



Mining Equipment, Technology and Services

A Roadmap for unlocking future growth
opportunities for Australia

MAY 2017



Case study

Imdex Group – REFLEX

Imdex Ltd is an ASX listed mining technology provider to the global minerals industry, headquartered in Perth, Western Australia. The company has operations in all key mining and exploration regions throughout Asia Pacific, Africa, Europe and the Americas. Imdex develops solutions to improve the process of identifying and extracting what is below the earth's surface for drilling contractors and resource companies. Imdex aims to be a market leader in real-time subsurface intelligence solutions, through its AMC and REFLEX brands. AMC provides quality drilling fluids, specialty products and innovative equipment. REFLEX provides advanced downhole instrumentation, data management and analytical software for geological modelling.⁸⁶

In 2015, REFLEX entered an exclusive agreement with the Deep Exploration Technologies Cooperative Research Centre (DET CRC) to commercialise the top-of-hole analysis technology, Lab-at-Rig, developed by DET CRC participants: CSIRO, Imdex and Olympus Scientific Solutions Americas. The technology allows measurement and analysis of drill hole geochemistry and mineralogy at a drill site within minutes of the drilling process, providing objective, consistent, quantitative and rapid geological data which is complementary to, and in many ways surpasses, traditional geological logging.

The technology is expected to result in significant cost savings by enabling timely decisions to be made by mineral explorers, such as whether to terminate or extend drill holes or whether to modify the location or trajectory of subsequent holes. The Lab-at-Rig technology will be developed alongside REFLEX's other Assay-While-Drilling technologies and integrated with REFLEX solutions such as the secure, cloud based REFLEXHUB-IQ, allowing real-time interrogation of drill hole assay data from any location.⁸⁷

BUSINESS MODEL CONSIDERATIONS – TAKING ADVANTAGE OF THE CROWD

There are immediate opportunities for METS companies to develop tools and services that help challenge existing practices. For example, the Integra Gold Corp 'Gold Rush Challenge' (2016) recently applied crowd sourcing to tackle their current exploration challenge, offering public access to historic mining and exploration data and a CAD\$1 million prize. The challenge received 100 submissions consisting of 1,342 participants across 83 countries working in 95 teams.⁸⁸

In the long term, accessible, integrated and high resolution exploration data could play a role in disrupting the 'venture' value chain – shifting exploration away from being risk based⁸⁹ – which could result in completely new business and operating models for existing METS companies.

ENABLING BUSINESS CHANGES

In order to unlock this opportunity METS companies will need to invest in business transformation – taking action internally and externally.

BUSINESS PRIORITIES: CREATING ADVANTAGE THROUGH CAPABILITY AND LEADERSHIP

People and skills

- Develop geophysical and geochemical knowledge in parallel with data sciences, modelling and geographic information system (GIS) skills. For example develop statistical modelling and interrogation techniques to improve targeting using available data or gaps (uncertainties) within datasets.
- Work with universities to develop graduates that understand established geological fundamentals as well as emerging computational and analytical skills.
- Improve field skills to take advantage of real-time (or near real-time) sensing and targeting data.

Process and standards

- Improve data integration and data transfer standards to take advantage of new sensors and emerging 'big data' technologies. The geospatial data standards that have been developed over the last 20 years have been funded and adopted by government agencies and will need further work for commercial application. The pathway to developing these standards is now well defined and should be leveraged rather than reinvented.
- Identify and promote best practice in data acquisition and processing to improve data quality and reduce issues with integrating large exploration datasets.

Culture and collaboration

- Facilitate greater collaboration between Junior explorers, METS and mining companies to address market failure risks and increase recognition of innovation needs. Note: While METS and junior explorers are often treated separately, both groups have a high degree of commonality.
- Improve multidisciplinary collaboration – such as between geologists and biologists for improving operation and post-closure outcomes.⁹⁰
- Create opportunities for sampling and analysing vegetation / geology for traces of minerals in exploration (but also for other industries like Agriculture).⁹¹
- Improve stakeholder and community engagement methods to reduce current barriers (e.g. raising capital, gaining licences, regulatory approvals).
- Promote the sharing and integration of exploration and geological data and leverage crowd sourcing to allow data science experts from fields other than mining to interrogate exploration data across tenement and regional boundaries.⁹²
- Support activities that improve decision making related to resource geography and its potential, and develop models and predictive tools to help resource governance.⁹³

⁸⁶ Imdex Limited (2016). 2016 annual report, Perth.

⁸⁷ DET CRC (2015). Press Release: REFLEX to Commercialise DET CRC's Lab-at-Rig® Technology, [Online] Available from: <http://detcrc.com.au/2015/september-2015-det-crc-press-release-reflex-to-commercialise-det-crcs-lab-at-rig-technology/>

⁸⁸ Integra Gold Corp (2016). Gold Rush Challenge, [Online] Available from: <http://www.integratgold.com/goldrush/#video/0/> Accessed 09/01/2017

⁸⁹ Stanway, G., et al (2016). Innovation: State of Play – CEO Insights Mining, VCI.

⁹⁰ Randell, A (2015). Exploration Is Multidisciplinary: Exploring the Relationships Between Geologists and Biologists. Geologyforinvestors.Com. [Online] Available from: <http://www.geologyforinvestors.com/exploration-multidisciplinary-exploring-relationships-geologists-biologists/> Accessed 19/12/2016

⁹¹ CSIRO (2013). Gilding the gum tree – scientists strike gold in leaves. [Online] Available from: <https://csiropedia.csiro.au/gilding-the-gum-tree-scientists-strike-gold-in-leaves/> Accessed 19/12/2016

⁹² Marketwired (2015). Integra Gold Corp. launches Cdn \$1,000,000 crowd-sourcing gold rush challenge. Mining.com. [Online] Available from: <http://www.mining.com/web/integra-gold-corp-launches-1000000-crowd-sourcing-gold-rush-challenge/> Accessed 19/12/2016

⁹³ Nordic Rock Tech Centre AB (RTC) (2013). Strategic research and innovation agenda for the Swedish mining and metal producing industry (STRIM), [Online] Available from: <http://www.rocktechcentre.se/wp-content/uploads/2013/06/STRIM-final.pdf>