Mining enters the EAM era

Smarter enterprise asset management (EAM) solutions that consolidate control of software, systems and services have become increasingly essential in today's connected mine as smarter machines, IoT sensors, and networks proliferate

By Craig Guthrie

EAM software's ability to give real-time insights into an asset's lifecycle, while minimising costs and enhancing its productivity, simply aren't replicable by human intervention alone.

Early adoption of new technologies and changes in management processes are never easy, but mining companies that fail to embrace the new EAM systems transforming maintenance and control of operational assets run the risk of lagging behind.

The potential rewards are great – as illustrated by a recent case study with a large mining customer by Paris-headquartered automation firm Schneider Electric and British technology company AVEVA.

Schneider and AVEVA found that if a miner moved from siloed operations across multiple different sites to a single integrated operations centre (IOC), EAM could deliver a potential return of more than €220 million (US$266 million) over six years – from an initial investment of just €22 million.

"We are increasingly seeing larger mining companies requiring the integration of platforms from many different suppliers, into a single operations management platform," says Craig Hudson, Schneider Electric's business development manager for Mining Metals and Minerals. "Having a holistic view of the entire operation or enterprise enables informed decision-making to best meet market requirements."

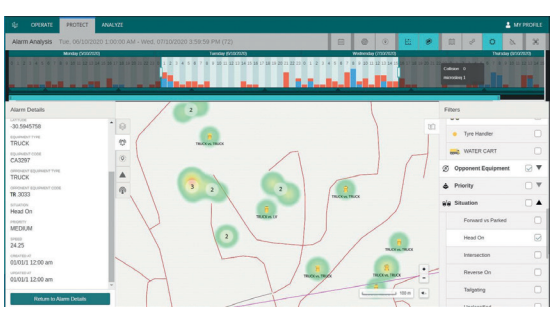
OPEN PLATFORMS

Hudson adds, however, that the openness and flexibility of the systems selected by the mining companies is of critical importance when designing these integrated operations centres.

"The benefits of using internationally accepted open standards reduces integration costs, and shortens project delivery times, while reducing OpEx and mitigating information silos among different areas during operations," says Hudson.

He adds that standardised interfacing options are essential when selecting platforms from different software vendors.

"By using open software, it is possible to gather data from multiple software and hardware sources, and integrate this data into a single database, delivering one version of the truth."



Hexagon launched its Mine Enterprise CAS Analytics in 2018

Hexagon's Geotech monitoring system can be integrated with its CAS Analytics

If implemented successfully, this "one version of the truth" can integrate all business decision-makers, metallurgists, planners, schedulers, process control, operational and maintenance personnel into a single operating environment, with a significantly beneficial effect on workflow.

"Connecting solutions together with these systems not only provides the industry with better situational awareness and insights but also enables the industry to begin to automate operational workflows," says Robert Daw, chief technology officer at Swedish mining technology firm Hexagon Mining.

Daw says that, for instance, an autonomously connected ecosystem such as Hexagon's geotechnical monitoring solution can provide outputs to a collision avoidance solution when there is movement in the walls or a rockfall.

INTO THE CLOUD

The wider adoption of technologies such as cloud computing and artificial intelligence has brought forward EAM's take-up in the industry. Some observers say that, after years of speculation over its abilities and potential, that the technology is coming of age.

"It is early in the overall mining sense, but many major mining houses are starting to look at cloud-based technologies and some even have a cloud-first strategy, which enables operations to take control of their operational management solution and leverage the computing capacity of the cloud to generate insights and process spatial information in a smarter and faster way", notes Daw.

"An increase in quality of data is enabling the mining industry to leverage the power of AI in several user cases, from computer vision to analysing large transactional data sets."

Hudson also notes that while currently too many mining, metals and minerals markets still host the data on-premise, this will change with the ever-increasing acceptance of cloud-based solutions in other parts of their operations.

"Many of these organisations are already using cloud-based solutions for IT infrastructure. There will be a convergence of the IT/OT [operational technology] environments, and the overlapping of software within these realms will accelerate the acceptance of cloud-based solutions in the future," he adds.

> "Having a holistic view of the entire operation or enterprise enables informed decision-making to best meet market requirements"

ALL CHANGE

While senior management can often more immediately see the benefits of having a single view of the operation, in some instances, lower-level operational staff can be traditionally more siloed in their operating mindset. Initially, some employees are resistant to operating mines based on business KPI's versus traditional process control philosophies.

Hudson points to the example of a leading supplier of high-grade manganese into the global market that implemented an IOC three years ago. In this case, some initial gains were achieved from the integration of multiple sites into a centralised process control facility, but it failed to deliver on its full potential.

Only after proper training and guidance were all operational staff at all levels able to see the clear advantages of integrated operational management. Realising that they were not maximising an integrated management environment's full potential, the company embarked on a second phase.

In this phase, third-party platforms, both hardware and software, were fully integrated into a single IOM environment, allowing an end-to-end visualisation of the entire mining operation.

"This enabled the decision-makers to make informed decisions, based on real-time data, having a complete picture of the entire mining value chain", says Hudson.

Real-time capabilities to manipulate information and control are a proving a critical driver for the demand for EAM systems.

"The Industry is no longer satisfied with post-production reports," says Daw. "There is a need to know what is happening right now and for it to be consumed easily from mobile devices. Data is considered power, power to react and make in-the-field decisions that can change an event's outcome."

With so much data and so many devices in today's mines, it is "impossible to fully realise the potential of these systems without an overarching hub connecting sites with head office and to each other, for benchmarking and trend analysis," he adds.

PUSHING THE ENVELOPE

Once change is achieved, and new EAM procedures are accepted by all management levels, software developers say that users often surprise them in adapting the solutions to push into new paradigms of cost savings and efficiency.

"It often amazes me how innovative people in operations are when it comes to using Hexagon solutions, leveraging hardware or software in ways we never intended for it to be used," says Daw. "Often, users find better ways, and it is pleasing to see how far our technology can be pushed, which gives us great insights into how far we can continue to push product roadmaps".

An emerging area that will drive demand is EAM systems' ability to efficiently manage and report requirements for company-wide greenhouse gas emissions reporting.

"The mining, minerals and metals market faces a transformational moment impacted by trends such as sustainability, market volatility, workforce shift, and shorter investment cycles, impacted by high capital costs and ever-increasing operating and maintenance costs. Today, more than ever, those challenges are of greater significance," says Hudson.