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Knowledge Systems and the Mine of the Future

Today's mining industry faces numerous challenges ranging from higher costs to new environmental and social governance requirements. Much has been done in the last decade to increase efficiencies, elevate productivity, and prepare for the inevitable shifts in mineral prices. The use of technology to streamline geological interpretation and modeling of ore bodies, the implementation of sensors to collect data that feeds into condition monitoring systems, fleet management systems, data historians like Pi, the use of PLCs to automate processing plants, and the digitalization of multiple business processes to reduce labor costs and increase collaboration have all resulted, in most cases, in increased productivity and lower all-in production costs. However, the challenges are getting bigger as we move into a future that will depend on "critical minerals" to power the clean energy economy. Higher labor and energy costs, remote locations, geopolitical challenges, new and more complex metallurgical processes, deeper ore bodies, and more restrictive ESG rules will keep impacting mineral production costs.

To remain viable, the mining industry must identify even more efficiencies in its value chain. However, how do you optimize a process that has been optimized multiple times over the past decade? How do you keep finding new opportunities for efficiency and productivity? The answer is data, and more specifically, Big Data. The good news is that mines have been collecting Big Data over the past few decades, with its volume and variability increasing exponentially. The challenge is being able to leverage Big Data.

SourceOne Enterprise Knowledge Performance System is a knowledge system specifically designed to leverage mining Big Data. It organizes data and provides it with context to transform it into information. New information, experiences, and insights are continuously added to generate and capture knowledge. This enables the identification of new efficiencies that were not possible to identify by the human brain alone and provides real-time actionable information delivered to any decision maker, when they need it, across any domain of the mining process.

The Mine of the Future requires a Knowledge System like SourceOne EKPS at its core to be able to process data in real-time. This system can automatically absorb and contextualize data with the help of a domain ontology, and then use advanced analytics, AI, and Generative AI, such as machine learning and Large Language Models (LLM), to make critical decisions. It can automatically switch off a SAG mill based on sensor data processed through predictive failure algorithms. The Knowledge System acts as the central coordinator for all sub-systems controlling mine operations like mobile equipment, process plants, maintenance, and comminution circuits. The Mine of the Future cannot function without a Knowledge System, and SourceOne EKPS is that system the mining industry needs to push into the future by enabling it to leverage its most valuable asset: DATA.

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SourceOne Enterprise Knowledge Performance System

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SourceOne System Benefits