

Seven digital trends rocking the mining world

Ever since mankind started pulling minerals out of the ground, it's been a labour intensive, dangerous job, with the majority of innovations being mechanical means of going deeper to extract more. The mindset on how to mine hasn't changed much either. Until now. The fourth industrial revolution is creeping up on the mining industry.

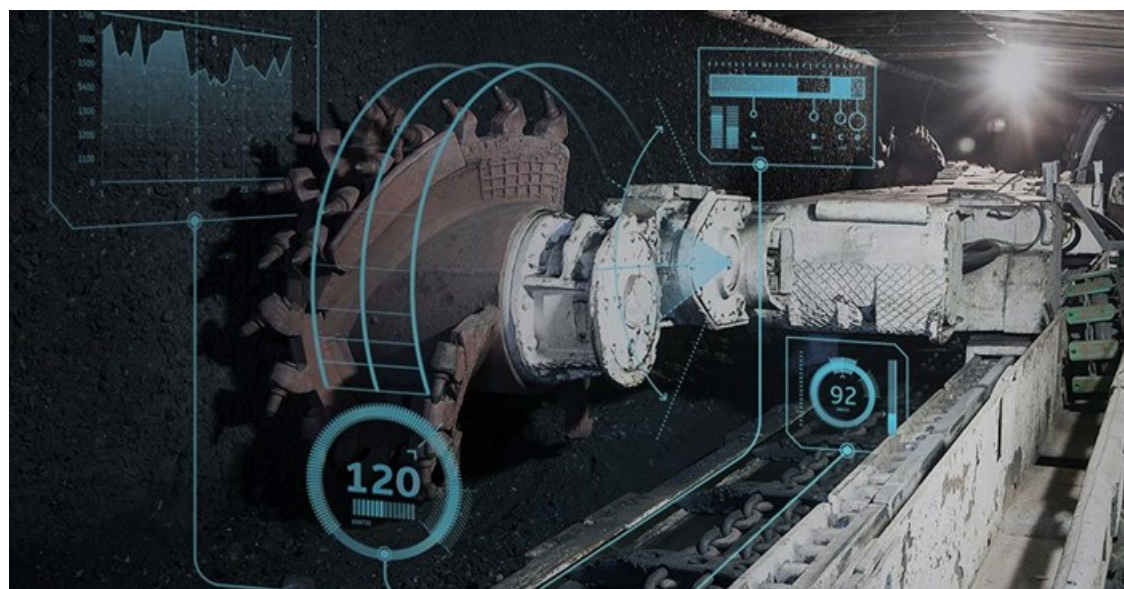


Photo: GE

Kevin Shikoluk, global strategic marketing leader, digital mine, GE transportation, says mining has evolved from a single industry into a complex collection of fragmented industries, thanks to the dynamic market forces that drive global supply and demand, among many other factors. Diversified mining operations—those specialising in iron ore or thermal coal, for example—face a completely different set of challenges than companies who focus on a single bulk commodities like gold or copper.

“For mining operations willing to engage in substantive change, this presents a unique opportunity to rethink strategies, unlock new productivity resources, improve sustainability, close functional gaps, and interact with key stakeholders in completely new and innovative ways. To successfully execute such a change, however, mining operations need to be prepared to make substantial cultural shifts—from strong leadership and increased cross-functional collaboration to the adoption of a long-term view and the incorporation of best practices from other industries.

“Companies who want to maintain relevancy need to be aware of the overarching industry trends driving these changes or risk losing ground to those who do.

Here are Shikoluk's seven trends driving digitalisation in mining:

Optimising equipment

Forward-thinking mining operations are less concerned with the purchase price of equipment and more concerned with total cost of ownership. The thought process has shifted from a “machine-only” mindset to the need for complete solutions that maximize asset health, reliability, quality, and lifespan. Investing in a holistic digital industrial transformation—one that includes intelligent asset strategies to collect, analyze, and optimise data from the edge to the cloud—helps drive safer, more reliable operations while also extending equipment life and minimizing the total cost of equipment ownership over time.

Attracting and retaining top talent

As the current workforce begins to retire, finding skilled labour to replace them is becoming increasingly difficult. Mining companies are struggling to attract and retain fresh talent, due in part to the antiquated systems and technologies many organisations still rely upon in day-to-day operations. Simply put, recent graduates are less likely to be attracted to an industry where core technologies have been outdated for a decade or more. To combat this, mining operations need to view the investment in leading-edge digital industrial solutions as more than a process improvement; it can be positioned as a competitive advantage and a recruiting tool capable of attracting top talent.

Streamlining operations

Productivity enhancements and operational efficiency have driven incremental improvement in the mining industry for generations. While the goals have remained the same, how a company goes about optimising operations continues to change as newer and better technologies come to market. Companies that do not embrace these new technologies can only improve operational efficiency so far, because they are limited by the outdated technologies they employ.

To make meaningful operational improvements that reach the next level of productivity gains, mining companies will need to change their thinking and consider transformative actions driven by the latest innovations.

For instance, nearly every mine operator will agree that increasing revenue and margins by optimising plant efficiency and throughput is a lofty goal. Today, new technologies make tackling these issues easier through process optimisation and KPI (key performance indicator) benchmarking. Mining operations that decide to approach digital industrial transformation holistically and embrace advanced technologies will be able to realize and capitalise upon these benefits sooner rather than later, giving them a competitive edge over those who do not.

Conserving energy and natural resources

Conserving the natural resources consumed during the mining process is becoming increasingly important to miners, their customers, and the communities they serve. Investing in more efficient equipment is a great place to start. But to realise even greater savings, mining companies need a complete picture of the operational data and insights that have a direct impact on efficiency. With this knowledge in place, operators can make informed decisions and meaningful improvements that have a direct impact on energy efficiency and overall operational efficiency.

Ore availability

As near-surface and open-pit resources are being depleted, miners are forced to either go farther into the mine or to expand operations into more remote locations. Given the increased costs associated with going farther and digging deeper, mining operations are considering another option: mining smarter. Miners who employ data-driven strategies start with a better idea of where to dig to meet pre-determined goals. Armed with robust data and powerful analytics, miners will be able to tell if a deposit or mine site can support their targets before digging even begins. This allows for more effective resource allocation and, ultimately, a better return on investment.

Ore quality

As ore becomes less available, variability in ore quality must be addressed. Miners need effective strategies to help them predict where to drill for the highest quality ore. If they are not meeting their quality targets, they need an intuitive dashboard mechanism that tracks and recommends process improvements as additional data comes to light. Mining operations also need to be able to share innovations across regions and functions by adopting a common core of systems, processes, and technologies designed to empower better decision-making and address fluctuations in ore quality in real time.

Improving safety

None of the trends discussed earlier in this article are more important than mine safety. The concern for safety extends beyond the mining company itself, and is of equal concern to employees, potential employees, vendors, suppliers, and customers. As social, environmental, and regulatory pressure increases, the mining industry is leaning on more proactive and predictive safety protocols driven by leading-edge technology to maintain the highest standards of regulatory compliance and safety.

All of these trends share one thing in common: to make the most of them requires more than incremental change, it requires a commitment to holistic digital transformation. Because in today's rapidly evolving and increasingly digital mining landscape, staying on top of the trends means staying ahead of the competition.

Source: [GE](#)

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