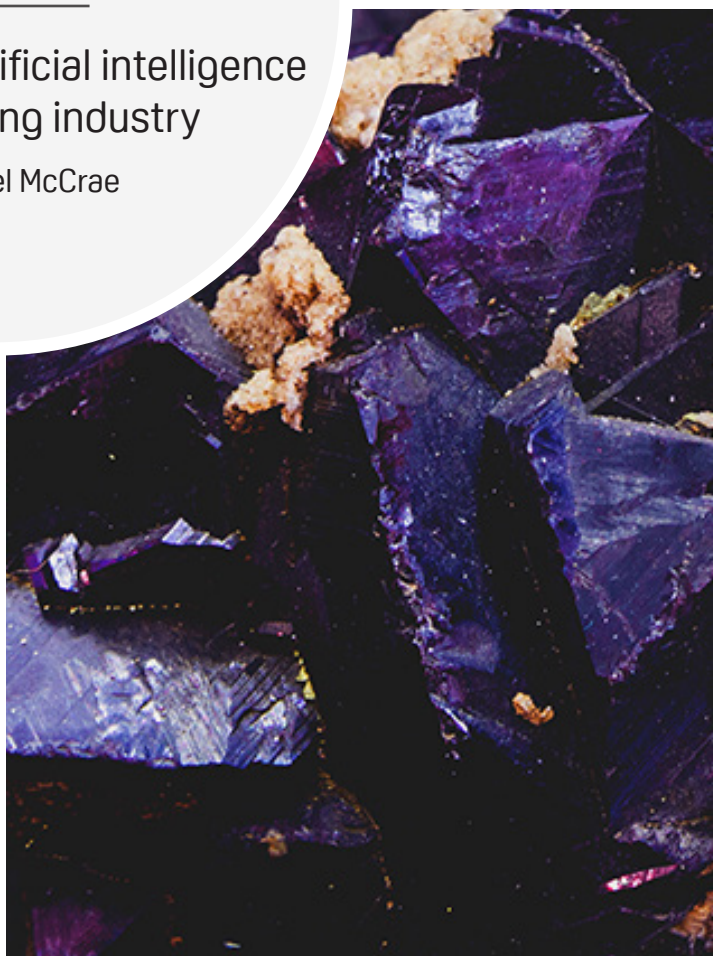
edumine

careermine

# THE FUTURE IS INTELLIGENT

The impact of artificial intelligence on the mining industry

by Michael McCrae



# AI

## Artificial intelligence and automation are already here and having a material effect on companies' bottom lines.

Since transitioning to autonomous trucks over eight years ago, Rio Tinto estimates that it has reduced load and haul operating costs by up to 13 per cent. At Barrick's Dominican Republic operations, a crew of surveyors were replaced by drones. Instead of workers spending days tromping over stockpiles and manually compiling their logs, drones fly over the project and instantaneously beam data to the cloud.

New digital tools are an opportunity to find elusive productivity improvements, and miners who don't embrace the new tools will find themselves at a disadvantage. Mining leaders need to embrace technology to stay both competitive and become productive.

# Goldcorp

Goldcorp, the world's third-largest gold miner by market cap, is using cloud computing and machine learning to tap many decades of data at its Red Lake Mine. The company has already sped up mine planning 10-fold, and sees it gaining a competitive advantage when considering future acquisitions.

Goldcorp kicked off the digitization drive when it realized it had a data problem. At Goldcorp's Red Lake, geological data resided on six different stand-alone software packages, as well as old mine reports and historical assays all printed on paper. Goldcorp digitized the data and uploaded it to the cloud to free the data from the strictures of old software packages. Analysts could now conduct unstructured data queries instead of pulling each individual data set onto a single spreadsheet to conduct analysis. The initiative saved geologists time and freed them to make more creative and critical decisions.

Goldcorp plans to push the limits of the technology and start using artificial intelligence for selective decision making, says Luis Canepari, Goldcorp's VP of Technology.

"We have a very ambitious target by third quarter next year, to be able to have artificial intelligence come up with targets for drilling and for exploration," says Canepari.

"That is our shot to the moon. We are putting a lot of effort into reaching that goal."

"That is our shot to the moon. We are putting a lot of effort into reaching that goal."

What has been learned to date at Red Lake is now being shared throughout the organization. Canepari plans to use the artificial intelligence tools not only on Goldcorp's projects and mines, but also analysis when planning mergers and acquisitions.

"When we are evaluating a junior, we can evaluate faster and make investment decisions quicker."

# Barrick Gold

At Barrick Gold, the company is getting digital ready by training all its staff to think more expansively about its data.

Up to half of a worker's tasks could be automated, McKinsey forecasts in a survey of work and digitization. The impact will not be limited to the mine site but felt across all levels of a company's organization, from the mine face to corporate headquarters.

Buying the technology will be the easy part; organizational change will be hard.

Ed Humphries, Head of Digital Planning at Barrick, says data is a fundamental driver of the company's business. Humphries says Barrick has to move from past work practices where data was discreet and customized for a particular purpose or function. Data must be widely shared and actionable.

For example, predictive data and analytics will improve management of energy, water, and emissions. Another example Barrick gives in a news release announcing the initiative is real-time data capture to allow the company to be even more transparent with, and accountable to, its local partners by providing water monitoring information in real time. Interactive data rooms outfitted with real-time data, analytics, and predictive tools will allow company leaders to work together across the organization. An enterprise-wide analytics hub will enable performance management, and financial and operational benchmarking. New digital tools will improve scenario planning and portfolio management. These new technologies will permit Barrick's leaders to make decisions with greater speed, precision, and productivity; to assess and mitigate risk more effectively; and to provide greater transparency to partners.

> "We should be turning high-grade digital operators. We would love to be seen as the place that gives people those skills."

Humphries aspires to produce future workers who are "high-grade digital operators." He realizes that investing in workers will not only help the company use technology better, but the effort will also help the company attract talent.

"We should be turning high-grade digital operators. We would love to be seen as the place that gives people those skills," says Humphries.

# Summing Up

Barrick and Goldcorp are not only transitioning their staff to new roles, but they are also actively hiring new talent, such as software developers and data scientists. At the industry hiring site Careermine, there are six new postings for data scientists and over 70 postings for automation development, all posted in the past month.

"We are seeing a marked increase in jobs that require some artificial intelligence or automation-specific skills," says Johann Robertson, division leader at Careermine.

Robertson noted some recent examples: Rio Tinto is looking for a remote operations controller, Caterpillar would like to hire an automation engineer, and ERM needs data scientists.

Work is being disrupted and Millennials may already sense it. According to a Harvard study comparing the motivations of different generations of workers when looking for a job, Millennials chiefly value the opportunity to learn and grow while Boomers, who are nearing the end of their careers, rank the quality of management and overall compensation higher.

"Millennials are most likely to have their careers disrupted by AI since they have so many working years ahead of them," says Katja Freitag, division leader at Edumine.

> "Millennials are most likely to have their careers disrupted by AI since they have so many working years ahead of them."

The upheavals at mining companies due to AI and automation may be helpful for attracting Milliennials, says Freitag. Younger workers may be drawn to mining since the industry offers learning and growth opportunities in a field that is traditionally not considered to be at the cutting edge of technology.

To onboard younger workers who may not be familiar with the mining industry or transition older workers, companies like Rio Tinto, Newmont, and Kinross have set up online campuses through Edumine, a professional training provider. Courses range from beginner subjects like Mining 101 to advanced topics such as tailings management.

Now more than ever, workers must become continual learners. Adoption of new digital tools will

scramble jobs roles. Workers must shift from predictable activities, such as driving trucks or collecting and processing data, to roles that emphasize their innate strengths: social and emotional skills, and advanced cognitive skills, such as reasoning and creativity.

To get employees to change, leaders need to be positive about the future. For decades to come, AI and automation will do marvelous things, above all remove work drudgery, usually the aspect of a job that high performers like the least. Leaders need to spark the creativity of their workforce. Remember that jobs filled at companies today couldn't be conceived of 100 years ago. Employees will ultimately drive the use of these new digital tools. Workers must learn to let go of mundane tasks and automate work not only for the good of the company but for the good of themselves, and leaders need to point the way.

> "We have no idea what the fields, industries, businesses, and jobs of the future will be. We just know we will create an enormous number of them."

The future is bright. Leading venture capitalist Marc Andreessen argues that pessimism about job loss due to AI give humans too little benefit.

"We have no idea what the fields, industries, businesses, and jobs of the future will be. We just know we will create an enormous number of them," writes Andreessen.

"To argue that huge numbers of people will be available but we will find nothing for them (us) to do is to dramatically short human creativity. And I am way long human creativity."

# Edumine

Edumine, a division of Glacier Media Mining Group, is the world's leading provider of training and education to the mining industry. We offer individuals, corporations, and educators effective solutions based on their training, continuing education, and professional development needs.

info@edumine.com +1 604 683 2037

# Careermine

Careermine, a division of Glacier Media Mining Group, provides the ideal platform for job seekers to find employment opportunities and interact with companies and recruiters who are hiring. Companies in the mining industry can showcase their employment opportunities, company profile, and career paths for both graduates and those already working in the industry.

info@careermine.com +1 604 683 2037

# Glacier Media

Glacier Media Inc. is an information and marketing solutions company pursuing growth in sectors where the provision of essential information and related services provides high customer utility and value. Glacier's strategy is implemented through two operational areas: content and marketing solutions; and data, analytics, and intelligence.