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# Data Mining

## How software is transforming the resources sector

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In a striking three-storey glass-and-steel building near Perth's international airport, a mining revolution is taking place – but the real effects of that revolution are felt 1,300 kilometres away. The building houses the Remote Operation Centre (ROC) of Hancock Prospecting's Roy Hill iron ore mine, which is located in the Pilbara region of Western Australia.

The staff at the state-of-the-art centre not only oversee the planning, operation and overall management of Roy Hill's mining, processing, rail and port operations – they actually conduct them. “It's the only mining company in the world that we know of that actually runs its whole mining operation from a single room, away from the mine-site,” says Steve Travers, general manager at the Internet of Things mining cluster at the Australian Information Industry Association (AIIA).



Gina Rinehart, pictured with daughter Ginia, is breaking barriers in more ways than one in the mining industry. Pic: supplied by Hancock Prospecting

“It's been the perfect opportunity to re-imagine mining, because this is a very new mine, started from scratch. The operations centre has been enabled with new technology such that there's no latency in the way that they move around data – data flows through the room in real-time, in the same way ore flows from the run-of-mine, through the train to down to the port,” says Travers.



As soon as any key performance indicator (KPI) deviates from the business plan, the ROC knows, and can take corrective action. For example, the tyres of the dump trucks in the mine did not last as long as forecast and budgeted: the business improvement team at the ROC analysed different data, including tyre sensor data, the load on the truck, environmental factors and operator behaviour. The

Gina Rinehart with Barry Fitzgerald (CEO, Roy Hill) and Sanjiv Manchanda, Project Manager. Pic: Bloomberg News

findings were applied to operator training, speed guidelines and road layouts, enabling expected tyre life

to be achieved.

The Roy Hill remote operations centre is an “extreme example” of how technological advances in areas such as the Internet of Things, high-speed connectivity and data analytics are changing mining, says Travers. “Getting devices on-site to talk to each other is actually something that the resources industry has been doing for quite a while. We’ve had the basic capability to be able to do this since the mid-1990s – we saw it first in oil and gas. “Where you’re seeing a difference in the modern definition of ‘Internet-of-Things,’ the meshing of operational technology, information technology and data analytics, it’s encouraging people to think differently about operations and what they can potentially do,” he says.



Steve Travers

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Expert Analysis by Gareth Moore, strategic sales manager at Sage

*Spurred by the need to make faster, more informed decisions, mining companies are increasingly looking for more in business management software. The ability to capture data in real time – and derive meaningful insights – is now critical. Read More...*

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Rio Tinto's operation centre in Perth has sophisticated monitoring programs that support increasing levels of automation. Pic: Ian Waldie/Bloomberg

The data is the driver, says Paul Snowdon, senior manager of Accenture's mining practice in Australia. "It's bringing together all the different applications that drive the mining business, and looking at the data that's driven from those applications, and understanding what we can do with that.

"Digital innovation is definitely enabling mining companies to look deeper into their assets, to have much more comprehensive uses for the data they get from those assets, to generate new insights, and ultimately make better business decisions," says Snowdon.

The end-to-end value chain for a mine, from exploration to development all the way through to the customer for the product, has typically been a "very siloed value chain," says Snowdon. "A lot of information is being generated across the chain, but we haven't been great at integrating that.



Paul Snowdon

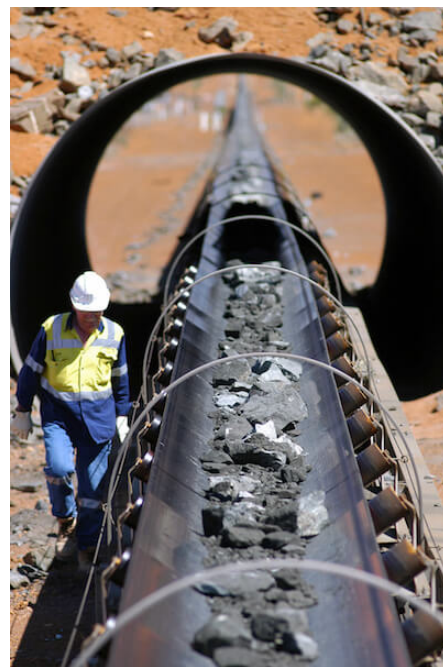
"We're now starting to use the information in real-time to tell us when problems are emerging with key equipment, from a maintenance perspective, we can start to mobilise more with teams to fix that, integrate more with supply and inventory to make sure that we've got all the parts and smarts that we need to fix this issue. Then we can work more closely with production to work out the optimum time to actually take that equipment down, rather than saying 'we've got to take it down straight away' – which is often not the most cost-effective decision. It's a much more integrated view."



Real time data is helping reduce maintenance costs. Pictured: Dan Williams at his Komatsu workshop in Brisbane. Photo: Peter Wallis

There is also a “culture piece” to this technological advancement, says Snowden. “When you’re breaking down silos, getting data flowing, generating insights such that they’re becoming part of the decision process and going through to action, we’ve seen from the companies in other industries that are going down this path, the excitement becomes palpable.

“When it’s driven from the top, and the engagement levels are high, the change pervades through the business, and you can actually feel it. That’s where the mining industry needs to go,” says Snowden. The mining sector is “pushing into innovation,” says Travers.



Golden Grove overland coal conveyor. Pic: Bloomberg News

“We see it reaching out into the tech community and asking questions of start-ups, participating in hackathons, and we’re seeing uptake in field tests at mines.



Australian technology was used in the rescue of the Chilean miners in the 2010 cave-in. Pic: Martin Bernetti/AFP Photo

“We’ve got really world-class small-to-medium-sized technology companies, they’re very laser-focused in terms of the things they develop, and what they develop is world-class.

A lot of it is in the safety and remote working area, because we know underground mining in this country – there’s a great desire to do things differently in the underground space, because of the inherent dangers. Not many people realise that it was Australian technology that helped rescue the Chilean miners (after the Copiapó mining accident in 2010, which

trapped 33 miners underground for 69 days).”

These technology developers are “going out there and striking relationships with miners of all sizes,” he says.

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Spurred by the need to make faster, more informed decisions, mining companies are increasingly looking for more in business management software. The ability to capture data in real time – and derive meaningful insights – is now critical.

Emerging to meet this demand is a new breed of business management software, designed to help mining companies gain deeper business

insights. And it's these insights that contribute to considerable gains – helping companies operate more efficiently, improve the safety and engagement of their employees, and optimise the use of their equipment.

Gareth Moore, Strategic Sales Manager of Sage X3 at global software company Sage, says this shift towards capturing data more effectively, and using it to derive deeper insights, is particularly critical for mining companies – many of whom are limited by legacy data systems.

“With the legacy data systems that mines commonly use, the best-case is that people are looking at data at the end of their shift. It could be two days, three days, a week old, which doesn't really give them the opportunity to make decisions that can optimise the plant.” says Moore.

“The focus (of software development for the mining industry) is that by providing key performance indicators and data in real time, and giving the company visibility of that data both at the head office and the mine site, they can use this data and technology to solve problems more quickly, plan better, and ultimately drive value.

“It's as much about reducing costs, maintenance and equipment downtime, and reducing usage of parts and spares, as it is about improving processes, but all of these aspects flow into improving returns.

“We find that the customer can improve returns by up to 50 to 60 percent, just by using data and analytical capabilities to plan better and make more informed and timely decisions,” says Moore.

And when a business can get more people out from behind desks, into the field, and keep them in touch with data, Moore says it can produce “very real engagement benefits.”

“Accessing data on any device, having full control and execution capability from any location, results in better productivity, better service and better access to critical knowledge for safety and upskilling,” says Moore.