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Mining company strategy evolution: an overview and example application in the platinum industry

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Introduction

Between 2000 and 2012, the platinum group metal basket price per platinum ounce sold increased at a cumulative average growth rate (CAGR) of 8% in SA rand terms. However, during the same period, industry cash operating costs per platinum ounce increased at a compound annual growth rate of 15–18%. This increase in operating cost was largely driven by increases in input costs such as wages, electrical components, electricity, explosives, support material, reagents, and diesel that were well above inflation. This was exacerbated by a reduction in average feed head grade by 1.8% per annum between 2005 and 2012 and a 22% increase in UG2 ore as a fraction of total ore mined over the same period. Together with anticipated uncertainty of the operating and market environments over a longer time period, these changes have necessitated that platinum mining companies fundamentally re-assess their operating strategies in an oversupplied market.

Within this shifting context it is necessary to reformulate asset portfolios and operating strategies in the context of in-depth analyses of:

- Trends that inform the industry structure
- Markets that inform demand trends
- Opportunities and threats in the operating environment
- Competitor performance
- Internal organizational performance, weaknesses, and strengths.

During this process a series of choices and trade-offs must be made in moving the organization to a different operating trajectory that provides stability and an element of competitive advantage in a largely undifferentiated industry. Inherent in any choice is risk – both internal and external. Internal risk is mitigated by robust implementation of plans and their rigid monitoring. External risk, driven by the uncertainty in the environment, is partly mitigated by the ability of an organization to anticipate and adapt strategy to changes in the operating environment as informed by alternative world views or scenarios.

A range of tools, techniques, and approaches to strategic planning in the minerals industry has evolved over time. This paper recaps some of the primary tools and describes the approach taken by Anglo American Platinum in conducting a strategic review, as an example.

Strategic planning in the minerals industry

'The philosophy of strategic long term planning is simple – it is an integrated logic, process and methodology that facilitates long term planning of mineral asset exploitation, within a strategic and market context' (Smith, 2012). Essentially, it is the link between the enterprise business strategy, informed by market requirements, and tactical planning activities (Figure 1). Strategic long-term planning creates the basis for the development of a portfolio of operations, both current and future, that ensures optimal resource exploitation while creating the flexibility to respond to changing economic and market conditions. These outcomes must be achieved within legislative and mandated strategic constraints.

The enterprise strategy, as defined and communicated by the Board, directs the execution of the business objectives and provides the framework for decision-making. This is the starting point for strategic long-term planning for metals and minerals entities.

Typically enterprise strategic planning follows elements of:

- Strategic analysis (internal and external)
- Identification of critical issues facing the organization
- Development of a strategic vision that articulates the future
- Mission statement that sets the fundamental purpose of the organization
- Formulation of the enterprise strategy
- Preparation for operational planning based on the enterprise strategy.

In the strategic long-term planning approach, the company strategy directs the objectives of value based management and defines prioritization logic in the long-term planning process, i.e. the overall mineral asset

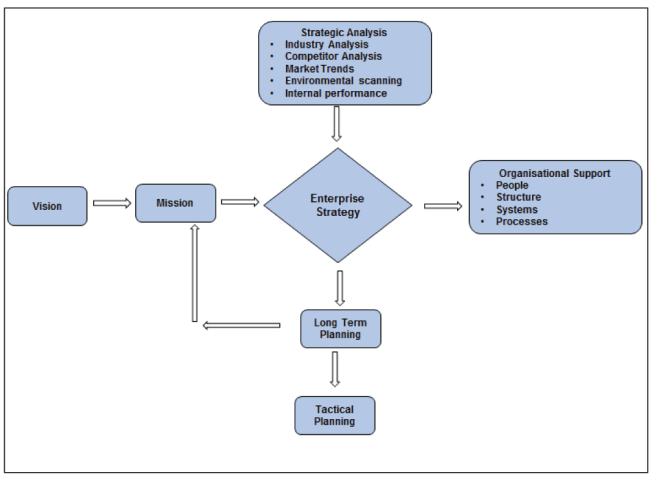

Figure 1. The strategy development process

portfolio optimization process is directed by the enterprise strategic intent. Conversely, possible trajectories / exploitation choices for the business comprise inputs to the aspect of identification of critical issues facing the organization. The core outputs of the strategic long-term planning process are thus also critical inputs into the enterprise strategic planning process

Enterprise strategy

Strategy generally involves business goals, objectives, and setting the overall direction (Bodwell and Chermack, 2010; Mintzberg *et al*., 1998; Hunger and Wheelen, 2007). It involves transitioning from a current to a different position, over a time. Simply put, strategies have both present and future time components. Depending on circumstances, a strategic plan provides an outline of the critical platform/and or emotional rallying point. Often described as a roadmap, it outlines where the business is going to compete, the resources, differentiators, where they will make money, and what organizational levers it will deploy to enhance its performance (Bodwell and Chermack, 2010; Hodgetts, 1999; Van Wyk 2004).

For any organization, an enterprise strategy entails choices of where to operate, how to compete, how to differentiate itself from its competitors, and how best to leverage its enablers – all these in the context of its targeted financial outcomes. This is well represented in the strategy diamond (Figure 2) by Hambrick and Fredrickson, 2005.

In the context of a mining company, the choice of *where* to operate could be geographical selection based on the natural endowment of a region or country, together with fiscal, legislative, social, and infrastructural considerations. At a local level, where a mining company operates could be a choice based on the physical characteristics of a deposit such as its size, the depth, and quality of the resources, which would govern the choice between targeting large open pit operations in contrast to small high-grade deposits. The *how to get there'* could be either a targeted exploration strategy, where a mining house uses its own technical resources, or it could be a combination of joint ventures with junior exploration companies to better leverage the span of opportunities. The organization could *differentiate* itself through superior relationships with such exploration companies, or through technology it may have developed itself or with technology partners. An organization could be *enabled* by the passionate people it develops or possibly by the unique access it may have to infrastructure such as power and water. The culmination of an organization's choice in where it operates, how it operates, what it differentiates itself with, and its enablers is in the business *performance outcomes* that it targets.

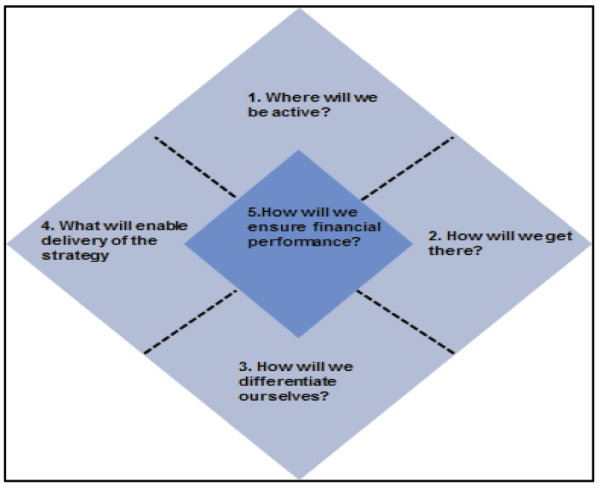

Figure 2. Elements of the enterprise strategy (Hambrick and Fredrickson, 2005)

Strategic long-term planning

The point of departure for the planning process is the enterprise strategic intent. This intent is based on the most likely world view of the future (scenario) from which planning parameters such as metal prices, exchange rates, and escalation regimes are derived. The composition of the mineral asset portfolio is reviewed relative to the most likely scenario, the current state of execution of projects, and company strategic intent. The physical characteristics of the individual mineral assets within the portfolio determine the development of a mine extraction strategy, the mining right plan, the budget and long-term plan per asset and collectively for a multi-asset business (Smith, 2012). Concurrently, value is optimized through application of value-based management principles (Van Wyk and Smith, 2008) during the development of the strategic long term plan – at mineral asset level and company level.

The business plan, which is the core output of the strategic long-term planning process, is then reassessed for a possible shift to the next most likely world view. Real options arising from evolving alternate trajectories are evaluated and a contingency plan is developed, based on planning parameters associated with the alternate scenario (Smith *et al*., 2008). The business plan then forms the basis upon which the organization is structured and resourced. Aligned execution plans are developed for the necessary supporting activities in finance, human resources, projects, engineering and infrastructure, and sustainable development.

Execution of this process, in a planning cycle, requires attention to (Smith, 2012):

- Enterprise strategic intent
- Business value optimization (value-based management for identification and choice of business model options)
- Long-term planning procedures (planning cycle, mine extraction strategies, mining right plans, long term-plans)
- Capital investment prioritization, real option analysis, and project value tracking
- Portfolio optimization
- Definition of the long-term plan and business plan
- Definition of upside or downside responses (contingency plan)
- Execution plans for supporting capability:
  - o Project portfolio execution
  - o Metallurgical process capacity (smelting, refining, effluent)
  - o Infrastructure (water, electricity, roads, rail, housing)
  - o People (skills, motivation, organizational culture)
  - o Community (stakeholder alignment and participation).

This process is schematically represented in Figure 3. Importantly, these activities are not necessarily sequential, and they could be iterated at different points in the planning cycle (Smith, 2012).

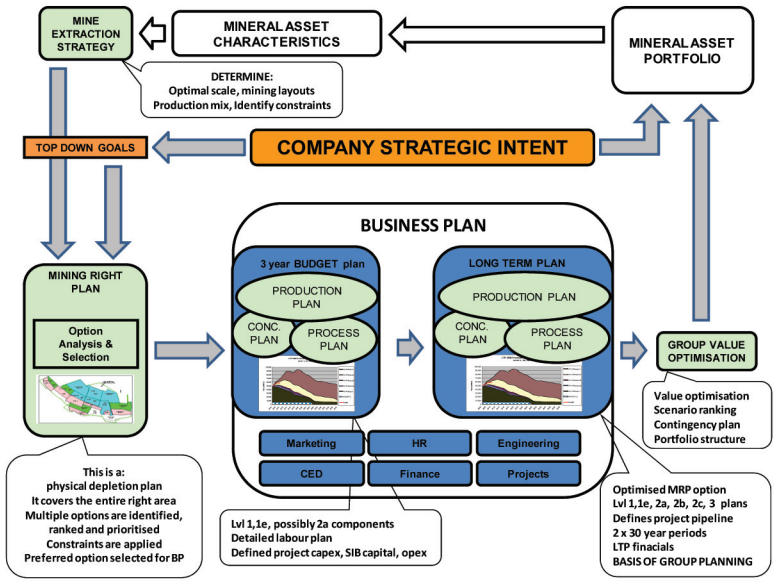

Figure 3. Business planning – key elements and interrelationships

Strategic analysis tools

Framework for strategic analysis and management

The field of strategy and strategy management has evolved substantially over the years. It has accumulated into a large body of knowledge, understanding and practices. Businesses have learned to analyse their environment, define their position, develop their value proposition, and understand better how to sustain their advantage in the face of challenges and threats. This is born from an endeavour by leaders of business to understand the environments in which they operate and pursue value-accretive managerial decision-making. A sense of background, outlining the tools and key processes, is necessary for situating the context of this paper and the case study outlined.

Strategic formulation, analysis and management use a suite of tools, either singly or in combination. Amongst these are Porter's Five Forces: the Resource-Based View, the PESTEL approach, market demand trends, and scenario planning. The following overview of these strategy tools is intended only to describe the salient features and create context to application in the example case.

PESTEL

The PESTEL (Political, Economic, Social, Technology, Environment, and Legal) approach to strategy is used to identify long-term internal and external trends in the business and/or industry. As a methodology, it seeks to unpack key material variables and drivers of change in the environment. It is an orderly frame that ensures that all variables are considered. Its strength is that it draws from the wide range of participants' backgrounds and experiences: for example social practitioners, in the same and equal space with economists and technologists

Its critics cite the following shortcomings as a tool for strategic analysis: its broad analysis of external influences on decision-making is not cost-effective and it often creates information overload; it is good at identifying material trends in and outside the industry but less effective in distinguishing between vital and merely important developments (Narayanan and Fahey, 2001; Van Wyk 2004).

Industry and competitor analysis

Competitor analysis is a deliberate strategic tool for generating corporate intelligence about competitors and the business environment. It has the following key facets: environmental analysis, industry analysis, competitor analysis, and temporal analysis models. In summary, it entails identifying and then profiling each of the competitors on identified matrices and performance areas in the form of factbases.

The challenge of this tool is to be able to convert the wealth of available data and information into a valuable form for decision-making and action. The data must be converted into insights and intelligence. The requirement in industry and competitor analysis is to be able to draw effective conclusions from limited data and to put together information that does not often fit together at first glance.

Internal factbases

Internal factbases are a means of documenting the internal strengths, weaknesses and resources of an organization. The method comprises a holistic financial and operational review of each asset, both of historical performance and potential future opportunities. Assessment criteria used in the evaluation of mining assets include asset quality, industry cost position, growth potential, production deliverability, financial returns, and capital investment required. Such a factbase provides a mechanism to categorize mining assets to support the decisions around portfolio footprints.

Scenario planning

The business environment is increasingly complex and dynamic. Developing an understanding of the uncertainty inherent in the external and future environments and testing the robustness of a strategy against a set of possible futures, is a critical component of strategic long-term planning (Smith, 2012). Analysing global trends and seeking to influence the possible business future(s), requires a widening of perspective to a range of possibilities.

Scenario planning is one of the tools for strategic planning. As a strategic tool, it is renowned for its ability to

identify uncertainties, capturing a whole range of possibilities and investigating assumptions in organizations. Scenario planning is like an 'organizational radar', providing an 'early warning system' for potential industry shifts (Bodwell and Chermack, 2010). According to Schoemaker (1995), once the basic trends and uncertainties are identified, decision-makers can construct scenarios that will help to compensate for the usual errors in decision-making. Scenario planning essentially tells multiple stories of different futures to underscore the fact that the future is unpredictable, unstable, and inherently filled with uncertainty (Bodwell and Chermack, 2010).

As scenarios unfold sequentially, Illbury and Sunter (2001) view them as multiple pathways into the future, with each path characterized by its own environment for which an action is required. They further provide the perspective that the more we consider these futures, the better it prepares us to respond when that future becomes reality. In so doing, 'it gives the best possible leverage, in advance, to deal with a wide variety of future developments and outcomes'. This is further elucidated by Bodwell and Chermack (2010) as 'scenario planning recognizes the inherent weaknesses in forecasting and single-outcome methods that essentially aim to predict the future'. As a tool for learning, it helps to rewire the organization, challenge conversational wisdom, and fast-track the future to present and evaluate optionality.

Strategic options

In strategic mine planning, choices must be made that impact the long-term viability of mineral assets. These choices are informed by an understanding of market conditions and expectations of how these could develop over time, an understanding of the supply industry in respect of how costs are evolving, where in the industry cost curve operations are positioned or likely to be positioned in time, and finally a view of new projects in the pipeline that could impact the previous two considerations.

The options available to a miner are to do nothing, seek continuous improvement opportunities, or make a step change that could take the form of opening a new mine, expanding current operations, contracting current operations, or closing a mine.

Mining projects are unique in that mining investments are either partially or completely irreversible; there is uncertainty over the future rewards from the investments; and finally investment in a mine does not happen immediately as there is generally a lag between the decision to mine and the mining investment (Shafiee *et al*., 2009). These characteristics of mining projects require that an informed decision on the viability of a mining project take cognizance of any ability to change the course of a mine life that seeks to minimize any downside risk and maximize any upside opportunity should they present themselves. This is the realm of real options, and attributes value to flexibility in order to inform strategic decisions.

Strategy, stakeholder engagement, and communication

According to Kaplan and Norton (2000), well-formulated strategies will not achieve much without stakeholder and, in particular, staff 'buy-in'. As an example, they claim that only five per cent of the employees understand the strategy of the organizations for which they work. The experience and learning is that sharing the key tenets of strategy provides enough to enable stakeholders to understand precisely what we are trying to do and to secure their support. Given that their support is needed for us to achieve our vision, makes this a crucially important aspect of strategy delivery.

According to the experience gained, and a fact that is often misunderstood, a critically important task in strategy requires analysis of the interface between the many and often competing demands of the different stakeholders in relation to the firm's strategic goals. This is a point supported by Ackermann and Eden (2011). A critical element of effective strategy development and execution is thus stakeholder engagement. Stakeholder engagement seeks to proactively engage and communicate with identified key constituencies of the business.

Industry cost curve analysis

The cost curve is essentially a graph showing how much output suppliers can produce and the unit cost of this production. It is applicable in industries where the product is consistent between producers, irrespective of who produces it, and where there is no difference in value received by the buyer. One of the insights of the cost curve is that market price is 'set at the cost of the next available entrant over and above those needed to satisfy current demand' (Watters, 1981). As long as the price hovers just below this cost, the next entrant is unlikely to enter the market.

As price takers, miners must respond to market supply in excess of demand by reducing production so as not to propagate loss-making operations. The slowness of such a response given the nature of mining, both in reducing production and the ability to ramp up production, exacerbates losses and inefficiencies in the industry. A forecast cost curve is a useful tool to inform strategy, but this depends on the ability to:

- Quickly open and close mines in response to market demand
- Accurately forecast the future in respect of commodity demand and supply
- Access large resource bases that provide production flexibility
- Access a flexible labour market to enable closure and opening of mines
- Estimate overhang in surplus stocks (bank vaults, end user stocks, etc.) that could re-enter the market quickly.

All of these are difficult, if not impossible, to implement.

Strategy dynamics

A challenge that executives face is the understanding of the drivers of business performance as they become increasingly complex and dynamic over time. Strategy Dynamics is an approach that provides explanations of business performance through time that are rigorous and fact based, and which can inform confident insights into the future (Warren, 2008).

On the surface, explaining business performance such as cash flows is a simple exercise. In the mining context, revenues depend on the rate at which metal produced is sold and the pricing obtained. From this, costs are deducted, and these are driven by labour costs, costs of mining and processing inputs, the costs of utilities, and other operating inputs. The ore, labour, equipment, and infrastructure are the strategic resources that are required now and in the future to ensure continued business performance. The simple notion is that these, in addition to certain external

factors such as markets and demand drivers, are all that is needed. However, cognizance needs to be taken of the 'softer issues' such as unique skills and capabilities; expectations of stakeholders such as government, labour, and communities; management ability; the power of leadership; etc. Hence, the question is not 'what explains current earnings?', but rather 'what explains where our earnings are going through time?' (Warren, 2008). Hence, the strategy challenge is to understand how these strategic resources have developed over time, and more importantly, how we can build them into the future

Strategy maps

The use of a strategic map is an effective way to show causal linkages between a set of objectives that ensure such choices are pulled together; and to communicate the integrated strategy of the organization. It should identify the critical few linkages that are imperative in delivering strategy. The challenge in doing this is that a strategy map often deteriorates into either a vague set of objectives that are not motivational to rally the organisation, or a 'kaleidoscope of confusion' (Creelman, 2013) that is essentially either an operational or activity map of the organization. The solution is firstly, to ensure that there is a well-defined set of the critically few objectives that are focused and which are easy to communicate, and are both inspirational and meaningful. Secondly, the objectives must be tested to ensure that they are strategic and not operational (Creelman, 2013)

Translating enterprise strategy to strategic long-term planning

The various analytical tools and processes available provide insight to the challenges facing a business. However, these need to be integrated into a framework that allows effective communication as an enterprise strategy.

A generic example of such a mining enterprise strategy is represented schematically in Figure 4.

This can also be represented in a strategy map, initially as a means of testing that the choices made in the strategy diamond mutually reinforce each other, and then further as a means of communicating the enterprise strategy. From a tactical perspective, enterprise strategy should direct business activity. This can be achieved by creating linkages between executive accountability and strategic priorities, value levers, and focus areas.

By way of example (Figure 5), a company could drive improved returns by choosing to increase production at its high-margin operations while moving to a lower operating cost environment. This could be achieved by leveraging strategic alliances to ensure access to such resources. The long-term plan, which could aim to effect this timeously, cognisant of development in other aspects of the portfolio, would be based on an improved tactical plan that includes revised operating structures that ensure effective cost control and efficiency interventions, premised on the availability of a strong cadre of skilled employees or an ability to develop these skills.

An integrated view showing the cascade of the enterprise strategy to mining divisional focus areas and strategic mine planning is shown in Figure 6.

Anglo American Platinum – an example application in the platinum industry

Company background

As an example, the generic application of these techniques and tools is applied to Anglo American Platinum (AAP) for public domain data available to the end of 2012.

Anglo American Platinum Limited (Amplats) is the world's leading primary producer of platinum group metals (PGMs) and accounts for about 40% of the world supply of newly mined platinum and more than half of the South African supply to the world market. The company is listed on the JSE Limited with the controlling shareholding (in excess of 77%) being by Anglo South Africa Capital (Proprietary) Limited. Anglo American Platinum Corporation Limited was originally formed in September 1997 as the holding company and sole listed entity for the restructured group of companies that resulted from the unbundling of Johannesburg Consolidated Investments. This consolidation resulted in a mineral asset portfolio encompassing properties across the Bushveld Complex, Zimbabwe, and internationally. During the period 2000 to 2008 considerable rationalization of mineral assets resulted from changes in South African mineral legislation; primarily the Mineral and Petroleum Resources Development Act and the Mining Charter.

During 2009, Anglo Platinum Limited's mining operations were restructured, with the former Rustenburg

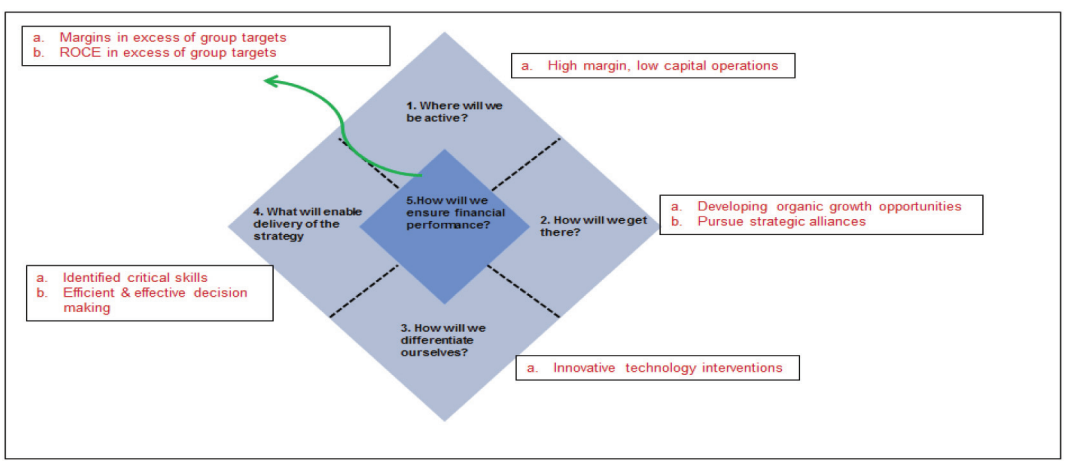

Figure 4. A possible strategy diamond for a generic mining company

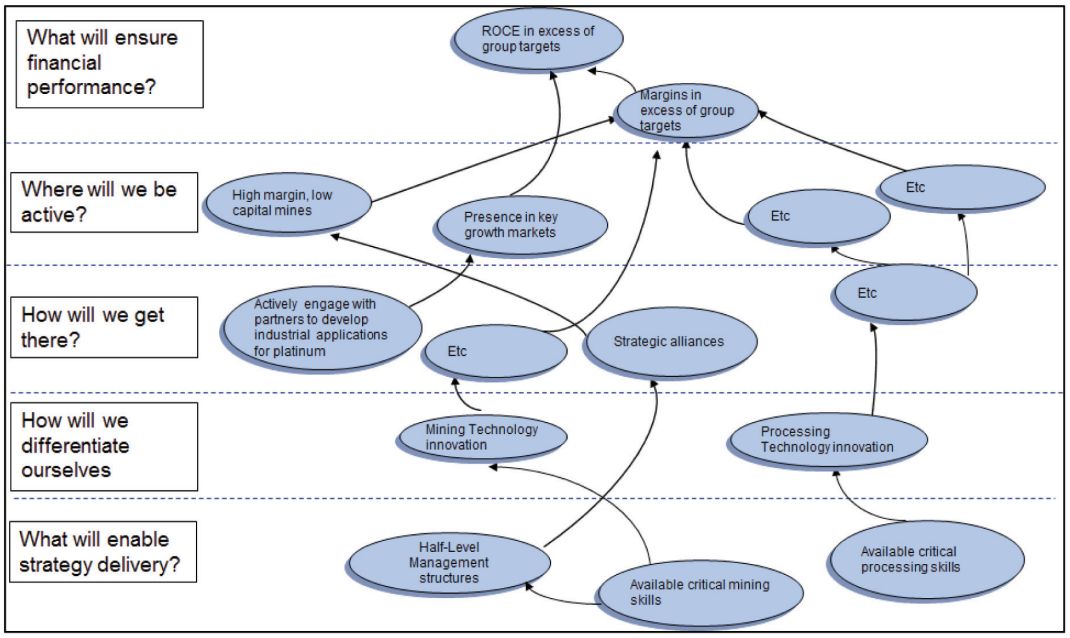

Figure 5. Illustrative strategy map

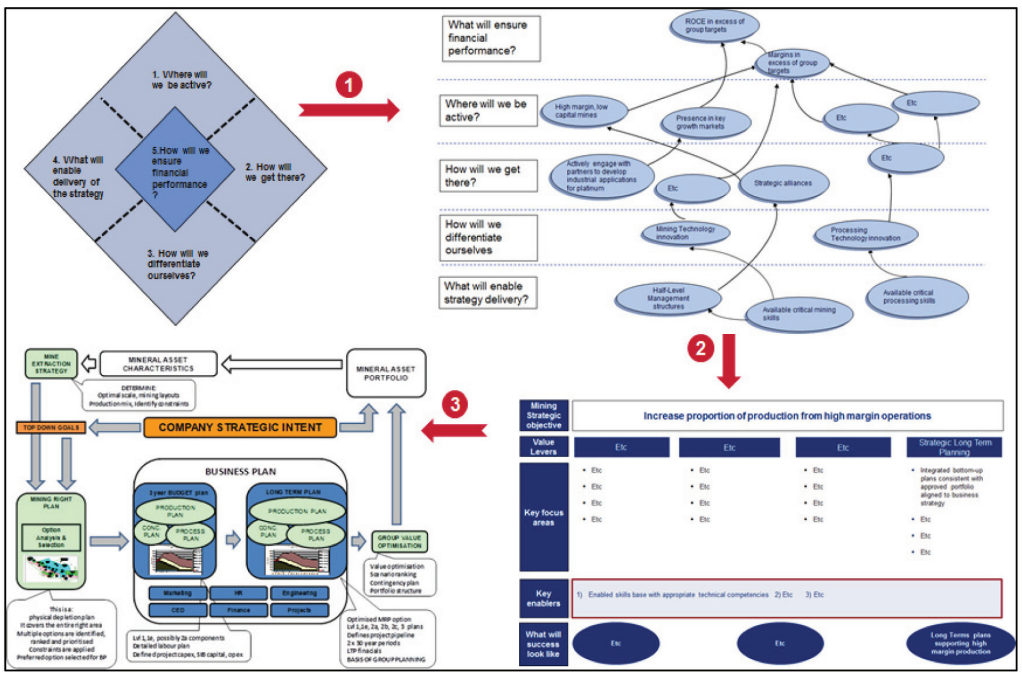

Figure 6. Cascading enterprise strategy to the strategic long-term plan

Section being split into five mines: Bathopele, Khomanani, Thembelani, Khuseleka, and Siphumelele, while the former Amandelbult Section was split into the Tumela and Dishaba mines. The Union Mine, Mogalakwena Mine (formerly Potgietersrus Platinum Mine), and Twickenham Mine remained unchanged. The group has a number of joint ventures encompassing Bokoni Mine, Modikwa Platinum Mine, Royal Bafokeng Resources, Union Mine, Pandora Mine and Mototolo Mine. Anglo Platinum also has pool–and-share arrangements with Aquarius Platinum (South Africa), covering the shallow reserves of their Kroondal and Marikana Mines that are contiguous with Anglo Platinum's Rustenburg mines.

The group's smelting and refining operations are wholly owned through Rustenburg Platinum Mines Limited and are situated in South Africa. These operations treat concentrates not only from the group's wholly owned operations, but also from its joint ventures and from third parties. Elsewhere in the world, the group is developing the Unki Platinum Mine in Zimbabwe and is actively exploring in Brazil. It has exploration partners in Canada, Russia, and China.

The company strategy is to create maximum value by:

- Understanding and developing the market for PGMs
- Expanding production into that opportunity
- Conducting business safely, cost-effectively, and competitively.

PGM mineralization of the Bushveld Complex occurs primarily in the Merensky, UG2, and Platreef horizons, each of which has characteristic metal ratios (PGMs and base metals) that vary by geographical region (western limb, eastern limb, and northern limb).

Mining operations commenced at the Rustenburg Platinum Mines in 1931, and mining and processing operations have evolved over time in terms of technology and market developments. Operations initially focused on the Merensky Reef because of limitations in smelter technology for smelting the higher chrome content UG2 Reef, and progressed to UG2 in the early 1990s with conventional UG2 mining at Amandelbult and then in the late 1990s with the establishment of the Bathopele Mine (the old Waterval Mine) and the use of the trackless mechanized mining methods.

During the history of operations there has been a steady evolution of mining areas, and of the application of technology in both mining and processing activities. Mining access has progressed from initial decline access from the surface, through first- and second-generation vertical shafts, with consideration currently being given to a third generation of vertical shafts. Mining activities have similarly progressed, from single-reef extraction of the Merensky Reef to dual extraction of the Merensky Reef and the UG2 chromitite layer, with co-extraction of both horizons planned for the deeper areas.

Similarly, process technology and infrastructure have progressed from early MF1 (mill-float single-pass) concentrators through to MF2 concentrators and more recently with ultrafine grind technology, with concomitant increases in recovery, especially from UG2 ores. Smelting technology has progressed from simple blast furnaces and converters through to electric arc smelting (1969), combined with the ACP (Amplats Converting Process) converter and acid plant (2002) to control emissions to acceptable levels. Concurrently, base metal and precious metal refining capacity and technology have been progressively upgraded, over time, with improved recoveries and reduced environmental and health risks as a result.

Despite investment in mining and processing assets in other operations such as Union, Amandelbult, Mogalakwena, and Polokwane, the core of AAP operations has remained in Rustenburg with its central location of critical processing infrastructure –the Waterval concentrator complex, the Waterval smelter, Rustenburg Base Metal Refiners, and Precious Metals Refiners. Concurrent with the establishment of processing infrastructure, there has been the development of supporting infrastructure such as the surface railway system (to transport ore and materials between shafts and to a centralized concentrator complex); centralized and interconnected compressed air generation and distribution; ring-fed electricity distribution from multiple Eskom supply points; ring-fed water supply and distribution; refrigeration plants; concentrated tailings disposal facilities; training facilities; and support workshops. Similarly, mining infrastructure has evolved with a number of first- and second-generation shafts being established with associated sub-declines. Over time, a number of shafts have been decommissioned (e.g. Waterval vertical, Central vertical, and West vertical) and others have been rationalized (e.g. Siphumelele 3) or utilized for training purposes (Siphumelele 2 – the School of Mines). As shafts have been decommissioned in the past, the ore reserves remaining have been allocated to other producing shafts in the vicinity so that the remaining resources can be extracted more optimally. Concurrent with this process, there has been the retention and maintenance of facilities to ensure second egress and to maintain the co-ordinated pumping of groundwater. Despite separate shaft access points, the whole of the Rustenburg mines complex is interconnected, necessitating continuous, co-ordinated groundwater pumping activity to prevent the flooding of operations.

As operations have been mined at deeper levels, there has been a change in the Merensky and UG2 ore mix, from 27% UG2 (as a fraction of UG2 and Merensky) in 2000 to 80% UG2 in 2012. The increased depth of the mines has also seen a 36% reduction in the head grade over the period. Platinum mining is characterized by significant requirements for capital (stay-in-business and project), without considerable increases in the production base. This high capital intensity is particularly obvious at more mature operations, which have deeper mines.

Developing the enterprise strategy

Developing the enterprise strategy requires an understanding of the industry, the market trends, competitor performance and actions, own operational and financial performance, a critical assessment of internal processes, and a review of the portfolio of assets. This intensive collation of data, information, and insights is integrated into various factbases:

- A market factbase to extract historic trends in supply and demand by sector, together with price evolution over time
- An industry factbase as a collation of information and insights of industry trends such as production costs, capital expenditures and efficiencies, and industry returns
- An operations factbase (mining and processing) to comprehensively review internal operations, looking at both historic trends and likely future performance given existing business plans. Parameters under review include cost escalations, production growth, production deliverability, financial returns, and capital investments. This factbase also incorporates a view on the resource and reserve characteristics of each asset, including grade evolution over time
- A portfolio factbase to determine the optimum size of the production base under various scenarios
- A comprehensive review of overhead costs provides insight into the evolution of overhead structures and support functions over time. It investigates ways to eliminate unnecessary complexity, and to identify opportunities for right-sizing overhead structures and costs.

To enable efficiency and timeous delivery of each of these fact bases, while at the same time ensuring that an integrated view of the insights were not missed, a governance structure should be created, based on key work streams, as shown in Figure 7. Each work stream, comprising diverse groups of individuals representing production, finance, strategy, technical services, business development, human resources, and corporate communications reports progress to a steering committee. The steering committee provides feedback and direction to the outcomes in each area, and the committee in turn reports to executive management through regular updates.

The outcome of the various factbases should be a comprehensive understanding of dynamics of the platinum

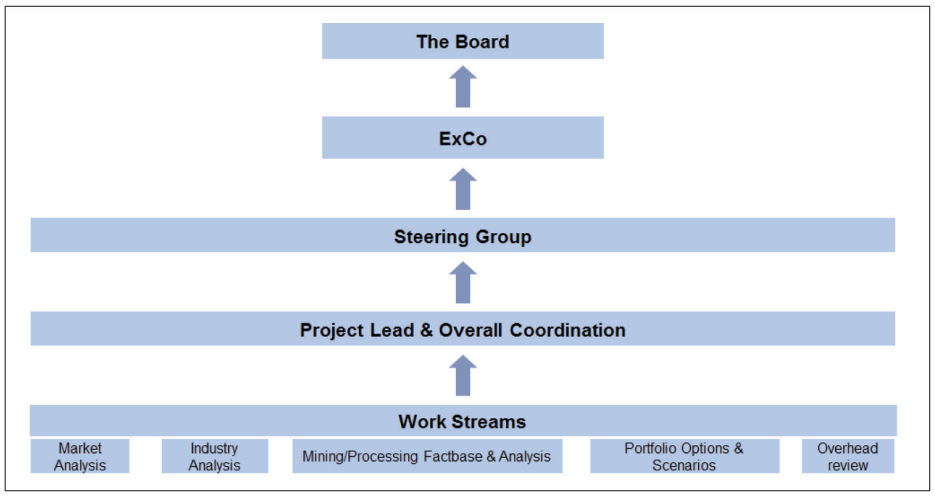

Figure 7. Strategy development governance structure

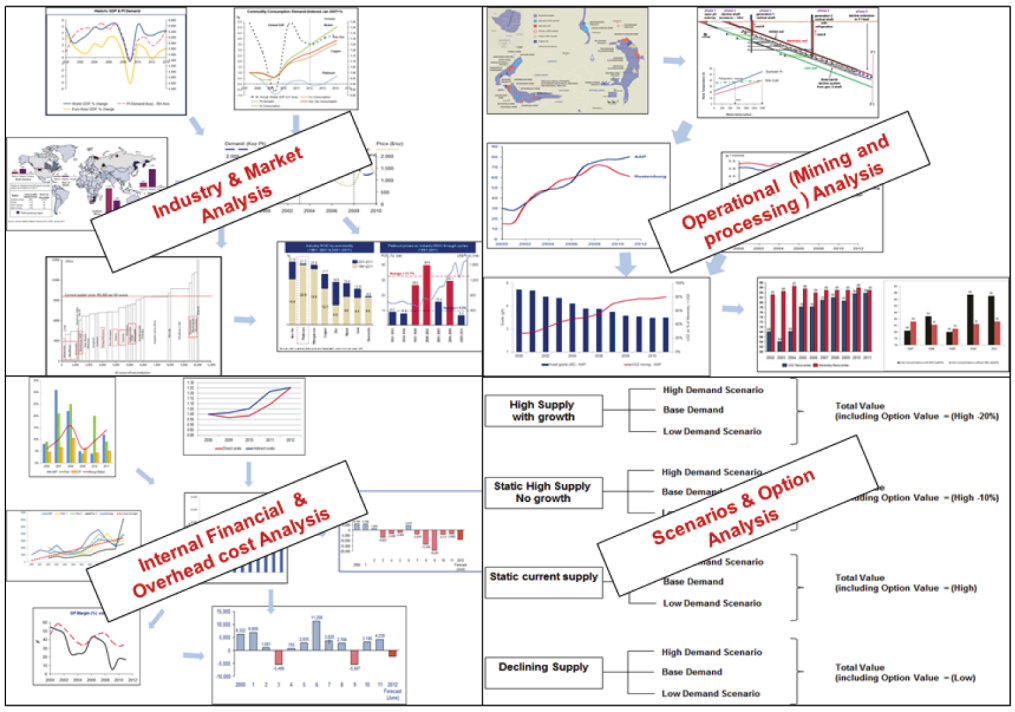

Figure 8. Integration of factbases to inform the dynamics of the industry and operations

industry driven by trends in the market, the industry, the performance of operations, and the impact of these on the financial performance of the company, illustrated schematically in Figure 8.

Key outcomes from industry and market analysis

Platinum remains a fundamentally attractive commodity. However, the industry has been subject to a number of structural changes in both demand and supply over the last five to ten years.

- Demand growth has stagnated since 2007; the annual growth rate has been only 0.6% since then compared to 5.2% in the period 1982 to 2007:
  - o Automotive producers have reduced load rates and thrifted away from platinum towards palladium
  - o The jewellery demand segment has become increasingly elastic due to the growth of highly elastic Chinese demand, which lends price support in weaker markets but attenuates price by giving up volumes in times of higher industrial demand
  - o Fuel cells have not stimulated demand as expected
- The industry has not actively managed supply in a weakening demand environment, spending substantial capital to maintain production, while effectively oversupplying the market and subsidizing high-cost assets with high-margin assets
  - o Unit costs have risen more quickly than price
  - o Mine depths have increased, head grades have decreased, and the share of higher margin Merensky ore has decreased in favour of UG2
  - o Capital intensity of mature underground operations and expansions is increasing, exacerbated by project

delays
- o New entrants account for most of the new supply since 2001, resulting in greater fragmentation
- o Secondary platinum supply has quadrupled since 2001, and has been a relatively elastic source of supply.

Key outcomes of the operational analyses

AAP has a resource base that is large and diverse. The diversity in its portfolio stems from its diverse mining locations, a distributed processing footprint, varied reef types being mined, and operations and infrastructure in various stages of maturity.

The project/mine portfolio was ranked against a set of technical and financial criteria. The operational analysis identified operations that:

- Consistently produce at high unit costs relative to the industry, making them quartile 3 and 4 producers on the industry cost curve
- Were relatively more capital-intensive than others, requiring excessive stay-in-business capital
- Were more prone to production under-delivery, contributing to high unit cost escalation
- Were disproportionately affected by structural changes resulting in them remaining high cost in spite of some improvements in operational efficiency
- Were unlikely to change their cost position without major operational restructuring.

The performance of these operations can, conceptually, be addressed by options of fixing, closing, reconfiguring, or disposal

Key outcomes of the financial analyses

- AAP's gross profit margins on sales have been on a downward trend since 2000, culminating in a low of 2.1% in 2012
- Both the EBITDA margin and the ROCE for AAP have moved downwards since 2002. Although there was evidence of a recovery in 2001 and 2007 for the EBITDA margin and ROCE respectively, this were not sustained
- In the last four to five years, the EBITDA margin and ROCE have been below the long-term average for AAP and lower than the returns during the financial crisis of 2009. The ROCE was impacted by continued investment with net operating assets growing while returns were not growing at the investment rate
- The net result of declining profit margins, substantial capital investment, and a flat production profile was that AAP required a R12.5 billion rights issue in 2010 to sustain its operations. While debt levels remained flat in 2011, net debt more than doubled in 2012 ending at R10.5 billion in December 2012
- AAP's market capitalization deteriorated from R347 billion (2008) to around R90 billion (2013). During 2012, its share price dropped by 33%.

Key outcomes of the scenario and portfolio options analyses

Various scenarios or world views were developed, within which the organization would have to effect a change. The purposes of the scenarios were to develop mitigation responses in the event that the expected world view did not materialize. From this analysis, the following conclusions were drawn:

- There is value in having a project portfolio that is responsive to changes in the market , and which could supply into demand, should it change from the most likely outlook
- Unless there was a significant change in demand, loss-making operations would continue to lose cash, with the situation exacerbated by the capital required to sustain them.

As a result of these analyses a range of options can be considered to create a sustainable and competitive business, under anticipated market and operating conditions (world views or scenarios):

a) *Maintaining the status quo*
In maintaining the status quo, significant capital investment would be required in order to sustain a flat production profile and offset the underlying natural decline in the ore reserve base. Over sustained periods loss-making operations would continue to impact on overall business viability and absorb capital that would be more effective in other, more profitable, parts of the asset portfolio.

b) *Returning loss-making operations to profitability*
A range of short- and longer term improvement initiatives were identified, e.g.
- o The reduction of overhead costs, including revised half-level management structures, training, and implementation.
- o Improved execution planning for short-term operational activities
- o A business improvement programme to improve effectiveness and efficiency of all operational processes; particularly production, process, and cost management
- o An ore extraction strategy (metals mix) better aligned to market expectations, while optimizing opportunities to extract higher grade Merensky in addition to UG2
- o A reduction in capital by rationalizing expenditure, timing projects optimally, and reducing engineering, procurement, and construction management costs
- o Rationalization of mineral resources through the potential optimization of farm fence boundaries.

c) *Rationalization of non-mechanized operations*
This option considered significant restructuring of operations such that only shallower, mechanized operations would remain in production. A key consideration in this approach is how to match substantial fixed downstream processing capacity to reduced throughput volumes associated with mechanized production potential over time.

d) *Disposal of loss making areas / entities*
The separation of shafts / production areas in interdependent business complexes obviates benefits gained through the centralization of facilities (such as ore transport, compressed air, electricity, water, concentrating, smelting, and refining), the increased scale and distribution of overheads (indirect costs) and increased capital efficiency. Typical complexities that arise are:
- o The effective (physical and economic) separation of above-ground infrastructure that is currently part of the same system (rail, ventilation, compressed air, and pumping)
- o Groundwater management and associated flooding risk of interconnected entities
- o Regulatory complexities and risks arising from the

splitting of liabilities and aspects of the mine works programme, social and labour plan, and environmental management programme.

e) *Restructuring of operating mines*
This option explores opportunities to reconfigure mine structures (internal 'farm fences') accompanied by commensurate re-sizing of the mine infrastructure, processing capability, and overheads. By rationalizing extraction shafts in ways that maximize the utilization of some shafts, while closing others, there was an increased likelihood of sustaining profitability from increased strike length, improved productivity, and shared overhead structures – the desired outcome being reduced operating costs and lower capital intensity for revised configurations.

Stakeholder engagement

Stakeholder engagement by its nature entails multiple people, interests, and often divergent views. As per the logic inherent in the factbases, it is critical to develop an understanding of the contexts in which stakeholders are operating and perspectives that may develop. Figure 9 represents a perspective on a possible stakeholder context, while Figure 10 indicates possible stakeholder expectations arising from the context.

The key insights that can be gained from structured stakeholder engagement processes and methodologies are:

- Stakeholder engagement takes longer than anticipated – it is a protracted and iterative process because of varying and often divergent viewpoints.
- Internal strategy review development needs to reach a

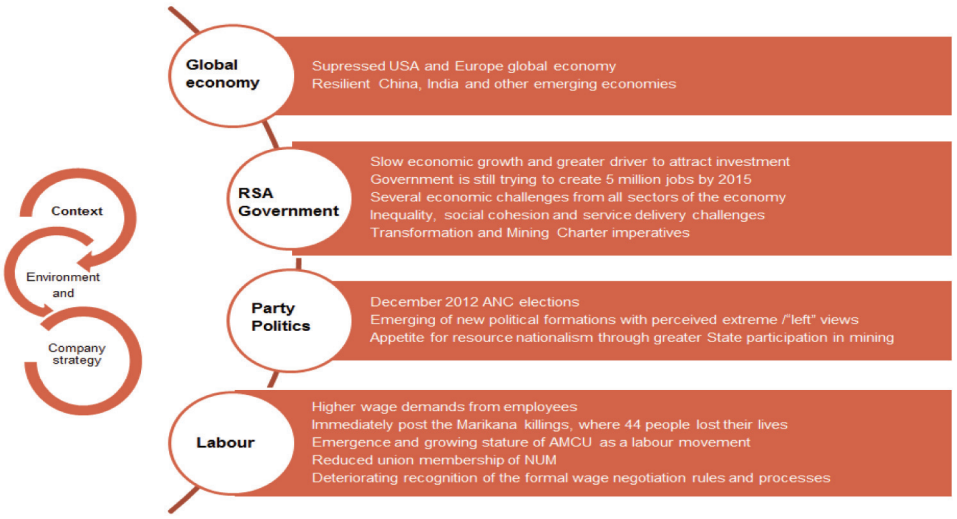

Figure 9. A possible minerals industry stakeholder context – South Africa 2012/13

Stakeholder mapping / profiling	Expectations	Key responses	Key outcomes
1. **Labour** ▪ NUM ▪ AMCU ▪ UASA/ ▪ Workers committees	▪ Improved and better wages ▪ Further consolidation of Union gains –e.g., housing ▪ Job creation and decent employment	▪ Engagement with employer ▪ Re-organisation outside union formations	▪ Aggressive recruitment ▪ Militancy and radicalism ▪ Deviation from established labour processes and protocols
2. **Government** ▪ National Government ▪ DME, Treasury, ▪ Provincial Gov (Limp & NW) ▪ Local Gov	▪ Job creation ▪ Law and order ▪ Attractive industry and sector growth ▪ Tax revenues	▪ Infrastructure de-bottlenecking interventions ▪ Regulation and incentives ▪ Engagement	▪ Engagement – e.g., formation of MIGDETT
3. **Local Communities** ▪ Host communities ▪ Surrounding communities ▪ Labour sending areas	▪ Share of proceeds from mining in the backyard ▪ Employment opportunities	▪ Solidarity with workers ▪ Disgruntlement &protests	▪ Instability, violence & crime ▪ Disenfranchise and marginalization
4. NGO's	▪ "anti-mining" goals ▪ Employee welfare and housing	▪ Studies and key reports ▪ Mobilization and engagement	▪ Raised expectations, militancy and radicalism ▪ Social welfare
5. Industry, political & other formations	▪ Improved and better wages ▪ Greater share of proceeds from mining	▪ Mobilization and greater organization ▪ Engagement	▪ Militancy and radicalism ▪ Fears and worries

Figure 10. Possible stakeholder profiles based on the context of Figure 9

point of maturity and be exposed to internal governance and approval processes prior to exposure to external stakeholders. The sequential nature of this engagement activity lengthens the process but is crucial to building shared understanding
- Geographical spread of operations adds complexity as each region has its own 'politics' and culture, resulting in different dynamics per region
- Detailed mapping and sequencing of engagements and closeout of outstanding matters is critical.

Lessons learnt

The key lessons learnt in the application of the various strategy tools and techniques in the example case cover elements of integration, dynamics, flexibility, trust, leadership, and contextual awareness.

An integrated approach is necessary for effective strategy development

While the process of strategy development is driven by a functional area or discipline, the strategy itself is enriched through contributions of different individuals across functions and disciplines. Diverse inputs enhance understanding of different perspectives and leverage the strengths of cross-functional interactions. The governance model is especially valuable in effecting this integrated approach.

Factbases are powerful tools for creating shared understanding

The generation of multiple factbases encompassing the business and industry creates a deeper understanding and common awareness of the industry and where the business operates. Contextual understanding around competitive positioning is created, and this has the potential to change behaviour. Although in its infancy, there is potential to further develop linkages and causality between broad business and industry drivers to enhance understanding of the dynamics of strategy.

Option development and flexibility in approach are crucial

The future is uncertain but we need to speculate on a world view in order to pursue the business strategic objectives. Exploring possible world views and associate options in a structured manner creates a better understanding of what the business could be – for better and for worse, and highlights the critical signposts of probable transitions from one world view to the next. Multiple options for differing world views must be developed and debated to understand possible outcomes and contingent risks.

Improved mechanisms for more inclusive stakeholder involvement should be developed

It appears that there is a fundamental lack of trust of 'management' or 'capital' intent in the broader stakeholder community. This is an impediment to effective strategy execution, which is exacerbated by general suspicion, manipulation, and a general lack of understanding of the viability of businesses. To help with this, it was discovered that:

- A willingness to listen to other views but with clarity of own purpose is key
- Understanding of stakeholder expectations and relationships between stakeholders is important
- Shared and common understanding of risk and risk management is useful
- Proactive engagement, as opposed to reactive engagement, is paramount.

Effective leadership and governance is necessary

Critical in this area is:

- Clarity on leadership, e.g. who delivers the message and how this is done. However, it helps not to have an over-reliance on protocol or leadership hierarchy to enable the engagement, but to use existing relationships spanning the different levels of the organization
- Governance of stakeholder engagement, especially on sensitive issues, is paramount. In this space, other stakeholders could be misperceived as posturing or grandstanding
- Legal and communication experts have a role to guide and inform the process. However, executive leadership must accept that risk exists in all engagement choices and processes.

Clarity and consistency of strategic intent is paramount

A full and continuous appraisal and understanding of the evolving business environment is critical. Tactical responses to short-duration events should not compromise overall strategic intent or the ability to execute the overarching strategy. Consistency in execution of fundamental policy, maintenance of fairness/equity and law and order is critical while moving towards strategic objectives.

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