

Innovating Through Radical Efficiency

The Imperative for Radical Efficiency

Innovation is the creation of substantial new value for a firm and its customers by changing one or more dimensions of its business system¹. Business leaders view it as a critical capability to address market challenges of competition, declining growth, and increasing commoditization. However, economic cycles pose challenges to a company's ability to fund innovation. This creates an innovation paradox, as companies struggle to fund step change improvements precisely when they could make the most impact. Amazon's Jeff Bezos said in an interview² that much like other constraints, frugality can drive innovation, and that one of the only ways to get out of a tight box is to invent your way out. This paper examines the approach of applying innovation thinking and methods to achieve radical efficiency gains, and provides a framework for companies to identify and implement such opportunities.

Key Features of Radical Efficiency

Maintaining a company's existing operating paradigm while looking to innovate in key technology and process areas

Learning and adapting technologies or process from other industries

Expanding the dimensions explored for innovation – explore multiple aspects of the business system¹ to unlock value from radical efficiency

A series of smaller more incremental looking changes that may provide a step change effect when combined and implemented together

Rapid pace of implementation and roll out

Continuous Improvement and Business Transformation

Most companies should – and often do – pursue operational improvements through efforts like continuous improvement and lean thinking, pioneered by Toyota. This approach looks for improvement opportunities that positively impact the bottom line, but typically tend to be incremental in nature. Companies applying these approaches look to improve performance in key operational metrics by 2% to 30%. For example, a 2% saving in fuel costs for a transportation company can have a big impact on its bottom line. The Herman Miller Performance System³ is an example of a company embracing lean to achieve operational excellence. In the mining industry, Barrick has initiated a Best-in-Class program, a data-driven system⁴ that looks to maximize value creation from operations by driving improvements in efficiency, productivity, and cost reduction. Barrick hopes such efforts will help it reach its targeted \$2 billion cash flow improvement target.

At the other end of the spectrum are large business transformations, which may involve changing the business model or ventures into new areas. An example of this is GE's current effort to transform from a finance-dominated conglomerate to a nimble provider of industrial goods and services, focusing on software and analytics to become

the first digital industrial company of its kind. If these large transformations are perceived as risky, they are often put on hold during times of market uncertainty and economic challenges. For example, changing economic conditions⁵ and competition from e-commerce giants such as Amazon led to Walmart's closing of smaller format stores.

Radical Efficiency is Overlooked

Radical efficiency approaches, which allow a firm to identify and deliver a step change in performance and business value, are often overlooked. For many capital intensive industries, and in particular, mining, we believe that radical efficiency is one of three pillars of a much needed innovation agenda, complementing the other two: transformative technology and transformative business models. However, most companies do not search for radical efficiency opportunities in a systematic manner. It involves looking for a step change improvement in performance, where the degree and nature of the step change is relevant to the industry and company context. Radical efficiency typically targets improvement above 30% in key operational metrics that directly impact the bottom line. While the opportunity for radical efficiency exists in many industries, we believe it is particularly relevant in industries that are yet to broadly adopt new technologies, such as the resources and mining industry.





"TraPac Terminal" by JAXPORT

Benefits of radical efficiency

Step change in performance improvement through technology or processes that may have been tried and tested in other industries and applications

Robust portfolio of opportunities across a spectrum of business value, risk profile, and time horizon that is prioritized based on company goals and strategy, and help address current market challenges

Examples of Radical Efficiency

Shipping terminals, such as the TraPac terminal in Los Angeles, are now utilizing automated cargo handling with robots⁶. This promises to reduce the time ships spend in port and improve productivity by 30%, while reducing labor costs by as much as 50%. Another example is in the agricultural industry, which is constantly looking for ways to improve the efficiency of water usage. Studies have shown that a combination of technologies and methods such as precision drip, micro-sprinkler, smart irrigation systems, and weather-based irrigation scheduling could reduce water usage by 17% to 22%, while maintaining productivity and total irrigated acreage⁷.

In the mining industry, proactive condition monitoring has led to radical efficiency gains. Benefits of such solutions have been well documented in other industries, such as aviation and manufacturing. While much of the equipment used in mining incorporates aspects of condition monitoring, solutions can now bring all monitoring data together to provide a holistic view and improve corrective work and predictability, resulting in

improved equipment health and productivity. One case study at a mining company shows an improvement of more than 30% in average component life, and a 45% increase in engine life performance at another site. Yet, these solutions have not been widely adopted, and we believe they represent potential sources of value creation for mining companies.

Another example from the mining industry is coarse particle recovery. Water is added in mineral processing to extract minerals during flotation⁸. Researchers estimate that if minerals could be recovered efficiently from coarse particles, mining companies could save significant energy and water and improve mineral recovery rates. The benefits – ranging from cost savings, to reduced water and energy needs, to incremental revenue – are immense. A number of recovery technologies have existed and have been studied extensively⁹; what is lacking is a focus and combination of these technologies specific to certain minerals, and their effective commercialization. This is an area particularly well suited for a radical efficiency approach.

Identifying Radical Efficiency Opportunities

The principles of ideation and design thinking, often used in innovation programs, can also be applied to identifying radical efficiency opportunities. However, as the context and desired outcomes are different in the case of radical efficiency, the approach must be adapted. The diagram below illustrates our approach to identifying and implementing radical efficiency.

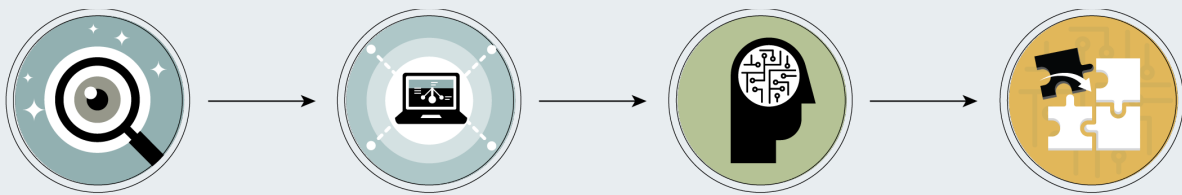
Discovery: Comprises the identification and articulation of key challenge areas for the company that could be addressed through radical efficiency. This requires an understanding of underlying cost and efficiency drivers, and develops hypotheses around the potential areas to target – where should we look (e.g., energy costs, production uptime, supply chain)? This sets up the scope for the subsequent inspiration and ideation steps.

Inspiration: Provides the stimulus to encourage creative thinking by learning from technologies and approaches from both within and outside of the industry. This step typically involves some research into key focus areas identified during the Discovery phase, and creatively expressing

the possibilities that could be applied to the company's situation.

Ideation: Consists of structured ideation sessions with key internal experts, and optionally, some external experts, to identify a set of potential opportunities. Ideation sessions are designed with the objective of radical efficiency, and ideation techniques are suitably modified for this context.

Implementation: Further develops opportunities and business cases, and applies predefined portfolio criteria to identify high priority areas. The interdependence and possible combination of opportunities are evaluated during the business case phase, and portfolio ranking typically looks at three dimensions for evaluating each opportunity: business value, ability to implement, and time to market. Each dimension may further be broken down into sub-dimensions that are relevant to the company's situation and strategy. A lean startup inspired approach to implementation is described in the next section.



Discovery

Where should we look?

Identify and articulate the key challenge areas - where should we look, e.g. energy costs, water, production uptime, and what are the underlying drivers

Inspiration

Where can we learn from?

Where can we look for inspiration?

Which industries and approaches can we learn from?

Ideation

How do we identify the opportunities?

Structured ideation sessions with key internal experts, and selective external experts

Adoption

How do we make it happen?

Develop opportunities, business cases and portfolio map.

Utilize lean startup approach to implementation

Implementing Radical Efficiency

Traditional implementation approaches used by many companies are beset with challenges, such as long and inflexible development cycles, high capital requirements, and budget and schedule overruns. Many industries struggle to scale from pilot to broader adoption of technological innovation. Clareo has developed a lean approach, called FastPath, with the following objectives in mind.

- Dramatically decrease the cycle time from idea to implementation
- Create the environment for fast yet objective decision making and governance
- Create a learning environment that enables you to learn fast, and learn cheap
- Balance flexibility needed for a learning environment with rigor needed for creating operational impact

This approach is described in Clareo's FastPath, a learning approach based on identifying critical uncertainties and assumptions that must be resolved to move initiatives forward, through the use of learning plans and milestone-based funding.

Critical factors for successful implementation also include change management, leadership, and organizational ownership. These cannot be treated with a "business as usual" approach, as radical efficiency will involve technology or process that has never been implemented before in the company, and internal stakeholder alignment will be critical to its success.

Call to Action

When faced with market uncertainty and tough economic conditions, many companies typically respond by cutting costs, and placing on hold ventures that are perceived as diverging from their core business. While this is understandable and often necessary, this creates an environment of short term thinking, and starving a company of innovation in any significant manner or duration can often spell danger for the company's long term sustainability. The innovation paradox is

challenging; it is precisely at the time of greatest need for innovation that a company decides to starve it. Looking at frugality as a stimulus for innovation can present a way out of the paradox. We propose that the addition of radical efficiency to the innovator's toolbox, as outlined in this paper, provides the benefit of optimizing its innovation portfolio, creating potential for a step change in performance and unlocking sustainable business value.



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About Clareo

At Clareo our mission is to help businesses adapt and grow.

We help leaders adapt their businesses and create new ways to grow in rapidly changing markets. Together, we build the plans and capabilities that deliver results. We assist clients in improving strategy execution, finding radical efficiency gains, developing entrepreneurial capabilities, taking new ideas to market, exploring plausible futures, and investing in business ecosystems.

Our clients choose Clareo when they want bold new ideas fueled by a network of leading experts. Working alongside our clients, we create compelling strategies that lead to action.

To find out more about Clareo, visit www.clareo.com.

To learn more about Clareo's solutions for the resources sector, visit www.mineofthefuture.net.

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