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What does it take to create an innovative industry? Lessons from corporate innovation

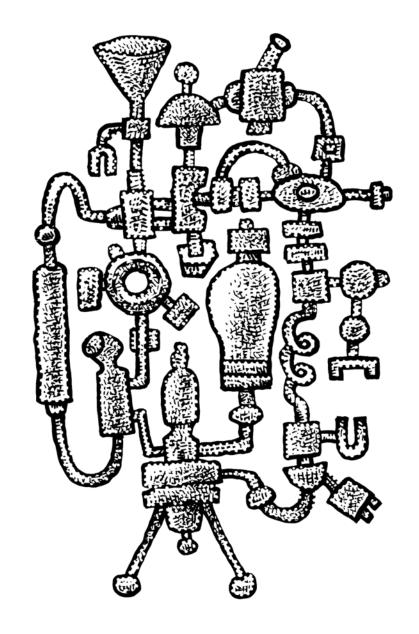




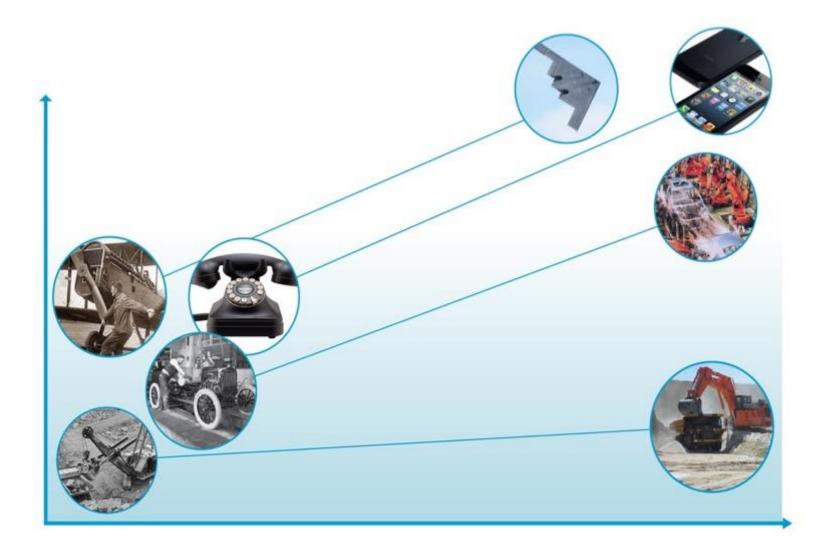
@KulvirSinghGill Green Mining Innovation Workshop May 31, 2018 | Ottawa, ON

INNOVATION ROOM

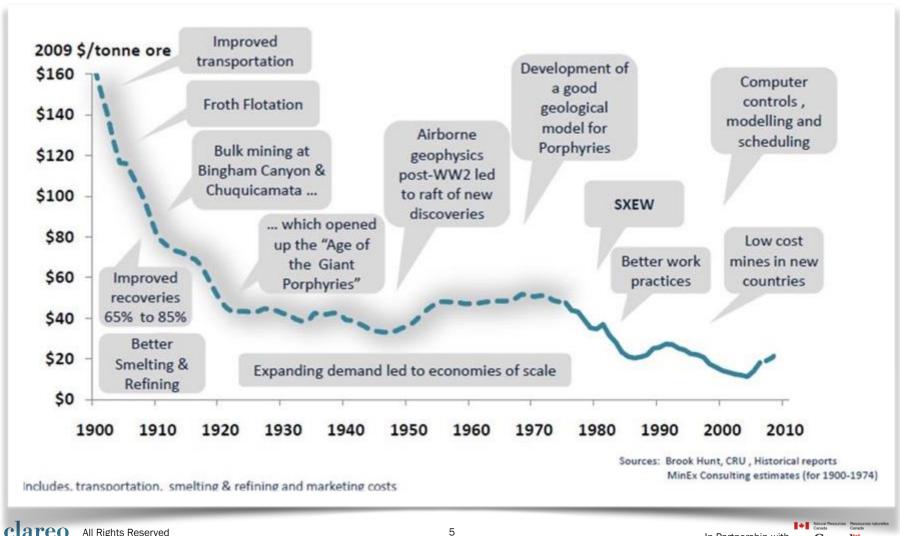
How would you design the least innovative industry in the world?



While technological innovation has fundamentally transformed many industries, mining is lagging



Historically, technical innovations have lead to step change reductions in operating costs for miners



Canadä

What Can We Learn From The Most Innovative Companies?







Hierarchy of Needs For Corporate Innovation



Source: Steve Glaveski. Collective Campus

A Great Empire: Fortresses & Ships





Addressing All Four Pillars of Innovation

70% 20% 10%



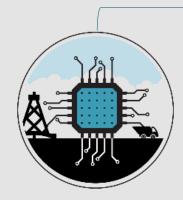
Operational Improvements

Look for operational improvements through efforts like continuous improvement and lean thinking, pioneered by Toyota; typically tend to be incremental in nature



Radical Efficiency

Look for significant improvement in key performance metrics; apply learnings and technologies from other industries to existing approaches



Transformative Technology

Look to fundamentally change many aspects of mining through new technologies – rethink and substitute existing process and approaches



Transformative Business Models

Address issues that impede mining's social license to operate by transforming its business model with a multi-stakeholder engagement approach



Innovation Strategy: The Fortress and the Ship



~70%

Continuous Improvement

Look for operational improvements through efforts like continuous improvement and lean thinking; typically incremental in nature



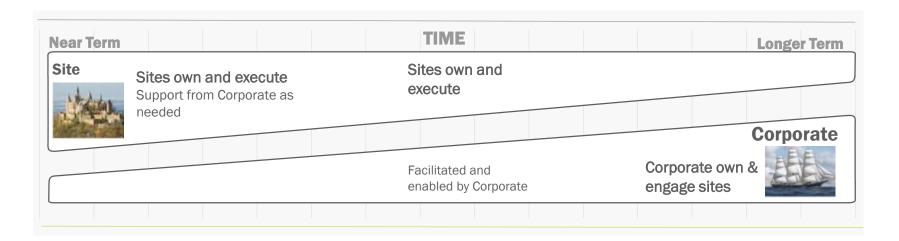
Significant improvement in key performance metrics; apply learnings and technologies from other industries to existing approaches



~10%

Transformational

Look to find and nurture new businesses that will transform the company and / or industry





State of Innovation In Mining Today



Edison did not deliver the lightbulb through continuous improvement of the candle!

Seven Foundational Aspects of a Successful Innovation Strategy

Based on our experience, and applying leading innovation practices with clients, the following are the seven key aspects of successful innovation organizations which will be addressed in this engagement



1. Leadership is aligned around strategic context (why), opportunity filters (what), and approach (how)



2. Organization design distinguishes between the different approaches to innovation



3. Appropriate **systemization** of the innovation processes and **balance** between corporate and sites

Seven Foundational Aspects of a Successful Innovation Strategy



4. Outside-in approaches to avoid conventional thinking (confirmation bias) and corporate antibodies (inside-in)



5. Governance, funding models and selection criteria are 'fit for purpose'



6. A **balanced portfolio** of opportunities, e.g. across time horizons (short to long term), distance from the core business (from core to adjacencies, and new)



7. Smart approach to organizational change and communication

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