Linking Strategy with Tactics
Identifying the intersection for dynamic portfolio management

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For many companies, linking the value of strategy with the delivery of tactical decision-making is a challenging task which, without appropriate frameworks and tools, often ends in compromised outcomes, inefficient use of resources, and incorrect performance metrics. For companies in the natural resources industry, this phenomenon is exacerbated due to the capital-intensive nature of the business. Because the vast majority of mining initiatives stretch far into the future, mining requires a vision of the future that goes beyond the norm of quarterly cycles. Crafting strategy based on multi-decade scenarios is not just preparing to succeed in make-believe worlds – it is a task that these companies must accomplish on a regular basis in order to identify, select, and pursue profitable assets. By using scenario-based strategies, companies, especially those whose businesses are heavily reliant on positive cash flows in the longer term, are better able to prepare for not only what will most likely happen in the future, but also for the events that they haven’t yet thought of.

Similarly, the role of tactics needs to be framed in such a way that is both industry-relevant and supportive of an overarching strategy. Virtual Consulting International (VCI) believes that the core of any mine’s tactical planning lies in its resource planning capabilities. Where strategies are the “what” in determining the future direction of a company, the tactics are the “how” in making strategies successful. In this context, VCI refers to Mineral Resource Management (MRM). According to Alistair Macfarlane, “MRM is an integrated activity which identifies, evaluates, and provides an optimal extraction plan of the mineral resource, to produce a quality product which satisfies the business objectives of the company, and the requirements of the customer, in a dynamic environment.” Mining companies should be managed to maximize the value of its mineral assets, while minimizing the risks associated with its extraction. MRM is the framework which mining companies use to evaluate ranges of tactical options and improve the liaison between geology, survey, evaluation, and planning activities in creating optimized plans to drive performance.

By preparing for the future through scenario-based strategies and embedding the best tactics in MRM, mining companies can improve their decision-making and ultimate profitability in an industry trapped in the current cycle of mega projects, rising costs, and volatile prices. This paper examines how companies should use scenario-based strategy and the mineral resources framework as one integrated model. It also describes the pitfalls of managing a mining company based solely on either. Finally, we discuss how mining companies can leverage the strengths of each of the methodologies by finding an appropriate intersection between the two.
Strategy is a function of leveraging competencies into external worlds to monetize opportunities. And while a lot of companies do a decent job of assessing their position, especially in terms of having an understanding of their own business, competition and industry dynamics, they often do a poor job of accounting for future changes in their surroundings, evidenced by the massive write-downs throughout the industry when cycles turn. And without that kind of analysis, it is impossible to know if a strategy is pointing the company in the right direction or, more seriously, when the company's current strategy begins to fail. This is often manifested by miners who run their operations several quarters behind the market's pricing curves.

*VCI's scenario development process combines trends and market forces to forecast the future.*

At VCI, we begin the future scenario process by analyzing current trends, forces, and issues. VCI's scenario model provides us with a solid starting framework in which to understand trends, events and black swans. The scenarios are oriented around major forces, like Political, Economic, Social, Technological, Legal and Environmental. Creating future scenarios is a crucial first step for any strategy – these evolving narratives form the crux from which we derive our strategies. The forces above are sprinkled with black swans, and form the basis for scenarios reflecting uniquely different, potential futures in which the company must succeed.

We also use evolving narratives and causal maps to describe not only what these future worlds hold, but also what their implications will be on businesses; which countries will hold the most political and economic influence? Which commodities will drive our global economy, if any at all? And most importantly, as a business, where do we need to position ourselves to succeed in a world dominated by fresh challenges and obstacles? In a sense, the strategy formulation is about positioning the company in the sweet-spot of a differentiated future.

**There are four strategic levers across the mining value chain:** Assets, Commercial Value, Technology, and People.

Every mining company needs to think about strategy from the standpoint of four strategic levers – Assets, Commercial Value, Technology and People. The company's mission, vision and values in any given environment determine the balance of these levers and it is up to management to maintain this balance as it becomes the core competency. As our future scenarios change, the company's profile, as it relates to these levers, should also change to accommodate the shifting external environment. In combination with crafting strategies to be competitive today, creating scenario-based strategies also prepares companies to tackle unknown challenges. This agility is a benefit not often realized by traditional strategic planning.
In order to get to the point where management can consider flexing its strategy, a company needs to review several aspects of its present and future worlds, beginning with a thorough competitive analysis. In particular, companies first need to understand their value proposition for the market – what makes them different and special, in comparison with their competitors and who might offer similar or substitute goods and services. The mining industry is largely a commoditized one with prices set at market values, so companies tend to compete purely on short-term costs across the mining value chain.

And because all of the other aspects mentioned above require some level of investment, it still remains uncommon for miners to consider their technology, people or assets as opportunities to drive their financial performance. This is, however, a critical point in being able to define your future strategy. We have to begin looking beyond every current crisis or we will simply find ourselves stumbling from one crisis to the next.

Figure 1: Effective management relies on scenario-based strategy to drive the interplay between assets, commerce, technology, and people.
We see a company's value proposition as a result of leveraging its core competencies which set it apart from its competitors. This is the formula that ultimately results in higher earnings. Identifying a company's core competencies, however, requires a detailed process which includes isolating and clustering major industry factors, analyzing the company's assets (including resources, capital, and competencies) and modeling future earnings. Ideally at its conclusion, a company will have mapped out its profile and be able to compare its portfolio of attributes to those of its competitors. Mastering core competencies forms the basis of identifying competitive advantage – informing management of what the company does well, whether it is an innovation leader, a low-cost producer, or otherwise – is the element that provides shareholders with long-term sustained earnings.

Beyond identifying a company's core competencies across the mining value chain, management teams must also implement a system for these competencies to work together efficiently in maximizing enterprise value. In particular, each competency within the business model should leverage the capabilities of its counterparts to create a streamlined process and synergies that, without the nature of the system itself, would otherwise not be attainable by the company. This system ensures that the combined value of the company's competencies is maximized – that all of them are worth more together than they are separately.

The key to maximizing enterprise value is maintaining your organizational flexibility.

Creating such a system is not without its challenges. For instance, at the corporate level, mining companies often make a commitment to adopting either a centralized or decentralized management structure. Centralized management structures designate a single center to assume accountability for the management and success of a company's operations across competencies. Decentralized management, on the other hand, relies on assigned teams to manage either an individual business or groups of businesses. While centralized management structures tend to be less flexible than decentralized ones, they function with fewer specialized managers. Decentralized companies, while flexible, often open the door to more complex decision-making processes, operational inefficiencies, and mismanagement.

The bottom line is that mining companies should recognize that both types of management structures are subject to strengths and limitations. However, their goal should always be oriented around maximizing enterprise value, which does not necessarily translate into making a commitment to any particular structure. Instead, miners should prioritize their ability to maintain flexibility in assuming varying degrees of centralized and decentralized management structures, as the business and external environment change over time and real-time data becomes more accessible and informative.
The end goal of these structures is to achieve a balance between flexibility and consistency to achieve value. By approaching the challenge under this framework, mining companies will replace static systems with dynamic ones that achieve the maximum enterprise value, while paving the way for strategic portfolio analysis.

After establishing a clear competitive advantage and future strategy, mining companies should then turn their attention towards portfolio analysis. From a high level, portfolio analysis allows a company to generate optimal financial returns from its assets, at a given level of risk. Ideally, management should conduct a review of the company's key asset classes and holdings, and build a balanced portfolio that accounts for its external world through future strategy. It is also important to note that such a portfolio must take into account both proper timing and cash flow management. In particular, companies need to tackle these challenges by analyzing their resource/reserve balances and spreading estimations of ore produced and sold over future years according to the planned timing of their development and production phases.

Portfolio analysis is the meeting between strategy and tactics and should be driven by forward simulations.

The portfolio management process functions upwards through the balance sheet, providing both the necessary transparency and analysis for maximizing value. While a company's balance sheet remains a snapshot in time, incorporating analytics allows management to create datasets around performance and potential opportunities, paving the way to craft and implement future strategy. In particular, modeling this data requires contributions from both the scenario-based strategy and operational tactics ends of strategic planning; while scenarios engender the frameworks in which our data is interpreted and filtered, operations analysts must collect, model, and translate it within these frameworks accurately. In this way, portfolio management is the true meeting of both strategy and tactics.

The process can be driven by, for example, Monte Carlo simulation, a modeling technique that allows a company to view all possible outcomes from its decisions and evaluate the impact across risk levels. While some mining companies use Monte Carlo in a limited role, applying the technique comprehensively across portfolio strategy and business planning is not common practice throughout the industry as much as it should be. The first and most common benefit of Monte Carlo is the ability to create risk/return investment maps by aggregating the results from different portfolio weights. In particular, simulations can be used to estimate future returns and standard deviations across business units. The results incorporate black swans and extreme decision-making (both aggressive and conservative), in addition to the potential consequences for all middle-of-the-road decisions. An investment frontier map is then generated to visualize the set of expected returns.
Additionally, Monte Carlo simulation can also be used for business planning purposes. Inputs to the simulation may include macroeconomic factors (commodities prices, interest rates, etc.), production and sales tonnages, capital expenditures, operating expenditures, etc. It can also take into account estimated impacts from future initiatives. By combining our future scenarios with Monte Carlo simulation for business planning, mining companies can now identify the potential business drivers of all returns charted on their investment frontier map, creating an opportunity for a more proactive, effective form of strategic management.

Once the enterprise value and portfolio strategy is established, we turn our attention toward execution. The best way to start is by creating a system to evaluate different tactical options. Mineral Resource Management (MRM) maintains that a mining company’s most important asset is its mineral resource. Macfarlane explains, “it requires that its [mineral resource’s] value be ascertained, and that this value is optimized, through each stage of the mining process...thus, MRM has the role of identifying, optimizing and realizing the value of the mineral asset, through converting it from an initial inferred resource, through to a proved Reserve, and ultimately to a saleable product.” Given that investors are more and more viewing mining companies as being in a high-risk business with the number of relevant non-investment stakeholders rapidly increasing, MRM returns the mining business to a more manageable view which focuses on maximizing ROA. The value position of a mining company begins with its revenue/resource position and cascades down to its portfolio, life of mine to the production system. The production system’s success lies in the quality and adherence of the mine schedule.

Management teams can use EVA and MineRP’s software solutions as tools to improve the effectiveness of the MRM framework.

MRM presents a widely-scoped framework, with one of its major pillars recommending a move away from the profit and/or DCF approaches to tactical options assessment. There are several pitfalls which prevent either approach from being optimal. For one, profits are short-term based, single-period measures and are unlikely to maximize value. More specifically, profit approaches lack the necessary incentives for companies to take on value-adding expenditures, because these expenditures may realize value in future periods rather than the current one. DCF, on the other hand, falls victim to its numerous assumptions, including the selected discount rate, technical inputs, and the assumption that cash flows are reinvested at the IRR (if viewing the results through IRR). As an alternative, one could use Joel Stern’s EVA, or Economic Value-Added metric in assessing tactical options. “Essentially, EVA is net operating profit minus an appropriate charge for the opportunity cost of all capital invested in an enterprise. As such, EVA is an estimate of the true ‘economic’ profit or the amount by which earnings exceed or fall short of the required minimum rate of return that the shareholders and lenders could get by investing in other securities of comparable risk.”
By using EVA as an evaluation metric for tactical options, mining companies will have a far improved idea of which tactical options will be more and less impactful and thus enable their teams to select the optimal bundle of tactics that follows their future strategy.

In addition to incorporating EVA as an evaluation tool, MRM maximizes the value of the mineral asset through its comprehensive framework, which includes: defining organizational goals, managing the asset portfolio, managing the asset systems, managing assets, planning and execution, optimization, and risk management. A 3D enterprise software suite is another tool which enables a mining company to adopt MRM and achieve full value from its assets. With this new generation software, users can easily visualize designs and schedules, while planning their mining operations for maximum efficiency.

This software ultimately enables a company to move from its inputs and outputs, to confidence in value from MRM, to the execution phase where real value is added. There are four categories across which mine planning software should support the process:

- Understanding the Market: Assumed demand to forecasted demand to managed demand.
- Understanding Value and Risk: Current cost to recent past and near future value to optimized and integrated short-term and long-term value.
- Managing Inputs: Manual planning tools to 3D modeling and valuations to exhaustive options and analysis.
- Planning, Controlling, and Reporting: Opportunistic mining to integrated MRM to whole business information.

By leveraging MRM with the appropriate software solutions, in addition to other supporting planning and analysis tools, mining companies can now transform the tactical process and drive execution towards value maximization.

While strategy points us in a particular direction which unlocks competitive positioning, strategy on its own is inadequate without integrating the appropriate production tactics. Specifically, where scenarios answer the questions of what our industry and external world might look like (both now and in the future), strategy answers where we need to be in order to stay competitive, with tactics focusing on how we’re going to get there. Ultimately, both strategy and tactics must work together in order to achieve goals: a strategy without tactics is only an idea based on needs, while tactics without a strategy remains a set of aimless actions. Simply put, you can’t leverage one without the other.

Mine planning systems allow companies to manage production, but should be linked with future scenarios to achieve optimized decision making.
We can start with a framework for how today's mine planning systems enable companies to manage production. In particular, these systems specialize in creating detailed short-term and long-term mining plans and graphical models of mine structures, while providing analytical tools to achieve improvements in scheduling efficiency. This describes the goals that our clients are trying to achieve on the tactical end. These systems allow them to record and adjust for variances in anything related to operations, such as deviations around scheduling, geography, drilling and blasting performance, etc. Using these systems appropriately in the current environment is of utmost importance – in many companies, current mine planning systems can degrade quickly to scheduling systems, due to an inability to manage low-quality input data and proper execution. These instances can prevent miners from optimizing operations, and possibly even lead to a loss in their competitive position whether or not the external world benefits them more than their competitors.

On the other hand, the pitfall of using these systems alone, rather than in an integrated model, is that they only provide optimization in the current world – a snapshot in time which may become outdated at any moment. And these types of major decisions need to be made in a more dynamic fashion than that, no company can ensure that an “optimized” decision is truly optimized when it is made in a world that is volatile. It is for this very reason that we use a scenario process to craft strategy and that it remains imperative for companies to leverage their strategic planning departments, resources and systems. The challenges between strategic and production ends of the system are unique from each other and should be addressed by managing an integrated model which features both.

Figure 2: An integrated model provides benefits across extraction efficiency, mineral reserves confidence, and mining and processing efficiency.
The implication is that mining companies must push their system suppliers to begin integrating scenario planning into their operations because, for each day that they do not, decisions that do not reflect the company's full information are being made and acted on. In what instances would this type of model add value? An integrated model can, for example, enable a company to improve its performance along several areas:

**Extraction Efficiency:**
- Increase the emphasis on designing a mine for mining and milling efficiency.
- Develop new technologies and increase the focus on R&D.
- Improve the exploration, technical, and economic evaluation processes.
- Rationalize the orebody layout and refocus the mining activities accordingly.

The goals of Extraction Efficiency can be achieved by improving access to information and analytical tools, as well as improving long-term planning functions. By doing both, companies can achieve an integrated model where optimized decisions not only take into account data as interpreted through the present world, but future ones as well. Mine designs will no longer be driven by immediate constraints and low costs, but rather by how the company sees production, the value of the ore, and other factors decades into the future. Likewise, a greater emphasis on tomorrow's technology will be realized, with decisions made based on expectation of technological evolution, rather than only on “what we have to work with” today.

**Mineral Reserves Confidence**
- Improve confidence levels of geological models.
- Identify and eliminate constraints around defining the full reserve.

Likewise, Mineral Reserves Confidence can be improved by leveraging geotechnical knowledge and reducing the occurrence of unexpected ground conditions. By forecasting the use of better instrumentation under improved conditions, mining companies should expect to achieve more accurate results in future scenarios.

**Mining and Processing Efficiency**
- Increase the use of lower cost production methods.
- Increase focus on geological risk management.
- Increase focus on R&D and process innovation.

Finally, Mining and Processing Efficiency can be achieved by improving production scheduling and staging processes, expanding the skills of the workforce, and aligning the associated performance management systems. Working with an integrated model which accounts for future scenarios in operational scheduling will allow mining companies to identify low-cost production methods for the long-term, rather than just for today.
Moreover, the integrated model enables them to train their labor force for future needs vs. the situation that most companies find themselves in: training workers only as a reaction to underperformance.

So, now that we've established the need for an integrated model, how do we describe the resources and intelligence that goes into getting us there? Strategy is typically best done by visionaries and big-picture thinkers. Without necessarily using a high level of detail, talented strategists are able to understand the world around them, and where they need to position their companies in order to stay competitive in these landscapes. They excel at:

- Framing challenges and identifying sets of goals to be accomplished
- Understanding constraints of the resources they intend to leverage
- Designing strategies at the appropriate level (internal / external, high-level or low-level)
- Creating strategies that anticipate future changes in external environments
- Suggesting solutions which consider all of the company's relevant stakeholders
- Understanding the inherent risk that comes with strategic commitment.

Similarly, we can list out the strengths of a skilled tactician as well. Tacticians play a critical role in taking a high-level strategy, described above, down to the “nitty-gritty” level. In practice, they plan appropriate resources and levers for timing, mobilization, and operational execution in accomplishing a company's future strategic positioning. In particular, strong tacticians excel at:

- Identifying the necessary resources and levers, including their timing, roles, and other aspects of a successful execution
- Understanding how plans and resources interact with each other in order to optimize cost and operations
- Managing and maintaining high performing plans
- Identifying and either correcting or eliminating underperforming ones

By all measures, a company's leadership team must include both strategic thinkers and tacticians. Each will enable the other to leverage their unique strengths and skill sets, and avoid the pitfalls of isolated planning (see Fig. 3). For mining companies, this translates into marrying scenario-based strategies with actionable plans that fall under MRM and maximize ROA. Not only do companies need to have established consensus on the likely scenarios they'll be facing decades into the future, but they also need to have an idea of what they'll be working with and how to achieve their future competitive positioning. While scenario-based strategies remind us that we need to be prepared for the unknown, MRM provides a balancing framework for selecting our best possible tactical options to deal with it.

**Mobilizing resources is the first step towards implementing a new framework. MRM requires the strengths of both strategists and tacticians.**
Finally, past mobilizing resources, mining companies need to have a system for monitoring execution and continuous improvement to ensure that their resources perform according to plan. The consistency of execution can be measured by conducting an analysis of planned vs. actual mining layout parameters. Such parameters can include production/development ratios as well as production and development timing. As an example of using production/development ratios, miners can record progress and create an analysis of the mounts of development relative to the reef made available for production. Percentages can then be calculated over a length of time and compared to the original forecasts to measure for deviations and consistencies in performance trends. Likewise, management should evaluate timing metrics to determine how limited any phase of the mining life cycle is by the actual work content in the previous phases.

In addition, while some of these metrics have been used as benchmarks for continuous improvement programs, traditionally, they have never been converted to financial terms, such as revenue per ton. Even in the cases where companies have converted their metrics, they were largely based on budgeted numbers, which would sometimes lead to misrepresentative perceptions of real-time data. However, these financial metrics have become much more important in today’s industry because they provide management with an adequate opportunity to respond to financial issues, before being blindsided by an issue only after the financial quarterly reports are out. This type of analysis should allow management to make better informed decisions about continuous improvement and planning in the future – whether management’s original expectations were too low, optimistic, or right on target.

**Successful execution requires both performance monitoring and continuous improvement programs.**
All in all, a proper evaluation of performance stretches across each phase of the mining value chain, and is based on comprehensive analysis of geology, layout, and economics of the mine. Measuring the success of execution is critical in allowing management to strategize around its current and future external environments, whether these environments present changing competitor positioning, prices, or production costs. In that respect, it is critical for companies to maintain the appropriate level of mining flexibility to ensure profit maximization.

**Final Thoughts**

There is no doubt that many companies struggle with the integration between strategy and tactics, or directional and operational planning for the future. In particular, companies in the natural resources or other capital-intensive industries face even greater challenges, due to the sheer length of their projects and an ever-increasing number of stakeholders. However, VCI’s methodology of scenario-based strategy planning is one way to address these challenges. Creating future scenarios by expanding on today’s trends and forces enables our clients to establish a consensus on not only how the world will eventually look decades from today, but also how it will progress and change along the way. In conjunction, for mining companies, an mineral resources-centric approach provides a necessary framework to answer the questions which exceed strategy’s scope, to determine and assess our tactical options available. By ensuring an understanding of the world around us and preparing to maximize the return of our assets in future worlds and by having transparent integrated information about daily production, mining companies will have greater ability to develop a distinctive competitive advantage.
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