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The smart miners putting people first

We've all heard about the sustained pressures mining companies are facing from stakeholders when it comes to changing the way they do business, with the use of new technology often touted as the way to transform the sector for the good of the industry and society.

Yet, as the COVID-19 pandemic has reinforced, these technologies can only work with the right suite of people to design, install, operate and maintain them.

The onset of machine learning and artificial intelligence in the mining space is expected to remove manual tasks in the exploration, development, production and maintenance processes of miners, but the real benefits come with freeing up skilled personnel to concentrate on more 'transformative' processes.

The same could be said for the automation of equipment and processes at mine sites, with contractors and mine owners able to use skilled workers across multiple operating stations above ground or at remote operations centres instead of being bogged down on one piece of kit on the mine site.

Keeping humans at the "centre" of this technology evolution is one of the underlying themes of the 2021 edition of the *Smart Mining Conference* (SMC2021), hosted by the Institute for Advanced Mining Technologies of RWTH Aachen University (AMT) and VDMA Mining, according to Aarti Sörensen, Scientific Research Assistant at AMT.

"Technology is an enabler, but you need to know what you actually want to achieve with any of these projects to be a success," Sörensen told *IM*.



Aarti Sörensen, Scientific Research Assistant of AMT

A focus on this human centre transcends just the people on the mine site, or the neighbouring communities; it includes the wider society that interact, judge and rely on the outputs of mining.

Elisabeth Clausen, Professor & Director of AMT, told *IM*: "One aspect that is really important for the mining industry is how to deal with the public perception of the industry. All miners are lacking the talent they need to continue to grow. We have seen this come through in the numbers of university students we are educating. While every student currently looks like getting a job upon graduation, there are not enough people coming through the system with the skills required and the appetite to work in the mining sector. That is not only in disciplines like mine engineering, but also machine learning, automation, big data analytics, etc. Mining is not currently viewed as an attractive workplace when compared with the likes of Google and Amazon."

The introduction of more 'carbon neutral' operations, improved safety procedures and flexible work practices will go some way to changing the perception and, to make the required leaps, collaboration will prove key.

This is a topic Sørensen and Clausen know well given the number of industry research projects the AMT is currently working on.

NEXGEN SIMS, the next generation of the EU-backed SIMS project, is a great example here. Involving Epiroc, Ericsson, Boliden, Agnico Eagle Finland, KGHM Polska, K+S, OZ Minerals, Mobilaris MCE, AFRY, KGHM Cuprum, LTU Business, Luleå University of Technology and AMT, NEXGEN SIMS (the Next-Generation Carbon-Neutral Pilots for Smart Intelligent Mining Systems) aims to develop autonomous, carbon-neutral mining processes.

While more innovation networks are gaining traction across the globe – in Canada, the Canada Mining Innovation Council or the Centre for Excellence in Mining Innovation, and Expande, in Chile, provide examples here – Clausen said there is still some reluctance in the mining community to commit to large-scale collaboration and collaborative innovation.

"Companies see the need but have some hesitation where it involves large-scale collaboration," she said. The dilemmas of data sharing, IP rights and the need to provide individual companies with a list of competitive advantage benefits remain.



Elisabeth Clausen, Professor & Director of AMT

"It all hinges on openness and trust," Clausen said. "Openness can only be generated by trust."

Sørensen said the 'sweetspot' for miner collaboration often comes from the mid-tier sector – those companies big enough and agile enough to commit funds and resources to projects, but not so big that they can develop their own technology in-house.

"They often open up their mine sites for demonstrations and are more open to collaboration," she said.

"The collaboration dynamic between suppliers and miners is also changing, with miners now driving the technology development and putting their requirements to suppliers, instead of the other way round. Some miners have also built key relationships with research institutions and start-ups to come up with solutions to their problems, building collaboration or innovation ecosystems around their companies."

Collaborations such as NEXGEN SIMS are seeing all parts of the mining ecosystem converge to help decarbonise the sector, as well as change the perception of how mines are operated. The use of 5G communication networks, battery-electric and automated machinery could see operators track equipment from a city centre in real time, without the need to even step on site.

What is clear is that more collaborations like this will be needed to decarbonise the industry, make it more appealing to younger people considering their career options, and change the 'dirty' and 'dangerous' connotations that are often associated with the word 'mining'.

This represents a challenge as well as an opportunity, but, like all technology developments/transformations, it requires the 'buy-in' of people to be a success.

Clausen concluded: "We are convinced that the benefits of all the technologies and innovations can only be fully leveraged if we have the right people in place. Putting people at the centre of all activities is of utmost importance to change and challenge the perception of mining."

SMC2021 will bring business leaders, policy makers and researchers together to discuss what 'smart mining' means against such a backdrop.