

Contents

2 Introduction

Open vs Closed Innovation

7 International Case Studies of Open Innovation

10 Exxrao Case Study

14 Opportunities of Open Innovation

Guide to delivering Open Innovation in the Mining Sector

Conclusior





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Innovation is a driving force within every industry to bring about operational excellence, disruptive ideas and competitive strategies. Businesses that are unable to continuously innovate are at risk of becoming obsolete. Organisations that do not recognise innovation as a differentiating capability, will fail to unlock new markets, produce new revenue streams or optimise costs.

There are several ways to pursue and implement innovation within a business, which can be characterised broadly into closed or open innovation. Open innovation is an innovation management approach to innovation, where the business model of an organisation features a central construct to create and capture value from externally sourced ideas, knowledge, or technology. The identification of collaboration-intensive R&D networks whose structures are influenced by the characteristics of

innovative technological platforms such as IoT for increased safety and productivity, should be prioritised in mining companies.

The greatest benefit of Open Innovation is providing access to experts/start-ups/tech-disruptors from areas outside of mining which could add value when applied to mining related challenges. Similar to how there was a convergence of a digital platform (an application) and the taxi business to create the e-hailing transport model we now know as Uber.

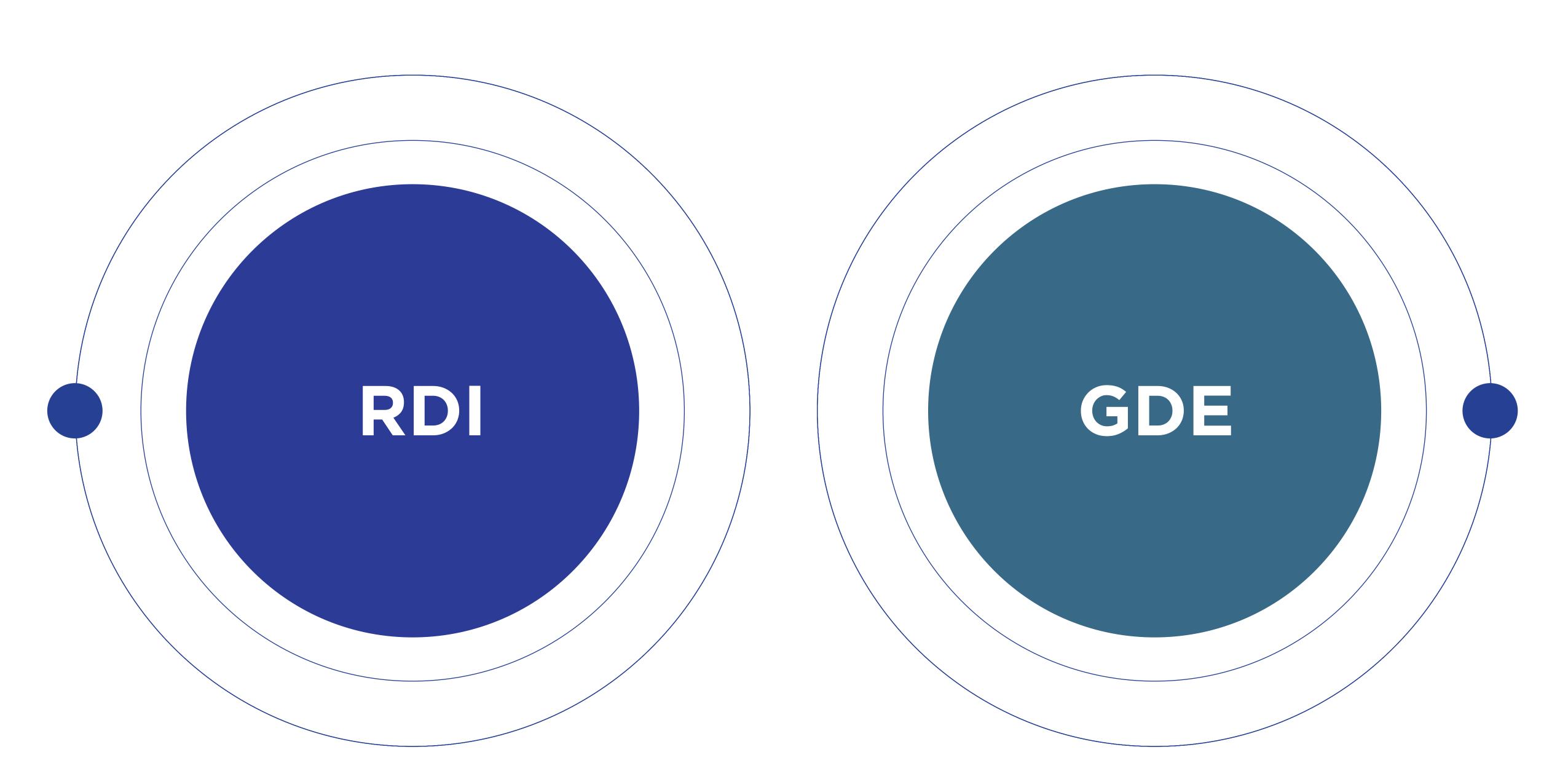
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Problems faced by the R&D Department in Organisations

South Africa's Research, Development and Innovation (RDI) expenditure declined for the first time since 2009/2010.



The gross domestic expenditure on research & development decreased by 5% from R38 725 billion recorded in 2017/18 to R36 784 billion for 2018/19.

The reason for this is that company executives are experiencing difficulty aligning their innovation strategy with their business strategy making it difficult to reap the full rewards of their innovation efforts.



This leads to high innovation costs as businesses work in silos and findit hard to come up with radical anddisruptive innovations and thusharvesting the fruits of their innovation investment.



Open vs Closed Innovation

Today, Open Innovation is a key strategic pillar of many of the world's leading companies. In the mining sector, open innovation is still nascent. The sector has made some strides towards open innovation over the years, however implementations of open innovation within the sector are not comparable to other sectors such as consumer goods, health and financial service.

Despite having been able to raise the visibility of Open Innovation, there remains a huge gap to be filled because neutral catalysts are needed to bring the different actors in the innovation system together.

Innovation partners such as COOi studios can offer the platform for large enterprises to partner with smaller businesses in order to solve existing internal problems using design thinking technologies and 4IR technologies.

Furthermore, platforms such as OpenIX, an open innovation exchange platform managed by the Innovation Hub, also delivers solutions to challenges presented by either government or private sector. They connect researchers and entrepreneurs with opportunities to monetize their innovations. The benefit of these innovation actors is that, as with the Uber example, they can provide access to innovators that are outside the mining sector since these companies are not solely focused on mining.

Closed innovation solves business related challenges using internal resources, knowledge, and expertise. Typical R&D functionalities are often classified into

this type of approach to innovation. The organisation has complete control over the innovation process, and this would result in owning the developed Intellectual Property (IP), where applicable. Closed innovation by default has high patent costs, slow innovation processes due to lengthy managerial approval processes and limited market share as it delivers uniform benefits to the consumers with no competitive advantage and in turn leading to less benefits for shareholders and the market.

Open Innovation is an innovation management model which promotes collaboration with people and organizations outside the company. The term was first coined by Henry Chesborough, a Berkeley professor, to describe the belief that firms should use external as well as internal ideas, paths, and capabilities to develop and market their technology. The idea is that, if knowledge which exists outside the organisation could be useful by sharing risks and rewards, the partners would be able to develop ground-breaking innovations, faster.

There are different forms of open innovation, namely outside-in, inside-out and coupled open innovation. Outside-in open innovation draws knowledge from outside the organisation to improve the organisation's own innovation performance. Inside-out innovation looks for possibilities to share already available in-house knowledge with the external environment in a way that adds value to the organisation, including out-licensing and transfer of rights. Coupled Open Innovation is a combination of the two previously mentioned approaches to open innovation. It is often narrowed down to joint development of new knowledge through collaborative partnerships where partners share their existing intellectual property to create new joint ownership on intellectual assets.

O2 International Case Studies of Open Innovation

There are various new solutions that were developed using an open innovation process. Wehave captured two international case studies to demonstrate Open Innovation success.

Using food additives to clean up oil spills in the ocean



Case Study

Research has found that food technologists may have the solution to cleaning up oil spills in the ocean in a more environmentally friendly way. Soy lecithin, commonly found in many food products is a less harmful and more effective way to disperse oil spills. This turns the oil to a non-sticky solid similar to plasticine which is lighter and can be easily collected than raw oil. Since the mixture of reagents is lighter, it will float on water. The solution also offers low costs for cleaning up oil spills. One of the great effects of adding the material to the water is that it can help prevent oil spills before they happen.



Using rum platform for coffee



Case Study

Nestlé East and Southern Africa region (ESAR) were looking for a way to further engage their audience by building a community. Through Open Innovation they identified an online community platform for rum developed in South America. This platform allowed users from different parts of the world to share their experiences with rum. With 1.2 Million unique users in over 230 countries, the platform has been a direct channel for brands to engage with the consumers. Nestlé implemented the same platform with a few tweaks for coffee lovers in only 3 months with soaring audience numbers. With features such as virtual tasting, coupons and influence videos, the online platform was able to grow the audience for Nestlé by 1Million unique users within a year.





History

Exxaro Resources is a leader in the era of innovation in mining. To introduce a local and tangible Open Innovation case study, we have interviewed the Manager, Innovation Planning and Execution at Exxaro to get some insights on the Exxaro experience of open innovation; what potential benefits have been realised; challenges to be aware of, and how to potentially overcome said challenges.

The initial focus of the innovation department was to support the organisations digital transformation journey. This was done in many pockets throughout business, with one example being the deployment of intelligent automation to support improving certain business processes. An example of where it was successfully applied was within operator equipment licensing, where a bot supported improving the efficiency of the process. The solution has since been scaled, with a new iteration of the solution currently in process.

Once digital transformation became successfully embedded within Exxaro, the Innovation team focussed on delivering purpose driven innovation. In the initial phase, they

studied how innovation is successfully driven in different organisations beyond mining companies on a global and local scale. The team discovered that Open Innovation provided an alternate vehicle to solving business problems and challenges, which could add immense value to the organisation.

The link of Open Innovation to Exxaro's broader organisational strategy was key. Considering that Technology and Innovation is a key strategic enabler and Innovation were seen as differentiating transformation capability within the organisation, it confirmed the decision to pursue Open Innovation as one of the tools to address certain business challenges. A decision was then made to develop a plan on how this will be implemented.

Three months of dedicated desktop research was completed to understand and internally substantiate the decision to test open innovation. One of the biggest challenges encountered in the process was socialising the idea of Open Innovation with key stakeholders.



Organisational Benefits



Technology and Innovation was identified as key enabler to Exxaro's strategy Innovation is essential to Exxaro, and it's at the core of the company's success

- 1. Innovation Supporting Exxaro's Decarbonisation aspirations
 The decarbonisation project management office, in collaboration
 with the Innovation Management team is investigating innovative
 technologies aimed at decarbonisation of Exxaro's operations
- 2. Accessing an ecosystem of digital disruptors
 In order to access truly disruptive and innovative solutions in support of Exxaro's decarbonisation journey, Exxaro is collaborating with a wide range of stakeholders through partnerships within the global innovation ecosystem

As using an open innovation approach to innovation, management is still new within the organisation a POC open innovation challenge was launched through a Public Open innovation challenge in collaboration with the decarbonisation project management office.



Building the ecosystem



According to Exxaro, there are three potential Open Innovation compartments giving access to three ecosystems.

- This includes research institutions such as universities, the CSIR and Innovation Hubs. Experts also include individuals who have been working in a specific sector for a long period of time but are not necessarily associated with a research institution.
- Publicly open ecosystems which allows a challenge to be openly posted on innovation platforms and promoted on social media for anyone to pitch a potential solution.
- Privately open ecosystem which is a curated ecosystem of companies with specific knowledge, skills and expertise.





Opportunities of Open innovation



Time

Shortened implementation time as the solution from 3rd party has already beenbuilt and tested.



Cost

As the solution is not built from scratch, the implementing organisation does not have to resource for research component of the R&D process.



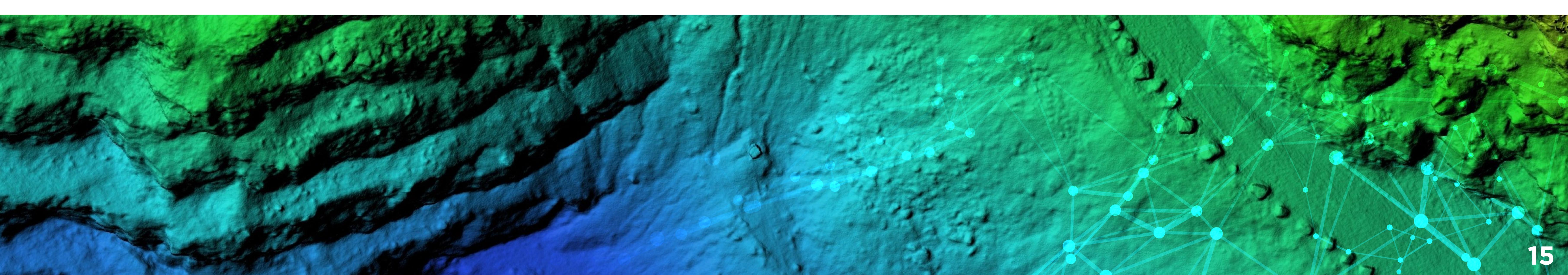
Culture

As the organisation collaborates, there is a cross pollination of ideas and new ways of working with the 3rd party, imposing a cultural shift for both parties.



Business Improvement

Open Innovation implementation insists on a revision of archaic processes, which forces the organisation to adapt to new ways of working.





Guide to delivering Open Innovation in the Mining Sector

The key benefit of Open Innovation is building on what someone has already built. Here are some guidelines to help corporates find a suitable approach for their Open Innovation Programme:



Research the approach

To start the journey of open innovation in mining, organisations need to embark on detailed research in open innovation. This research should not be limited to mining companies, but what other industries are doing in this space.



Innovation is a Strategic Objective

The organisation at the leadership level needs to identify innovation as a strategic objective, where Open Innovation needs be included as an approach to deliver minnovative solutions.



Leadership Support

For successful implementation, support, coupled with a dedicated financial budget is required. Leadership also needs to be in line with the corporate strategic objectives.



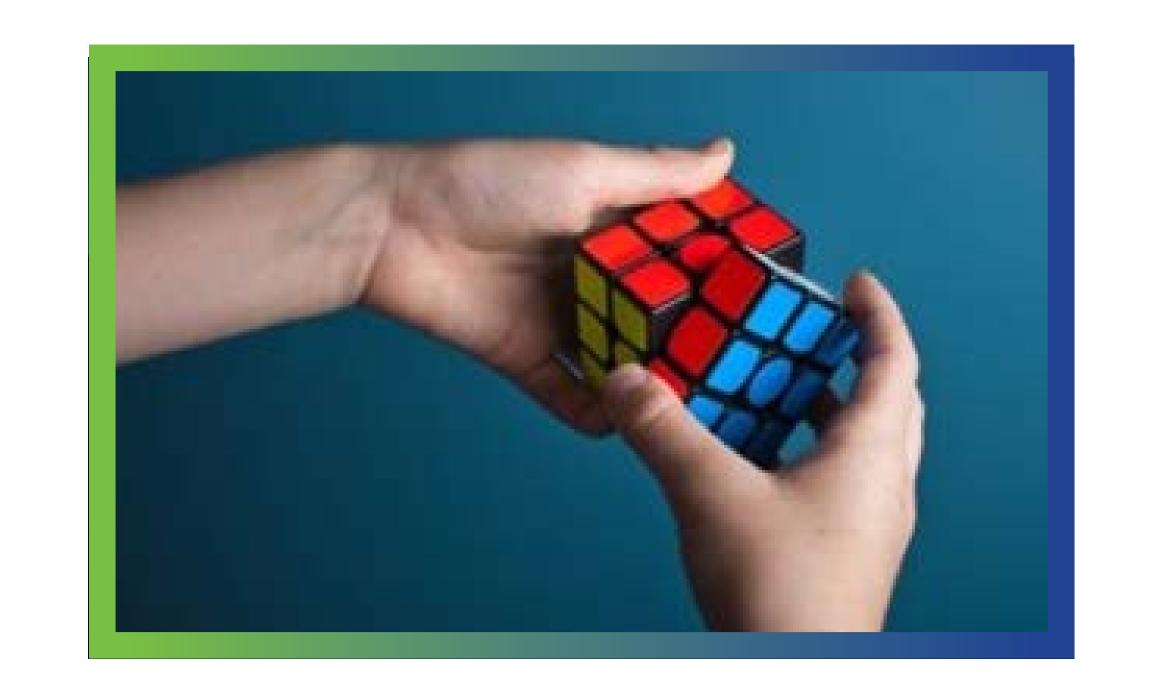
Establish a Team

The organisation's implementation capacity and capability play a role in determining project success. The organisation should have a innovation team to introducing external knowledge into the business. In some organisations the innovation role is a dual role, meaning the innovation director will also have other roles and responsibilities outside innovation such as strategy, technology, or people management. The company must also have strong project management capabilities allowing for successful implementation from idea to commercialisation. To allow for streamlined implementation, the resources allocated to innovation must have the innovation agenda as their primary role, and other responsibilities must be secondary. The winning formula is to have an exclusive innovation manager and team in the firm.



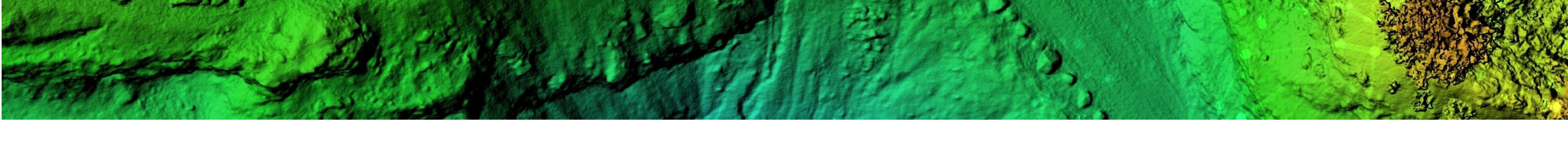
Educate the Organisation

An innovative company's mindset should be one that considers 'failing forward'. Similar to a traditional R&D process, where the product development lab outcomes are unfavourable, yet the learnings of the process aid in other or future projects. The same applies for Open Innovation, the unfavourable outcomes as insights to support other and future ventures. The varying stakeholders from procurement to end user of solution need to be cognisant of the challenges and the benefits of the organisation. The organisation must make a concerted effort in educating on technology trends, innovation methods and the mindset shift required, up front, not when resistance occurs.



Process Revision

This procurement misalignment hurdle warrants corporate internal flexibility when developing the idea. Procurement practices relating to the supply chain of the mining fleet need to be revisited to allow start-up companies to tap into the space of innovation in mining. The established innovation team must proactively identify and communicate procurement or legal hurdles to the appropriate team, and request for special policies to be developed that support the open innovation projects.



About COOi Studios

COOi Studios is an innovation accelerator partner to corporates, start-ups and government organisations. We help enterprises accelerate innovation to deliver exponential growth using our highly-tuned innovation methodologies. We work with business leaders to drive innovation culture and rapidly deliver emerging technology innovations (Al, VR, AR, IoT, Robotics and 3D printing).

We look forward to hearing from you and partnering with you in an exciting, innovative journey.

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