

30 Years of METS Sector Transformation: Exploration



Austmine is proud to be celebrating 30 Years of support and advocacy for the Australian Mining Equipment, Technology and Services (METS) sector. As we lead up to our anniversary date in November, we will be examining the significant transformations and key innovations driven by Australian METS and their effect on the global mining industry.

At a time where prospective mining districts are maturing and discovering the next major project is a cost-intensive and challenging exercise, mining is in a race against time to ensure the sustainability of our industry and many others that rely on natural resources.

While the industry is looking towards innovation to solve this challenge, it is essential to consider how Australian METS have transformed exploration over time.

Exploration – 30 Years Ago

According to Manager of Exploration, Marcus Willson at [CSA Global](#), leading exploration and mining consultants in the field, a lot has changed in 30 years. “The larger global exploration field was just starting to open up, with the beginnings of more modern exploration techniques being developed. At the time, traditional

exploration techniques were dominant and still very successful due to limited coherent exploration.”

Further analysis of traditional techniques creates a stark contrast to what we know as common today. **“Minimal use of computers occurred. Early spreadsheet and primitive database systems were starting to appear, but no centralisation occurred.** The majority of exploration continued to be based on a combination of regional mapping/prospecting, while a lack of computer power and appropriate software prevented the ability carry out true 3D modelling,” CSA Global state.

However, we have seen this scenario shift over time with the adoption and invention of digital technology, much of which has responded to the needs of the exploration industry.

What has changed in exploration?

Michelle Carey, General Manager - Product Development, [IMDEX](#), the leading provider of real-time subsurface intelligence solutions to the global minerals industry, describes this process of digital change in exploration. **“In my mind, the most game-changing innovation has been the digitisation of the exploration cycle, which has dramatically improved the availability, accuracy and timeliness of data for critical decision making.”**

“An example of this digitisation is the development of portable XRF on-site assays and how that has been incorporated into work flows that allow geologists to look at chemistry data they can trust in real-time. Similarly, the availability of analytical software to allow any geologist to interpret large amounts of data using sophisticated methodology, from classification diagrams and cluster analysis to self-organising maps.”

“Finally, the trend of sensors and software all joining up into systems has enabled geologists to monitor progress of their programs in 3D, and no doubt will soon go from data to 3D modelling in a semi-autonomous way.”

What were the drivers of change?

Commenting on how these changes have occurred, Mr Willson describes a promising trend for the future of greater industry collaboration. **“From a technological aspect, the most significant changes have been in increasing collaboration between stakeholders,** which, when coupled with more openness amongst mining companies to embrace new technologies, has resulted in increased availability of, and uptake in new technologies.”

Reinforcing this key point, Michelle Carey reflected on her own experiences with IMDEX. “Our own recent examples include collaboration with MICROMINE, Seequent and acQuire Technology Solutions, which mean that data from the field is seamlessly put where a geoscientist needs it. The Seequent partnership integrates IMDEXHUB-IQ™ with Seequent’s Central software, which provides 3D visualisation of geological data in real-time and our partnership with acQuire also integrates IMDEXHUB-IQ™ with its GIM Suite. The result for clients is an integrated and

automated workflow, which means less manual handling of data, improved data governance and data quality, and streamlined access to trusted results.”

What are the next great challenges for exploration?

As [Expedio](#), a geological data science consultancy, stress, people are vital to the future of exploration. **“As near surface finds become rarer, technologies will need to be found to further exploit opportunities.** Finding the right people to make this happen will be a challenge, with many of the best and brightest future employees looking elsewhere from mining.”

CSA Global reinforce this challenge of finding people but also incorporating the current skills sets that will always be needed. “As remote sensing/remote analysis tools become more effective, increased desktop prospecting will occur. Ultimately, key primary datasets, such as structure, geochemistry and basic geological mapping cannot be done in this environment. We can postulate all we like from afar, but you must get up close and personal (on the ground) to gain true understanding. **We are in danger of losing our field skills. You might find some interesting features via your computer screen, but you won’t know much at all until you get out in the field.**”

In combating the primary exploration challenge of finding new orebodies, CSA Global emphasise that much of the technology is here, it just needs to be utilised. “The exploration business is endeavouring to explore in areas of known prospectivity but at greater depth and with more difficult cover. While tools and techniques increasingly exist to help mitigate the explicit additional risk, there remains very poor uptake within the industry. There will be no easy solutions, so the industry **MUST** get more sophisticated across the board.”

What next for exploration innovation?

“Machine learning and artificial intelligence is a blanket buzz word for expertise in using computers to exploit data better, but it will no doubt play a big part across the industry,” Expedio believe. “Cheaper sensors will contribute to more widespread data and information available, which will be exploited through advanced processing techniques for greater understanding of the orebody.

CSA Global note the overall nature of exploration has the potential to change. “Mineral deposits are created by processes, of variable nature depending on the type and style. At present, the industry remains reliant on a high degree of interpretive analysis to assess the presence/absence of those processes, identifying where it has occurred and where it may result in the future. Progressive developments in remote sensing and analytical tools and techniques will see the industry define and measure proxies for these processes, but progressively measure them more directly and understand the variations that help define where an ore body will be located. This will revolutionise the entire process.”

Conclusion

With such vast change occurring in exploration across the past 30 years, the possibilities and technologies 30 years from now are almost unimaginable and unquantifiable at this point. No matter what this holds, it is certain that Australian METS will continue to lead the way to a more sustainable future, driven by further smart innovations, industry collaboration and problem-solving techniques for our toughest challenges.