:

- Competition for scarce resources (natural resources, workers, etc.);
- a need to understand and manage cultural diversity;
- a need for stakeholder management especially in the mining industry where natural resources are an important aspect of the social fabric of the rural communities;
- a need to understand and manage the impact of corporate natural resource management practices on local ecosystems (e.g., water and air quality, natural habitats) as well as on local communities (e.g., population resettlement, HIV/AIDS among mine workers);
- gaps in the availability of skilled labour created by educational challenges; and
- labour unrest, particularly in the mining industry, which present a threat to the future sustainability of the industry (George, Corbishley, Khayesi, Haas, & Tihanyi, 2016).

All of these places pressure of making the right decisions to avoid wastage of scarce resources. It also implies numerous options and dealing with different dynamics which can be seen as contributors to rising complexity.

The report by Deloitte (2015) puts foward the challenges that the mining industry is likely to face in 2016. Volatility, falling commodity prices, falling demand and growing stakeholder expectations all create the following tough questions that mining houses need to ask (Deloitte, 2015): Have the world's demand factors for commodities changed forever? Are new mining approaches needed? Is the traditional profit model changing? The approach to answering these questions, if they have any answers at all, will determine the sustainability of the company/industry.

1.4   Research purpose

This research sought to explore the approach senior managers in the mining industry use to make decisions when faced with dilemmas. This is of relevance because even though all organisations and all levels within an organisation are faced with decision making, the approach to reaching the decision varies (Bowen & Bowen, 2016). By understanding whether rational, intuitive or dual processes guide the decision process and being aware of the factors impacting on the decisions, recommendations can be made to the organisation on processes (such as decision review processes) that would assist the company in mitigating the limitations of the approach taken. Where appropriate, recommendations can be made on ways to improve or enhance the approach which will increase the overall confidence in the decision making process and increase the probability of a successful outcome.

2   Theory and Literature Review

The purpose of this research was to explore the decision making approach employed by senior managers in the mining industry when presented with dilemmas. In order to unpack this and achieve the research outcomes the literature review aimed to unpack every element of this statement. The approach followed by senior managers will be explored, this implies a strategic view and therefore the literature review aims to understand the concept of strategic decision making, what it entails, what the characteristics are and how this contributes to it being a challenge in decision making.

Dilemmas are the next focus of the review, and the aim is to understand what a dilemma is in order to be able to effectively identify it in the situations researched and to understand the unique contribution it makes to the decision challenge.

Approaches to decision making are then investigated to enable the researcher to correctly identify the approaches used by the interviewees. Rational and intuitive approaches are the focus of this section. The aim is to obtain an understanding of the approach and the advantages and disadvantages. When rational approaches are employed, tools and techniques are used to support a structured, sequential and analytical thinking process. The tools available to rational strategic decision makers is then the next focus of the literature review.

Numerous factors then come into play which can impact of the effectiveness of the decision making process. Some of which may be a function of the approach selected, the decision maker and the decision itself. The literature attempts to unpack these.

Finally, the focus is shifted to utility theories to understand at what point of the decision making process or how does the decision maker come to a point of selecting an alternative and thus making a decision.

The decision making approach, choice of tool, factors impacting on decisions and the utility approach contribute to the effectiveness of the decision making process.

2.1   What is strategic decision making?

Strategic decisions are those decisions that set the direction or goals for the organisation (French et al., 2009). Mintzberg (1992) in French et al (2009) suggests that the strategy defines the *plan* for future action; a *ploy* to accomplish a defined end state; a *pattern* of behaviour; a *position* comprising of goals and values and a *perspective* on how to view the

world. This is consistent with more recent perspectives, such as that of Rumelt (2012) who views strategy is a pattern of decisions.

According to Mitchell, Shepherd and Sharfman (2011) it is of importance to understand the processes that support effective decision-making as they influence organisational outcomes, and the efficiency and effectiveness of these outcomes.

The responsibility for strategic decisions resides with top management and these decisions are characterised by having both an inner context (e.g. cultural, structural, political) and an outer context (environment of business including competitive forces) (Elbanna, 2006). Simon (1993) in the words of Igor Ansoff characterises strategic decisions as being primarily concerned with external rather than internal problems. This view does not exclude the internal environment as a match must be established between the firm and the environment (Simon, 1993). These views although dated are still relevant and effectively convey the external focus of strategic decisions in contrast to decisions at other organisational levels. The organisation has no control over external factors and this contributes to the uncertainty characteristic of strategic decisions. More recent studies support this as they find that while the external environment is still a source of uncertainty in strategic decision making, the internal environment and the reaction within the organisation to strategic moves is beginning to present a fair amount of uncertainty creating dual sources of uncertainty in what is termed a strategy dilemma (Poblador, 2014).

Shepherd and Rudd (2014) view strategic decisions as possessing characteristics that include a lack of structure, concerned with future uncertainties and non-routine in nature.The characteristics of strategic decisions then presents a unique challenge for senior managers who possess the experience however, this is generally linked to one context which may be unlikely to work in another context (Lewis D. , 2013). Lewis (2013) presents four principles that may assist with improving decision making by dealing with the complexity and unfamiliar nature of strategic decisions. These include reframing and looking at the decision from different perspectives; experimenting and working with real data in real situations or piloting as soon as possible; modelling to predict outcomes based on patterns and rules that emerge from data; and theorising which requires developing new stories to explain outcomes (Lewis D. , 2013). Maitland and Sammartino (2015) found two contrasting methods employed to deal with complexity, one being the creation of Small World Representations to assess longer-term consequences of alternative courses of action alternatively, they found that experts tend to lean towards using experiential learning and expert judgement. The use of heuristics to lend focus to specific cues given the vast amount of information present as well as tools such as simulations and optimisations models were also explored (Maitland &

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Sammartino, 2015). One may argue though that simulation models comes with the weakness and risk of fitting past trends to possibly very different futures that is characteristic of strategic decisions.

In summary, strategic decisions are concerned with defining the future of organisations aimed at ensuring future sustainability. While the focus is on the external context and the environment of business, the decision affects the internal environment so that there is a need for coherency and alignment. The implication is that there is a broad span of impact that is not easy to reverse and thus requires a rigorous decision making approach.

2.2 What are decision dilemmas?

As the research is based on situations classified as a dilemma, it may be useful at this stage to gain an understanding of what decision dilemmas are.

A decision denotes the existence of two or more alternatives from which one must be selected (Certo, Connelly, & Laszlo, 2008). Mintzberg (1975) in Certo et al. (2008) found in his study of the decision making processes of executives, that their decisions mostly consisted of two alternatives in a yes/no trade-off. Cameron and Quinn (1988) and Clegg (2002) in Smith (2014), define dilemmas as situations that require a trade-off between two alternatives ("either/or") that are resolved by selecting one of them. Smith & Lewis's (2011) definition further adds that the selection is based on weighing the relative advantages and disadvantages of the the alternatives.

The article by Poblador (2014) makes reference to strategy dilemmas described as situations where strategic choices can lead to any of numerous possible outcomes and these outcomes may not have been intended. The dilemma and the dual source of uncertainty arises from both the rapidly changing external or business environment as well as the unpredictability of the way in which the organisation will react to the changes. Resolving this dilemma requires a movement away from traditional strategic planning approaches to dynamic, continuous adaptive and experimental approaches (Poblador, 2014).

In the process of strategy execution encountering dilemmas is a certainty and six key dilemmas are discussed in the article "Avoiding the strategy execution pitfalls: Confronting dilemmas when turning plans into action" (Emerald insight, 2016). These dilemmas include those of balancing the scarcity of both time and resources in providing a quality service to existing customers while creating future value by improving the orgainsation; honouring the

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past and corporate DNA without becoming bound by it while building the future; acting with integrity when hard earned trust is at risk due to corporate and staff needs are at odds; managing the confidence dilemma when transitions are protracted as a result of delays; maintaining morale and motivation given shifting situational requirements and differing individual needs; and maintaining control given the threat of chaos brought on by either moving too fast or intensifying efforts (Emerald insight, 2016). To effectively deal with this, the article proposes a five-step process of detecting and scanning continuously for rising issues; accepting that dilemmas will occur; diagnosing the nature of the dilemma and engaging with others on ways to resolve it; designing and evaluating options; and finally acting in the knowledge that the response to the core dilemma influences that success of the strategy execution (Emerald insight, 2016). This seems to indicate a preference for a predominantly rational approach.

Competing demands permeate organisations and at a strategic level these include decisions of exploring or exploiting (March, 1991), globalisation vs local adaptation (Marquis and Battilana, 2009), decisions relating to time frame (manage for today or tomorrow) and those tensions relating to profit maximisation against creating value for a broader range of stakeholders (Smith, Lewis, & Tushman, 2016). Drummond (2014), explores the dilemma of quit or continue with reference to important ventures or projects that appear to falter and as well as the forces that drive persistence and escalation (e.g. denial, overconfidence, self-justification, exit barriers) versus those that drive abandonment (e.g. risk aversion, intolerance for failure).

Mining companies operate in rural communities where natural resources are an important aspect of the social fabric (George, Corbishley, Khayesi, Haas, & Tihanyi, 2016). This exposes them to social dilemmas. Social dilemmas are defined by Zettler, Hilbig and Heydasch (2013) as situations where the maximisation of individual utility is at odds with collective utility. In such dilemmas, that occur in the context of relationships between individuals, organisations and society, the decision to cooperate may have collective benefits at a cost to the individual (Evans, Dillon, & Rand, 2015). Studies into the cognitive justification behind cooperation in such dilemmas and the role of role of intuitive and reflective thinking tend to indicate that people are cooperative from an intuitive perspective and reflectively selfish (Zaki & Mitchell, 2013). These implications link to reaction time where intuitive processes are viewed as fast, automatic and emotional while that of reflective processes being slow, calculated and more rational (Evans, Dillon, & Rand, 2015). In other research such as that conducted by Zettler et al. (2013) who investigated the impact of certain personality traits on social dilemmas, an increased likelihood towards cooperation was found to be high given the presence of the honesty-humility trait.

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A view on dilemmas would be incomplete without a consideration of ethical dilemmas. Ethical dilemmas include the presence of moral issues when the choice of action has consequences for others (Selart & Johansen, 2011). The model applied to conducting decision making where ethics are present include as a first step, the recognition of the presence of a moral issue, making a moral judgement, prioritising moral concerns based on the established moral intent and lastly acting on it (Selart & Johansen, 2011). In this article by Selart and Johansen (2011), the authors explored the role of stress on ethical recognition and ethical acting and found that stress only affected ethical acting by reducing prosocial behaviour. The presence of stress was based on stressors including a sense of powerlessness, work overload and a lack of feedback and punishment. This study was limited in the number of females in the sample with the result that further exploration is required on the effect of prosocial behaviour shown by males versus females. Where the typical "fight or flight" response may be more applicable to males whereas females may be prone to the "tend and befriend" response thus resulting in females acting more ethically (Selart & Johansen, 2011).

Based on the literature explored, it is evident that there is an abundance and diversity of dilemmas faced by senior managers and these are supported by various opinions in how they should be resolved as well as situational factors (e.g. time) and forces that influence the approach and the outcome.

Studies seem to indicate that it is no longer sufficient to choose between the alternatives presented in a dilemma, but that a third option exists. According to Jarzabkowski and Sillince (2007); Kraatz and Block (2008) as well as Smith et al. (2010) in Smith (2014), survival in the current complex and global environment requires that organisations be able to handle competing strategic demands simultaneously. Laureiro-Martinez, Brusoni, Canessa, and Zollo (2015), term this ability to manage trade-off situations simultaneously as ambidexterity. However, according to Gavetti (2012) in Laureiro-Martinez et al. (2015) leaders would then require superior abilities to manage and switch between cognitively distant opportunities and closer tasks effectively and there are limited theorethical foundations to the study of these abilities.

2.3   Rational versus intuitive decision making

This section aims to explore the thinking style and decision approach available to decision makers and is useful in understanding which approach dominates so that organisations can be aware of the limitations and put the correct processes in place to mitigate them and ensure effective decision making.

In the early article by Sjöberg (1982) three approaches to decision making were discussed: unqualified rationalism, qualified rationalism and irrationalism. This differentiation still appears in literature today. The first approach holds that man is fundamentally rational and where proper substantial knowledge is at hand, one can expect correct diagnosis and prediction. According to the second approach cognitive biases exist and heuristics or processing strategies are used to simplify difficult judgement tasks. The third approach holds that thinking is strongly influenced by non-cognitive sources of distortion and that these emotions and motives produce errors of thinking (Sjöberg, 1982).

Richard Thaler and Cass Sunstein in their book, Nudge, refer to System one and System two thinking styles (Kahneman, Lovallo, & Sibony, 2011). System one is based on intuition, associations and feelings and result in effortless action, while system two is based on slow deliberate thinking consistent with rational approaches (Kahneman, Lovallo, & Sibony, 2011). Self monitoring on the quality of the decision and reasoning conducted continuously is also a typical feature of System two styles (Kahneman & Klein, 2009). In another study by Przasnyski and Elias (2011) decision making is approached from two perspectives: prescriptive theory which uses quantitative tools and behavioural theory and the authors believe that the best decisions are based on a combination of these two perspectives. Behavioural theory looks at what the decision maker does; the impact of habits, psychological factors and values on how the decision is made; the context of the organisation including culture as well as internal and external pressure (Przasnyski & Elias, 2011). In the remainder of this section we will seek to gain some understanding of rational and intuitive approaches to decision making.

Evans (2008) and Hodgkinson et al. (2009) in Kaufmann, Meschnig, and Reimann (2014), state that rational decision making follows an analytical, sequential and rule based process. It is supported by information and decision tools. This thorough and structured process is believed to contribute to better decision outcomes as it increases the likelihood of identifying pros and cons of all alternatives (Slotegraaf & Atuahene-Gima, 2011) and reducing bias, this according to Dean and Sharfman (1993) and Elbanna (2006) in Kaufmann et al. (2014). On the other hand, rational approaches according to Hodgkinson et al. (2009) and Klein (1999) in Kaufmann et al. (2014), rely on the availability of information which could introduce the risk of a lack of focus due to information overload and analysis paralysis. In the study conducted by Przasnyski and Elias (2011) the prescriptive approach also refered to the quantitative modelling approach follows the basic steps of abstraction which involves creating a symbolic representation of the decision in the form of a model, this is then solved using analysis and the results are inferred back to the original decision situation. This depicted in figure 1 and from this it can be seen that the symbolic world of quantitative

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modelling does require inputs from Behavioural Theory in the form of management judgement, intuition and experience and that the quality of these inputs determine the quality and success of the model outcomes..

Figure 1: The Modelling Process (Source: Przasnyski & Elias, 2011, p.23)
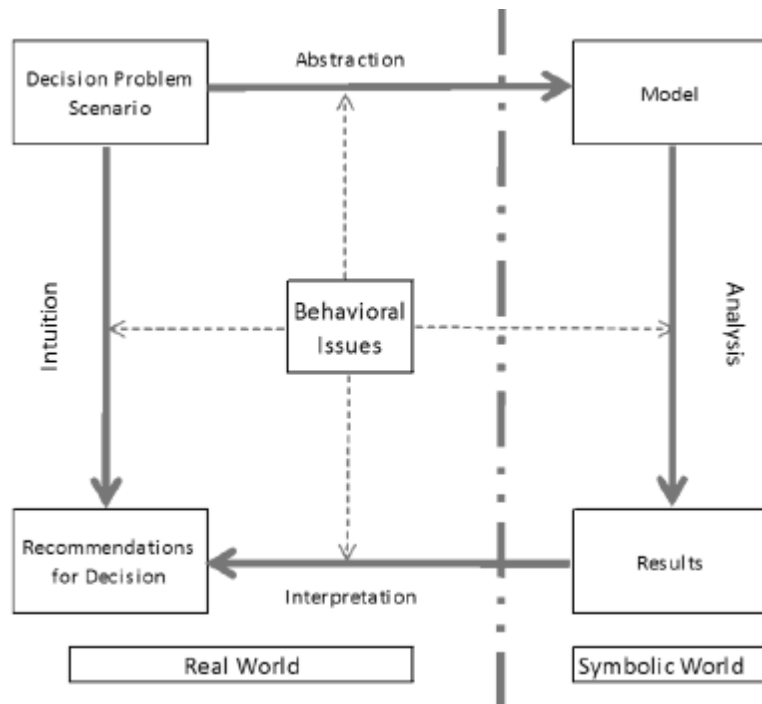
While the analytical and sequential process of rational decision making may create a sense of comfort (Kourdi, 2003) and thoroughness, one could argue that information by itself is not useful, rather relevant information and information that tests more than one perspective. Therefore, the biggest potential flaw of rational decision making could be information and information bias. It is also suggested that up to middle management levels, quantitative decision-making seems to serve quite well however, as one becomes more senior and decisions become more complex and ambiguous rational methods cannot be used (Kourdi, 2003).

Experience-based intuition draws from expertise specific to certain fields and stored knowledge according to Burke and Miller (1999), Sadler-Smith and Shefy (2004) and Salas et al. (2010) in Kaufmann et al. (2014). Benefits arise from the ability to form associations and predict under conditions when little information in available. However, this approach is open to the weakness of immature intuition that is raised by Carter et al. (2007); Katsikopoulos and Gigerenzer (2013) and Riedl et al (2013) in Kaufmann et al. (2014). This does raise the question on the measurement of the maturity of intuition as well as how would one know when a decision has fallen prey to this weakness. In a similar vein of trying to understand the validity of intuition and expertise, Kahneman and Klein (2009) refer to two

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approaches, naturalistic decision making (NDM) and heuristics and bias (HB). NDM arises from the studies of chess players and firefighters and the ability to recognise complex patterns without the need to calculate all possible contingencies and put forward a single plausible option, this arises from experience and skill. For intuition to be considered skilled, the environment must provide real cues relating to the nature of the situation and there must have been sufficient opportunity to learn the cues and practice these skills. The Heuristics and Bias approach on the other hand arises from heuristics and not specific experience and is considered informal judgement which can be prone to inconsistencies. These inconsistencies are observed in two ways: firstly when presented with the same information on different occasions the judgement differs and secondly where others given the same information, arrive at different conclusions (Kahneman & Klein, 2009).

The case for the use of intuition is based on the realisation that not all processes and phenomena can be predicted and planned based on logic and proven algorithms as found by Zohar and Marshall (2000) in Malewska (2015). Conditions that predispose the decision-maker to using intuition include the presence of information noise, a shortage of information, high levels of uncertainty, a shortage of time or resources and variables (Malewska, 2015). These are scientifically predictable to a limited extent (Malewska, 2015). Having intuitive potential does not imply that it will be used in decision making as internal determinants and external determinants affect the decision maker's use of this approach (Malewska, 2015). Internal determinants include personality traits and preferred work style while external determinants include organisational culture, the structure of a problem and time pressure.

Both rational and intuitive approaches contain benefits and deficiencies and one might consider a combined approach as being more effective. To express this point, instinctive or intuitive methods of decision-making are prone to bias and flawed judgment while rational decision making can ignore experience and insight leading to both methods being flawed (Kourdi, 2003). As a possible solution, dual process theory Evans (2008) and Salas et al. (2010) (as cited in Kaufmann et al, 2014), is a combination of both rational and intuitive based decision styles and it is believed that it can increase decision making quality. This combination arises from the belief that decisions are rarely based on one or the other approach but that the two operate in parallel and interact in complex ways (Kaufmann et al, 2014).

2.4   Tools and techniques used in decision making

Given that, rational decision making is an analytical and sequential process it expected that the literature study would be incomplete without an investigation into the tools and

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techniques available for use to the rational decision maker and the general advantages and disadvantages of the use of tools in decision making.

Operations research provides a useful set of tools (e.g. linear programming, simulation modelling; queuing theory; decision trees; multi-criteria decision making) that finds it application more in the decisions of middle management (Simon, et al., 1987). It requires a defined set of input and is generally used to determine optimal solutions given a set of constraints. For decisions at a strategic level, which are characterised by complexity, incomplete information and a lack of consistency and structure, some of the tools provided by operations research may not be effective.

According to Leonova (2014), ill-structured problems, which require consideration of the internal and external environment, require methods that combine expert information with heuristics, common sense and intuition. Popular methods that support this requirement include cognitive maps, decision trees and the analytical hierarchy process (Leonova, 2014).

The selection of investment alternatives requires the consideration of a variety of criteria both qualitative and quantitative in nature and many of the multi-criteria mathematical tools available (e.g. the Analytical Hierarchy Process) to support the nature of the decisions were found to be avoided due to the complexity of the tools (Frank, de Souza, Ribeiro, & Echeveste, 2013). To this end, the authors of the article attempted to formulate an easy to use multi-criteria framework to support investment decision making. The framework was supported by techniques such as the Quality Function Deployment technique, the SWOT analysis and financial analysis using indicators such as NPV and Payback and the outcome of the quality; strategy and economic evaluations were integrated using the Multi-Attribute Utility Theory (Frank, de Souza, Ribeiro, & Echeveste, 2013). While this does present a fairly thorough and integrated model, it is clear that the techniques used in combination or individually requires a large amount of data and data analysis to support it as well as a significant time implication thus restricting its use.

Strategic planning is a tool used frequently by senior managers and Rigby and Bilodeau (2007) in Meissner (2014), state that this tool remains one of the most influential tools in strategic management. The tool provides a set of planning guidelines in the aim of formulating a single optimal strategy. In spite of it being viewed as an important tool a debate still exists on the effectiveness of this tool (Meissner, 2014). Grant (2003) (as cited in Meissner, 2014) speaks of a new perspective termed 'planned emergence' which views strategy as aspirations and performance goals as opposed to the traditional view of strategic planning as a resource deployment tool, the result is reduced planning time and greater flexibility.

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Scenario planning is another tool used by senior management for strategic and long term planning and differs from strategic planning in that a range of possible futures are imagined and the process enables senior managers to prepare for the various environments that their long term plans may encounter (Phadnis, Caplice, Sheffi, & Singh, 2015). According to Haeffner, Leone, Coons, and Chermack (2012) scenario planning was seen as a means of addressing the shortcomings of strategic planning which was found to be prescriptive and reactive. Not without its own shortcomings, Schoemaker (2004) (as cited in Phadnis et al, 2015) found scenario planning to be subjective and heuristic in nature and its usefulness has been linked to its ability to reduce framing bias and change the way decision makers view of how the world works and how it will influence their plans. To further understand it's usefulness, a study to determine the influence of scenario planning on expert judgement found that it had no impact on confidence in judgement but that it did lead to decision makers updating their judgement in favour of specific investments based on its performance in a scenario (Phadnis, Caplice, Sheffi, & Singh, 2015).

Borison and Hamm (2010) suggest a decision theory approach termed probability encoding (the process incorporates judgemental probabilities from the expert) and expert aggregation (similar to probability encoding however it aggregates the judgements of more than one expert) for quantitative assessment of judgemental uncertainty to support strategic decision making. Limitations do include the tendency towards limited spread and clustering of expert opinion (Borison & Hamm, 2010). A more recent tool highlighted by the author is that of prediction markets, a market is created where a number of individuals can place bets on an outcome (Borison & Hamm, 2010).

Game theory has been noted to be a useful tool in supporting rational strategic decision making particularly in negotiations (Peleckis, 2015).

There are numerous tools to support a rational approach to strategic decision making and a few of the more common tools and techniques have briefly been explored. The selection of an appropriate tool to support the decision, if a tool is deemed useful, will depend on the context (time, information, etc.) relating to the decision.

Some of the key benefits of using quantitative methods include that it allows for the evaluation of alternatives in a safe environment, it allows for optimal as opposed to merely satisficing decisions, it requires a systematic approach which lends towards greater precision and depth when considering all factors relating to the decision and it's alternatives (Przasnyski & Elias, 2011).

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The limitations as highlighted by Przasnyski and Elias (2011) relate to the concept of "garbage in, garbage out" in that assumptions and information feed models and need to be appropriate and sufficiently accurate to create a realistic representation of the real situation. Models require information and time which in strategic decisions, is not always available. Another feature of strategic decisions, complexity becomes a limitation in that as complexity rises greater modelling skill and knowledge is required. Przasnyski and Elias (2011) state that the benefits and usefulness of models increases if the modeller and decision maker are the same however, one finds that there exists a misunderstanding and fear of models due to their mathematical nature.

While this literature review highlights some of the more commonly stated benefits and limitations, it is expected that the list is not comprehensive.

2.5 Factors impacting on the effectiveness of decision making

Factors impacting on the effectiveness of decision making are explored to understand whether decision makers are swayed or forced into an approach, these include amongst others bias, risk tolerance and the availability or unavailability of information. All of these ultimately influence the quality of the decision made.

Einhorn (1970) and Hunt et al. (1989) in Appelt, Milch, Handgraaf, and Weber (2011) state that decisions are affected by three sets of factors: decision features, situational features and individual differences. Decision features or characteristics of the decision include the way in which decisions are framed and the ordering of options, situational factors include elements of time pressure and social context while individual differences focus on the characteristics of the decision maker (Appelt et al., 2011).

Appelt et al. (2011) highlighted the following as common measures of individual differences:

- Decision making measures such as: style referring to the extent to which rational as opposed to intuitive styles are used; approach which includes aspects of how decisions are management pre and post taking the decision, decision conflict and regret; and competence which refers to the ability to make good decisions and includes the ability to reach satisfactory outcomes.
- Risk attitude measures include risk taking and aversions as well as the closely related aspect of tolerance for ambiguity.
- Cognitive ability measures which refer to the decision maker's capability and aptitude.

- Motivation measures which refer to the desire to engage in certain behaviours including aspects of social desirability, self-regulation, altruism, etc.
- Personality measures which covers aspects of the individual's personality with special reference to dimensions of openness, conscientiousness, extraversion, agreeableness and neuroticism
- Personality constructs which relate to aspects of the self, such as self-esteem, self-consciousness (includes empathy and trust), impulsiveness, cultural differences (individualism versus collectivism, power distance, masculinity versus femininity), time orientation and measures of perceived control.

Framing has an impact on decision outcomes. A positive or negative framing of the problem can lead different outcomes as the decision maker's perspectives shift (Certo, Connelly, & Laszlo, 2008). According to these authors, theory suggests that loss avoidance is more likely to be favoured as opposed to favouring gains. In a study by Laing (2013), the rational decision making model and its effect on an outsourcing decision was tested. The author found that the framing of the problem, positive or negative, had an influence on whether there was a difference in the decisions taken by rational as opposed to intuitive decision makers (Laing, 2013).

Information is a commonly cited factor influencing decisions, it could be as a result of overload a symptom of the current information age or a lack of information. One area generally overlooked when it comes to information is that of the value of information decision makers choose to use (Patrick, Steele, & Spencer, 2013). According to Dhami and Harries (2010) (as cited in Patrick et al., 2013), experts tend to conduct very few information searches when making decisions. Experts are able to make quality decisions by "zeroing in" on critical information (Patrick, Steele, & Spencer, 2013). The amount of information to use in a decision is another problem faced by decision makers and Newell and Michael (2011) suggests that evidence should be sampled sequentially and adjusted within a decision threshold. These thresholds are expected to vary based on between individuals and decisions (Newell & Michael, 2011).

In some cases, decision makers irrationaly gravitate towards risk, this observed in situations where the alternative is a guaranteed loss or when the gains are significant (Certo, Connelly, & Laszlo, 2008).

Simon, et al. (1987) raise the concept of aggregation which extends decision making to organisation-wide and society wide phenomena. Even though this is based on a dated article, in my opinion this is a factor that cannot be overlooked under current economic

conditions where silo based strategic decisions taken by individual companies can potentially contribute to the slow-down of economic growth at a country level.

The article, "A Danger to Ourselves", by Barbieri (2013) talks about the work by Daniel Kahneman and Amos Tversky on bias and the role it plays in placing people at risk of poor decisions. The solution though may be found in becoming aware of the flaws in our reasoning (Barbieri, 2013). To this end, some of the biases that impact on the effectiveness of decisions made will be explored. This will aid the study by making the researcher aware of of the biases that senior managers may be susceptible to and whether they are aware of it and seek to actively manage it.

In the article, "Before you Make that Big Decision", the authors list at least three biases that executives fall pray to (Kahneman, Lovallo, & Sibony, 2011). These are confirmation bias, anchoring and loss aversion. Note that there are numerous other biases not covered in this article that do influence decision making such as overconfidence bias. In the case of confirmation bias, the decision maker ignores any information that contradicts his perceptions. Anchoring bias tends to view one piece of information as significantly more important and loss aversion results in the decision maker favouring options of lower risk (Kahneman, Lovallo, & Sibony, 2011). With the aim of mitigating these biases organisations introduce a process of review and approval before decisions are taken to the next level. The argument for this process is that while executives may not be aware of their own bias they can recognise an neutralise it in the decision made by others. On other hand, the authors argue the the review process has a potential to introduce more distortions arising from bias at every stage of the process (Kahneman, Lovallo, & Sibony, 2011). Interestingly, some Mining companies have a tendency to follow a stringent review process particularly on their more strategic projects which include reviews at each stage of the project management process. These reviews evaluate projects according to project management discipline and key performance indicators, business indicators as well as for technology and engineering soundness. However, going back to the article, the failure of these review processes could be linked to reviews focusing more on the content and a challenging of recommendations rather than challenging the recommendation process and searching for bias that may have influenced the proposals put forward (Kahneman, Lovallo, & Sibony, 2011).

Gary, Wood, and Pillinger (2012) suggest that managers make strategic decisions in novel situations based on analogies drawn from existing mental models and familiar problems. According to Duhaime and Schwenk (1985) and Gavetti et al. (2005) in Gary et al. (2012) analogies can help in shaping the problem and serve to reduce complexity and uncertainty, performance outcomes is enhanced when there is structural alignment between the source

and target problems . The other perspective raised by Schwenk (1985) in Gary et al. (2012) is that analogies can be misleading and create an incorrect or or simplistic view of new strategic situations.

The contextual variables composed of the top management team, strategic decision specific characteristics, the external environment and the firm characteristics were derived from an extensive literature study and evaluated for its impact on the strategic decision making process as part of Shepherd and Rudd's (2014) study. The contextual variables and its integration with the characteristics of the strategic decision making process and its outcomes were captured in a framework as depicted in figure 2. The findings of the study as it relates to these contextuals variables and the direct impacts were:

- The management team

  The concept of creeping rationality as termed by Fredrickson and Iaquinto (1989) becomes prevalent where one finds an increasing tendency towards rational decision making and more comprehensive decision making as tenure increases.The level of education was found to influence rationality and comprehensiveness in that the more highly educated, the more predisposed to rationality due to a more developed analytical capability. Although at CEO level this does not hold true as his basis for rational decision making is related to financial indicators. As cognitive diversity, which refers to differences in the preferences and beliefs concerning the strategic goals and priorities of the organization, increases the tendency is towards decreasing comprehensiveness. Finally, cognitive style which describes how people perceive, think, solve problems, learn, and relate to each other was found to be inconclusive on how this influences strategic decision making (Shepherd & Rudd, 2014).

- SD Specific categories

  Specific categories covered included strategic decision matter; uncertainty, motive, importance and time pressures. The review indicated that when uncertainty is present, rationality diminishes together with the inclination to gather data. Uncertainty does however, increase flexibility, lobbying and the level of disagreement in problem solving. The coalitions and lobbying is used to overcome/minimise disagreement. Motive refers to whether the decision is made in response to an opportunity or threat and the only significant finding in this regard is that if the decision is made in response to a threat, the involvement of middle management is increased. Overall, studies were not conclusive on the impact of motive on strategic decision making. In terms of importance, studies were contradictory. Some found that decisions with a high magnitude of impact were followed by comprehensive engagement with all levels including a focus on financial information

while others found that the level of importance had no significant impact on rationality. When time pressures exist, disagreement will be present however, involvement and communication will be reduced (Shepherd & Rudd, 2014).

- The external environment

  In terms of the environment, two variables were explored: hostile environments and high-velocity, dynamic and unstable environments. Findings in respect of either of these variables were not conclusive indicating that the external environment has a less significant impact than other SD variables (Shepherd & Rudd, 2014).

- Firm characteristics

  Firm characteristics were evaluated from the perspectives of power centralization, structure, size, performance, slack resources, external control, corporate control and planning formality. Power not shared was found to be destructive in that it stimulates the fomation of coalitions with personal agendas. Structure influences participation and rationality in that participation is enchanced by fewer rules and standardised operating procedures while organisations that have formalised systems and commitees have a tendency towards increased rationality. While the size of the organisation influences the level of comprehensiveness findings are not conclusive on how it impacts on rationality (Shepherd & Rudd, 2014).

It is of relevance to note however, that the authors found significant methodological implications that were raised as part of this review.

Figure 2: Contextual variables in SDMP research: an illustrative framework of extant research (Shepherd & Rudd, 2014, p.342)
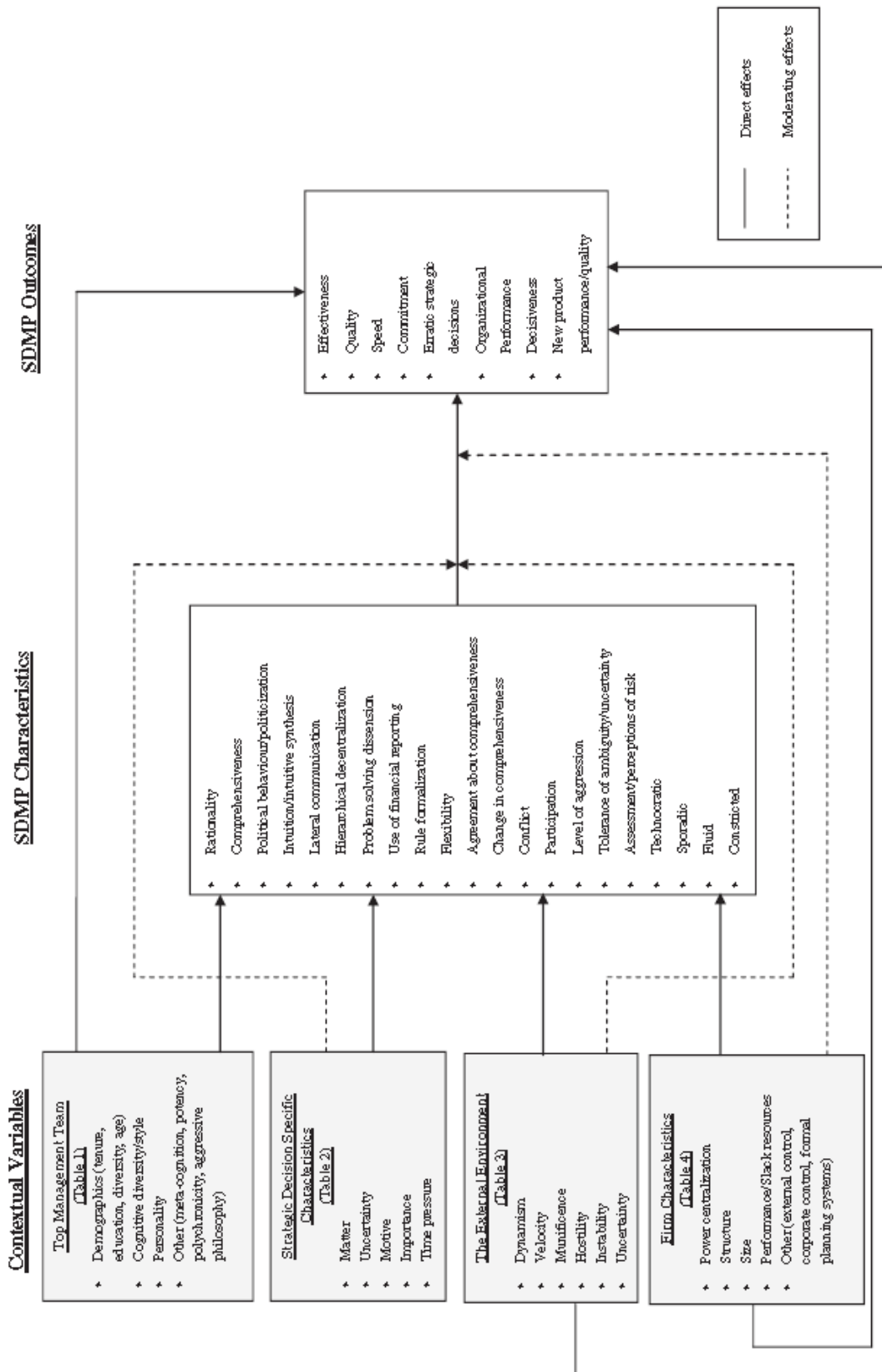
The "coersive" influence exerted by formal systems such as corporate governance is another interesting factor that impacts on decision making as suggested by Lubatkin et al. (2005) (as cited in Olie, Van Iterson, & Simsek, 2013). These institutions establish and enforce a set of explicit legal rules.

Given that decisions at senior level level frequently require group consensus, social influence among group members is another factor that impacts on effective decision making (Henningsen & Henningsen, 2015). The study by Henningsen and Henningsen (2015) attempted to understand the impact of social influence in the organizational setting. This study made reference to two types of social influence, informational influence and normative influence. Informational influence which attempts to influence other decision makers on the basis of making the best decision and this is best implemented by using logical arguments and facts. Normative influence attempts to influence others in the group based on the desire to belong. The study confirmed previous research findings that informational influence created positive perceptions of effective decision making while normative influence was negative in contrast and this can be associated with theories such as group think (Henningsen & Henningsen, 2015).

2.6   Decision utility

Utility is a concept that is fundamental to decision making, it refers to the personal worth or subjective value that an outcome produces (Busemeyer, Townsend, & Stout, 2002). The mechanism of executing utility was believed to be based on subjective values stored as parameters in the decision maker's brain to be retrieved on decision making however, according to Slovak (1995), the view has changed in that utilities are constructed in the moment and based on the current context of the decision (Busemeyer, Townsend, & Stout, 2002). Hastie (2001) in Certo et al. (2008) puts forward that a good decision may be recognised as one that effectively links the decision makers utilities/desired outcomes with the actual decision outcomes. Common utilities employed by decision makers will be explored as these contribute to a holistic understanding of decision making approaches.

Herbert Simon (1957) in Certo et al. (2008) stated that managers make imperfect decisions due to numerous factors which include their own bounded rationality, limited time and information. Therefore, better decisions can be made if these limitations can be overcome which is not always possible and this results in sub-optimal or good enough decisions being taken. This is termed satsificing and to add from French et al. (2009) it involves selecting the first reasonable option rather than the best.

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The classic expected utility theory mentioned by Savage (1954) and (von Neumann and Morgenstern) (1944) in Glöckner and Witteman (2010), assumes that people choose that alternative which presents the highest value or utility. Utility is based on the sum of all outcome utilities multiplied by the probability of occurrence however, it is argued that calculations are used in important decisions and that people generally make use of shortcut strategies or heuristics to do this (Glöckner & Witteman, 2010). One such heuristic is the fast-and-frugal or more the commonly known, quick-and-dirty and it is argued by Gigerenzer et al. (1999) in French et al. (2009), that these can be as effective or even more so than some of the more complex heuristics.

According to Fishburn (1974) in Glöckner and Witteman (2010), people compare the attributes in options in a sequential manner and select the option that is first in meeting a differentating attribute, no further attributes are considered further.

 Another view on decision utility relates to a framework of prospective decision utility where decisions are made based on the perceived outcome and the anticipated emotions that accompany it (Cheng, 2014). According to Cheng (2014), this behaviour of gravitating towards positive emotions and avoiding the negative emotions attached to the perceived outcomes extends to investment decisions as well. The model put forward by Cheng (2014) to explain how anticipated discrete emotions gives rise to investment decisions, finds it roots in the proposition by Sjoberg (2007) on cognitive evaluation which refers to the process of first conducting a preliminary evaluation, this then gives rise to emotions which then influence the final decision (Cheng, 2014).

2.7   A summary of the literature review

Strategic decisions are concerned with defining the future of organisations aimed at ensuring future sustainability. Strategic decisions have a broad span of impact, both on the environment of business as well as the internal environment of the company that cannot easily be reversed thus emphasing the need for coherency and alignment and a rigorous decision making approach. Based on the literature explored, it is evident that there is an abundance and diversity of dilemmas faced by senior managers in the strategic decisions that they take and these are supported by various opinions in how they should be resolved as well as the situational factors (e.g. time) and forces that influence the approach and the outcome. The key approaches covered in the study relate to rational and intuitive approaches and both contain benefits and deficiences with recent studies suggesting that a combined approach might be more effective. Where rational approaches are used, tools and techniques support quantitaive modelling and the literature unpacks typical decision making

tools with a focus on those that support the nature of strategic decisions. Benefits and limitations of tools were also unpacked and one finds fairly opposing views with some citing precision and depth as a benefit and the limitation being "garbage in, garbage out". This suggests that the understanding of the decision maker and that of the decision modeller need to be aligned. Factors impacting on the effectiveness of decision making were unpacked from various literature however the framework presented by Shepherd and Rudd's (2014) provide a good reference base for the various variables that impact on the decision making approach.

The literature indicates a need to understand the process of strategic decision making. Even though there have been numerous studies over time, one finds an ongoing debate regarding the use of rational versus intuitive decision making and the contextual variables that influence the approach. The current age is abundant with sources of information and is characterised by an ever changing environment, this has changed the way individuals, groups, organisations and industries work (Van Knippenberg, Dahlander, & Haas, 2015).

3   Research Questions

The primary or overarching question that the research seeks to answer is what strategic management approach senior managers in the mining industry follow when faced with a dilemma.

A series of supporting research questions have been identified to answer this question.

3.1   Research question 1

What categories and/or types of dilemmas do strategic decision makers face in the mining industry?

3.2   Research question 2

What are the natural or preferred approaches or styles followed by strategic decision makers when faced with a dilemma?

3.3   Research question 3

Do strategic decision makers when faced with dilemmas deem tools effective?

3.4   Research question 4

How do strategic decision makers define a "good decision"?

3.5   Research question 5

What are the factors (enablers and obstacles) influencing decision making when faced with a dilemma?

4   Proposed Research Methodology and Design

This chapter outlines the research methodology utilised in the study. This study sought to explore or discover what approach senior managers in the mining industry apply when making decisions in situations classified as a dilemma a topic not fully captured in literature under the particular context. To this end, the study was qualitative and exploratory in nature as is evident in the methodology, design, population, sample and analysis techniques employed and as described in this chapter.

4.1   Study methodology and design

Saunders and Lewis (2012), define three types of study approaches to research, i.e. exploratory studies, descriptive studies and explanatory studies. Exploratory studies are those that seek to discover general information about a topic that is not clearly understood by the researcher. This study sought to explore or discover what approach senior managers in the mining industry apply when making decisions in situations classified as a dilemma. The context of the unique challenges facing the industry, being presented with a trade-off situation and the variables that have potential to influence the approach, present a unique phenomenon that is not clearly understood and begs further insight. According to Creswell (2007), a qualitative approach to inquiry is best used to study or inquire into a social or human problem and involves obtaining data sensitive to the people and places being studied in their natural context.   Therefore, the methodology that supports this study is qualitative study following an exploratory research approach. Exploratory research is usually conducted by searching the academic literature; interviewing 'experts' in the subject or by conducting interviews (Saunders & Lewis, 2012). Individual depth interviews was the approach selected for conducting the research requirements, as it allows for open engagement with the respondent about the subject matter with the respondent generally leading the direction of the interview and it allowed the interviewer to probe various avenues based on the responses (Fischer, 2010). This was deemed an appropriate method as the researcher wanted to obtain a view of the meaning the participant holds about strategic decisions in the context of dilemmas, the approaches he/she employs, the rationale behind the selection of the approach and the variables that influence the approach selected. Key to this is the meaning participants hold as opposed to the meaning that the literature brings (Creswell, 2007).

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4.2 Universe

The research universe refers to the entire group of members or population, which is the focus of the study (Saunders & Lewis, Collecting data , 2012). Stated differently, it is the group that is most likely to contain the answers to the problem. Answers to the question, how do senior managers in the mining industry make decisions when faced with dilemmas lie in a universe that is composed of senior managers in the mining industry.

4.3 Population and sampling

The population consisted of all managers in the selected mining company classified as senior management. This classification included job titles such as senior manager, general manager and executive general manager. In the study conducted by Shepherd and Rudd (2014), the effects of contexts on strategic decision making were examined. When studying one such context i.e. "the top management team", different results were observed between the top management and the CEO specifically when considering variables such as tenure and education. For these reasons, the CEO is excluded. Middle managers are also excluded and the main reason behind this is that the research title and question is focused specifically on senior managers and strategic decisions. Supporting the reason for the separation of middle and senior managers is that studies indicate that the nature of decisions faced at middle management levels tend towards repeatable, predictable and structured problems that lend itself to rational or quasi-rational methods and find no commonality with the definition of strategic decisions (Malewska, 2015).

Only senior managers at the Corporate Office of the selected mining company formed part of this study, as this is where the strategic decisions defining the direction of the company are taken. This group was expected to be more exposed to dilemma situations thus supporting the requirements of the study.

The paper by Reed (2006) regards phenomenography as a research approach which takes a second order approach to understanding key aspects of the variation of individuals' experience of a phenomenon. In this approach statements are not made about the phenomen directly but rather the individuals views and experiences thereof. According to this approach the individual's experience (internal) is not viewed as separate to the external or environment (Reed, 2006). This is consistent with the aims of this study as the issue, how senior manager make decisions, under the context of conditions of a dilemma and within the mining industry was explored by interviewing senior managers on their lived experience of this phenomenon. For the purposes of this study, 13 managers at the Corporate Office of the selected mining company formed part of the study sample.

Sampling in the case of qualitative research aims to achieve relevance therefore, a non-probability sampling method was used to select the sample thus judgement and convenience was applied to the selection. Options for non-probability sampling include convenience, purposive, self-selection, quota and snowball (Saunders & Lewis, 2012). Purposive sampling requires the use of judgement in selecting participants who would best help answer the research question. There are varieties of purposive sampling however, the one that best suited the research aims was that of critical case that is based on the premise that the topic of interest is most likely to occur in the sample selected (Saunders & Lewis, 2012). In this research, participants were selected based on:

- The individual's position fits the research requirements, i.e. he/she fall in the group classified as senior managements
- Their position requires them to make decisions that alter the direction of the company and all that is consistent with the definition of a dilemma.

4.4 Unit of analysis

The unit of analysis for this study will be the individual senior manager in the mining industry. The research will seek to understand the individuals approach to decision making when faced with situations classified as dilemmas. Whether rational, intuitive or a combination of approaches are employed and what factors influence the decision making approach.

4.5 Analysis approach

Audio recordings of interviews were transcribed in order for analysis to be conducted using Microsoft Excel.

The transcribed data was explored to obtain a general sense of the data, and to establish how best to organise the data. The following steps as recommended by Saunders and Lewis (2012) was applied to identify patterns identify patterns arising from the data based on an inductive approach: 1) meaningful categories/codes were developed to describe the data; 2) the unit of data to attach to the relevant categories/codes was determined; 3) categories/codes were then attached to units of data.

Given that the study applied an inductive approach, the interview transcripts (data) were scrutinized to identify categories/codes. This played out as an iterative process. Once the categories/codes were finalised, the data was categorised and analysed using the Microsoft Excel to identify patterns and relationships in the data and frequencies of occurrence.

Content analysis is a method used with qualitative and applies to both an inductive or deductive approach (Elo & Kyngas, 2007) and provides a method of systematically and quantitatively analyse written or verbal communication. It was used as a method to allocate the data obtained in the interviews into categories and frequency analysis to rank the categories into the number of respondents who raised the category in the interview. Thus data was summarised using the number of times a category occurred.

4.6   Study limitations

According to Saunders and Lewis (2012), when a study focuses on a single case, a limitation exists on the extent to which one can call the selected organisation typical of all similar organisations. Therefore, limitations of the design type include that the results of this study is not generalizable to other mining companies or all industries.

The study focused only on the decision making approach, how decisions are implemented was not considered. This is considered a limitation as research implies that implementation is a significant contributor to the success of strategic decision making success (Elbanna, 2006).

The interviewer was not trained to conduct such interviews and this may have some impact on the results obtained. The study is qualitative and exploratory in nature and therefore is subjective and reflects the interpretations of the researcher (Saunders & Lewis, 2012). The study is based on the results of the interviews which is dependent on the quality of the responses received.

5   Results

5.1   Introduction

In this chapter, the results of the study are presented and these results are represented in accordance with the research questions stated in Chapter 3.

The research sample consisted of 13 senior managers at the corporate office at the selected mining company. These senior managers were selected from a diversity of functional areas to gain insight into how dilemmas in the mining industry influence their strategic decision making. As per the ethical agreements made, the name of the company as well as the interviewees are not disclosed however a high level demographic profile is presented in the list below.

Table 1: Interviewee List

Interviewee Number	Gender	Org Description	Position	Number of years in the industry	Educational Background
Int_1	Male	Portfolio Management	Group Manager, Portfolio Management	25	Master's in Engineering MBA
Int_2	Female	Human Resources	Group Manager, Strategic Workforce Planing	14	Master's in Industrial Psychology MBA
Int_3	Male	Metallurgy	Manager Metallurgy	24	Metallurgical Eng Business Studies
Int_4	Female	Information Management	Services Group Manager, IM	23	Masters in IT Honors in information systems
Int_5	Male	Business Technology Management	Executive Head, Business Technology	30	Metallurgical Eng MBA Executive training
Int_6	Male	Technology	Group Manager, Ferrous	30	Mechanical Engineering Incomplete MBA
Int_7	Male	Environment	Group Manager Environment	24	BSC in Chemistry MBA
Int_8	Male	Projects	Manager, Projects	27	Mechanical Engineering Incomplete MBA (Honours in Business Administration)
Int_9	Male	Sustainability	Executive Head, Sustainability	45	Mining Engineering MBA Advanced management
Int_10	Male	Supply Chain Management	Group Manager, SCM	10	MBA
Int_11	Male	Corporate Finance & Modelling	Group Manager, Corporate Finance & Modelling	19	Chartered Accountant
Int_12	Male	Relations & Compliance	Group Manager, Relations & Compliance	19	Bachelor in Social Sciences and industrial psychology Post graduate studies iin labour law
Int_13	Male	Growth & Portfolio Management	Executive Head, Growth & Portfolio Management	25	Mining Engineering Incomplete MBA Executive development

This information was utilised to determine the profile of the number of years that respondents have spent in the mining industry as presented in figure 3. This was done to determine whether tenure as a contextual variable may help to provide insight into some of the responses received. The results reveal that the majority of senior members have been part of the industry for at least 20 to 30 years, which is significant.

Figure 3: Number of years' respondents have spent in the industry
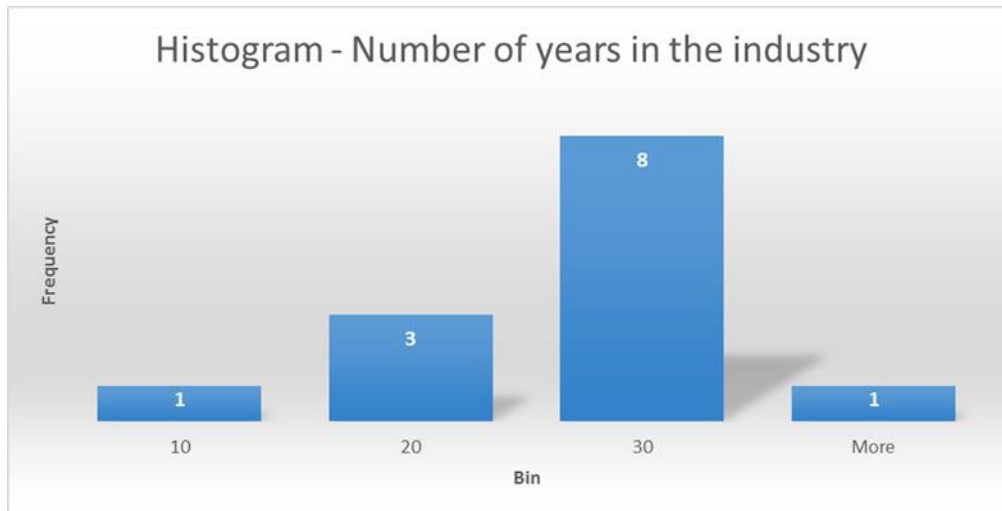
5.2 Analysis of the in-depth interviews

The interviews conducted with the 13 senior managers, which ranged in duration from thirty minutes to one hour, were based on the interview guide as contained in Appendix III. These were transcribed and then analysed using the content and frequency analysis technique. The content analysis was performed by capturing the data onto a created template in Microsoft Excel. Comments relating to each question were captured and categories were identified, the frequency of the recurrence of these categories across interviews was then tallied. These were then rank ordered from the most frequently mentioned to the least mentioned. In some cases, the number of responses provided in the aggregate table does not necessarily correlate to the number of interviewees that participated, given the fact that some interviewees may have shared many experiences and others may have had little or no response to the specific question asked. In all cases, the researcher attempted to use all the data to create a more meaningful analysis. It is important to note that when interpreting the results and in all cases, focus should be given to the depth of insight rather than merely the values represented.

The aggregated research findings are presented in the remainder of the section. The results are discussed in relation to the five research questions and are directly correlated to the responses of the six interview questions. The key concepts are listed for each question and then those with the highest frequency count are presented for each question. Data sheets with all questions containing all concepts are presented in Appendix IV.

The results are presented as follows:

- Research question 1 – Interview question 1, 1.1 - 1.4

  This question explored the categories and/or types of dilemmas that senior managers in the mining industry face.

- Research question 2 – Interview question 2, 2.1 - 2.7

  This question explores the natural or preferred approaches or styles followed by strategic decision makers when faced with a dilemma.

- Research question 3 – Interview question 3, 3.1, 3.2

  This question explored whether tools are deemed effective by strategic decision makers when faced with dilemmas.

- Research question 4 – Interview question 4

  This question explores what strategic decision makers define as a good decision

- Research question 5 – Interview question 5, 6

  This question explores the factors (enablers and obstacles) influencing decision making when faced with a dilemma.

5.3 Results for research question 1

This question explored the types of dilemmas that senior managers in the mining industry face, in addition to this the interview sought to explore similarities and differences in dilemmas faced, the trade-offs that were commonly made and why the senior managers considered the decision a dilemma.

5.3.1 Types of dilemmas

The interviewees were asked whether they experience dilemmas in their strategic choices where they did not know which way to turn due to the respective advantages and disadvantages. The response was that dilemmas were a frequent reality in this space and the following types of dilemmas were raised in the discussion as depicted in table 2.

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Table 2: Types of dilemmas faced

Types of dilemmas faced	
Category	Number of respondents
Licence to mine	14
Enablement of company strategy	5
Ethical dilemmas	5
Macro Economic Challenges	5
Company direction, future sustainability	2
Investment decisions	2

These categories are composed of the specific sub-categories as depicted in figure 4.

Figure 4: Breakdown of dilemma categories
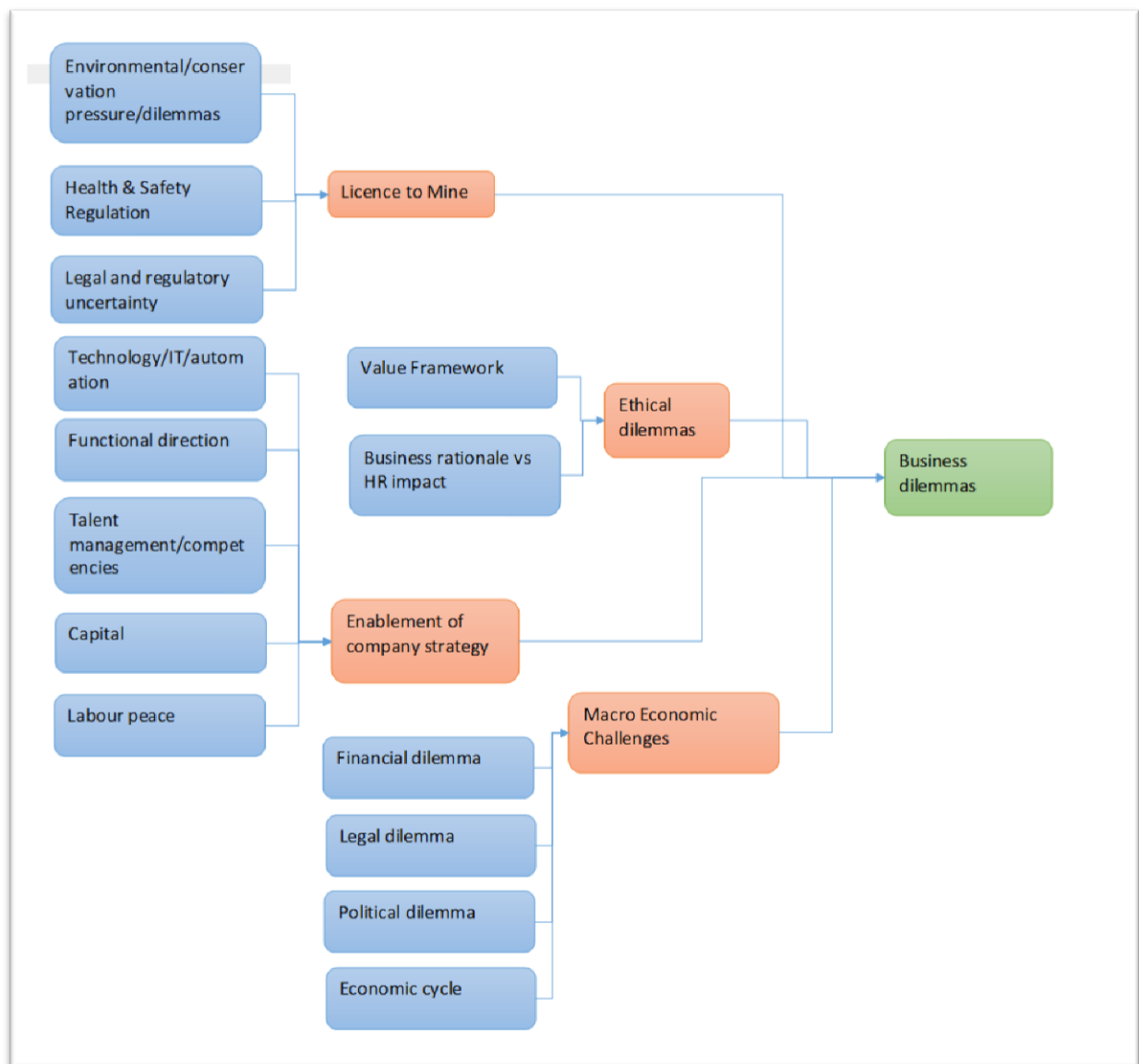
Licence to Mine is viewed as the most dominant type of dilemma faced by senior management and some of the specific issues faced within this category includes the uncertainty associated with the regulatory environment as raised in the following comments:

"…you don't necessarily have all the information regarding regulatory environment." (Interviewee 5)

"…you never know how legislation will change...So you never know how legislation can also become a threat for you as an industry". (Interviewee 13)

While uncertainty on how legislation will change poses one concern, there is also an uncertainty associated with the timing of approvals, which makes planning on the timing and prioritisation of projects difficult for senior managers; this was raised in the following comments:

"We are waiting, we want to execute, we have plans but yet, you are waiting for others also to play their part in the broader SA Inc. type of environment" (Interviewee 5)

"…the regulatory, sort of, environment that's extremely unpredictable to plan timing" (Interviewee 11)

Other concerns relate to environmental impacts and the pressure that arises in this regard that influence a mining company's ability to obtain a mining licence, these are evident from the following comments raised:

"…a green pressure that's arising" (Interviewee 6)

"…being exposed to issues of climate change and global warming" (Interviewee 9)

The second category that was raised by a number of interviewees is categorised as Enablement of the Company Strategy, this relates to factors that support the execution of the strategy of the company. During the interviews, senior managers commented on IT and technology enablement to support the company strategy, capital funding for projects and the need for appropriate competencies and skills as being some of the dilemmas faced in terms of making decisions to support the company strategy. Evidence of this is captured in the following comments:

"We try to enable what the strategies of the business operations are, and even from a corporate perspective. So although there is a balance between what your different stakeholders need, you need to also look at what is the trend within the market, what new

technologies are becoming available and could be of value to the organisation that the customers might not be aware off or the stakeholders might not be aware off" (Interviewee 4)

"what talent do I need for an organisation going forward, you know, I'm talking about knowledge you know, and talking about information you know, intellectual property of this organisation that I'm running, how is it maturing you know, I'm talking about the enabling platform of this organisation" (Interviewee 10)

"The third constraint here is the fact that we have a balance sheet, that we are totally reliant on debt to fund any sort of future growth for us" (Interviewee 11)

Senior managers in the mining industry also experience Ethical Dilemmas when there is a threat to their personal values or when there is a conflict between what is right for the business versus a human resource impact. This is not necessarily a dilemma unique to the mining industry. The interviewees made the following statements in this regard:

"I normally evaluate something using my values as a context. As the framework within which I approach anything. So if there is a strategic decision to make, my value system is based on, if I look at Company X as the company I work for, it's based on ensuring the sustainability and longevity of Company X … I would have personally withdrawn if it was in conflict with what I believed in…" (Interviewee 2)

"…there is a technical portion to it, there's the process portion, there's a financial and the most difficult to all is that at the end of the day, there's a human impact and that's normally the dilemma" (Interviewee 8)

A number of interviewees also considered macro-economic challenges as a type of dilemma faced. These would include challenges of a political, economic, social, legal, environmental and technological nature. Evidence of this is found in the following comments:

"some dilemmas of more political, country-political issues… you sit actually in my view with four things, you sit with the world market which is the one side and it's kind of known or predicable, then you sit with your infrastructure portion and so on, you sit with your legal portion and ... government portion, and then the fourth ... your self-created liability" (interviewee 6)

"…last sort of let's say two years since the commodity prices actually turned down on us … will it impact everybody and how long or is it a permanent sort of shifting in the market forces" (Interviewee 11)

5.3.2 Similarities and differences between dilemmas

Interviewees raised a diversity of similarities and differences between the dilemmas that they faced and many related back to the type of dilemma, which has already been discussed however, some of the similarities and differences that stood out most are quoted in table 3. Interviewees discussed risk as having elements of commonality and differentiation in relation to the various dilemmas faced in that all dilemmas contain risk however, the size and impact of the risk differs.

Table 3: Similarities and differences between dilemmas faced

Similarities	Differences
"Both at risk and at cost"	"...depends on the economical cycle and where we are and whether it's good or bad times."
"Competing objectives, competing risks and no perfect solution"	"How one handles the different dilemmas"
"Uncertain future"	"It's only the risk of whether it becomes a national issue that flicks onto the pages of Carte Blanche or whether it's just an unhappy shop steward"
"Fast changing environment"	"I think some higher risks than others maybe… "
"...is always cost cutting pressures"	"No real difference"
"all have uniqueness towards that specific decision that you need to make. but the similarities are driven by the process that you follow"	"Different context of impact on business outcome."
"environmental and conservation, extractive industry and conservation..."	
"...that's a similarity is that most of the decisions has a personal impact at the end of the day somewhere for people."	

In analysing the similarities, it was clear that interviewees took two approaches in their responses, some based it on the definition of strategic decisions and made reference to the rapidly changing environment, as well as the high levels of uncertainty and others reverted to the types of dilemmas faced. The results will look specifically at the similarities in the types of dilemmas faced. This is represented in table 4.

Table 4: Similarities in dilemmas faced

Similarities in dilemmas faced	
Category	**Number of respondents**
Cost/risk trade-off	5
Ethical dilemmas	2
Licence to mine	2
How one approaches it	1
Macro Economic Challenges	1

The categories raised are mostly aligned to the types of dilemmas discussed in the previous question however, the most frequent similarity raised refers to the trade-off that is made between cost and risk, followed by ethical dilemmas and licence to mine.

Differences between dilemmas faced are presented in table 5 and the size of the risk and where the decision impacts was by far the most dominant difference. For clarity, the point of impact included whether the decision had bearing on a business unit or corporate level or whether it had a technical, legal, financial or human impact.

Table 5: Differences in dilemmas faced

Differences in dilemmas faced	
Category	**Number of respondents**
Size and point of impact	8
How one approaches it	1
Where the economic cycle sits	1

5.3.3 Trade-offs made

Interviewees were asked what were the trade-offs that they were required to make when presented with the dilemmas. Typical of the type of decisions facing senior managers, the most frequently raised trade-off was whether to take a short or long term view in their decision making as represented by the Manage for today vs Manage for tomorrow category. Following closely on this in terms of the number of managers faced with this dilemma, is whether to maximise profit as opposed to creating value for a broader range of stakeholders. These stakeholders would include the communities in which mining companies operate as well as company employees. Senior managers are also required to trade-off higher value against increased risk and to reconcile whether the cost justifies the benefit. Table 6 provides the list of trade-offs that senior managers felt they were require to make.

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Table 6: Trade-offs that are made

Trade-offs that are made	
Category	Number of respondents
Manage for today vs Manage for tomorrow	5
Profit maximisation against creating value for a broader range of stakeholders	4
Value vs Risk	4
Cost vs Benefit	4
Ethics Trade-off	3
Insource vs outsource	2
Fit for purpose vs Standardisation	1
Personal goals vs Organisational goals	1

The decision of Manage for today vs Manage for tomorrow is influenced by a number of factors as depicted in figure 5. The economic cycle influences time related decisions as stated by one interviewee: "depends on the economic cycle and where we are and whether it's good or bad times". This creates implications for whether decisions should be based on the current state of the economy or focus on the future state. This is not an easy decision to make given that beneficiation plants and mines take a few years to be established. Therefore, it is possible for the establishment of a mine or plant take place during a downturn in order for the company to be in a position to maximise benefits when the economy is more conducive, provided that the economy does pick up. In a similar vein, technology decisions also need to take into consideration a short and long term view given the many variables at play, e.g. sustainability of technology maintenance and licencing during peaks and dips in the economy, the impact of aging technology, etc. This is captured in the following comment; "I think it depends on the economic cycle and where we are and whether it's good or bad times. I think in the good times it's not as difficult to, to get these things through, to dream wide and to start implementing with certain things. On the other side, the problem that you face is, if you have to now support certain things that were decided on in the good days and now you have to still maintain them in the bad days". The challenges experienced by the senior managers in terms of Balancing the scarcity is concerned with providing a quality service to existing customers while creating future value by improving the organisation. The statements made by one interviewee best express this, "…that you use the current revenues coming from this current business to plough them into a new business instead of continuing with the same business".

Figure 5: Decomposition of the Manage for today vs Manage for tomorrow category
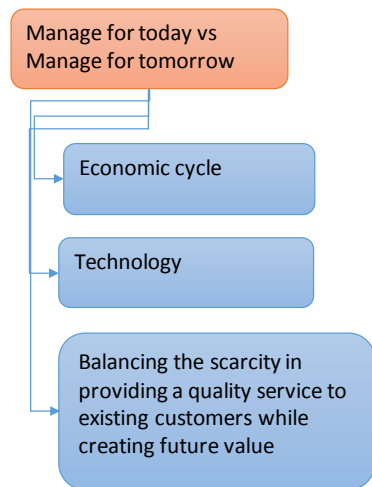
Senior managers need to trade off profit maximisation against creating value for a broader range of stakeholders and the interviewees expressed this in terms of the following comments:

"there's the environmental pressure which is its actually in conflict with the political agenda because the political agenda is to create jobs and so on and the economic agenda is to create value..." (Interviewee 6)

"…Which looks at the social impacts, you know economic impact and environmental impact and on the basis of it you are able to decide you know, this is a go or no, it's a no go." (Interviewee 7)

"It's normally the balance between the success of projects and the impact of the decision there off on let's say the people on the end of the day." (Interviewee 8)

"…there's environmental climate change risk but on the other hand it is also creating a lot of jobs…" (Interviewee 13)

5.3.4   Reasons for why it is a dilemma

This question sought to explore what contributed to the decision being regarded as a dilemma for the interviewee. We find that in addition to the business specific dilemmas raised in 5.3.1 there is a personal aspect to the dilemmas experienced as depicted in the categories raised in table 7.

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Table 7: Why was this a dilemma for the senior manager?

Why was this a dilemma for the senior manager	
Category	Number of respondents
Alignment of personal approach	5
Loss of decision control	5
Ethical dilemmas	4
Conflicting business requirements	2
Lack of certainty to accurately predict	1

The alignment of personal approach to that required by the company was one of the most frequently cited reasons and relates to the senior manager instinctively having a certain view on a decision but being required to provide facts and base decisions on the criteria set by the company. This category is further decomposed into the subcategories presented in figure 6.

Figure 6: Decomposition of "Alignment of personal approach"
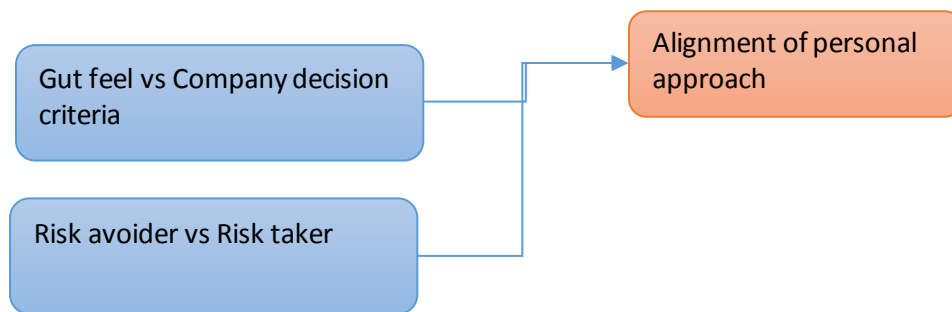
Managers felt that their gut feel on a decision was sometimes inhibited by the governance process and the criteria on which company decisions are based. This is expressed in the following comments:

"…gut feel - you cannot put in company motivated language" (Interviewee 1)

"…you see this value but you've got this, these issues that's not logical you know… if you do an analysis on the project you get this great NPV but with all of these potential liabilities and pit falls that you can't really say whether it's going to play out and not play out, so it's trying to make a decision but not be able to actually put facts to, it gets down to that gut feel." (Interviewee 6)

"…what is justifiable costs that the developer must put in, must assimilate? What are the costs of mining that society must pick up from the developer because society is also a

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beneficiary of the economic activity that the developer is doing? And we sort of blindly are internalising, this is where the dilemma is." (Interviewee 7)

In terms of being a risk avoider as opposed to a risk taker, interviewees found the company to be more conservative and favouring avoidance resulting in some senior managers putting their personal approach aside, as expressed by one senior manager in the following comment: "feels like the right thing but ...don't back your own decision and be conservative".

Loss of decision control was also found to be a frequently experienced personal dilemma. This is decomposed into the following sub-categories:

Figure 7: Decomposing "Loss of decision control"
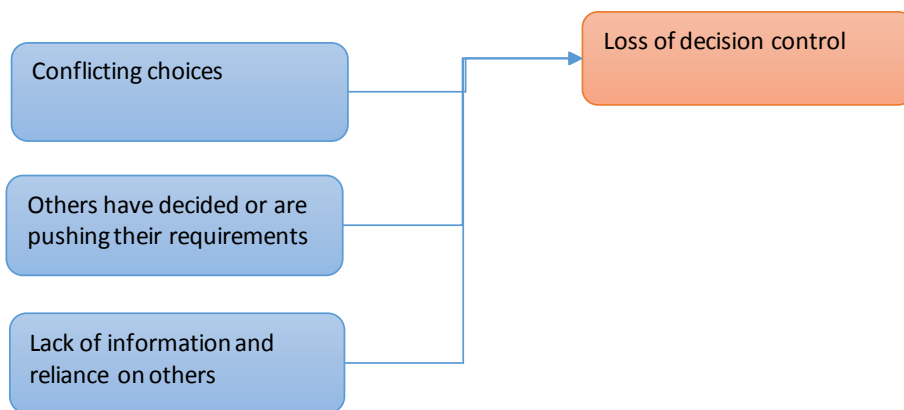
The sense of loss of decision control experienced by some senior managers is expressed in the following comments raised:

"…they've already decided on what they want and even though it's/may be against your strategy..." (Interviewee 4)

"…don't have all the information… not having access to all the conversations at different levels… then you rely on others ...trust your fellow colleagues…" (Interviewee 5)

"Of the three constraints (limited funding, timing of approvals and macro uncertainty) a lot is not in your control" (interviewee 11)

Once again, ethical reasons was raised as to why managers regard the decision as a dilemma.

5.4   Results for research question 2

This question explores the natural or preferred approaches or styles followed by strategic decision makers when faced with a dilemma. This includes exploring whether senior managers follow a process, what the steps followed are, how complexity is dealt with, whether collective or individual decision making is practiced, the presence of bias and the use of logic and reasoning, intuition, emotion and creativity.

5.4.1   How senior managers make decisions

Key words evident in the narrative used by the senior managers in answering this question were the used to create a profile of what the dominant approach followed was, this is depicted graphically in figure 8.

Figure 8: Number of respondents using an approach
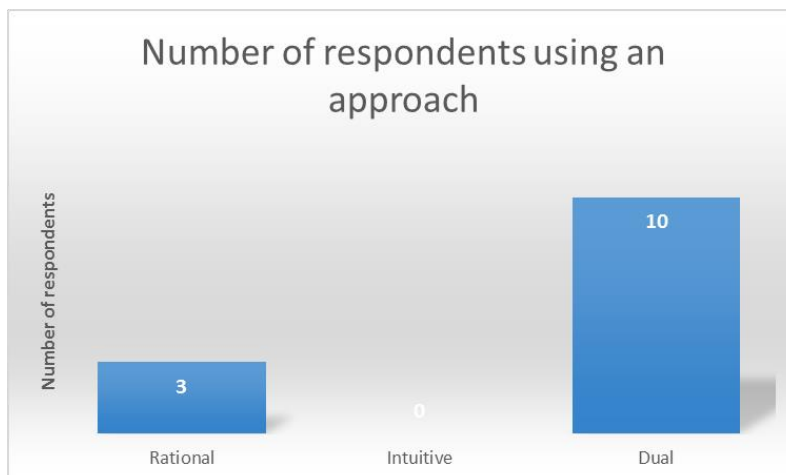
From this, we see that the tendency is predominantly towards a dual approach with a few responses leaning towards a purely rational approach. None of the interviewees identified with a purely intuitive approach.

Some of the responses obtained and in support of this are:

"I didn't follow some academic or theoretical or formal process but there is a process of my own…the first step is to try and understand the context. Uhm, so gather as much as possible information to understand the context and the implications of the dilemma, the two opposing choices in your dilemma, try to eliminate factors or information or data that's the same for both. So, the end result would be to try and pin point where the real differences in the two decisions lie. Third would be to then simulate the effect of taking either decision…then you got to try and value those parts and value does not necessarily mean rand and cents but try and put some criteria or metric to it or what are you trying to

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achieve and see which one would give you the closest to what you trying to achieve" (Interviewee 1)

"…understand your environment; what are the levers; are there specific strategic directions that you need to enable; know where do we need to get to; But also dreaming... a strategy for me although it needs to be achievable" (Interviewee 4)

"I make sure that all the information from the technical side is done thoroughly; done the assurance part of it and then I come up with a so called technical review committee, where technically I say this decision is a sound one to be taken...think the process that we put in place is an assurance process and we follow a project lifecycle...we take it through the various gates... the last time before we take a strategic decision to invest, there's Investment Review Committee, EXCO and the Board by which we then explain all of this and then only we get the capital and make the final decision... a lot of technical sanity checks before you go to the investment forum." (Interviewee 5)

5.4.2   How complexity is dealt with

This question sought to gain more insight into the approach followed by determining how senior managers dealt with complexity, a characteristic of strategic decisions. The analysis revealed the range categories depicted in table 8. Leveraging the team and shared knowledge was found to be the most frequent method of dealing with complexity; it allows the decision problem to be dissected from a diversity of viewpoints relating to different skill sets, different functional and different organisational levels as is evident in the following comments made by the interviewees:

"…bringing the shared knowledge of the team together" (Interviewee 4)

"Engaging because we had several sessions engaging with the both EXCO, the board and so on to get opinions… use those opinions to try and filter through the, non-tangible facts" (Interviewee 6)

"…get the information… not to rely only on my own experience and competency to take a decision, so get more people involved" (Interviewee 8)

"…the more complex it is I think the more wisdom you need around the table, you need to get the opinion of everybody, you need to get the views from outside companies,

independent companies, eh and eventually then put all that together and try to make sense out of the complexity" (Interviewee 13)

Senior managers also indicated that breaking down the decision into its fundamentals based on formats that make sense and focusing on key differences assisted in dealing with complexity. Fundamentals can include breaking it down into skills, functional area, project/decision phases, milestones, etc. Formats that make sense refer to the needing to map it, create process flow diagrams, draw links, etc. This is supported by the following statements:

"…and simplify it as much as possible by taking the noise out … focus on the differences" (Interviewee 1)

"…conceptually understand and map... in my experience creating a simple model, graph or diagram normally facilitates the alignment of understanding so that contributions can be drawn into generating alternatives for finding solutions or for progressing" (Interviewee 3)

"…just break it down to its absolute fundamentals...take the noise out, I call it the noise which is sometimes the undue complexity, break it up to the fundamentals and get to the crux of where the solution lies." (Interviewee 12)

"It's broken down but also broken down by various skills looking at various different matters...My decision process is driven by people...Because I'm very relying on my own people to give me comfort ...It's all about attention to detail and the technical nature and that we have all the required information before making decisions" (Interviewee 5)

Table 8: How complexity is dealt with

How complexity is dealt with	
Category	Number of respondents
Leverage the team and shared knowledge to understand different views	8
Breaking it down into it's fundamentals based on formats that make sense, focusing on the key differences	7
Map and play out scenarios with the aide of tools and techniques	3

5.4.3   Individual vs collective decision making

This question explored whether there was a preference for individual or collective decision making in the approach taken by senior managers.

Figure 9: Frequency of individual vs collective decision making
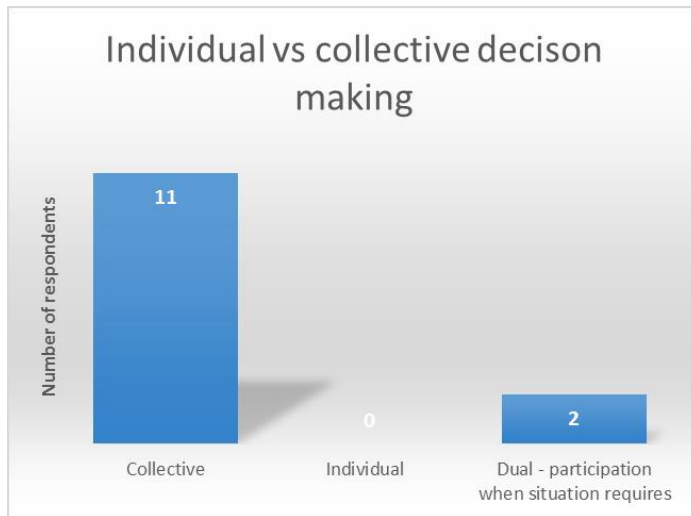
Based on the results as depicted in figure 9, it would seem that an exclusively individual approach is not favoured. Most interviewees follow a collective approach with just two responses indicating that a dual approach is followed. In this context, dual approach means that based on situational factors such as the amount of time available, the senior manager would then decide on whether to follow a collective approach and include others in the decision making or to make the decision on his/her own.

Given the collective approach to decision making, the second part of the question sought to determine how participants were selected to partake in the decision making. The categories of criteria used to select participants to include in making the decision are depicted in table 9.

Table 9: Criteria used to select participation

Criteria used to select participation	
Category	Number of respondents
Involve the experts	8
Decision falls in their area of responsibility	6
Use personal network to validate, test and/or lobby decisions	4
Create a diverse team	3
Governance requires that the decision is taken to senior decision takers	1

The results indicate that involving experts is the dominant method of selecting participants for collective decision making followed by selecting participants on the basis of the decision touching on their area of responsibility and thirdly, a few senior managers indicated that they had access to a personal network within the company. This network comprises of people

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whose opinions are valued and trusted and they are used to validate, test and/or lobby decisions. This is captured in the following statements made by the interviewees:

"…your network of people that you value their opinion; someone that can challenge your thinking…" (Interviewee 1)

"…it will include the people that I hold in confidence in other words people that I trust that I know will always look for my safety and therefore will not provide me with misleading information…" (Interviewee 2)

"…know the people...know who to ask...I physically have a list drawn up with, the let's call it the experts in the company on different levels…" (Interviewee 8)

5.4.4 Detection of bias

The question, 'what were you thinking when you made your decision?' aimed to explore the presence of bias in the decisions made. The total interview together with the response from this question was analysed to determine any relation to the concept of bias.

The interviews revealed that senior managers have an awareness to self-interest and constantly test themselves to ensure that this bias does not present itself in the decisions they make. The following statements made during the interviews support this:

"There's sometimes cases were you just feel there's a, choice A is the obvious choice to make but you cannot really put it in company motivated language, it's just, man, certain we should go this way but why? You know, it just feels to be the right thing and so its personally to not back your own personal decision" (Interviewee 1)

"…maybe I should not take this on board, I'm personally wanting to do that, call it a pet subject that is personally close to me but then you actually put that aside and then rather say because of the risk in the broader organisational goals you will then sit back and say alright, maybe I should not follow own rules, my own thinking, its rather for the organisation" (Interviewee 5)

"…am I impartial or not, am I being biased or not." (Interviewee 6)

One interviewee showed an awareness to potential prejudice and also indicated that self-testing is done to ensure that decisions are not negatively impacted by this as put forward in the following statement: "what is the triggers that cause a reaction and a response from me,

be on the guard for that, what is it I don't like about that individual or situation, how can I work around it rather than bombard through it".

There were some senior managers who shared an awareness of their own risk aversion, "my approach used to be more towards finding certainty in the solution that I want to gun for and take less risky positions. So a bit, I find on myself I start off risk averse and I have to manage that natural tendency of risk averseness". Again showing that they are aware of the bias and actively test themselves to mitigate the impact on the decisions they make. On the other hand, some managers found themselves being more risk tolerant and managing this bias in keeping with the with the risk aversive nature of the company, this is captured in the following statement: "the safety verses the taking a chance, if me saying, man, let's go for the size of the prize. So to motivate because I know the company is more conservative, to motivate the more conservative side which would be wrong for me even though I may have expected that would be the outcome."

There were other biases mentioned that do not relate necessarily to the individual decision making approach but were highlighted by interviewees as tendency observed in the company. These include the expensive advice bias where paid experts outside the company are valued for their advice more than the experts within as captured in the following statement by one interviewee "people don't believe their own and rather believe the external although, in my view we need to trust, we need to trust the experts within".

5.4.5   After the decision is made

This question aimed to explore what happens after a decision is made, whether senior managers have any thoughts on improving the decision or were they satisfied to proceed with the decision. Table 10 shows the results obtained in the study.

Table 10: Initial thoughts after the decision is made

Initial thoughts after the decision is made	
Category	Number of respondents
Adapt and change decision as you progress	8
Let this decision lie and use experience on the next one, only fix fatal flaws or have a plan B	4
It does not matter which decision as long as you took a decision	2
Focus on execution to according to plan	1

The dominant feeling among the senior managers interviewed is that deliberating and delaying on a decision is not advisable however, once a decision is taken, it can be adapted and changed as one progresses towards execution. The rationale for this is based on the

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acknowledgement that the environment of business is constantly changing which then necessitates a continuous review of all decisions taken. The managers made the following comments in relation to this category:

"You need to decide whether you gona keep deliberating and going in circles or take a decision, take a point in time and as you progress you can adapt and change" (Interviewee 2)

"There's always room for improvement as you implement, you see the opportunities… but the logic was, he said, let's bed down this first part of the solution, we'll improve on it as we go along. Otherwise we just have too many moving parts of a solution that you know we struggle to implement" (Interviewee 7)

"Everything has to be constantly reviewed, constantly looked at, cause the environment changes so quickly" (Interviewee 11)

"One should always revisit your major decisions … the world is changing and I think you're living in a dream world if you think you're gonna make decisions and those decisions will stay exactly the same for the next 10 years" (Interviewee 13)

Some managers took the stance that once the decision is taken it should not be second-guessed and should be allowed to play out. Any lessons learnt should be used to improve future decisions; this is made evident in the following statements:

"I don't ponder about the decisions, once the decision is made you always see how best you can implement it and next time you reach a decision you use that experience that you have built up your previous decision to try and improve your decision making process" (Interviewee 1)
"Based on the decisions and all the processes that you put in place, you are comfortable of making that decision. Obviously, once that journey plays out there's lessons that you learn on that specific journey which could influence your thinking for the next strategic decision" (interviewee 5)

"Once you've made the decision, live with the consequences but rather be ready with response B should the decision not work, how do you rectify the situation" (Interviewee 10)

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5.4.6 Presence of logic and reason versus intuition, emotion and creativity in decision making

All the senior managers were asked to what degree logic and reason, intuition, emotion and creativity played a role in their decision making. Based on the results depicted in figure 10 we find that all managers see themselves as predominantly using logic and reason as a basis for making their decisions. Ten of the thirteen managers included intuition as part of their decision making style. This is consistent with the results of 5.4.1 where ten managers are seen as following a dual approach including logic and intuition in their decision making. Very few managers seem to acknowledge the presence of emotion in their decision making and we find that in the later questions asked, emotion is deemed to be a hindering factor to effective decision making. Where managers did comment on the creativity aspect, it was deemed necessary irrespective of whether logic and reason or intuition is applied. The following comments support this view:

"if you comfortable with your logic you also emotionally more charged up...Creativity I think is always at play...the one that I try to take out of it is emotion in other words whether you having a great day or whether you having a bad day, you would be comfortable and you could still arrive at the same decision... The logic helps me to be comfortable with a decision, having to get it across to someone else and having that at the back of your mind just supports that you'll be comfortable with your decision" (Interviewee 1)

"… I think my intuition guides how I direct the arguments but my logic and my reasoning is what actually contributes to the final product so I would then say 70 – 30. I know if things won't work and will...you can't play the intuition too much" (Interviewee 2)

"…differs also with the dilemma …, in cases where you had similar experiences before, you would use less reasoning and logic because you have developed intuition in those spaces. Where you have less experience you would count more on reasoning" (Interviewee 3)

"I think there's more logic and reason to those things than intuition and I think a lot of the intuition is also based on previous experience and the sort of combined knowledge of people" (Interviewee 11)

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Figure 10: Approaches used to make decisions
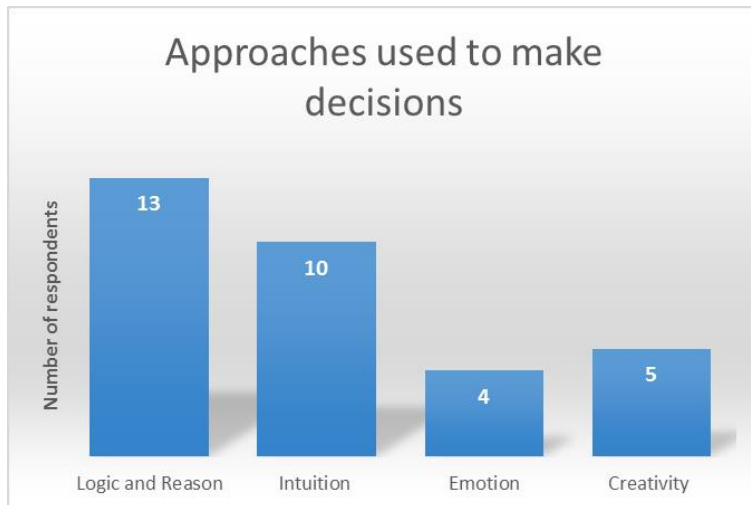
5.5 Results for research question 3

This question explored the use of tools in the decision making process and whether tools are deemed effective or not. There were three parts to this question, first the interviewees were asked whether they used tools and based on that answer, what the reason for the use of tools where and where tools were not used, why were they not used.

5.5.1 Use of tools in the decision making process

Figure 11 depicts the results for the first part of the question, which reveals that eleven out of thirteen senior managers make use of tools in decision making. The manner in which these tools are utilised may in some cases not be formalised. Formalised is interpreted as being concerned with the rigorous adherence to recognised forms or procedure. This was communicated by four of the senior managers. This means that they know of the tools and understand the underlying principles of the tools so when presented with a decision making situation one does not sit down and formally work through the steps in the tool but rather applies some of the principles in their thinking about the problem. The following statements made by the interviewees capture their views on the use of tools:

"…if we have to do a paper exercise you always do a SWOT or you know but …. But it's not a formal thing" (Interviewee 2)

"I don't apply ... by default...I think I've got that basis but I don't open up a spread sheet each time we each take a decision" (Interviewee 3)

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"Where a decision requires a tool, I'll use a tool, where decision requires a particular thinking framework that, not necessarily a tool like a hardware, software tool, I will use that thinking framework. But it all happens like a lightening sometimes, so you don't say now I'm at the stage of a thinking process, you just get to that process" (Interviewee 10)

Figure 11: Was a tool used
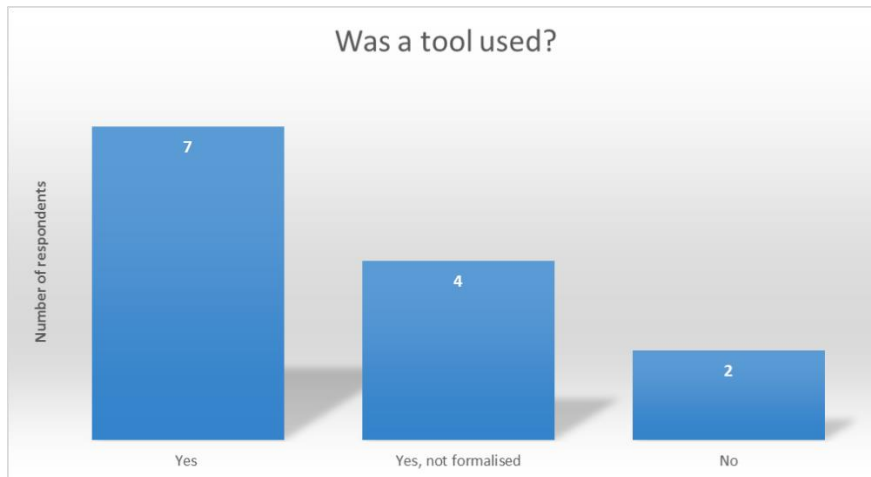
The following list of tools and techniques used were compiled from the interviews.

Table 11: Tools and techniques used by managers

Tool/technique	Number of respondents
Financial Analysis	4
PESTLE analysis	3
Scenario Planning	3
SWOT	3
Market analysis	2
MCDM	2
Risk management	2
Scenario Analysis	2
Cost benefit analysis	1
Decision trees	1
Depth analysis	1
Disciplinary procedures, LRA, agreements	1
Kepner Tregoe	1
Pros and cons	1
Statistical analysis	1

5.5.2   What were the reasons for using tools?

The interviewees were asked to provide a reason for why tools were used and table 12 reveals the categories that were extracted from the interviews. The most frequent reason

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mentioned by the interviewees is that tools facilitate a structured and thorough process. This is best expressed by one of the interviewee's as, "It's for me a nice complete and it almost leads you to an answer that you, you didn't anticipate". In addition to this, there were a spread of other reasons including the intelligence that a tool adds to the decision making process, the fact that the use of tools result in a paper trail that can be used for auditing purposes and another mentionable reason is that tools are used for psychological reasons. The explanation that supports its use for psychological reasons is that decisions are accompanied by a number of opinions from various stakeholders, running these opinions through a tool gives the stakeholder a sense of being considered in a fair manner. This is expressed by the interviewee in the statement, "the reason we use that is because there were so many opinions, so it's, you sat with a little bit of facts and huge bunch of opinions that you couldn't discard… if you sit with a lot of opinions you need to show all those opinions and you need to show the evaluation of the opinions...show to the decision makers that we considered all of the opinions and then try to quantify to or to put it into some sort of a advantages, disadvantages kind of matrix to guide them or to lead them or to give them opportunity to criticise it and so on... so it's more for psychological reasons why you sometimes use some of these things".

Table 12: Reason for the use of tools

Reason for the use of tools	
Category	**Number of respondents**
Facilitates a structured and thorough process	3
Adds intelligence to the decision	1
Creates an audit trail and facilitates validation of the decision	1
It facilitates playing out and evaluating the decision	1
It makes sense to use tools	1
Psychological reasons	1

5.5.3 Reasons why tools don't work

The senior managers did raise some criticism on the use of tools and why it is not always effective. Table 13 shows the categories relating to this. The value add of tools is seen to be minimal as it is reliant on information that needs to be gathered and fed into it and therefore it merely fine tunes what can already be gauged as expressed in the following sentiments:

"Because I base it on gathering information from a team, again tools will give you a fine tune on a very close decision…" (Interviewee 8)

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"Where it's not useful. Its complex, because you have to think about almost everything and you need to think of, you almost need to anticipate all the questions that could be asked ...you can easily make mistakes" (Interviewee 11)

The interview also highlighted the fact that tools are open to manipulation given that the choice and the use of information feeding the tools are at the discretion of the user and one always finds a way to justify reworking the tool when the answer does not match the expectation.

Interestingly, while the previous question saw the provision of a paper and audit trail as a benefit, we find that in some environments the paper trail provided by the use of tools can be negative especially when dealing with employee relations as highlighted by one interviewee in the following statement, "there's a danger to what that in terms of some of the stuff. If you write too much stuff into a document to guide you. That same document can be used against you".

Table 13: Reason why tools do not work

Reason why tools don't work	
Category	**Number of respondents**
The value add is minimal	2
It's not about a tool it's about integration	1
Can be manipulated	1
Open to errors	1
Tools create a paper trail that can be used against you	1

5.6   Results for research question 4

This question explores what strategic decision makers define as a good decision, what maximises the personal price tag associated with the decision. Table 14 provides the ranked categories based on the responses from the interviews.

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Table 14: what makes it a good decision?

What makes it a good decision	
Category	Number of respondents
Comfort in the decision process leading to decision	13
Emotions accompanying decision and perceived outcome	5
It's not that simple to define a good decision	2
Decision is taken at the correct organisational level	1
Solutions aligned to regulatory requirements	1
The decision maker owns/takes accountability for the decision	1

We find that the category most decision makers identified with relates to decision makers having comfort in the decision process leading to the decision.

Figure 12: Decomposition of "Comfort in the decision process leading to the decision
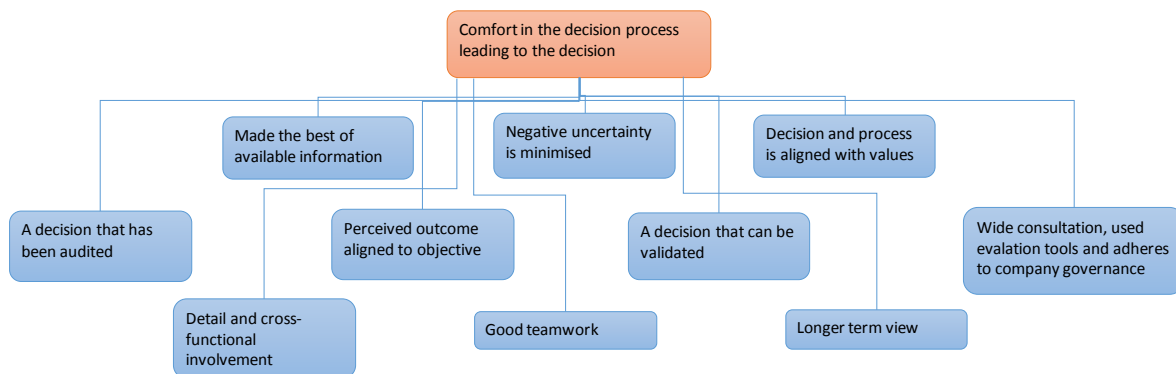
If one considers figure 12 which contains the sub categories that contribute to "comfort in the decision process leading to the decision", it contains key words such as making the best of available information; wide consultation; use of evaluation tools; adheres to company governance and a decision that can be validated.

Few interviewees also indicated that they associated good decision making with certain emotions felt when the decision is made or when looking towards the outcome. This is conveyed in the following statement made by the interviewee:

"…you will have a calmness about it if it's right" (Interviewee 4)

"…we were not so emotionally involved because we never felt the pain or we never faced the music in terms of the investors…" (Interviewee 6)

"A good decision for me is when somebody walks out and they're smiling … it's the gratification of the outcome" (Interviewee 12)

5.7   Results for research question 5

This question explores what factors enable or are obstacles to good decision making.

5.7.1   Factors that enable good decision making

Table 15 reveals the results of the study with regard to what factors help in making good decisions. Having a clear and correct delegation of accountability and responsibility for decision making is deemed essential in the sense that those making decisions should be delegated with the authority to do so, they should be empowered to do so and they should take accountability for the decisions that they make.

Strategic debate and conversation is also deemed sufficiently important as communicated by some senior managers:

"If there's no strategic debate or strategic conversation on a matter on all the various assets, aspects of that decision whether it's human capital, whether its social capital, what's the impact on the society, what's the impact on, you need to have the conversation. Without that a decision can't be made because that gives you the, eventually that's the integration part where everything comes together". (Interviewee 5)

"The correct people around the company and networking in that sense. More people more opinions and more knowledge." (Interviewee 8)

"…follow the structured process, make use of your tools, make use of the wisdom of people around you, not only the EXCO but also people lower down in the organisation, make use of the expert opinions of people inside and outside the company, look at trends in the world, have regular discussions on them…" (Interviewee 13)

Some senior managers felt that there is value in bringing in or using experts as a soundboard. In this context the focus was on external experts, the following suggestions were made by the interviewees:

"…expert opinion would be good, especially because these things are inherently about the future so if a well-respected economist says he or she thinks that the rand will go up, it helps" (Interviewee 1)

"…sounding board from the external expert in the lead-up towards a particular decision…" (Interviewee 9)

"…make use of the expert opinions of people inside and outside the company…" (Interviewee 13)

Finally understanding the decision context is also considered important in supporting good decision making as one senior manager put it, "…spend a lot more time before I have to, get to the ropes, who's who, how does it work, what's the legal framework, who to get to assist … build a proper network based on a better understanding of the environment…".

Table 15: Factors that help good decision making

Factors that help good decision making	
Category	Number of respondents
Clear and correct delegation of accountability and responsibility for decision making	5
Strategic debate and conversation	5
Include expert opinion	3
Understand the decision context	3
Consider all critical information	2
Decision based on quantitative methods	2
Support and collective drive to execute	2
The correct people, knowledge and diversity of opinions	2
Increase reliance to a structured process as risk increases	1
Know and align to company strategy	1
Trust those delegated to make the decisions	1

5.7.2 Factors that hinder good decision making

An overwhelming majority of interviewees agreed that power, ego and driving personal agendas all serve to hinder good decision making, as presented in table 16. Senior manager felt that it blinded decision makers from even considering other options or flaws in the options presented, the following are some of the comments made in this regard:

"…power and ego… if you can't hear another person's point of view and you can only hear yourself and you're only driving your own agenda, which is all for me an ego thing…" (Interviewee 2)

"I think egos. Egos, pet projects, it's not playing in a team, not having values, no respect for other team members… Its normally let's get closer to our pet projects and egos getting into the way not having the conversation, he or she wants to push through with a personal view not as a collective…" (Interviewee 5)

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> "…egos I think plays a major role in... the guys don't change and they don't listen" (Interviewee 8)

Accountability is an important factor as well, meaning that if managers are not delegated with the authority to make the decision and if people do not take accountability or not held accountable for the decisions that they make, the potential for bad decision making is increased.

Decisions based on emotions and opinions as opposed to the actual situation was also considered by a few interviewees as a contributing factor to bad decision making. This differs from the previous category in that the intentions are not based on self-interest and are in the interest of the company however, they are seen as being emotionally based and thus interpreted as not being of sound judgement. Interviewees made the following comments in this regard:

> "Emotional opinions clouds decision making…" (Interviewee 1)

> "…you need to be able to discard emotional opinions…" (Interviewee 6)

> "…when structured process decision is overtaken by let's say, emotional decisions…" (Interviewee 13)

Consistent with understanding the decision context as factor that supports good decision making, some interviewees also raised it as a hindering factor if there is a lack of clarity in the decision context and objective. The following comments made support this category:

> "…what inhibits decision making I think there's sometimes a lack of the objective or a lack of direction. So if I need to drive to the cafe to buy some milk, if it's not defined, then I would have to stop at a stop street, is it really relevant? So I think something what inhibits decision making could be an unclear context or unclear objective" (Interviewee3)

> "I will not go in there unless the following changes, you need to define that and you need to, kind of, set that up before you take your strategic, it should be part of your strategic decision making beforehand, so that you don't, because you get carried away by your vision ... You hammer the analysis to fit your dream... be honest with yourself is what can you as a company stomach…" (Interviewee 6)

> "…the tendency to chase the markets for the sake of high profits… an inability to understand different cultures in different territories. Or, lack of understanding of different

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cultures and the effect of that in different geographies. The other one would be to underestimate the complexity of different languages in territories where one wants to make a business...just driving a project for the sake of a project, driving success of a project at all costs is also dangerous." (Interviewee 9)

Table 16: Factors that hinder good decision making

Factors that hinder good decision making	
Category	Number of respondents
Power, ego and driving personal agendas	9
Accountability	7
Decisions based on emotions and opinions and not the actual situation	5
Not fully understanding the decision context and/or objective	5
Team dynamics	5
Missing critical information	2
Taking shortcuts and not following the full governance process	1

5.8 Conclusion

The results from the five research questions have provided good insight into the approach taken by strategic decision makers in the mining industry when faced with dilemmas. This will be discussed further and in more detail in Chapter 6

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6 Discussion of Results

6.1 Introduction

In this chapter, the research findings presented in Chapter 5 are discussed in more detail and is related to the literature that was reviewed in Chapter 2. This chapter provides depth of insight into findings that were derived from the individual depth interviews utilised in this study. The findings represent answers to the five research questions that were gathered through a process of 13 depth interviews conducted on sample group of senior managers in a mining company. The data coding and analysis techniques followed allowed for the data to be refined, aggregated and synthesized into useful information and insights into the types of dilemmas faced in the mining industry and how senior managers approach these situations thus contributing to an improved understanding of this matter. The relevance of the results and the existing literature in context with this study are discussed in the next section.

6.2 Discussion of results for research question 1

The aim of research question one was to explore the categories and/or types of dilemmas that senior managers in the mining industry face. The depth interview, data coding and analysis phase of the research revealed the following results:

6.2.1 Types of dilemmas

According to the results obtained and depicted in table 2, the most frequently, occurring types of dilemmas faced by senior managers in the mining industry was the 'licence to mine'. This is explained as the mine being granted legal permission to proceed with mining activities and is based on compliance to regulatory standards and achieving the necessary approvals from government bodies on new projects. Examples of these approvals include environmental approvals and water use licences amongst others, which grant the company permission to mine. The interviews revealed that uncertainty in how the regulatory environment will change and the timing of when the approvals will take place create dilemmas in the organisation. Tying this back to the literature, we find that legal and environmental regulations are a reflection of challenges faced in terms of scarcity of key resources, where government uses control to prevent depletion thereof, as George et al. (2016) put forward, Africa is not without challenges with global warming and drought creating challenges for food and water supply. Mining companies are exposed to social dilemmas as they operate in rural communities where natural resources are an important aspect of the social fabric (George et al., 2016); this conflict of individual utility and collective utility is

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frequency the source of delays with environmental approvals, which the local communities including environmental activists can contest. According to the report by Ernest and Young (EY's Global Mining & Metals Center, 2014) social licence to operate maintains its position as one of the top ten business risks as the influence of local communities to stop or slow mining projects continues to rise. This irrespective of the company's good record of accomplishment with social engagement. The report finds a continual increase in the frequency and number of projects being delayed or stopped due to community and environmental activists thus consistent with the concerns raised in the research findings.

The second category that occurred frequently in the interviews, was that of 'enablement of the company strategy' and this centred on supporting the execution of the company strategy in terms of IT and technology decisions, capital funding and the appropriate competencies and skills. To elaborate on this further, senior manager felt that they faced challenges in the availability of funding to support future growth as well as a scarcity and understanding of the talent required to take the company into the future. This relates well to the literature as it was established that in the process of strategy execution, dilemmas are frequently encountered, one of which relates to balancing the scarcity of both time and resources (e.g. people skill, capital) in providing for the current company while building and creating the future (Emerald insight, 2016).

Ethical dilemmas was also raised as a frequently occurring dilemma that is faced with five senior managers supporting this view. The interview conversation in this regard related to potential threats to personal values and it is noteworthy that while this was raised by interviewee it was mostly hypothetical in that the value test is performed by the decision maker when faced with decisions however, decision makers do not generally face a conflict as there is good alignment between company and individual values. The other aspect of ethical dilemmas that was brought up and that senior managers find to be a manifesting dilemma was that of the conflict between what is right for the company as opposed to the employees and the human resource impacts that may ensue. Relating this back to the literature, we find that once again, this dilemma falls in the space of dilemmas encountered in the process of strategy execution where managers need to balance acting with integrity when hard earned trust is at risk due to corporate and staff needs being at odds (Emerald insight, 2016). Smith, Lewis and Tushman (2016) also make reference to the competing demand of profit maximisation against creating value for a broader range of stakeholders, in this case the employees of the company.

Macro-economic challenges were also raised as a dilemma with a frequency of occurrence of five. Challenges that were clearly expressed in the interview included those of a political

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nature with specific reference to country politics. To provide context, the company that provided the interview sample had a recent experience attempting to venture into an African territory and therefore experienced some dilemmas in relation to the project business case and managing a different political environment. The other challenge that was brought up in the interviews was that that of an economic nature with the dominant challenge being that of the commodity prices. Relating this back to the literature, the report by Deloitte (2015) predicated that the challenges the mining industry was most likely to face in 2016 included volatility, falling commodity prices, falling demand and growing stakeholder expectations. This then forces mining houses to ask tough questions on whether the world's demand factors for commodities has changed forever, or whether new mining approaches are needed (Deloitte, 2015). Thus predisposing them to dilemmas of quit or continue with reference to important ventures or projects that appear to falter as a result of the macro-economic conditions (Drummond, 2014).

6.2.2   Similarities and differences between dilemmas

According to the results presented in table 4 on the similarities that managers experienced between the dilemmas they faced, the cost/risk trade-off between the options was found to be most common. This similarity may be attributed to the decision criteria on which projects and decisions are primarily evaluated in the company, i.e. financial criteria and risk appetite, thus making it a common trade-off that many managers face. In addition to this, the mining sector having experienced an extended period of lower and volatile commodity prices with severe impacts on earning, balance sheets and investors' perceptions, has been forced to maintain focus on margin, cash flow and capital returns (EY's Global Mining & Metals Center, 2015). Thus making the cost versus risk trade-off a critical one for decision makers. Compounding this is the reality that capital markets are currently displaying high levels of risk-aversion, which then forces mining companies to focus in the short term on cost-cutting and risk, with possible longer term implications to future growth (EY's Global Mining & Metals Center, 2015). Ethical dilemmas and the 'licence to mine' was also found to be a commonality among dilemmas faced. While there is relevance in these results as it ties in with the types of dilemmas raised in the previous question the fact that it was again raised in this question may just be a function of the recency effect, having just discussed it, it was still at the top of the interviewee's mind.

The results presented in table 5 depict what senior managers believe to be the differences that are experienced between the dilemmas faced and the size of the risk and point of impact was found to be the most dominant difference expressed.

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6.2.3 Trade-offs made

According to the results obtained and presented in table 6 on the trade-offs that senior managers were forced to make when dealing with their respected dilemmas, 'manage for today vs manage for tomorrow' was the most frequent with a count of five. Given the scarcity of resources, in particular, funds and skilled resources and compounded by uncertainty in the economic cycle, managers are forced to trade-off putting effort in the current business as opposed to the future, which is uncertain. Smith, Lewis and Tushman (2016), put forward that decisions relating to time frame (manage for today or tomorrow) are especially salient as the long term survival of the company is contingent on experimenting with new products/services/processes and taking risks. In fact, the authors raise this as one of the three categories or questions that leaders grapple with based on their 20 years of work with corporations.

Profit maximisation against creating value for a broader range of stakeholders followed closely as an important trade-off. Interviewees expressed this conflict in terms of the nature of mining as an extractive industry, the environmental pressure faced in terms of global warming, carbon pressure as well as the preservation of the environment (wetlands, indigenous fauna and flora) as well as social impacts (e.g. increased traffic, HIV/AIDS) and finally economic impacts in the form of job creation and commodity exports. Again this forms one of the top three questions or categories that leaders are faced with as raised by Smith, Lewis and Tushman (2016). According to the authors, while the primary reason for a company's existence is to create value for shareholders, many leaders are torn between this and creating benefits for a wider range of stakeholders including investors, employees, customers and society (Smith, Lewis, & Tushman, 2016). These tensions arise as a result of public concern over poverty and climate change and creating value for employees is driven by human capital being increasingly recognised as a source of value and distinctive competencies (Smith, Lewis, & Tushman, 2016). The Mining Charter acknowledges that mining comunities form an integral part of mining development thus requiring a balance in the development of the Mine and socio-economic communities. This development must be meaningful in size and impact and adhere to the social licence to operate. The requirements state that this contribution should equate at the minimum to 1% of total annual turnover (Department of Mineral Resources, 2016).

The relevance of considering trade-offs is based on the rationale that how managers resolve dilemmas is viewed as a critical issue as it serves towards their competitive advantage (Naidoo, 2014) and in order to effectively manage dilemmas, managers must understand the implications of their decisions and therefore the competing demands that they are faced with (Johnson, 2012).

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6.2.4 Reasons for why it is a dilemma

This question sought to explore what contributed to the decision being regarded as a dilemma and the results as presented in table 7 tended towards interviewees seeing this from a personal perspective. Therefore, in addition to the business specific dilemmas that senior managers face when presented with a decision they also experience personal dilemmas and the most frequent category observed was that of the alignment between their personal approaches to decision making, to that of the company. In an attempt to understand the conflict, we revert to the study by Elbanna and Child (2007) where firm characteristics such as performance and size have an influence on rational decision making. There are two opposing ways in which performance is believed to influence decision rationality however, given the current economic circumstances faced in the mining industry as well as based on comments raised in the interview process, decision rationality may be attributed to lower performance which results in companies pushing decision makers to follow more rational processes as a wrong decision can influence the company's survival (Elbanna & Child, 2007). It is also argued that size may affect rationality in that larger companies have a tendency to employ more rational and formal processes (Elbanna & Child, 2007). Given the rational decision making approach imposed by the company any alternative natural preferences of individual decision makers are then overridden causing internal conflict.

The feeling of a loss of decision control was also raised as another dilemma faced which included the sense of the decision already being made by other stakeholders, by having numerous conflicting choices with little in the decision makers control and finally the lack of information and reliance on other participants to add to the final decision.

6.2.5 Conclusive findings for Research Question 1

The results indicated that dealing with dilemmas is a frequent reality in the job of the senior manager in the mining industry. Obtaining or maintaining the licence to mine was the dilemma that was most frequently raised in the interviews, which includes dilemmas relating to environmental /conservation pressure, health and safety regulation, and legal and regulatory uncertainty. The two specific issues that senior managers faced in this area was that of the uncertainty in the changes that affect this environment as well as the timing of approvals to proceed with the implementation of projects to establish plants mines and beneficiations plants thus putting the future sustainability of the company at risk. The findings are consistent with literature in that George et al. (2016) raises the challenges of global warming and food and water supply which is threatened by drought which results in

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more stringent regulations being imposed on key resources. EY's Global Mining and Metals Center (2014) also support this by listing social dilemmas as one of the top ten business risks facing the mining industry where local communities and environmental activists are delaying or stopping mines from obtaining environmental approvals. Senior managers also faced dilemmas in terms of technology, funding and skilled resources to enable the company's strategy. This is well aligned and expected in the current economic environment and given the reality of the skills shortage the country is said to face. Ethical dilemmas and macro-economic challenges were also frequently raised in the interviews. It is a fair observation that under a more positive world economic climate most of these dilemmas would cease to exist and in the current economy it is well aligned to what the industry faces.

The dilemmas faced result in managers having to make trade-offs and we see that the most frequent trade-off that strategic decision makers in the mining industry are faced with is whether to place their scarce resources in managing the current business or towards the future of the company. Another very relevant trade-off is that of profit maximisation against creating value for a broader range of stakeholders and the impact of this trade-off may have series repercussions on the company's licence to mine. It is evident though that this a real concern for managers in the company and that balance must be found as one manager put it, "what is justifiable costs that the developer must put in, must assimilate. What are the costs of mining that society must pick up from the developer because society is also a beneficiary of the economic activity that the developer is doing? And we sort of blindly are internalising, this is where the dilemma is".

An interesting outcome of this research question was the realisation that the senior managers experience two facets to the dilemmas they faced and that on the one hand there is a business dilemma being faced and on the other, a personal dilemma in trying to resolve it. In this regard, managers faced a dilemma relating to their personal approach which was closely linked to gut feel on a decision and the rational requirements of the company. We can link the rational approach required by the company to the study conducted by Elbanna and Child (2007) to contextual variables such as firm characteristics of performance and size but raise the question of how this influences the effectiveness and quality of the decision.

6.3   Discussion of results for research question 2

This question explores the natural or preferred approaches or styles followed by strategic decision makers when faced with a dilemma. This includes exploring whether senior managers follow a process, what the steps followed are, how complexity is dealt with, whether collective or individual decision making is practiced, the presence of bias and the

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use of logic and reasoning, intuition, emotion and creativity. The depth interview, data coding and analysis phase of the research revealed the following results:

6.3.1 How senior managers make decisions

According to the results obtained and presented in figure 7, only three of the 13 senior managers interviewed described themselves as following a purely rational approach while the remainder seem to follow a dual approach. The dual approach leans predominantly towards the rational approach with some managers quoting splits of 70% to 90% towards a more rational style of decision making. The results depicted in figure 9 reiterate that all managers see themselves as predominantly using logic and reason as a basis for making their decisions. Ten of the thirteen managers included intuition as part of their decision making style while few managers seem to acknowledge the presence of emotion in their decision making where in the latter part of the discussion they indicated that, emotion is deemed to be a hindering factor to effective decision making.

Tying this back to the theory, Evans (2008) and Hodgkinson et al. (2009) in Kaufmann, Meschnig, and Reimann (2014), state that rational decision making follows an analytical, sequential and rule based process which is supported by information and decision tools. This thorough and structured process is believed to contribute to better decision outcomes as it increases the likelihood of identifying pros and cons of all alternatives (Slotegraaf & Atuahene-Gima, 2011) and reducing bias, this according to Dean and Sharfman (1993) and Elbanna (2006) in Kaufmann et al. (2014). Given this explanation of a rational approach to decision making, one would not expect to find this as an approach used by senior managers in that strategic decisions are characterised as being ill-structured and uncertain and further add the elements of it being non-routine and pervasive (Shepherd and Rudd, 2014). Eiselta and Marianovb (2014) support this view and add that these decisions are prone to being ill defined with multiple decision makers, multiple objectives and/or criteria, and feature many uncertain outcomes. The biggest potential flaw then of rational decision making according to Kourdi (2003) could be information and information bias suggesting that up to middle management levels, quantitative decision-making seems to serve quite well however, as one becomes more senior and decisions become more complex and ambiguous rational methods cannot be used (Kourdi, 2003). So how then does one reconcile the rational style dominating the dual approach reflected in the results? One possible explanation can be tied back to Shepherd and Rudd's (2014) study which looked at the contextual variables composed of the top management team, strategic decision specific characteristics, the external environment and the firm characteristics and its integration with the characteristics

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of the strategic decision making process. The findings on the characteristics of the top management team state that the concept of creeping rationality as termed by Fredrickson and Iaquinto (1989) becomes prevalent where one finds an increasing tendency towards rational decision making and more comprehensive decision making as tenure increases. The level of education was found to influence rationality and comprehensiveness in that the more highly educated, the more predisposed to rationality due to a more developed analytical capability (Shepherd & Rudd, 2014). This is supported by the demographic profile of the senior managers interviewed as depicted in table 1 where we find that a number of managers have completed an MBA or equivalent qualification and some have incomplete MBA which from the discussion held means that all core modules were successfully completed however, they opted against completing the dissertation. The histogram in figure 3 suggests that the highest frequency in terms of tenure in the industry ranges from 20 years and more thus supporting the concept of creeping rationality. It is also interesting to note that while one may have expected the high tenure to support higher levels of intuition the study by Malewska (2015), failed to confirm the relationship between the amount of experience and the doninance of the use of intuition in decision making.

6.3.2   How complexity is dealt with

This question sought to gain more insight into the approach followed by determining how senior managers dealt with complexity, which is a characteristic of strategic decisions. The analysis revealed the categories and rankings as depicted in table 8. Leveraging the team and shared knowledge is found to be the most frequent method of dealing with complexity. What this contributes to the reduction in complexity is that each expert views a portion of the problem from the perspective of his/hers' skills set therefore decomposing the problems from a functional/body of knowledge perspective. Senior managers also indicated that breaking down the decision into its fundamentals based on formats that make sense and focusing on key differences assisted in dealing with complexity.

In terms of obtaining a holistic understanding of how senior managers approach strategic dilemmas, the specific method used to decompose or simplify the problem is not as critical but rather the implication that all managers consider the complexity of the decision problem and seek to decompose or simply it thus further supporting the rational approach taken. Parameters such as alternatives, criteria, resources, the perceptions attached to decision problems, internal characteristics of decision makers and information inputs from the environment, all contribute to increasing the challenge and complexity of decision making and given that decision makers are bounded in their rationality it is possible to fall prey to

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decision traps (Yu & Chianglin, 2006). By considering complexity through a process of rethinking the objective and decomposing the model and problem, decision analysis is facilitated and the instance and impact of decision traps can be avoided or reduced (Yu & Chianglin, 2006).

6.3.3 Individual vs collective decision making

This question explored whether there was a preference for individual or collective decision making in the approach taken by senior managers. The analysis presented in figure 8 indicate that the dominant approach followed is that of collective decision making where 11 interviewees described this approach. Two interviewees indicated that the situation would dictate whether an individual approach would be followed or whether other stakeholders would be involved in the decision making.

According to the results presented in table 9, those senior managers that choose to involve other stakeholders in the decision making process base their selection predominantly on the involvement of experts. The second basis for selection is to involve those stakeholders if the decision falls in their area of responsibility. The third most frequent basis for involvement is to make use of personal networks to validate, test and/or lobby decisions.

Relating the preference towards collective or participative decision making to the theory, Shepherd and Rudd (2014) indicate that structure influences participation in the strategic decision making process. According to Ashmos et al. (1998), where organisations have formalised rules and procedures in place the strategic decision making process follows a consistent and standardised approach with the same small number of individuals involved. This is supported by the outcomes of the interview process where some interviewee made specific reference to the company's governance, project management and strategic processes e.g. "we've got a strategic process is spelled out as a yearly process"; "take decisions within the framework of governance… you put a pen and a paper together and try to motivate a decision through the structures of the organisation…"; "we follow a project lifecycle...we take it through the various gates... the last time before we take a strategic decision to invest, there's Investment Review Committee, EXCO and the Board by which we then explain all of this and then only we get the capital and make the final decision... a lot of technical sanity checks before you go to the investment forum".

Theory does support the value in participation, which is viewed as a mechanism for sense-making and knowledge generation, which results from the development and sustaining of a web of relationships (Plowman, Duchon, McDaniel, & Huonker, 2002).

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6.3.4   Detection of bias

This question aimed to explore the presence of bias in the decisions made. The total interview together with the response from this question was analysed to determine any relation to the concept of bias. The results show that some types of bias were raised by the senior managers but mostly from the perspective of self-awareness, and ensuring that decisions are not negatively impacted by their own biases and blind spots. Misaligned individual incentives refer to individuals seeking outcomes favourable to themselves or their unit at the expense of the interest to the overall company (Lew, 2016) and the interviews revealed that senior managers have an awareness to this bias and constantly test themselves to ensure that this bias does not present itself in the decisions they make. Richard Thaler and Cass Sunstein in their book, Nudge, refer to System one and System two thinking styles, where system two is based on slow deliberate thinking consistent with rational approaches (Kahneman, Lovallo, & Sibony, 2011). Self-monitoring on the quality of the decision and reasoning conducted continuously is said to be a typical feature of System two styles (Kahneman & Klein, 2009).

6.3.5   After the decision is made

This question aimed to explore what happens after a decision is made and whether senior managers have any thoughts on improving the decision. The results obtained in the study and presented in table 10 indicates that the dominant feeling among the senior managers interviewed is that deliberating and delaying on a decision is not advisable however, once a decision is taken, it can be adapted and changed as one progresses towards execution. The rationale for this is based on the acknowledgement that the environment of business is constantly changing, which implies that no decision is cast in stone and thus a continuous review of all decisions is taken throughout the execution process. Other managers felt that once the decision is taken it should not be second-guessed and should be allowed to play out. Any lessons learnt should be used to improve future decisions.

The rationale for this question is based on Yu and Chianglin (2006) who propose a checklist of questions that serve to improve the way in which challenging decisions are dealt with by changing and expanding our actual domain to second degree with the implication that we acquire new concepts or operators through external information inputs or self-suggestion. The outcomes of the study indicate the majority of managers prefer not to deliberate and review decisions in the decision-making phase but rather to improve on decisions already taken during execution or as a lesson learnt for the next decision. This may have implications on the quality of the decision outcome.

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6.3.6 Conclusive findings for Research Question 2

The findings for this question was interesting as there is a sense of subtle conflict between the natural inclination of the interviewee and what is accepted from a company perspective and this plays out in the various questions covered throughout the interview. When managers described their approach, the key words that were used related to a rational approach; it was only when asked in a later question how their approach included logic, reason, intuition and emotion that the dual approach was expressed. In terms of the responses received, the dual approach is specified to include intuition with the understanding that the intuition arises from expert knowledge and experience and interviewees were adamant that it plays a very small role (10%-30%) in the decision making process. Many steer away from the word emotion even raising it as a factor that hinders effective decision making in the final question of the interview. The other concern with alignment comes in with the personal dilemma raised by some interviewees in research question one, where managers spoke of the conflict in their intuitive processes or personal styles that could not be reconciled with the rational approach required by the company as one manager put it, "gut feel - you cannot put in company motivated language ". One would question and seek more understanding of what is the driver of the rational approach, how the individuals' personal approach is reconciled with firm characteristics as well as the impact this has on the quality of decision making. Consistent with the rational approach described, all managers were found to respond positively to considering and having an approach to address complexity.

The collective decision making style is the dominant approach but many commented on it being a function of the conservative company approach and as per the discussion that took place, a function of structure and formalised process. Therefore, while literature does promote the value of participative decision making, further study is recommended to evaluate whether this is a function of the senior manager's personal style or once again, firm characteristics.

All of the biases picked up in the interview were based on awareness and self-monitoring, this is positive in respect of senior managers acknowledging their blind spots and attempting to mitigate the influence thereof. However, this raises a potential limitation in the study, which was based on an interview process and interviewees may have tried to reflect a positive impression.

It was interesting to observe that senior managers were wary of delaying or deliberating on decisions and that making improvements on decisions should be during decision execution or as a lesson learnt to be incorporated in the next decision. On the one hand one may

argue that there is comfort with the thoroughness of the process leading to the decision and on the other research suggests the value of improving challenging decisions by changing and expanding our actual domain to second degree (Yu & Chianglin, 2006). The tendency displayed by the senior managers to move along with the decision process irrespective of whether it has been optimised and the impact of this on the quality of the decisions and decision outcomes should be investigated further. One may consider whether this is in relation to speed and adapting to the constant and rapidly changing business environment and whether there is relevancy to the mining industry.

In summary while decision makers described an approach to decision making it would seem that that the approach is influenced by contextual variables particularly to firm characteristics rather than individual approaches.

6.4 Discussion of results for research question 3

This question explored the use of tools in the decision making process and whether tools are deemed effective or not. There were three parts to this question, first the interviewees were asked whether they used tools and based on that answer, what the reason for the use of tools where and where tools were not used, why were they not used. The depth interview, data coding and analysis phase of the research revealed the following results:

6.4.1 Use of tools in the decision making process

According to the results obtained and depicted in Figure 11, eleven out of the thirteen senior managers interviewed made use of tools either explicitly or implicitly. The interviews revealed that seven managers described their use as explicit and four managers followed an implicit use of decision making tools and techniques. This means that in some cases the tool in the form of a spreadsheet or facilitated process was adhered to in a structured manner and thus explicitly applied while in other cases senior managers explain that the process was not necessary physically executed or followed a structured manner however what they referred to as the DNA of the tool or the underlying principles of tools and techniques are known and understood and these are applied to their thinking and rationale in the decision making process.

This is expected as the approach suggested by the results is a dual approach to decision making where rational decision making is more dominant in the application. According to Leonova (2014), ill-structured problems, which require consideration of the internal and

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external environment, require methods that combine expert information with heuristics, common sense and intuition. Popular methods that support this requirement include cognitive maps, decision trees and the analytical hierarchy process (Leonova, 2014). Other tools available to senior managers include strategic planning and as stated by Rigby and Bilodeau (2007) in Meissner (2014) this tool remains one of the most influential tools in strategic management. The tool provides a set of planning guidelines in the aim of formulating a single optimal strategy. Scenario planning is another tool used by senior management for strategic and long term planning and differs from strategic planning in that a range of possible futures are imagined and the process enables senior managers to prepare for the various environments that their long term plans may encounter (Phadnis, Caplice, Sheffi, & Singh, 2015). If one considers the list of tools that were extracted from the interviews, it is in keeping with the literature.

6.4.2 Reasons for using tools

Table 12 presents the results on why senior managers use tools in decision making. The most frequent reason mentioned by the interviewees, with a frequency count of three, is that tools facilitate a structured and thorough process. In addition to this, there were a spread of other reasons including the intelligence that a tool adds to the decision making process, the fact that the use of tools result in a paper trail that can be used for auditing purposes and another mentionable reason is that tools are used for psychological reasons. Some of the key benefits cited in the literature study on the use of tools include that it allows for the evaluation of alternatives in a safe environment, it allows for optimal as opposed to merely satisficing decisions, it requires a systematic approach which lends towards greater precision and depth when considering all factors relating to the decision and its alternatives (Przasnyski & Elias, 2011) thus supporting the belief held by senior managers in the study. In addition, the analytical and sequential process of rational decision making may create a sense of comfort (Kourdi, 2003) and thoroughness.

6.4.3 Reason why tools don't work

Table 13 shows the results of the study that reveal the criticism some managers had on the use of tools and why it is not always effective. The most frequent reason is that the value add of tools is seen to be minimal as it is reliant on information that needs to be gathered and fed into it and therefore it merely fine tunes what can already be gauged. Other reasons include that tools can be manipulated this is a function of the tool being reliant on the inputs and open to the subjectivity of the person providing the inputs. This makes sense given that

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very few tools allow for consistency testing. The other reason is that it is open to errors and this is a function of growing complexity.

The results obtained are consistent with the limitations as highlighted by Przasnyski and Elias (2011) which relate to the concept of "garbage in, garbage out" in that assumptions and information feed models and need to be appropriate and sufficiently accurate to create a realistic representation of the real situation. Models require information and time which in strategic decisions, is not always available. Another feature of strategic decisions, complexity becomes a limitation in that as complexity rises greater modelling skill and knowledge is required (Przasnyski & Elias, 2011).

6.4.4   Conclusive findings for Research Question 3

In support of the predominantly rational and quantitative approach to decision making revealed in the study, the majority of senior managers indicated that they use tools or the principles of tools to guide their decision making. A wide spread of tools was raised by interviewees including financial analysis, scenario planning and various methods for environmental scanning. The frequency count on some tools such as financial analysis is low even though it may be expected to be higher as it is the dominant criteria for investment decisions. One reason may be that some managers do not use the tools directly but rather make use of the results obtained from the tools.

The results suggest that the value of using tools is in the structured and thorough process that it facilitates. This is consistent with research findings on the value of tools and given that, collective decision making is favoured, a structured process is expected to play a positive role in supporting the group dynamics.

There was a large spread of reasons criticising the use of tools however, the one that stands out is the low value add closely linked to the availability and quality of information and that it is open to manipulation.

6.5   Discussion of results for research question 4

This question aimed to determine what senior managers in the Mining Industry define a good decision to be, in essence aiming to determine the utility attached to the decision. The depth interview, data coding and analysis phase of the research revealed the results depicted in table 14.

A sense of comfort in the decision process leading to the decision was the category every manager identified with when asked what defines a good decision. The sub-categories that contribute to "comfort in the decision process leading to the decision" contains key words such as making the best of available information; wide consultation; use of evaluation tools; adheres to company governance and a decision that can be validated. This is consistent with the Classical Decision Theory, which is puts forward that people are rational and attempt to make decisions that are well reasoned having included all possible alternatives, made use of the maximum amount of information and has weighed the associated costs and benefits (Lew, 2016). In this traditional view, the economic man is assumed to deal with decisions in a rational way even in the presence of complexity, to have a systematic and stable system of preferences and the ability to effectively evaluate all alternatives realising a rationally determined best course of action (Pataki & Padar, 2013). This view has however long been recognised as having limitations, put forward by Herbert Simon in his bounded theory of rationality which identified three limits of rationality: risk and uncertainty; incomplete information about alternatives which may be a consequence of limited resources to devote to information searches and complexity (Pataki & Padar, 2013).

The second most frequently occurring response on what defines a good decision related to the emotions accompanying the decision and the perceived outcome. The work by Cheng (2014) puts forward a framework of prospective decision utility where decisions are made based on the perceived outcome and the anticipated emotions that accompany it. This behaviour of gravitating towards positive emotions and avoiding the negative emotions attached to the perceived outcomes extends to investment decisions as well (Cheng, 2014) and finds it roots in the proposition by Sjoberg (2007) on cognitive evaluation which refers to the process of first conducting a preliminary evaluation, this then gives rise to emotions which then influences the final decision. Of interest to note and as stated in the conclusion of the study by Cheng (2014), the influence of the emotions of investors and financial practitioners has contributed to the increasing volatility in financial markets. Results of section 5.4.6 on the presence of logic and reason versus intuition, emotion and creativity in decision making showed that only four senior managers hinted towards a small degree of presence of emotions in their decision making however at least five managers strongly linked decision utility to emotions. This brings into question the split between the influence of the individual and firm characteristics and the interplay over the decision making process.

6.5.1 Conclusive findings for Research Questions 4

A sense of comfort in the decision process leading to the decision was seen as essential to every managers interpretation of what defines a good decision and this is aligned to the Classical Decision Theory, which is puts forward that people are rational and attempt to make decisions that are well reasoned. This may provide the answer for why managers prefer to proceed with decisions taken and to not deliberate further. This view has limitations and implications for the effectiveness of decisions made. It is suggested that a review process is required to validate the decision making process and considerations leading to the final decision.

The other tendency observed is to relate good decisions to emotions attached to the perception of the outcome, this may result in inconsistency and volatility in decisions taken and may create legal implications especially if this is applied to decisions in the HR space.

6.6 Discussion of results for research question 5

This question explores what factors enable or are obstacles to good decision making. The depth interview, data coding and analysis phase of the research revealed the following results:

6.6.1 Factors that enable good decision making

The results of the factors that enable good decision making are presented in table 15. Having a clear and correct delegation of accountability and responsibility for decision making is viewed as an important factor to consider. It is expected that those making decisions should be delegated with the authority to do so, they should be empowered to do so and they should take accountability for the decisions that they make. The relevance of this is found in the study by Pitesa and Thau (2013) where the the authors demonstrate that accounability and holding decision makers accountable reduces the level of self-serving decisions as well as the negative influence of power. To curb these moral hazards and potential for managers to attempt to maximise their own personal utility to the detriment of others, organisational make use of institutional arrangements in the form of rules, laws and customs (Gaumnitz & Lere, 2002).

Of equal importance and frequency, senior managers believe that strategic debate and conversation must take place in order to facilitate good decision making. According to Quinn (1996), dialogue helps managers understand and influence expectations, furthermore in

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terms of the relevance to strategy, strategic plans are viewed as being simplifications and idealisations potentially omitting a great deal of a managers knowledge which may be consciously and tacitly held, conversation, dialogue and debate encourages this to be teased out. A dated but relevant study conducted by Schweiger and Sandberg (1989) found that dialectical inquiry and playing devils advocate resulted in better strategic decisions with higher quality recommendations and assumptions than group that aimed to achieve consensus. This because the two approaches made better use of the capabilities of individual group members. The effects of conversation can be two-fold as the results of the study by Gunia, Wang, Huang, Wang, and Murnighan (2012) demonstrate that while contemplation and moral conversation improve ethical decision making, immediate choice and self-interested conversation have the opposite effect and therefore the type of and the nature of the conversation is important.

There were three instances of senior managers who felt that there is value in bringing in or using experts as a soundboard. Yu and Chianglin (2006), suggest that involving resources beyond the scope of the decision problem itself, such as experts supports decision makers in solving a challenge problem.

There were three instances where senior managers indicated that understanding the decision context is also considered important in supporting good decision making. Theory to support the belief that context matters in decision making has been considered as part of Shepherd and Rudd's (2014) study, the contextual variables composed of the top management team, strategic decision specific characteristics, the external environment and the firm characteristics were evaluated for its impact on the strategic decision making process. Even though the authors found significant methodological implications that were raised as part of this review there were noteworthy findings relating to these four contextual variables and its influence on the strategic decision making process and outcomes.

6.6.2   Factors that hinder good decision making

Table 16 contains the results of the factors that hinder good decision making. The results indicate that power, ego and driving personal agendas ranked the highest with a frequency count of nine. Senior managers believe that this type of behaviour prevented decision makers from even considering other options and blinded them from evaluating the flaws in the options presented. In support of this Keltner, Gruenfeld, and Anderson (2003), state that power influences individuals to focus on rewards thus resulting in decision making that pursues self-serving interests in what is referred to as the approach/inhibition theory. It is argued however in the study by Pitesa and Thau (2013) that an individual's power is only

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likely to result in self-serving bias in the absence of appropriate accountability systems. Thus suggesting that there may be value for the company to review its accountability mechanisms.

Decisions based on emotions and opinions as opposed to the actual situation was also considered by a few interviewees as a contributing factor to bad decision making. In this category, the intentions of decision makers are good and are in the interest of the company however, they are seen as being emotionally based and thus interpreted as not being of sound judgement. Research conducted by George and Dane (2016), concluded that state, including memories of past emotional experiences as well as feelings attached to the future has an influence on decision making. In addition to this different affects (positive or negative) and different emotions (happiness or sadness) impact on the effectiveness of decision making and result in it varying significantly between decisions (George & Dane, 2016). Therefore the views of senior managers are relevant particulary from the inconsistency that emotions potentially bring from one decision to the next.

Decisions that lack clarity in the decision context and objectives was also considered by a few interviewees as a contributing factor to bad decision making. To support this view, one of the key lessons to improving decision making from the study conducted by Turpin and Marais (2004), is that of understanding the decision making context which includes being able to successfully classify people, situations and processes into existing frameworks and cultivating an awareness of value systems held.

6.6.3   Conclusive findings for Research Questions 5

If one looks at the helping and hindering factors presented by the interviewees in the study, they can be considered in conjunction with each other as it almost presented in the interviews as a problem with a solution. Having a clear and correct delegation of accountability and responsibility for decision making was demonstrated in the study by Pitesa and Thau (2013) to curb moral hazard and reduce reduce the negative effects of power and the tendency to drive self serving decisions. Interestingly enough managers raised power, ego and personal agendas as the most frequent factors that prevents managers from making good decisions as it creates blinds spots and a resistance to listening to or considering other options.

Conversation and debate is also raised as a enhancing factor for good decision making. This is well supported by studies to improve the quality of recommendatiions as the capabilities of the group are leveraged and it may also contribute to more ethical decision making if the

group is strong enough to mitigate the instance of self-interested conversation and dominance by some group members. A good facilitator will support these outcomes.

Understanding the decision context was raised in both the discussions on helpng and hindering factors thus emphasing the importance that decision makes attach to it.

The value of the collective and participative decision making comes through quite strongly in that the request for conversation and debate and also in viewing the involvement of experts to improve decision making.

6.7   Conclusion

The research has provided insight into the strategic dilemmas that senior managers in the mining industry face. These have been well aligned to the business risks facing the industry as raised in various research reports. Senior managers have unpacked the approach that they follow with the research also providing insight into the possible variables that that contribute to this. The utility attached to decision making as well as factors that enable and hinder good decision making have been clearly unpacked. Therefore, the research objectives, as posed by the five research questions in Chapter 3, have been met.

7 Conclusion and recommendations

7.1 Introduction

In this chapter the strategic decision making approach that senior managers in the mining industry follow when faced with dilemmas is presented in terms of the findings and insights gained from the interview respondents as discussed in Chapter 5 and Chapter 6. Recommendations to management are made based on these findings. Recommendations for future research are also put forward.

7.2 Principal findings

A multitude of decisions of varying levels of complexity and importance are made daily and how these decisions are made will always be a source of constant research interest. To this end, this study sought to unpack the decision making style of senior managers in the mining industry when faced with dilemmas.

The research outcome indicates that senior managers in the mining industry tend to follow a dual approach when making strategic decisions in the context of dilemmas. To further describe this approach, managers expressed that their decision making leaned more strongly towards more rational decision styles with a small presence of intuitive-based decision making. This is deemed a positive outcome as dual process theory is supported by Evans (2008) and Salas et al. (2010) as being an approach that enhances the quality of decision making. This combination arises from the belief that decisions are rarely based on one or the other approach but that the two operate in parallel and interact in complex ways (Kaufmann et al, 2014). Initially, one may have expected a more dominant intuitive approach in support of research by Malewska (2015) indicating that conditions that predispose the decision-maker to using intuition include the presence of information noise, a shortage of information, high levels of uncertainty, a shortage of time or resources and variables which is consistent with the nature of strategic decisions as well as conditions facing the mining industry. However, the research found that the approach followed by senior managers linked more closely to studies such as that conducted by Appelt et al. (2011) which investigated the role of individual differences and how much of human behaviour and the decisions people make is influenced by the person as opposed to the situation. Shepherd and Rudd (2014) further contributed to this line of thinking by looking at how contextual variables such as characteristics of the top management team, decision specific variables, the external environment as well as the firm characteristics contribute to the decision making approach. The study has contributed to literature in this regard by reconfirming that the strong tendency towards rational styles in the dual approach taken, is influenced contextual variables.

Specifically, the results were able to express a relationship between the increasing tenure and the tendency towards more comprehensive decision making and a stronger emphasis on rational decision making in the dual approach taken. This concept of creeping rationality was termed by Fredrickson and Iaquinto (1989) and reaffirmed in the study by Shepherd and Rudd (2014) as a characteristic of the top management team. The role of firm characteristics as investigated in the study by Elbanna and Child (2007) and Shepherd and Rudd (2014) was also reaffirmed in the study conducted where the performance and size of the company was found to also play a role in influencing the requirement for a more dominant rational approach. The split between the individual and the influence of contextual variables is emphasized in the study by the two facets to the dilemmas senior managers said they experienced. On the one hand there is a business dilemma that they face and on the other, a personal dilemma is experienced when trying to resolve the business dilemma. This was suggested in the interviews by the conflict experienced in the personal approach and the decision criteria or the formal processes required by the company. The study found that senior decision makers in the mining industry favoured a participative approach to making decisions. To this end, while the studies by Elbanna and Child (2007) and Shepherd and Rudd (2014) focused on the role of company performance and size in determining a tendency towards rational decision making, this research also found that firm characteristics, in this case processes and procedures, play a role in the level of involvement that decision makers allow in their decision making. This study thus confirms and supports the findings by Ashmos et al. (1998), where organisations that have formalised rules and procedures in place find that the strategic decision making process follows a consistent and standardised approach with the same small number of individuals involved.

The research supported views held in George et al. (2016) and the report by EY's Global Mining and Metals Center (2014/5) in terms of the types of dilemmas and trade-offs that were found to be experienced by senior managers in the mining industry. Obtaining a licence to mine due to environmental pressure, health and safety regulation, and legal and regulatory uncertainty places the future sustainability of the mining sector at risk. The two key issues that managers expressed included the uncertainty in how regulation will change or impact the industry and the uncertainty in the timing of approvals granting the licence to mine. The result is that mining companies are forced to make trade-offs in how to allocate scarce resources in managing the current business or towards the future of the company. Another very relevant trade-off highlighted in the study is that of profit maximisation against creating value for a broader range of stakeholders. In the study interviewees expressed the conflict in terms of the extractive nature of the mining industry and the environmental pressure it faces as well as resistance society has to the social impacts that it brings but on

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the other hand both society and government welcome the economic impacts in the form of job creation and commodity exports.

The relevance of considering and understanding the trade-offs one is required to make is found in the rationale that in order to effectively manage dilemmas, managers must understand the implications of their decisions and therefore the competing demands that they are faced with (Johnson, 2012). The outcomes of this study emphasize the importance of understanding the objectives of the decision as well as all aspects relating to the context in order to ensure that good decisions can be made.

The research found that the dominant utility attached to decisions was aligned to the Classical Decision Theory, which is puts forward that people are rational and attempt to make decisions that are well reasoned. This was expressed in the literature as having limitations in that decision makers are considered bounded in their rationality and therefore this may impact on the effectiveness of the decision making process. The other tendency observed is that some senior managers relate good decisions to emotions attached to the perception of the outcome, this may result in inconsistency and volatility in decisions taken

7.3   Implications for management

The business dilemmas and trade-offs highlighted in the study were well aligned to the challenges for this industry as expressed in research reports and acknowledged by anyone who works in the industry as a reality. However, understanding the specific dilemma and trade-offs enhances the understanding of the decision context and objectives which was expressed as a key requirement to enhancing the quality of decision making. Therefore, management should emphasize this in the decision making processes of the company where sufficient time to be allocated to understanding ensuring that key decision makers are aligned in terms of this. If possible this should be incorporated as one of the first gate of approvals in the life cycle of strategic projects and decisions.

With regard to the decision making approach, the conflict between personal and company required processes was raised as having potential implications on the quality and effectiveness of decisions made. The utility decision makers attach to the decisions which is consistent with Classical Decision Theory as well as the prevalence of prospective decision utility have implications for the quality of decisions made and it therefore suggested that managers should consider development and training in terms of strategic decision making.

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The importance of accountability was raised in many of the interviews and therefore it is suggested that the company evaluates the accountability mechanisms currently in place to mitigate the impact of moral hazard, ego and personal agendas. While project management, review and assurance processes may go a long way to create checks and balances on tactical decisions or those made by middle management, it is not entirely clear how is this handled a senior management levels, which have more serious consequences on the survival of the company if these decisions are not effective resulting in unsuccessful outcomes. We understand that the utility attached to decision making by some managers contains limitations and those by others is based on a framework of prospective decision utility where decisions are made based on the perceived outcome and the anticipated emotions that accompany it (Cheng, 2014). These carry consequences for the quality of decisions made and its benefit to the company. This carries implications for senior management training on decision making.

7.4   Limitations of the research

The research was based on interviews and therefore heavily dependent on what the interviewee says which carries implications of subjectivity and bias. It could be that that the answers provided were based on putting the best impression forward or that interviewees were not sufficiently critical of their own styles and approaches.

The study focused only on the decision making approach, the outcome or the success of the decision implemented was not explicitly raised in the interviews. Further, many of the interviewees considered dilemmas recently faced and in most cases being of a strategic nature, these would not have reached a point of being implemented with a clear outcome result. This is considered a limitation as research implies that implementation is a significant contributor to the success of strategic decision making success (Elbanna, 2006).

7.5   Suggestions for future research

The role of contextual variables on the decision making approach was raised in a number of areas of this study and it is therefore suggested that further investigation into how approach is influenced by contextual variables. Thus study by Shepherd and Rudd (2014) should form the basis however it is recommended that firm characteristics should be expanded beyond performance and size study and the unique circumstances of the mining industry should also be considered.

The conflict in personal and firm approach was evident in the study however, it was not addressed in terms of the implications this may have on the quality of decision making. It is therefore recommended that further research be considered specifically how variables contained within firm approach, including performance, size, process and culture influence the decision making approach of the company, how conflicts in personal and company approach impact on the effectiveness of decision making and how this conflict is reconciled.

While literature does promote the value of participative decision making, further study is recommended to evaluate whether this is a function of the senior manager's decision making style or once again, firm characteristics.

8 Consistency Matrix

Title: Strategic Decision Making in the Mining Industry when presented with Dilemmas

PROPOSITIONS/ QUESTIONS/ HYPOTHESES Do they match the title?	LITERATURE REVIEW Complete sections of literature you expect to be covered in the main body of the report	DATA COLLECTION TOOL Where is it on the questionnaire	ANALYSIS Is this data analysable?
Research Question 1: What categories and/or types of dilemmas do strategic decision makers face in the mining industry?	Smith, 2014; Zettler, Hilbig and Heydash, 2013;	Interview Guide: Question 1 and 1.1	Theme analysis, identifying themes or types of dilemmas that emerge in the data and how that relates to the mining industry.
Research Question 2: What are the natural or preferred approaches or styles followed by strategic decision	Kaufmann, Meschnig and Reimann, 2014; Sjöberg, 1982; Kahneman, Lovallo and Sibony, 2011;	Interview Guide: Question 2	Content Analysis, determining how many respondents use words associated with rational methods (e.g. "rational", "quantitative", "tool", "data analysis") or intuitive methods (e.g. "intuition", "experience",

makers when faced with a dilemma?	Malewska, 2015;		"expert knowledge", "gut feel") frequency tables will be set up to analyse.
Research Question 3: Are tools deemed effective by strategic decision makers when faced with dilemmas?	Meissner, 2014; Simon, et al, 1987 Borison and Hamm, 2010	Interview Guide: Question 3, 3.1.and 3.2	Content Analysis, determining how many respondents use words associated with an effective vs ineffective experience in the use of tools when following a rational approach. Frequency tables will be set up to analyse. Narrative analysis to understand the story behind why tools were deemed effective or not effective.
Research Question 4: How do strategic decision makers define a "good decision"?	Certo, Connelly and Laszlo, 2008; Glöckner and Witteman, 2010; French, Maule, and Papamichail, 2009	Interview Guide: Question 4	Content Analysis, determining how many respondents use words associated with keywords such as "optimising", "satisficing", "highest value", etc. Frequency tables will be set up to analyse.

Research Question 5: What are the factors (enablers and obstacles) influencing decision making when faced with a dilemma?	Appelt, Milch, Handgraaf, and Weber, 2011; Certo, Connelly and Laszlo, 2008; Laing, 2013; Patrick, Steele, and Spencer, 2013; Newell and Michael, 2011; Kahneman, Lovallo, and Sibony, 2011; Gary, Wood, and Pillinger, 2012	Interview Guide: Question 5, 6	Theme analysis, looking for themes of enablers and obstacles. Narrative analysis, understanding the factors raised, why it is an issue and its relation to the context of a dilemma.

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10 Appendices

10.1 Appendix I: Cover Letter

Good day,

I am busy with my MBA studies at GIBS and as part of my thesis, my research aims to understand how senior managers in mining companies actually make strategic decisions when the situation is classified as a dilemma.

This is a qualitative study and I would really appreciate an hour of your time to conduct an individual depth interview with you.

I have received permission from …

Thank you for your time.

Mala Padayachy

10.2 Appendix II: Consent Letter

Consent Letter

I am conducting research on how strategic decisions are made in the mining industry when presented with dilemmas. Our interview is expected to last about an hour, and will help us understand how senior managers in the mining industry approach decisions under this context. **Your participation is voluntary and you can withdraw at any time without penalty***. Of course, all data will be kept confidential. If you have any concerns, please contact my supervisor or me. Our details are provided below.*

Malathee Padayachy_____   _____

Researcher name   *Research Supervisor Signature*

Email: Malathee.Padayachy@exxaro.com   *Email:* lewc@gibs.co.za

Phone: 083 609 0172   *Phone:*

Signature of participant: _____

Date: _____

Signature of researcher: _____

Date: _____

10.3 Appendix III: Interview Guide

<u>Setting the context</u>

The focus of this interview will be on strategic dilemmas in the mining industry and your personal approach to making a decision in this context.

Breaking this statement down into its components we interpret:

- Strategic decisions as those decisions that set the direction of the company, are future orientated which includes implications of a lack of structure, high levels of uncertainty, complexity and lacking routine.
- Dilemmas are defined as those decisions that have competing choices that contain both pros and cons which need to be weighed in order to resolve the dilemma (Smith & Lewis, 2011).
- Approach – your unique method of dealing with the situation

<u>Questions</u>

1   Have you been faced with dilemmas in your strategic choices where you did not know which to turn because of the respective advantages disadvantages?

1.1   What were the similarities between these dilemmas?

1.2   How did they differ from each other?

1.3   What were some of the trade-offs you needed to make when faced with these dilemmas? (prompt: what did you lose out on? What were some of the biggest gains?)

1.4   Why was this a dilemma for you?

2   Bearing in mind these strategic dilemma scenarios, how did you go about making the decision?

2.1   Did you follow a process?

2.2   What steps did you follow?

2.3   How did you deal with the complexity of the decision?

2.4   Did you make the decision by yourself? If not who did you involve and why did you involve them?

2.5   What were you thinking when you made your decision?

2.6   After you made your choice did you consider whether it could be improved or were you satisfied to proceed?

2.7   Referring back to your choices how much is based on logic and reason versus intuition, emotion and creativity?

3   Did you use any tools to make the decision? If no, what were your reasons for not using a tool? If yes, proceed to 3.1 and 3.2.

3.1   What tools did you use? What influenced the selection of the tool?

3.2   Talk about in what respect they were useful and not useful in helping you arrive at a decision.

4   When you made these decisions, how did you know that you were making a good decision?

5   What else needs to be in place to help you make a good decision?

6   What do you feel inhibits effective decision making?

10.4 Appendix IV: Results

Types of dilemmas - the challenges					
				Refined Categories	
Source	Note #	Note	Category 1	Category 2	Category 3
2	1	I normally evaluate something using my values as a context. As, as the framework within which I approach anything. So if there is a strategic decision to make, my value system is based on, if I look at Company X as the company I work for, it's based on ensuring the sustainability and longevity of Company X … I would have personally withdrawn if it was in conflict with what I believed in…	type	Ethical dilemmas	Value Framework
2	1	stand my ground for what I believed in at the expense of the relationships	type	Ethical dilemmas	Value Framework
2	1	I had a lot of conviction in. Corporate office is too big and needs to be downsized, unfortunately, there is going to be some casualties on the way	type	Ethical dilemmas	Business rationale vs HR impact
3	2	Context of impact	type	Macro Economic Challenges	Financial dilemma
3	3	Context of impact	type	Macro Economic Challenges	Legal dilemma
3	4	Context of impact	type	Licence to mine	Environmental/conservation pressure/dilemmas
3	5	Context of impact	type	Licence to mine	Health & Safety Regulation
4	1	we try to enable what the strategies of the business operations are, and even from a corporate perspective. So although there is a balance between what your different stakeholders need, you need to also look at what is the trend within the market, what new technologies are becoming available and could be of value to the organisation that the customers might not be aware of or the stakeholders might not be aware of.	type	Enablement of company strategy	Technology/IT/automation
5	1	whether it's the CEO optimisation journey which has to do with people	type	Ethical dilemmas	Business rationale vs HR impact
5	2	whether you are implementing capital towards a Belfast project compare that to a GG6, typical example, capital do you throw capital into a new environment of business of tomorrow	type	Investment decisions	Manage for today or tomorrow
5	3	It's also to do with smaller things that you don't necessarily have all the information regarding regulatory environment	type	Licence to mine	Legal and regulatory uncertainty
5	4	We are waiting, we want to execute, we have plans but yet, you are waiting for others also to play their part in the broader SA Inc. type of environment	type	Licence to mine	
6	1	some dilemmas of more political, country-political issues	type	Macro Economic Challenges	Political dilemma
6	2	strategic decision was taken and the dilemma is proceed (making it work) or not proceed (this is the self created liability)	type	Investment decisions	Quit or continue
6	3	sit actually in my view with four things, you sit with the world market which is the one side and it's kind of known or predicable, then you sit with your infrastructure portion and so on, you sit with your legal portion and … government portion, and then the fourth … your self-created liability	type	Macro Economic Challenges	Economic cycle
6	4	same as above	type	Licence to mine	Legal and regulatory uncertainty
6	5	infrastructure portion	type	Licence to mine	
6	6	a green pressure that's arising	type	Licence to mine	Environmental/conservation pressure/dilemmas
7	1	value in game…actually game farm on a mining property… sure that you safeguard the assets…species that are prone to poaching…mining of the wetland…got the authorities to agree with us that we could mine	type	Licence to mine	Environmental/conservation pressure/dilemmas
8	2	there is a technical portion to it, there's the process portion, there's a financial and the most difficult to all is that at the end of the day, there's a human impact and that's normally the dilemma	type	Ethical dilemmas	Business rationale vs HR impact
9	2	being expose to issues of climate change and global warming	type	Licence to mine	Environmental/conservation pressure/dilemmas
9	3	high carbon intensive organisation, likely to have a company that will not be in existence in more than 20 years from now	type	Company direction, future sustainability	
10	2	example of mining charter changes but uncertain about what these changes will mean	type	Licence to mine	Legal and regulatory uncertainty
10	3	what's the future role of supply chain in the future of the company	type	Enablement of company strategy	Functional direction
10	5	what talent do I need for an organisation going forward, you know, I'm talking about knowledge you know, and talking about information you know, intellectual property of this organisation that I'm running, how is it maturing you know, I'm talking about the enabling platform of this organisation you know, and I'm talking about the structural design	type	Enablement of company strategy	Talent management/competencies
11	1	last sort of let's say two years since the commodity prices actually turned down on us … will it impact everybody and how long or is it a permanent sort of shifting in the market forces	type	Macro Economic Challenges	Economic cycle
11	2	the regulatory, sort of, environment that's extremely unpredictable to plan timing	type	Licence to mine	Legal and regulatory uncertainty
11	3	the third constraint here, is the fact that we have a balance sheet, that we are totally reliant on debt to fund any sort of future growth for us.	type	Enablement of company strategy	Capital
12	1	the dispute resolution process means that you always have to weigh up… of weighing up outcomes, versus operational risk versus labour peace	type	Enablement of company strategy	Labour peace
13	1	strategic debate in terms of what the future of coal… all the pressure from environmental point of view, the climate change and so forth	type	Company direction, future sustainability	
13	2	same as above	type	Licence to mine	Environmental/conservation pressure/dilemmas
13	4	you never know how legislation will change…So you never know how legislation can also become a threat for you as an industry	type	Licence to mine	Legal and regulatory uncertainty

Similarities				
Source	Note #	Note	Category 1	Category 2
2	1	When dilemmas are experienced it is ethical	type	Ethical dilemmas
3	1	Both at risk and at cost	type	Cost/risk trade-off
3	2	Element of technical compliance, Element of sustainability	type	Licence to mine
3	3	Competing objectives, competing risks and no perfect solution	type	Cost/risk trade-off
4	1	is always cost cutting pressures	type	Cost/risk trade-off
4	2	more and more things are being automated so our costs are continuously increasing	type	Cost/risk trade-off
5	1	all have uniqueness towards that specific decision that you need to make. but the similarities are driven by the process that you follow	type	How one approaches it
7	1	environmental and conservation, extractive industry and conservation,	type	Licence to mine
8	1	that's a similarity is that most of the decisions has a personal impact at the end of the day somewhere for people.	type	Ethical dilemmas
11	1	the biggest thing on in our life in the mining is the sort of certainty you have in predicting, sort of, medium to long term where your macro environment will end up	type	Macro Economic Challenges
13	1	the short answer is they are risks, fundamental risks for your business and they touch on the strategic question	type	Cost/risk trade-off

Differences				
Source	Note #	Note	Category 1	Category 2
1	1	No real difference		
1	2	Company direction	Size and point of impact	
1	3	Individual operations	Size and point of impact	
3	1	Different context of impact on business outcome. *Context referes to realms of business functions e.g. financial dilemma, legal dilemma, etc*	Size and point of impact	
4	1	depends on the economical cycle and where we are and whether it's good or bad times.	Where the economic cycle sits	
4	2	enterprise solution and if we implement it we implement it for everybody. So the fit for purpose thing becomes critical…	Size and point of impact	
6	1	How one handles the different dilemmas	How one approaches it	
7	1	there are some dilemmas that are disastrous, they are real disastrous. There are some of that are impactful, but you can still recover from them	Size and point of impact	
8	1	there is a technical portion to it, there's the process portion, there's a financial and the most difficult to all is that at the end of the day, there's a human impact and that's normally the dilemma	Size and point of impact	
12	1	It's only the risk of whether it becomes a national issue that flicks onto the pages of Carte Blanche or whether it's just an unhappy shop steward	Size and point of impact	
13	1	I think some higher risks than others maybe… I think some higher risks than others maybe.	Size and point of impact	

			Trade-offs		
				Refined Categories	
Source	Note #	Note	Category 1	Category 2	
1	1	Certainty vs Uncertainty of outcome - certain outcome but not exciting outcome	Value vs Risk	Magnitude of value relative to risk	
2	1	Values, principles and judgement weighed against situation	Ethics Trade-off		
2	2	best for company vs risk to relationships	Ethics Trade-off		
3	1	Cost vs benefit	Cost vs Benefit		
3	2	Relationship gain and loss	Ethics Trade-off		
3	3	trade off risk positon for the potential gain	Value vs Risk	Magnitude of value relative to risk	
4	1	Balancing stakeholder need...new technologies... look at aging technologies... stability of current technologies	Manage for today vs Manage for tomorrow	Technology	
4	2	Q1.1	Cost vs Benefit		
4	3	I think it depends on the economical cycle and where we are and whether it's good or bad times. I think in the good times it's not as difficult to, to get these things through, to dream wide and to start implementing with certain things. On the other side, the problem that you face is, if you have to now support certain things that were decided on in the good days and now you have to still maintain them in the bad days	Manage for today vs Manage for tomorrow	Economic cycle	
4	4	Q1.2			
4	5	Q1.2	Fit for purpose vs Standardisation		
5	1	from a risk perspective, it's ...the money into a specific avenue...decision which could impact shareholders ...	Value vs Risk	Shareholder impact	
5	2	that is personally close to me but then you actually put that aside and then rather say because of the risk in the broader organisational goals	Personal goals vs Organisational goals		
6	1	there's the environmental pressure which is its actually in conflict with the political agenda because the political agenda is to create jobs and so on and the economic agenda is to create value	Profit maximisation against creating value for a broader range of stakeholders	Macro economic factors	
6	2	the hard facts about the world economy that your NPV, you'll never get here or you'll have to wait for super cycle again before you'll get here	Manage for today vs Manage for tomorrow	Economic cycle	
7	1	required to cost benefit analysis what is the cost of this economic activity that you are proposing, environmentally and are you able to offset	Cost vs Benefit		
7	2	cost-benefit analysis. Which looks at the social impacts, you know economic impact and environmental impact and on the basis of it you are able to decide you know, this is a go or no, it's a no go.	Profit maximisation against creating value for a broader range of stakeholders	Macro economic factors	
8	1	It's normally the balance between the success of projects and the impact of the decision there off on let's say the people on the end of the day.	Profit maximisation against creating value for a broader range of stakeholders	Employee impact	
8	2	Should you do it with external, internal? Should you do it with sourced-in technologies	Insource vs outsource		
9	1	that you use the current revenues coming from these current business to plough them into a new business instead of continuing with the same business	Manage for today vs Manage for tomorrow	Balancing the scarcity (time and resources) in providing a quality service to existing customers while creating future value by improving the organisation	
10	1	need for right talent, there's need to drive cost down, there's need to improve service delivery and value of the organisation in supporting the Company strategies	Manage for today vs Manage for tomorrow	Balancing the scarcity (time and resources) in providing a quality service to existing customers while creating future value by improving the organisation	
10	2	here was a decision that the business was asking us to outsource	Insource vs outsource		
11	1	if you're a constrained company ... approvals for projects...mergers and acquisitions...when do you get it to implement this project or not	Cost vs Benefit		
12	1	Q1.0	Value vs Risk	Business risk vs labour peace	
13	1	there's environmental climate change risk but on the other hand it is also creating a lot of jobs	Profit maximisation against creating value for a broader range of stakeholders	Macro economic factors	

Personal Dilemma				
			Refined Categories	
Source	Note #	Note	Category 1	Category 2
1	1	gut feel - you cannot put in company motivated language	Alignment of personal approach	Gut feel vs Company decision criteria
1	2	feels like the right thing but ..don't back your own decision and be conservative	Alignment of personal approach	Risk avoider vs risk taker
1	3	safety vs taking a chance - go for the size of the prize	Alignment of personal approach	Risk avoider vs risk taker
1	4	possible to run into situations where personal values are challenged	Ethical dilemmas	Value alignment
2	1	clash in personal values	Ethical dilemmas	Value alignment
3	1	Sense of hopelessness (interms of the personal definition of a dilemma)	Loss of decision control	Conflicting choices
4	1	you do too much then … outside of that benchmark... criticized for that. Although … the new strategy... to be a modernised… costs, it actually, it explains why it is higher	Conflicting business requirements	
4	2	they've already decided on what they want and even though it's/may be against your strategy,	Loss of decision control	Others have decided or are pushing their requirements
5	1	don't have all the information… not having access to all the conversations at different levels… then you rely on others …trust your fellow colleague	Loss of decision control	Lack of information and reliance on others
6	1	you want to execute the strategy so there's the execution of the strategy of Exxaro to be in iron ore, but you sit with all of these almost unquantifiable issues that you face	Loss of decision control	Conflicting choices
6	2	you see this value but you've got this, these issues that's not logical you know… if you do a analysis on the project you get this great NPV but with all of these potential liabilities and pit falls that you can't really say whether it's going to play out and not play out, so it's trying to make a decision but not be able to actually put facts to, it gets down to that gut feel	Alignment of personal approach	Gut feel vs Company decision criteria
7	1	what is justifiable costs that the developer must put in, must assimilate. What are the costs of mining that society must pick up from the developer because society is also a beneficiary of the economic activity that the developer is doing? And we sort of blindly are internalising, this is where the dilemma is	Alignment of personal approach	Gut feel vs Company decision criteria
8	1	Because you need to look at the people in their eyes	Ethical dilemmas	Empathy for human impact given Business Rationale
10	1	All of them are important, that's why all of them are important. You can't make a decision by dropping one. . So cost, service delivery and being comparable and competitive, a call for you to adapt but you still need to provide a service	Conflicting business requirements	
11	1	Of the three constraints (limited funding, timing of approvals and macro uncertainty) a lot is not in your control	Loss of decision control	Lack of information and reliance on others
12	1	The dilemma comes in for me is making the right decision for the business first and foremost but always understanding that the decision being made, there is a person at the end of it no matter what you do	Ethical dilemmas	Empathy for human impact given Business Rationale
13	1	there is not a manual or a crystal ball that gives you the 100% correct answers if you look 20-30 years ahead	Lack of certainty to accurately predict	

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Process/steps followed - one answer on approach and one line on description key words		
Source ▾	**Note #** ▾	**Note** ▾
1	1	I didn't follow some academic or theoretical or formal process but there is a process of my own
1	2	Key words: understand the context; gather as much as possible information; eliminate factors or information or data that's the same for both; pin point where the real differences; simulate the effect of taking either decision; try do the decision or the cause and effect tree; you've narrowed it down to really what are the crucial differences; try and value those parts; put some criteria or metric to it; which one would give you the closest to what you trying to achieve
2	1	Based on complexity answer and Q6
2	2	key words: now whenever there is a dilemma I always bring it back to myself; once I have a firm grasp of what is it I am dealing with and where am I actually posing the bottlenecks or obstacles or whatever you call it I quickly try to clear my mind; look within; triggers that cause a reaction and a response from me, be on the guard for that; look at the bigger picture, where are we going and how do we get there and how do I, how do we go there together
3	1	Based on below and Q6
3	2	Key words: what is the objective or what is purpose; sketch the scenario; understand the context of the dilemma; have some prioritisation framework; time frame in which the decisions need to be made… helps to define the context of the dilemma; which are the important facts, which are the relevant facts; define some alternatives… understanding the context and the time available will actually drive the creation of alternatives…weigh them; you know before-hand is not going to be a perfect decision but you have to give guidance to go forward; When things are really a dilemma and there's uncertainty involved it's like a decision tree with multiple branches; In the end, it would be a series of decisions
4	1	
4	2	Key words: understand your environment; what are the levers; are there specific strategic directions that you need to enable; know where do we need to get to; But also dreaming… a strategy for me although it needs to be achievable
5	1	Based on below and question 6
5	2	Key words: ? I make sure that all the information from the technical side is done thoroughly; done the assurance part of it and then I come up with a so called technical review committee, where technically I say this decision is a sound one to be taken…think the process that we put in place is an assurance process and we follow a project lifecycle…we take it through the various gates... the last time before we take a strategic decision to invest, there's Investment Review Committee, EXCO and the Board by which we then explain all of this and then only we get the capital and make the final decision… a lot of technical sanity checks before you go to the investment forum
6	1	
6	2	Key words: but we never went on a process of… did the Porter or whatever analysis, it was more going through a process facing the current board, the investors…So we used decision trees to try and work out our options and what's the risks and point out different things…we found ourselves in the midst of a already strategic decision taken, so it's actually how do I execute…it was not really a process, it was more tools
7	1	I follow a process and the process is based on the biggest and the most disastrous impact associated with it
7	1	But what is the true risk… We tried to do that in a model last year… started to measure it… understanding the risk, understanding the type of solution that deals with the risk and then you are able to execute.
8	1	it depends it's anything from 100% that side or 100% on that side and again it depends on what the impact is

Process/steps followed - one answer on approach and one line on description key words		
Source	Note #	Note
8	2	Key words: technical side of things, that's the easy one…I tend to try and get the most of the information on a very quick basis. Try to hear more than one side and if it's really a difficult choice I know it doesn't really matter which one you take…don't second guess yourself, if you've done enough pre work, if you've done gathered enough information… only change your decision if it's a fatal flaw. The people side that's actually a difficult one… again the approach is to get all necessary information and the decision itself mainly is again a relatively easy decision. It's the communication of the decision that's important… the more time you spend, at a stage more information does not necessarily give you a better decision so you need to get that sweet spot to say, do I have enough information to take decision
9	1	process is key, especially in an organisation as big as ours
9	2	Key words: take decisions within the framework of governance… start by lobbying and idea in an informal situation, and thereafter you put a pen and a paper together and try to motivate a decision through the structures of the organisation… the decision gets registered…then it becomes a decision of the organisation that then in principle, the decision is approved and then go and put the numbers onto the ideas so that then we can see if there is any business case or not
10	1	
10	2	One approach, experience and gut feel. You quickly evaluate and then you make a decision. there are decisions that are allow you sufficient time to plan, organise, consider inputs, you know, and then use the input to enhance your decision
11	1	I have a live model of the full business.. See Q6 while the tool is there inputs is based on expert intuition
11	2	So at least every type of high level decision…we can try to quantify it and see if it makes sense… this whole model we try to keep as up to date as possible, to try and keep it a live model
12	1	you can't follow a process… It's walking in on the day, weighing up the pros and cons of what might happen. And I'd like to say that almost 60% is gut feel … it's experience and that's what I'm saying, it's stuff that you learn by virtue of getting it wrong
12	2	it's experience and that's what I'm saying, it's stuff that you learn by virtue of getting it wrong… always, business risk and mandates. So nothing we do is un-mandated
13	1	it's a EXCO decision and we've got a strategic process is spelled out as a yearly process
13	2	start with your scenarios…politically what can play out in the country, environmentally what can play out… draft a couple of scenarios and you plot them into quadrants and then you go through that whole process of scenario planning

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Dealing with complexity			
			Initial Categories
Source	Note #	Note	Category 1
1	1	and simplify it as much as possible by taking the noise out … focus on the differences	Breaking it down into it's fundamentals based on formats that make sense, focusing on the key differences
1	2	get through the complexity by playing out scenarios	Map and play out scenarios with the aide of tools and techniques
2	1	I break it down into the fundamentals…to understand a bigger picture I need to understand the components…I see the linkages between those things	Breaking it down into it's fundamentals based on formats that make sense, focusing on the key differences
3	1	conceptually understand and map… in my experience creating a simple model, graph or diagram normally facilitates the alignment of understanding so that contributions can be drawn into generating alternatives for finding solutions or for progressing	Breaking it down into it's fundamentals based on formats that make sense, focusing on the key differences
4	1	bringing the shared knowledge of the team together	Leverage the team and shared knowledge to understand different views
5	1	It's broken down but also broken down by various skills looking at various different matters…My decision process is driven by people…Because I'm very relying on my own people to give me comfort …It's all about attention to detail and the technical nature and that we have all the required information before making decisions	Breaking it down into it's fundamentals based on formats that make sense, focusing on the key differences
5	2	Same as above	Leverage the team and shared knowledge to understand different views
6	1	decision wasn't for us to take, so it was a board decision… we had to answer those things so what we did is we tried to in these decisions trees, tried to map all of the different scenarios	Map and play out scenarios with the aide of tools and techniques
6	2	Engaging because we had several sessions engaging with the both EXCO, the board and so on to get opinions… use those opinions to try and filter through the, non-tangible facts	Leverage the team and shared knowledge to understand different views
7	1	financial, compliance, stakeholders, yes we do. All of those things, we do make those considerations	Leverage the team and shared knowledge to understand different views
8	1	get the information… not to rely only on my own experience and competency to take a decision, so get more people involved	Leverage the team and shared knowledge to understand different views
9	1	try to unpack the project into different phases, stages or milestones	Breaking it down into it's fundamentals based on formats that make sense, focusing on the key differences
9	2	assign specific tasks to specific individuals	Leverage the team and shared knowledge to understand different views
10	1	do I have the time to sit down and understand and dissect the problem using a team … there are points which sometimes when you get to that scenarios you must choose whether you want to do it alone, collectively, have you got the time, what will it require of you	Breaking it down into it's fundamentals based on formats that make sense, focusing on the key differences
10	2	Same as above	Leverage the team and shared knowledge to understand different views
11	1	quantify, but quantification it's one way of doing it. My job is not necessarily to take the decisions myself its more to put the EXCO into the position to take decisions, but try to give them something that can stimulate their thinking both ways to indicate the risks and the opportunity.	Map and play out scenarios with the aide of tools and techniques
12	1	just break it down to its absolute fundamentals…take the noise out, I call it the noise which is sometimes the undue complexity, break it up to the fundamentals and get to the crux of where the solution lies.	Breaking it down into it's fundamentals based on formats that make sense, focusing on the key differences
13	1	the more complex it is I think the more wisdom you need around the table, you need to get the opinion of everybody, you need to get the views from outside companies, independent companies, eh and eventually then put all that together and try to make sense out of the complexity	Leverage the team and shared knowledge to understand different views

Collective decision making… note only one comment for style but many for selection criteria			Categories	
Source	Note #	Note	Category 1	Category 2
1	1	it's a bit of a collective trying to bounce with other people… 99% of the time is no, it's not by myself… as a company tend to take decisions more in groups, the conservatism tend to rule sometimes.	Style	Collective
1	2	who is involved is a combination of, depending on what the decisions is about, so people who are more knowledgeable in that field or area where the decision plays out	Selection criteria	Involve the experts
1	3	your network of people that you value their opinion; someone that can challenge your thinking	Selection criteria	Use personal network to validate, test and/or lobby decisions
2	1	I don't make decisions myself…, I always consult	Style	Collective
2	2	include people that are technically sound or strategically sound, so the experts in the area,	Selection criteria	Involve the experts
2	3	it will include the people that I hold in confidence in other words people that I trust that I know will always look for my safety and therefore will not provide me with misleading information	Selection criteria	Use personal network to validate, test and/or lobby decisions
3	1	there are cases where you just make the decision yourself because of the nature of the situation… In other cases it could be a team setting … the nature of the dilemma that drives the approach to resolve it	Style	Dual - participation when situation requires
3	2	dilemma is understood by more than one person and the contributions of multiple persons would in the end resolve the dilemma situation	Selection criteria	Involve the experts
4	1	definitely will involve	Style	Collective
4	2	at the end of the day the specific focus areas that you need to drive	Selection criteria	Involve the experts
4	3	…with very different thinkers in that room, which is good	Selection criteria	Create a diverse team
5	1	My decision process is driven by people…	Style	Collective
5	2	various skills looking at various different matters… I have my technical review committee were I look at my group manager engineering or I look at my group manager mining to say, give me comfort	Selection criteria	Involve the experts
5	3	same as above	Selection criteria	Create a diverse team
6	1	we analysed we recommended and we recommended to the EXCO and to the board and it was a decision that was taken… the board… took a different view on it	Style	Collective
6	2	selected people from different areas… people with skills and knowledge in these kinds of things and then we also used some consultants… So it's based on experience and a field of expertise	Selection criteria	Involve the experts
6	3	same as above	Selection criteria	Create a diverse team
7	1	involve people because it's part of their responsibilities… company is a very conservative company, so we try to consult	Style	Collective
7	2	involve people because it's part of their responsibilities…	Selection criteria	Decision falls in their area of responsibility

Collective decision making… note only one comment for style but many for selection criteria				
				Categories
Source	Note #	Note	Category 1	Category 2
8	1	I try to involve one or two guys	Style	Collective
8	2	know the people…know who to ask…I physically have a list drawn up with, the let's call it the experts in the company on different levels	Selection criteria	Use personal network to validate, test and/or lobby decisions
9	1	if you are making organisational decisions, it goes without saying that those decisions must be collective decisions	Style	Collective
9	2	I can use the very people that have assisted you in gathering the information towards making a decision	Selection criteria	Decision falls in their area of responsibility
9	3	lobbying to your peers… you actually have more prospects of success in the decision making if you involve other people because they will expose you, or expose things or items that could have been in the blind spot	Selection criteria	Use personal network to validate, test and/or lobby decisions
10	1	three decisions: decide whether I want to form a steercom or a collective team; understand what's the impact of that in me getting quicker to that purpose; make sure that all stakeholders have got a view because they going to be impacted by the decision neh, I need to understand how much time do I want to consult and who do I want to consult with	Style	collective
10	2	same as above	Selection criteria	Decision falls in their area of responsibility
10	3	know what the other party that you are inviting has the potential to bring to the decision	Selection criteria	Involve the experts
11	1	Based on comments below	Style	Collective
11	2	you make your plans and define what are the best sort of outcomes before you get to the EXCO and then you actually test those things against them	Selection criteria	Governance requires that the decision is taken to senior decision takers
11	3	I think one shouldn't underestimate a lot of these sort of interdepartmental, can almost call them informal decisions, where you make your plans and define what are the best sort of outcomes before you get to the EXCO … get everybody sort of views from a different perspective and then try to put them together	Selection criteria	Decision falls in their area of responsibility
12	1	I generally make those decisions on my own within the ambit	Style	Dual - participation when situation requires
12	2	person I work the closest with is my REM colleague… it's like a large part of what I do impacts him. Or, he can give me solutions to stuff that I need to check.	Selection criteria	Decision falls in their area of responsibility
13	1	the more complex it is I think the more wisdom you need around the table, you need to get the opinion of everybody, you need to get the views from outside companies, independent companies, eh and eventually then put all that together and try to make sense out of the complexity	Style	Collective
13	2	per theme, per situation	Selection criteria	Involve the experts
13	3	same as above	Selection criteria	Decision falls in their area of responsibility

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Was a tool used?					
			Was a tool used		
Source	Note #	Note	Yes	Yes, not formalised	No
1	1	there's some, almost principles of scenario analysis that I tried to use	x		
2	1	if we have to do a paper exercise you always do a SWOT or you know but …. But it's not a formal thing		x	
3	1	, I don't apply … by default…I think I've got that basis but I don't open up a spread sheet each time we each take a decision		x	
4	1	the mind of a fox, Clem Sunter …I like his approach of following a strategy, that nine step approach that he does, for me it's just a very complete process, and we've used it before	x		
5	1	as an executive there's no simulation model or obviously you utilise tools for example, what is the net present value or the IRR of a specific investment there are those types of tools that you utilise but that's just piece of information …			x
6	1	did financial and some analysis from market guys	x		
7	1	financial analysis is one of those, risk matrix in terms of resources, those are the two ones. That make sense for me. Remember we are risk managers	x		
8	1	it's on the knife its whatever side, like I said previously actually then it doesn't matter. You don't need a tool to decide on something that's obvious, you need a tool to decide on something that's extremely close and that doesn't really matter			x
9	1	a tool like as the technology will provide today is one best instrument to use to help you, lead you in the right direction… the NPV of, yes economic evaluation	x		
10	1	Where a decision requires a tool I'll use a tool, where decision requires a particular thinking framework that, not necessarily a tool like a hardware, software tool, I will use that thinking framework. But it all happens like a lightening sometimes, so you don't say now I'm at the stage of a thinking process, you just get to that process		x	
11	1	although you can't normally predict your prices if you understand what drives it and what makes things work	x		
12	1	it's a blend of both, we look at different scenarios in terms of how a different scenario might be a solution or decision that we can arrive at and at the same time we test from a SWOT point of view as to how we might arrive at something … So it's not really a tool but an agreement in my game is a tool		x	
13	1	I think scenario planning is one, I think we also do the SWOT analysis, we do the PESTEL, so there is a couple of those tools that you use and eventually you put them all together to get to the, to the answer at the end of the day	x		

Reason for why it works/was chosen				
Source	Note #	Reason for why it works	Category 1	Category 2
3	1	if you want to have brain in a decision, people needs to trust evaluation or trust outcomes	Why tools are used	Adds intelligence to the decision
3	2	you also would want to have a record or understand the playing field at least of competing decision options, against the criteria that you set out for yourself.	Why tools are used	Creates an audit trail and facilitates validation of the decision
4	1	it considers all aspects, it considers you know the external factors, the internal factors, even risks and like you said different scenarios, how does it make us feel, you know is it actually inspiring. It's for me a nice complete and it almost leads you to an answer that you, you didn't anticipate	Why tools are used	Facilitates a structured and thorough process
6	1	the reason we use that is because there were so many opinions, so it's, you sat with a little bit of facts and huge bunch of opinions that you couldn't discard… if you sit with a lot of opinions you need to show all those opinions and you need to show the evaluation of the opinions…show to the decision makers that we considered all of the opinions and then try to quantify to or to put it into some sort of a advantages, disadvantages kind of matrix to guide them or to lead them or to give them opportunity to criticise it and so on… so it's more for psychological reasons why you sometimes use some of these things	Why tools are used	Psychological reasons
7	1	That make sense for me	Why tools are used	It makes sense to use tools
9	1	lead you in the right direction	Why tools are used	Facilitates a structured and thorough process
11	1	it can be used sort of on a live basis… you sort of see from that model immediately what the implications are if you make certain decisions or certain scenarios play out	Why tools are used	It facilitates playing out and evaluating the decision
13	1	so it's the value for you of the tools is that it adds structure	Why tools are used	Facilitates a structured and thorough process

Why tools don't work			
Source	Note #	Reason for why it does not work	Category 1
5	1	there's no tool around that it's about the executive having the ability to integrate all of the information and then take a decision	It's not about a tool it's about integration
8	1	Because I base it on gathering information from a team, again tools will give you a fine tune on a very close decision,	The value add is minimal
10	1	I can use the tool and manipulate it to suit my own interest and package it in a way that suits my interest	Can be manipulated
11	1	Where it's not useful. Its complex, because you have to think about almost everything and you need to think of, you almost need to anticipate all the questions that could be asked …you can easily make mistakes	The value add is minimal
11	2	same as above	Open to errors
12	1	there's a danger to what that in terms of some of the stuff. If you write too much stuff into a document to guide you. That same document can be used against you	Tools create a paper trail that can be used against you

How did you know you are making a good decision			
			Initial Categories
Source	Note #	Note	Category 1
1	1	the level of my own and the groups comfort … it may well turn out to be a bad a decision once it really plays out but with all the information available and with all knowledge that we had, if I feel comfortable that we taking the right decision that's that I would regard as good decision …	Comfort in the decision process leading to decision
1	2	if you feel confident to implement	Emotions accompanying decision and perceived outcome
1	3	If there's as little as possible uncertainty on the downside… if it turns out to be bad, it's not catastrophic	Comfort in the decision process leading to decision
2	1	it resonated with my values	Comfort in the decision process leading to decision
3	1	if the decision you made represents your intent and the process you engaged in within your value system, to enable an outcome towards the objective and you can explain it, that for me would define a good decision	Comfort in the decision process leading to decision
3	2	same as above	Comfort in the decision process leading to decision
3	3	same as above	Comfort in the decision process leading to decision
3	4	to what level do I own the decision that I make because once uncertainty comes to play you can do all kinds of analysis and you can actually manipulate all weightings and factors and all of these things but ultimately in the end when you make a decision are you committing to the decision that you make	The decision maker owns/takes accountability for the decision
4	1	it is realistic to achieve, but if it's yet, inspiring	
4	2	you will have a calmness about it if it's right	Emotions accompanying decision and perceived outcome
4	3	once the team sort of, ja, sometimes people need to also agree to disagree	
5	1	I feel comfortable if I know I've gone through my processes and checking all the detail … if I'm comfortable that all my functional areas are supporting me I can take a comfortable decision	Comfort in the decision process leading to decision
5	2	so when there's good team work.	Comfort in the decision process leading to decision
6	1	we try to look in the longer term	Comfort in the decision process leading to decision
6	2	we were not so emotionally involved because we never felt the pain or we never faced the music in terms of the investors	Emotions accompanying decision and perceived outcome
7	1	a lot of this risk and understanding of solutions is all available in various disciplines… because it is more of a regulatory type of environment	Solutions aligned to regulatory requirements

How did you know you are making a good decision			
			Initial Categories
Source	Note #	Note	Category 1
8	1	Because I back my decision. You believe it's the right decision, in our job decisions is only, the result thereof is only realised years after the decision most of the time, so if you don't back your decision critically	Comfort in the decision process leading to decision
9	1	if you have externally audited your project for instance	Comfort in the decision process leading to decision
9	2	you have involved everyone concerned internally in the process of building up this idea and you have exposed this project to the evaluation tools that we have just spoken about and this project has followed the governance of a particular organisation up to the board level and it has been approved by the board, then it gives me confidence that it will work	Comfort in the decision process leading to decision
10	1	be at the right level of maturity… there's a reason why in the organisation decisions are, certain decisions are wanted to a certain level of role … it's a level that experience-wise, knowledge-wise and ability-wise you are in a, at the right level to take what you assume certain responsibilities…	Decision is taken at the correct organisational level
11	1	you don't {know that you are making a good decision}… If you look back on most of those things you, would have made the same decision at that time but things change… to judge them in terms of whether it's a good decision or not it's never sort of that simple, to say whether if, because some of our poor decisions in the past turned out excellent just because of the markets that assisted and some of the very good decisions sort of turned very wrong just because suddenly the tide turned	It's not that simple to define a good decision
12	1	A good decision for me is when somebody walks out and they're smiling … it's the gratification of the outcome	Emotions accompanying decision and perceived outcome
13	1	you will never know whether your decision is a good one because only time will tell that.	It's not that simple to define a good decision
13	2	I think you know it's a good or the right decision based on exactly the processes that you followed, the tools that you used, the structured processes …	Comfort in the decision process leading to decision
13	3	I think it will be a good decision because you will feel good about the process that you followed	Emotions accompanying decision and perceived outcome

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Factors that help good decision making			
			Initial Categories
Source	Note #	Note	Category 1
1	1	as much as possible context,	Understand the decision context
1	2	expert opinion would be good, especially because these things are inherently about the future so if a well respected economist says he or she thinks that the rand will go up, it helps	Include expert opinion
1	3	if there's a great willingness to implement and to go through with it … support and the collective drive to make it happen.	Support and collective drive to execute
2	1	need to know the various uhm roles, I need to understand impact, I need to understand hidden information I need to understand politics I need to understand the role players,	Consider all critical information
2	2	Same as above	Understand the decision context
3	1	need to be empowered, to make a decision	Clear and correct delegation of accountability and responsibility for decision making
3	2	access to information	Consider all critical information
3	3	clear accountability and responsibility for decision making	Clear and correct delegation of accountability and responsibility for decision making
4	1	important that everyone knows what is, let's say the company strategy. Because if that is not known you can't align to anything	Know and align to company strategy
5	1	If there's no strategic debate or strategic conversation on a matter on all the various assets, aspects of that decision whether its human capital, whether its social capital, what's the impact on the society, what's the impact on, you need to have the conversation. Without that a decision can't be made because that gives you the, eventually that's the integration part where everything comes together	Strategic debate and conversation
6	1	from an engineering background you want to do a calculation and get their answers, so if you can only prove that through a financial model then it's fine… proper political risk analysis in a country	Decision based on quantitative methods
6	2	have proper engagement… we wanted to influence	Strategic debate and conversation
6	3	spend a lot more time before I have to, get to the ropes, who's who, how does it work, what's the legal framework, who to get to assist … build a proper network based on a better understanding of the environment	Understand the decision context
6	4	the more risky, the more you should stick to your processes… You should be diligent in your process and execute it accordingly	Increase reliance to a structured process as risk increases
7	1	Communication, consultation	Strategic debate and conversation
7	2	ease of decision making… are starting to over-manage the process… It's like a doubt whether you are making the right decision … you see a scared board that even the most mundane decisions are covered with a lot of doubt.	Trust those delegated to make the decisions

Factors that help good decision making

			Initial Categories
Source ▾	Note # ▾	Note ▾	Category 1 ▾
8	1	The correct people around the company and networking in that sense. More people more opinions and more knowledge.	The correct people, knowledge and diversity of opinions
8	2	Same as above	Strategic debate and conversation
9	1	sounding board from the external expert in the lead-up towards a particular decision	Include expert opinion
9	2	move away from the tradition, to involve the younger employees, eh in tapping into their minds in the process of making decisions	The correct people, knowledge and diversity of opinions
10	1	accountability and a responsibility,	Clear and correct delegation of accountability and responsibility for decision making
11	1	good sort of system … everyone around you that are using your information or living with your decisions … there's proper understanding of what's happening or what decision has been taken and that everybody is sort of, alignment is extremely important… you have to follow through on decisions	Support and collective drive to execute
12	1	accountability	Clear and correct delegation of accountability and responsibility for decision making
13	1	follow the structured process, make use of your tools, make use of the wisdom of people around you, not only the EXCO but also people lower down in the organisation, make use of the expert opinions of people inside and outside the company, look at trends in the world, have regular discussions on them	Decision based on quantitative methods
13	2	Same as above	Include expert opinion
13	3	Same as above	Strategic debate and conversation
1	4	Accepting accountability	Clear and correct delegation of accountability and responsibility for decision making

Factors that hinder good decision making

			Initial Categories
Source ▾	Note # ▾	Note ▾	Category 1 ▾
1	2	the importance is over stated … things that are deemed important but actually has no impact on the decision being discussed	Not fully understanding the decision context and/or objective
3	1	what inhibits decision making I think there's sometimes a lack of the objective or a lack of direction. So if I need to drive to the cafe to buy some milk, if it's not defined, then I would have to stop at a stop street, is it really relevant? So I think something what inhibits decision making could be an unclear context or unclear objective	Not fully understanding the decision context and/or objective
6	1	if you are not clear where you going you take decisions based on, you know, on your own thoughts or thinking, so people have got opinions and because they've got opinions that's the one thing that I think is a problem	Not fully understanding the decision context and/or objective
6	6	I will not go in there unless the following changes, you need to define that and you need to, kind of, set that up before you take your strategic, it should be part of your strategic decision making beforehand, so that you don't, because you get carried away by your vision … You hammer the analysis to fit your dream… be honest with yourself is what can you as a company stomach,	Not fully understanding the decision context and/or objective
9	1	the tendency to chase the markets for the sake of high profits… an inability to understand different cultures in different territories. Or, lack of understanding of different cultures and the effect of that in different geographies. The other one would be to underestimate the complexity of different languages in territories where one wants to make a business…just driving a project for the sake of a project, driving success of a project at all costs is also dangerous.	Not fully understanding the decision context and/or objective

10.5 Appendix V: Ethics Clearance

10.6 Appendix VI: Turnitin Results

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