BETTER DECISIONS, BIGGER PROFITS
Eliminating Profitability Killers through a Collaborative Decision Environment in the mining industry

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INTRODUCTION

Generally, the mining industry has not kept projects in line with feasibility study forecasts. A series of studies that analyzed approximately 100 different mining projects from 1965 through 2001 revealed that the average project had a cost overrun of 25% against forecast. This overrun directly impacts the profit expected from each project which in turn undermines the use of feasibility studies as a basis for management green lights.

Mining corporations and operating units are under constant pressure to improve financial performance. Operational costs have steadily increased over time. Subject matter experts are stretched thin because of multiple demands for their input. Key stakeholders and decision makers are spread out over long distances and multiple time zones. Given the need to rapidly align all stakeholders on huge volumes of data within the same context, making timely and informed management decisions in this environment is challenging.

Efforts to improve financial performance are eroded by a range of operational profitability killers that are embedded in traditional processes and procedures and that inhibit effective decision making.

Technology supported collaborative decision making has emerged as a key efficiency driver at all stages of the asset lifecycle, from planning and construction through production and into decommissioning. This paper will focus primarily on the characteristics of successful collaborative environments as established and operated in the production phase due to the fact that the lifecycle of this stage is the longest of the four with the most complex combination of technology, applications, processes and behavioral change.

PROJECT PROFITABILITY KILLERS

Project profitability killers that impede timely and effective decision making are centered on several key obstacles:

- **Functional Silos.** In an effort to be most efficient, many operators break their projects into function-based teams so that groups of specialists can focus on various problem sets. While this approach is efficient in one way, these teams are often so focused on their particular issues and responsibilities that they do not have insight into, or appreciation for, the impacts of their decisions on other functional teams. This commonly leads to problems with opportunity realization, deferment, planning, and cost management. Another by-product of functional silos is the insulation of subject matter experts and other resources, which end up being hard for other elements of the project to access.

  A key success factor in streamlining and optimizing projects is employing processes, technologies, and physical infrastructure that facilitate transparency and integration across functional silos.

- **Geographic Separation.** Mining is one of the most global industries. As operations expand across the globe in search of new finds, decision makers and key subject matter experts are increasingly dispersed across a wide geographic area, sometimes several continents. Movement through the decision making process, therefore, can be very slow and costly as key decisions often involve staff travel for in-person meetings.

- **High Demand/Low Supply.** Availability of experts with specialized knowledge and field experience can become a critical path item for a project. It is not unusual for an organization to have multiple projects underway around the globe that must all tap into the expertise of one specific person (or handful of persons) in order to move forward. High demand for a small number of individuals can be a logistical and financial challenge, and can create a “bottleneck” that can lead to expensive project delays.

“...The mining industry has entered a new era. Demand continues to be stoked by strong growth in emerging markets. Supply is increasingly constrained, as development projects become more complex and are typically in more remote, unfamiliar territory. The cost base of the industry has permanently changed as lower grades and shortages of labour take effect.”

From Mine 2011: The game has changed, PriceWaterhouseCoopers
• Reinventing the Wheel. As projects move through the production phase, many operating units create their own approach to roles, systems, and processes that are common across the organization. These redundant, non-aligned processes prevent the spread of best practices and lessons learned across the organization and create “nontransferable” methodologies and practices which erode efficiency and profits.

• Data Access. Obtaining and managing reliable data in the right format, and presenting it at the relevant time to decision makers is a challenge for many mining enterprises. Thousands of staff hours are wasted annually verifying, transforming, visualizing and presenting data needed to make informed decisions, and most organizations still feel they are making key decisions without access to the right data.

Economic pressures and labor shortages have driven remote, automated technologies to the forefront of major mining enterprises. With the potential to lower costs at mine sites and reposition people in ways that bring costs down further, these technologies are fostering new approaches to process, workflows, and capital investment. However, despite efforts to integrate technology into and across projects, profitability killers remain deeply embedded in traditional processes and procedures, as well as in staff mindset. Eliminating them means finding new ways to leverage assets and establish connections across land masses and between functional silos.

The equation for eliminating profitability killers that exist in the production decision making process looks like this:

With all necessary decision makers available (either physically or virtually), and presented with all the decision-critical data at the right moment, the actual task of making the decision becomes cost- and time-effective. This state is achieved by leveraging technology with a series of new decision making processes and a shift in user mindset. The drive to establish this capability has driven the establishment of the Collaborative Decision Environment (CDE).

As the name implies, the core of the CDE is collaboration, both within the organization and across its third party network of contractors, vendors, and other stakeholders. It consists of three major components:

Collaborative tools and applications including:
• high quality video conferencing;
• immersive data displays;
• information visualization and integration portals; and
• intuitive, flexible resource search capabilities.

A fit-for-purpose physical and/or virtual environment designed to:
• align staff activities to standardized work processes; and
• enable right time connections between people and information.

Adoption of collaboration as a best practice by:
• driving and rewarding a team-based approach to problem solving and opportunity identification;
• implementing behavioral coaching & training to embed organization priorities at the individual team and staff member level; and
• tracking quantitative metrics mapped against accepted business logic to measure performance and impact and to identify areas for continued improvement.

“Mining is at best an inexact science. Technical projects involve complex interrelationships between departmental ‘silos’ within an organization as well as with external consultants and stakeholders. They do and will always rely very heavily on the experience of the people involved. Any shortage of available skilled resource will only tend to exacerbate inadequacies in systems…”


ENTER THE COLLABORATIVE DECISION ENVIRONMENT

Right Information + Right Connections + Right Time = Right Decision
CDE implementation focuses on achieving replicable collaboration that increases efficiency across decision processes. At a high level, it comprises four components:

- Identify: Provide management and key stakeholders an objective understanding of how key business processes function in the field. This allows identification of roles, systems, and process areas that are not functioning effectively, and the insights from key staff into where and how these can improve.

- Enable: Establish infrastructure and technology that connect people to people and people to information in a time-effective manner.

- Collaborate: Develop and embeds new process workflows that foster collaboration in order to address the problems identified in Step 1, and builds an understanding among staff of the possibilities for process improvement through situation driven, rather than schedule driven collaboration.

- Maintain: Install systems and processes for monitoring and measuring project performance in order to drive ongoing performance improvement.

Based on experience planning, deploying, and maintaining CDEs for clients in the oil and gas industry, Wipro has fine tuned its model for optimum profitability. To effectively manage the complexity of the environment, we take a layered approach to design and implementation which has proven highly effective. Each layer establishes and manages a specific facet of the CDE and focuses on specific objectives:

- **Data Capture and Quality Assurance**
  - Establish a standard mechanism for data capture, storage and retention with checks built in to cleanse data at the source.
  - Remove ambiguity by gathering and verifying all decision-relevant data.
  - Achieve a clear understanding and delineation of system of record for each data type to ensure appropriate ownership and maintenance of data.

- **Data and Application Management**
  - Remove barriers between applications and data channels to provide a robust data model.
  - Create a common standard set of application and technologies that is used across the organization for clear and unambiguous interpretation of results.

**True or False:**

Are You a CDE Candidate?

How many of the following conditions are true for your project? If all or most of the statements below are true, the more benefit you will see from CDE implementation.

1. There are decision processes and/or accountability structures which are not clearly defined.
2. Decision makers are distributed over a wide geographical area.
3. Multiple staff members are filling the same role across different locations.
4. Decisions frequently call for input from geographically dispersed experts and/or stakeholders.
5. The right people and the right data are not always available at the time a decision must be made.
6. The project routinely incurs high travel costs.

**Information Integration**

- Transform data into decision-ready information.
- Implement a common portal for data visualization to co-relate and collate data from multiple sources and to construct the scenario for analysis and review needed for decision making.

**Infrastructure and Equipment**

- Reduce physical barriers to collaboration through facility construction/renovation.
- Install technology to mitigate the impact of physical barriers that cannot be removed.

**Workflow and Data Visualization**

- Visualize key data dynamically to support decisions across business processes.
- Reduce the amount of data being presented to users by applying automated analytics such as exception based surveillance.

**Collaboration**

- Set up and embed a culture of collaboration that draws upon the best resources and information across the organization and includes external third parties (partners, vendors, etc.).
Because several of the layers can be developed concurrently rather than serially, our approach facilitates project management and optimizes resource utilization. Once all the layers have been built and the CDE rolls out, there must be constant reinforcement for its use among staff and management in the production environment to successfully embed it into day-to-day activities.

**CDE BENEFITS**

A CDE eliminates profitability killers in a mining project by:

- minimizing the issues related to geographic separation,
- making specialized knowledge and expertise more readily available without physical travel,
- standardizing common roles, systems, and processes across the organization, and
- using automation to present data in the right views and in a timely manner.

Last but certainly not least, the CDE connects functional silos in ways that foster transparency, which in turn generates significant time and cost savings.

The nature of the CDE makes measurable results relatively easy to obtain. In deployments that Wipro has led in the oil and gas industry, some of the results that have contributed to improved profitability include:

- 5% reduction in costs
- 2% reduction in production losses
- 15% decrease in trouble shooting time
- 30% increase in shutdown compliance
- 6% production increase

The cumulative impact of these results has had a significant positive impact on our clients’ profits.
Conclusion

In today’s world, a mining company must be flexible and adaptable in order to maximize profits while meeting growing market demands. Better decision making will lead to more accurate forecasting and project management which in turn will lead to more profitable outcomes. Traditional processes and procedures do not foster improvement in these areas. Breakthroughs to new levels of performance require establishing new ways of working. The CDE takes down project profitability killers and has shown excellent short term returns on investment.

Collaboration is fundamentally an organizational change, and this must be taken into account in CDE design and rollout. Successful deployment calls for a multi-layered combination of engineering, technical, and organizational/behavior change expertise, and management commitment.

CDE implementation may be a new kind of project for a mining organization. It requires elimination of functional silos from the start of the project. This is not just an IT or an engineering initiative, nor can it succeed without inclusion of behavior and organizational change management experts. The new environment calls for new ways of working, including modifications to organizational structure (e.g., collocation depending on the functional silos being addressed) and addition of “soft metrics” (e.g., tracking length and types of meetings to gauge meeting effectiveness) to the management dashboard.

Establishing a collaborative culture where one does not currently exist requires a visible and sustained commitment from management which includes communication and change management initiatives that must be reflected in the timeline; in addition, the rollout may need to take place in small increments so that CDE participants can learn and assimilate new processes and workflows most effectively.

About the Authors

Chris Anderson has worked with multinational energy firms, governments and non governmental organizations throughout the world leading innovation in process, team building, analytics, and technology application. In his current role as a Manager in Wipro’s Energy, Natural Resources, & Utilities Global Practice, Chris focuses on building partnerships across industries and specialties to drive innovation and creativity around the integration of technology and business culture, with a focus on collaboration across complex, geographically dispersed operations.

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