

Maximizing ROI and Sustainability in Mining Through Digital Transformation

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Life Is On

Schneider
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Our mission in mining

We help the mining industry adopt a culture of innovation that ensures long-term sustainability, productivity, energy efficiency, and value chain excellence.

Our digital-first approach integrates automation, power, and process solutions. The result of this connected consolidation is enhanced stakeholder return and a more sustainable, efficient operation.

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Challenges

Mining operations today face five main challenges.

License to operate

In addition to adhering to the highest safety standards, mining companies today need to contribute to community development and environmental sustainability. Expectations for responsibility are embedded in the industry's social license to operate; mining companies must navigate stakeholder pressure while driving down OpEx.

CapEx and OpEx constraints

The demand to remain profitable in a very competitive landscape, all while doing more with less, is another hurdle mining companies must face.

Value chain responsiveness

Mining operations need to be able to swiftly pivot to the traditional value chain. Market changes and price volatility undergird the values that digitization brings to the mining industry, including improved connectivity and flexibility.

Workforce shift

By 2025, millennials will comprise 75% of the workforce. As experienced employees retire, it's important to transfer their knowledge by leveraging technology. Right now, however, the mining industry needs to attract new talent and improve gender diversity.

Culture of innovation

As is true in many industries, there's a relentless drive to accelerate digital transformation, technology adoption, and innovation to remain competitive.



The digital transformation — the promise of new technology

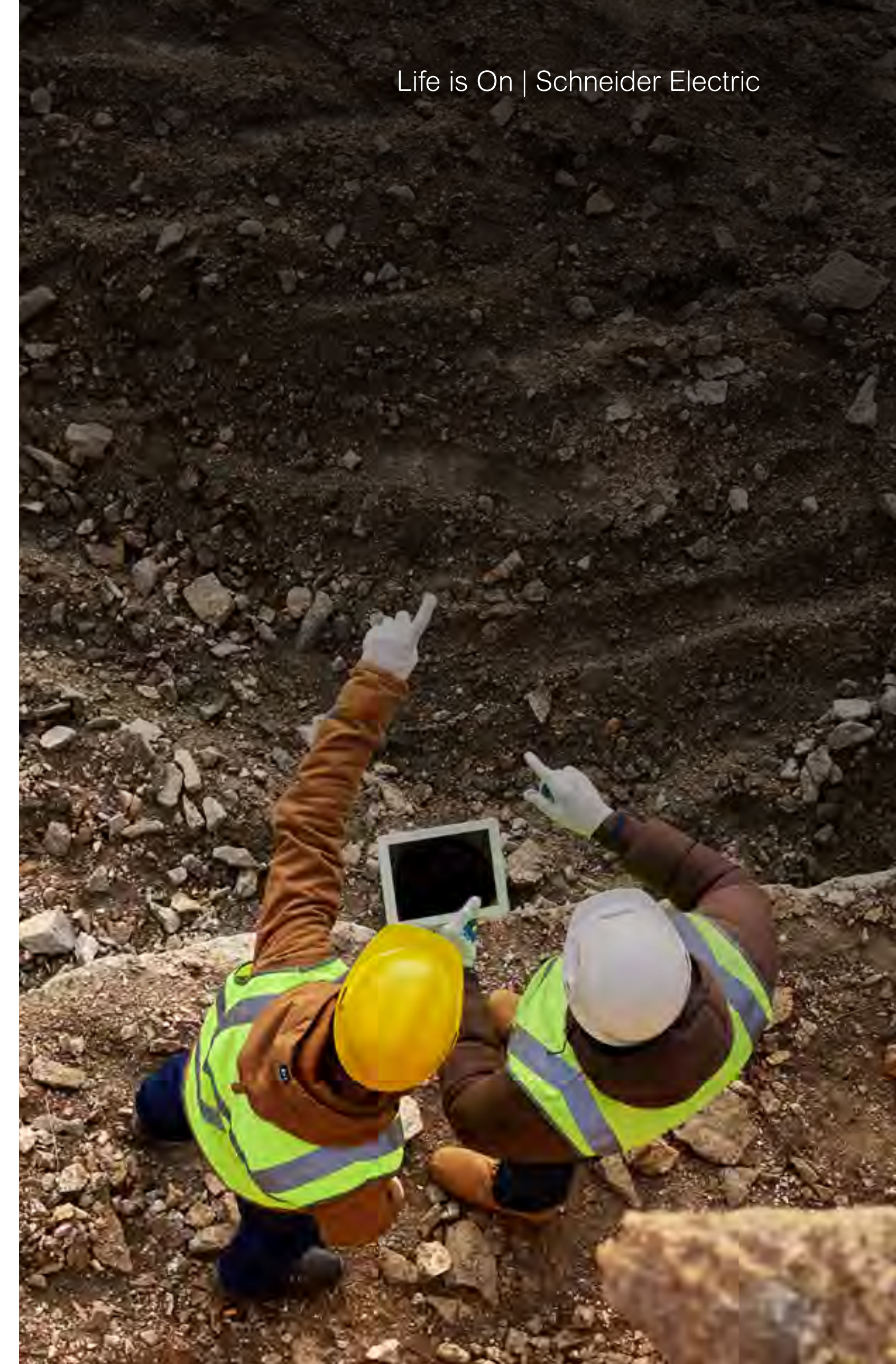
Digital technologies and IIoT

The digital transformation is happening all around us, and the mining industry has taken notice. The advantages of a digital, IIoT-connected environment are necessary not just for survival, but to attract the best and brightest of the next generation of workers. It's also a key contributor in maintaining and improving sustainability.

From data to wisdom

Smart devices and sensors are generating lots of data from processes, from both fixed and mobile equipment, and with unprecedented granularity. They even allow data to be collected from things such as fire extinguishers and personal protective equipment that are not typically connected

to a network. But massive amounts of data alone is not an answer. Companies need to derive real business value from this ocean of data and turn it into meaningful, insightful information – and that is achieved thanks to intelligent software and technology that can transform data into information, information into knowledge, and ultimately knowledge into action that advances efficiency and profitability.





Mining supply chain simulation can cover a planning horizon of up to

30 years.¹



A single haul truck can have more than

300 sensors²

collecting and pushing data on its location, condition, and performance.²

¹ "Rio Tinto's big data play delivers promised ore," itnews, 2014.

² "Rio Tinto digs for value in data," ZDNet, 2015.

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Why partner with Schneider Electric?

We empower through digital transformation to ensure our customers' competitive advantage.

We have an unrivaled ability to integrate power and process throughout the entire value chain — from design, planning, and scheduling to operation, production, and maintenance.

- Our deep industry knowledge features demonstrated value through an mining-specific application portfolio.
- We offer the greatest breadth of smart connected products, edge control solutions, and analytics that cover the entire industrial automation space.
- Our strategic partnership with AVEVA™ allows us to build digitally connected, unified environments quickly.
- EcoStruxure for Mining delivers IoT-enabled solutions that drive operational and energy efficiency in the mining industry.



Resiliency through EcoStruxure

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EcoStruxure for Mining

What is EcoStruxure for Mining?

EcoStruxure is our IoT-enabled architecture designed to leverage the digital transformation. It connects existing sensors to your fixed operations and mobile equipment, collects data, and analyzes and presents that data. This allows you to take real-time corrective action in the short term so you can optimize your entire ecosystem over the long term.

How are we different?

1. We have an unmatched portfolio of solutions and hardware.
2. Our solutions are interoperable; open standards allow for seamless integration of third-party systems and devices.
3. Our offers enable users to access data on-premise or via the cloud.

Innovation At Every Level

We have leveraged advanced technology in IoT, mobility, sensing, cloud, analytics, and cyber security for solutions that deliver Innovation At Every Level.

Connected products

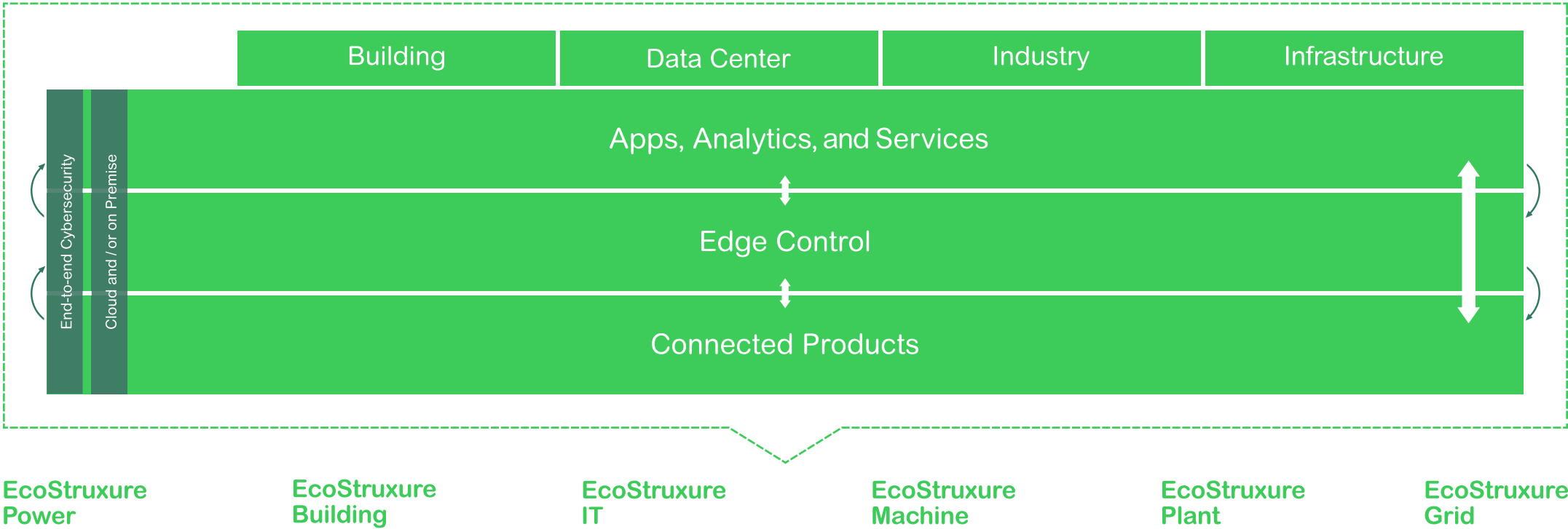
Field devices with embedded intelligence such as sensors, circuit breakers, meters, variable speed drives, and process instrumentation provide the link to real-time data that is essential to higher-level control and decision-making.

Edge control

Most mining processes are mission-critical, so control of devices at the edge of the IoT network is a must. This essential capability provides real-time solutions that enable local control at the edge, increasing safety and uptime.

Applications, analytics, and services

Sophisticated problem solving and analysis at the enterprise level optimizes business operations and maximizes results.



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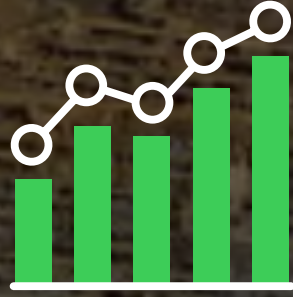
Four values enabled by digital transformation

Discover the wide array of benefits unleashed by digital transformation.

Mining industry leaders will achieve their biggest successes by embracing digital technologies like IIoT and advanced analytics. We see four main areas that digitization will improve:



Maintain license to operate
Provide clean, safe, and reliable operation while ensuring compliance and brand image by increasing end-to-end sustainability and corporate transparency.



Improve asset efficiency
Digitally transform operations for reduced OpEx and resiliency. Improve process and technology interoperability through integrated power and process for data-driven decision-making.



Optimize value chain from resource to market
Increase value chain flexibility, agility, and predictability to boost competitiveness in a volatile environment.



Empower workforce
Retain knowledge, eliminate information silos, improve operator safety, and provide virtual learning programs, immersive training, and collaborative digital environments that allow for informed decisions in real time.

Maintain license to operate

Digital transformation helps our clients transition to renewable energy while facilitating clean, safe, and reliable operation. In addition to allowing mining companies to more easily meet compliance goals, digital transformation enhances brand image by increasing end-to-end sustainability and corporate transparency.

The digital transformation is greatly enhancing mining companies' social license by:

- Improving compliance and safety of people, buildings, and assets with integrated safety and security

- Eliminating power incidents and supporting business continuity through reliable power distribution and automation
- Increasing corporate sustainability and transparency with a comprehensive strategy and implementation plan

- Optimizing resource usage with real-time control
- Decarbonizing and reducing energy costs while making it easier for companies to manage a complex energy mix
- Protecting business, assets, and people with end-to-end cyber security



Improve asset efficiency

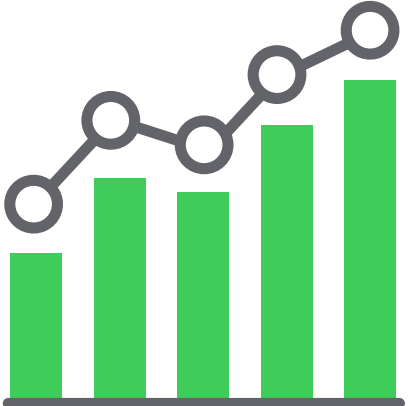
Digitally transform operations for reduced OpEx and resiliency. Improve process and technology interoperability through integrated power and process for data-driven decision-making.

Digital transformation is improving asset efficiency for the mining industry by:

- Mitigating information silos by unifying key power and process across the value chain
- Minimizing production losses through integrated asset performance

- Allowing for the real-time analysis of performance indicators through a suite of optimization solutions
- Reducing process variability and increasing profitability with state-of-the-art automated process control

- Improving operations efficiency by optimizing power and process engineering, and designing via simulation
- Decreasing costs by minimizing maintenance OpEx with an integrated, mobile workforce



Optimize value chain

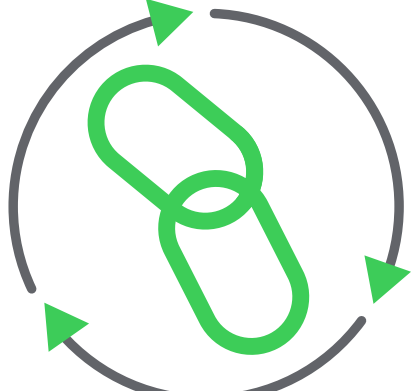
Increase value chain flexibility, agility, and predictability to boost competitiveness in a volatile environment.

Digital transformation is optimizing the mining industry's value chain at every level by:

- Improving decision-making by embedding key processes across the value chain through integrated operation

- Optimizing value chain visibility with unified planning and scheduling solutions
- Reducing transfers, damages, and bottlenecks in supply lines with automated material handling solutions

- Improving response agility with real-time inventories that allow for rapid containment measures and optimized immobilization



Empower workforce

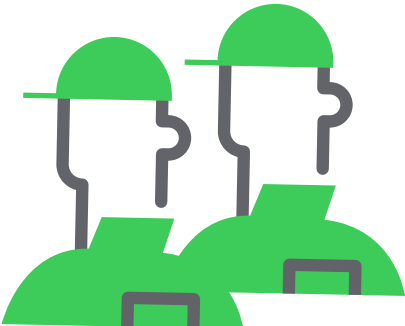
Retain knowledge, eliminate information silos, improve operator safety, and empower the workforce through virtual learning programs, immersive training, and collaborative digital environments that allow for informed decisions in real time.

Digital transformation greatly enhances process management and empowers all levels of the mining industry’s workforce by:

- Allowing for rapid training of new teams on safety and other best practices via immersive virtual training

- Enabling faster and better-informed decisions with instant, hands-off augmented reality digital diagnostics and maintenance
- Mitigating information silos for improved decision-making in a collaborative environment

- Equipping field workers with essential data on operations and maintenance, equipment diagrams, and operating history using digital, current, and valid technical and process information
- Lowering training costs with fast, easy access to training modules, especially during production stoppage



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[Tüprag gold reserve enhances safety and reliability](#)

[GTK Mintek promotes mining circular economy with automation modernization and digital twin solution](#)

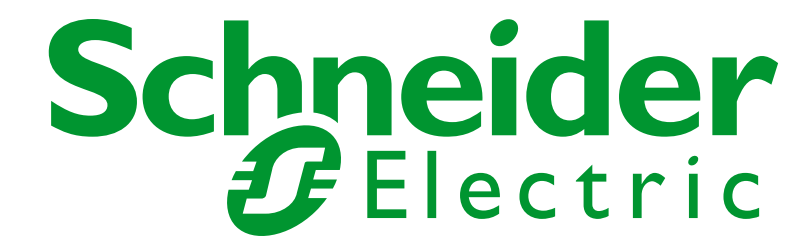
[First Quantum Minerals reduces OpEx](#)

[Lonmin Mining centralizes operations](#)

[MMG Limited increases asset utilization by 10% globally](#)

[Black Rock Mine Operations consolidates its value chain](#)

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