Achieving innovation in a tough environment

Metal Bulletin Events speaks with Satish Rao, Partner, Clareo about the pressing need for the mining industry to learn from the agile and innovative approaches of other industries, and even, start-ups.

Speaking on the side-lines of Metal Bulletin’s Mining Strategic Excellence in Toronto this June, Rao suggests that a radical and systematic approach is needed if the mining industry is going to survive the next downturn.

However, with commodities prices where they are, many mining companies are struggling to fund innovation. So how can you develop the vision of the mine of the future and achieve innovation?

What is the mine of the future for Clareo? It is achievable in the current pricing environment?

At Clareo we help clients with their growth strategy and innovation. We are firm believers in looking at the innovation occurring other sectors and bringing those in.

One aspect of innovation that’s not as commonly utilized is the concept of radical efficiency. Companies often think of about continuous improvement, also called optimization, and of big bold ideas that can change everything. These bold ideas could be based on technology-led transformation, which is where you fundamentally do away with your existing processes and do something completely different. Or they could involve a transformation of a company's business model.

Radical efficiency is in between those things. It is overlooked but it is particularly relevant in mining. We think that the mining company of the future looks at a portfolio of innovation, while it’s trying to fundamentally transform itself. There are opportunities in the short and mid-term to do significantly better things than a pure focus on optimization.

Why is it called ‘radical’?

To bring the notion of a step change. We are not necessarily talking about the 2% to 10% improvement that is in the world of continuous improvement and optimization. And we are not saying to completely do away with certain business processes. With radical efficiency, you are rethinking some approaches, change something to create a step change in performance, a 30% or more improvement in some operational aspects, which drives business value. This can be accomplished by learning from other industries and applying technologies that may be new to the company or to the mining industry.

With radical efficiencies we are not necessarily saying to completely do away with everything you are doing; rather it is about bringing radical step change by applying technologies new to the company or mining, and involves learning from other industries.
In a panel at the conference, Carl Weatherell of CMIC said this that people mistake optimization for innovation. Where does the idea of radical transformation fit into this statement?

To a large degree, I agree with Carl. There is a long list of innovations that companies look at but if you peel under that, a lot of them are about optimization. This is because mining companies have not developed a systematic approach to radical efficiency or technology-led transformation. We view it as complimentary to optimization efforts. Radical efficiency is how you rethink those approaches based on advancements in the world around us.

Other sectors are innovating in many different areas. For example in the world of agriculture, companies are looking at smart irrigation to reduce water consumption. They are attempting to reduce consumption by 20 or 30%.

Then isn’t that just optimization?

The distinction is in terms of the goal you are setting. I would say optimization would probably come in at anywhere from 1% up to 10% or 15%. The world of radical starts to be 20 to 50%.

At Clareo, we believe in the four pillars of innovation for the mining sector: continuous improvement or optimization, radical efficiency, technology-led transformation and business model transformation. We think of radical efficiency as a way for mining companies to do more than optimization. If the current environment doesn’t support a lot of investment in the more transformative approaches, radical efficiency can be an effective short- to mid-term investment.

We recommend bringing approaches that are proven in other industries. It doesn’t mean you can push them into mining right away; you do need to learn about them. There may be some additional R&D required, but often it is about adaptation, as opposed to a lot of new development.

For a mining company looking for inspiration from other sectors, who should they be looking at?

If you were to have a systematic approach, you’d start by trying to understand your biggest challenges. As a leader in a mining company, you might look at new drilling technologies in oil and gas when looking at new ways to reach the ore. The oil and gas sector could potentially help mining companies understand how to unlock resources that are difficult to mine economically.

From the start-up and engineering worlds, you can bring in the concepts like “minimum viable product” and “design thinking”. There are actually industrial companies that are doing it, and it is not farfetched for mining companies to think about doing it either.

With design thinking, you don’t over-engineer a product. If you have an idea, how do you get it down to the essence of identifying the minimal set of features that are still valuable? You start with a hypothesis around what that might be and conduct many trials and solicit regular feedback. You create learning plans, you say “these are things that are valuable to explore and we can do them with limited budgets.” If you are learning, then you adjust and refocus, as opposed to spending a lot of
money, realize it is not working and then create a failure that everyone is going to remember. Design thinking creates learning about what is a viable. It’s a more agile model.

At this conference, I was intrigued by the crowd funding discussion earlier – about bringing aspects of it to fund corporate efforts. That’s another example of how innovation that happened in another world of finance, typically the world of start-ups, is now coming to corporates and heavy industries.

I read in your **Radical Efficiency Report** that spending in mining is a 10\(^{th}\) compared with the petroleum industry. Why is that the case?

As was identified at the conference; with mining being a cyclical industry, much of the innovation and research has been pushed out to the suppliers and others players in the ecosystem. Further into the down cycle, suppliers and vendors have been pressured on costs and realized they weren’t being rewarded in the innovation aspect too. So they started dropping their innovation efforts, and– it becomes a self-perpetuating cycle.

Furthermore, when the cycle is up, commodity pricing provided a shelter or buffer for a lot of inefficiencies to creep in. There was not incentive at that point to focus on innovation. As commodity prices have gone down, it exposed the lack of innovation, and companies haven’t been able to adapt. That’s why you are seeing a growing realization that we had better do something about it now so that we are not continually caught up in the cycle.

**Are there particular sectors within mining that are leading within this space?**

There is innovation happening but it’s in pockets. You can find many examples that are more anecdotal. For example, Rio Tinto’s fully autonomous mine in the Pilbara region in Australia. But beyond iron ore, I don’t think Rio Tinto has rolled that out to other business units.

Adoption requires a change in culture, the willingness to learn and try different things. I think that’s where the mining industry could learn and improve more.

**Is the industry ready?**

I believe the industry is ready because the recognition is there amongst its leaders. Awareness is always the first step to change. The second step is to have a systemic way to address this. There might be a few projects that have been successful but there haven’t been a lot of systematic approaches to building innovation and capabilities. Tools, approaches and framework should be next on the path to change.

That’s where the mining industry needs to focus its attention and the time to act is now. People have been talking about innovation for a while. However, in a high capital expenditure environment, the cost of failure is seen to be too high, and investors don’t like risk. So you have to take a smarter approach. For example, can you learn something from the way start-ups work? Not every start-up is
successful but when they fail, the cost of start-up failure is much lower than the cost of a corporate failure. So can you create innovation capability in the same mindset that a start-up can?

Companies do need to continually optimize to achieve scale and returns that investors are looking for. But can they also set sail a few ships that are exploring, that are learning and have permission to fail? To fail fast and fail cheaply? Or, for a more positive analogy, mining executives need the permission to learn, and then incorporate new approaches and technologies to enhance innovation.