

How digital innovation is future-proofing mining

 By [Anton Fester](#)

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The past year, whilst not as challenging as 2020, will be a year many will reflect on as a period when the world hasn't put its best foot forward. Rolling power cuts, war, inflation and climate change combined to create a perfect storm of negativity, weak growth and lack of jobs and prospects. However, there are clear signs that better tidings await in 2023, thanks to significant digital advances across sectors, including primary industries in South Africa such as mining.



Anton Fester, managing director at Sedna Industrial IT Solutions

The mining and metals industry certainly stands out as among the sectors with upside potential in the year ahead. We may all be focusing on 5G, but 6G and 7G (or so-called xG) will be next on the horizon. In this world, we expect substantially increased capacity and one microsecond latency communication, with data transfers effectively taking place at a quantum level.

From my perspective, being close to how we are innovating and harnessing data solutions within mines in Africa, these are very exciting times and one area of change will be critical communications ushered in by a growing use of LTE private wireless networks. I expect underground LTE to be a game-changer on mines and other industrial sites, taking them beyond the less reliable underground WiFi options. Also expect to see a rise in spectrum strategies for strategic industries and bespoke customer use cases in this environment as well.

The proliferation of private wireless networks will in turn drive greater advances in automation, enabling greater productivity and efficiency on sites and in factories. This digital transformation will propel African businesses into the digital future, creating even more opportunities for growth, skills development, and jobs. It will also greatly improve safety, which will be a critical feature of

any strategy as mines go ever deeper, which increases risks to workers' health, lives and equipment.



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Collaboration key in the new normal

Collaboration will be the key to success in this new normal. A recent Sedna partnership, for instance, saw Nokia's LTE private wireless networks installed and supported to deliver safer, more efficient, and productive solutions in operational areas in South Africa. These networks were built around a solution design and identification of a suitable device ecosystem, thanks to local expertise. Nokia has already deployed more than 70 private wireless mining networks with over 40 mining companies worldwide.

Sedna installed Africa's first licensed spectrum LTE private wireless network in South Africa. We also deployed Africa's first underground leaky feeder licensed spectrum LTE private wireless network (a "leaky feeder" is a communications system used in underground mining and other tunnel environments based upon coax cables). This system provides seamless communication underground and from underground to the surface. It does not refer to leaks in the normal sense

either, but just that the coax cables in the tunnels have gaps in their outer conductor so radio signals can radiate or “leak” in or out. It is a great example of smart digital technology in action to improve efficiencies and safety in mines.

This all comes as demand for wireless data solutions in remote areas increases by the day, with access a perennial challenge. Partnerships will again prove critical in overcoming these hurdles – for instance a solution lies in the stars – satellites actually.

Satellite powerhouse Globalstar is harnessing Band 53 in Africa – the mid-band spectrum resource that Globalstar offers to partners and customers that otherwise would not have access to the benefits of licensed spectrum. I have already experienced the power of this solution first hand and expect to see much more growth in the future as alternatives to the bandwidth access problem persist in Africa.

There is no doubt that spectrum is sorely needed for progress in Africa as everyone pushes for faster and more reliable speeds and the inherent benefits of 5G. More and more bandwidth will be needed as we move towards 6G and 7G and even further. Interestingly, the 5G variant of Globalstar’s Band 53 is known as n53. As all these advances take shape, there will be an increased need for strategic, smart spectrum deployment strategies. Companies should not wait before getting going with these deployments, or they will be truly left behind.



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The connected worker

Which brings me to the next big theme to watch – that of the connected worker. There are now increasingly better solutions to enable a lone worker a few kilometres underground to be tracked, checked, and kept safe. These systems may even have algorithms to detect physical stress and fatigue by monitoring core body temperature of workers and heart rates.

With safety an ongoing priority, we are not far off from seeing solutions such as vibration detection to pre-empt any possible weaknesses in underground structures, detect abnormal seismic activity and prevent dreaded fall of ground incidents well before anything happens. These communication networks will run through mines like veins in a body, creating an entire view of what’s happening in and around mined areas.

Greener solutions

Another key theme right now is adopting greener solutions, and technology and data will have a key role to play. All businesses wanting to benefit from the exciting advances in the digital age will, of course, need to reduce their carbon footprint. There is little doubt that one of the major themes in 2023 will be how companies have moved from talking about ESG initiatives to actually implementing them.

Automation, better use of data, partnerships all combine to aid this drive to greener solutions.

At the end of the day, South Africa and Africa need to ensure their mines are safe, efficient, profitable, and environmentally friendly. We are on a path to do that thanks to the power of technology. Perhaps 2023 will not be as bad as 2022 after all – we live in hope.

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