

How wearables can revolutionise mining safety

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Like the force that creates diamonds, the South African mining industry itself is under pressure through subdued commodity prices and global demand. Miners, therefore have to delve deeper and into more dangerous locations to extract valuable materials. To deal with these forces, there's a surging interest in digital solutions that improve the productivity and safety for mine employees.



Photo: Digital Construction News

The humble helmet sits at the centre of such innovations. It can become far more than merely a piece of safety equipment – with the likes of connected cameras, augmented reality apps, sensors to detect dangerous gases or record heat levels, accelerometers, voice-to-text microphones, and collision-detection to alert miners of any potential threats.

Modern, smart helmets represent a hands-free way for miners to improve the way in which they work.

This kind of technology fits within a broader digitisation strategy for the mine: where the primary goals are gaining clear visibility over one's resources and assets, optimising the flow of materials through the value-chain, and embedding greater automation into the mine.

Safety

Mining safety is an ever-present concern for mine operators, who are developing a strong appetite to adopt tools that can help to improve the safety of one's staff.

With sensors that alert mine managers to the early warning signs of heat exhaustion, rising gas levels or even seismic activity, the teams can take quick action to help avoid accidents or disasters.

Looking beyond the helmet, exciting innovations in mineworker bodysuits employ haptic technology, connected locally via beacons to other equipment in the mine. This can give miners a very tangible warning of potential collisions or accidents as early as possible. In the South African mines – where they are so hot and so deep – it is in those few seconds, that can mean the difference between disaster and a sign of relief.

Connected technologies also allow mines to satisfy all the legal, compliance and governance obligations. Head office gets automated reports that show the activity of their staff, and the various safety checks that are completed throughout the day, leaving no room for manual entry of information and no room for error.

Productivity

Advanced ‘hands-free’ technologies cannot be deployed in isolation: the true value of these innovations is unearthed when we pipe all of the data into the mine’s enterprise systems – such as ERP systems or mine operations scheduling platforms.

With rich data flowing back to the nerve-centre, mines can embrace analytics tools to crunch through data and derive valuable insights.

This could be from a predictive maintenance perspective, to understand when a piece of equipment needs servicing, or it could be from a mineworker productivity perspective – helping the mine deploy their teams in the most productive way.

The mines taking an early lead in digital transformation are automating the workflows, so that information from underground devices like sensor readings is ‘mashed up’ with images and voice notes from the teams and other data sources, to be ultimately fed into the company’s core operational systems.

By connecting various different datasets, mine leadership can build a far richer perspective on how the mine is functioning and decide on the best operational strategies for the future.

With relentless pressure on mining organisations to improve efficiencies and modernise their operations, the field of smart wearables will continue to gain traction in mining circles over the years to come.

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