

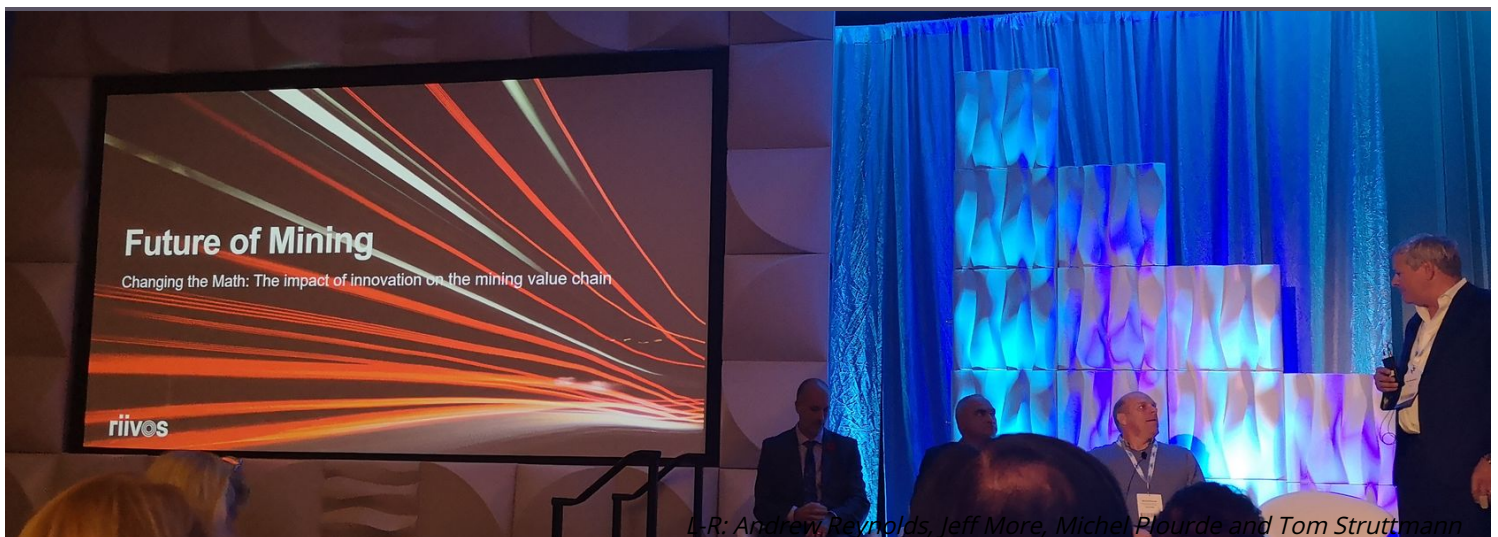
Moving mining **➤ FORWARD**



Mining Magazine 

Mastering the mining value chain

A miner, tech company and consultant on the impact of innovation on the mining value chain



L-R: Andrew Reynolds, Jeff More, Michel Plourde and Tom Struttmann

Future Of Mining > Innovation

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A Future of Mining Americas panel moderated by Tom Struttmann, group executive of Riivos Mining; and consisting of Michel Plourde, manager of integrated operations at ArcelorMittal Mines Canada; Jeff More, CEO of MineSense; and Andrew Reynolds of Reynolds Mining Systems Integration looked into some of the key innovations that are driving change within the mining industry.

"I think the innovations that are going to drive mining, those are the innovations that have a dual impact," said More, "so innovations [from which] we can see a nice short-term impact. If there's questions of 'why should I spend money on this initiative?', you have an answer that's going to show up in the first year or so.

"Secondly, innovation that in addition to an immediate impact [also shows] how you can build off of that innovation and expand the value over a hundred years."

Reynolds believes that in the long term, the most important technologies are those that better engage stakeholders.

"If you take a purely economic view of that and investors, and look at declining ore grades, it's really hard to see how the value of the whole mining enterprise increases in the future, unless you deliver better outcomes, triple bottom line outcomes, to broader groups of stakeholders," he said.



So, the sooner we can start engaging them more positively in the whole mining system, the better. I think technologies like virtual reality and augmented reality are really going to pay big dividends in that area in the future."

According to Plourde, modelling and optimisation and integrated execution and planning are where the industry will get the biggest 'bang for the buck'.

"From pit to port it's a relatively siloed value chain, and that's where we spend a lot of energy right now, trying to generate maximum value and trying to get that value chain as optimal as possible. So, simulation modelling, advanced analytics, AI, machine learning, I believe is the way forward for us," he said.

"However, that being said, none of that can happen in a systematic way without some of the other technologies that are coming on board these days - these low-cost technologies that we're deploying or attempting to deploy in very specific areas to gather more data and improve the decision-making process. Again, it's that reaction time that we're trying to reduce."

Plourde stressed that individually a lot of interesting technologies are not of that much use, "but when you start combining them together and getting more digital information out of them, that's where we believe there's integrated planning and optimisation that becomes available and that generates short-term value".

Innovation, he added, is not just about technology, but also about how you can bring operations people on board, have them participate in the decision process and make sure they understand what the technologies do.

"It's simple to say, but there's a lot of pushback, and there will continue to be pushback from individuals, operators.

"People are insecure, especially in the mining industry, and we have to be weary of that. That in itself is a large part of the innovation process."

Accordingly, instead of forcing technologies on people, ArcelorMittal has taken a "human perspective".

"We ran through a process that really looked at how people work, whether it was on-site or different areas of the value chain, who they collaborated with and how they did it, before we got going," Plourde said.

"It's people, then process and finally the right technology to support that - for us anyway it was innovative."

"Mining is a very big enterprise. It has very long time constants; things change very slowly," Reynolds added.

"You've got to remember that the core inertia of this business is enormous. There's not much we can do to change that, but I think the digitalisation, the insights that it brings to more and more people, the democratisation of the mining system will force more and more difficult questions to be asked about who is master of what in this value chain."



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