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Digital Leap In Mining

8th Apr, 2021



Ever thought you could have end-to-end visibility of what's occurring in a mine in a far flung location? You may be the head of mining operations with a large standalone miner or a government official tasked to check every stage of the mining chain. Overseeing an activity as diversified and convoluted as mining isn't easy. But at the same time, it is desirable and compatible with all actors in the ecosystem. And, it's possible with an interconnected solution- one that is scalable and configurable for achieving pit-to-port optimization. Here, we are talking of a seamless IT-OT-ET (Information Technology-Operational Technology-Engineering Technology) convergence capable of integration with vendor agnostic legacy systems. Stakeholders on either side of the spectrum can mine the gains.

For miners, it balances higher productivity and efficiency with safety and sustainability. The state machinery, too, can benefit from such a seamless solution that enables a robust regulatory oversight by tracking all actors, issuing permits, ensuring compliances and even auto calculating revenues.

The Need for Tech Led Transition In Mining

Historically, mining has this perception of a capital and labour intensive industry where the mine-to-market chain is not fully integrated and works in siloes. Mining functions span locations and occur in isolated processes. Many miners of global repute have embraced automation of such processes. Yet, the technology stacks remain unconnected. Leveraging intelligent technologies just for moving autonomous trucks within mines will not suffice. All locks of automation can be unlocked only when automated solutions connect people, processes and equipment 'real time'. With innovations in **Artificial Intelligence (AI)**, Machine Learning and the **Industrial Internet of Things (IIoT)**, the mining sector can potentially save \$373 billion by 2025 through automation of machinery operations, improved traceability and tapping the power of real time data and analytics.

Unlocking Possibilities With End-To-End Mine Management System

An end-to-end mineral management and accounting system can inject automation to the whole gamut of mining operations. Stakeholders should think of automation as an embedded, fundamental capability to optimize the mine-to-market chain for the best possible outcomes. In this backdrop, the **Integrated Mines and Minerals Management System (i3MS)** pioneered by Odisha, an eastern Indian state, in 2010 has stood its ground as a phenomenal solution. Owing to its startling success in tracking the life cycle of ore from extraction to evacuation and beyond, **i3MS** has been replicated in other mineral laden states like Bihar and Jharkhand as customizable solutions.

Striking Takeaways of i3MS

- It ensures strict compliance with multi-layered mining laws as every single ton of ore moved from pit to port is accounted for
- The system alone handles around a third of the total output of 900 million tons of major minerals and coal produced in India
- It offers online applications of all administrative approvals, tracks mineral transportation from the source to destination, facilitates online payment of rents and auto calculates royalty and other statutory payables
- It is capable of seamless integration with the Freight System of Railways, ports, regional transport office, electronic toll collection and tax registry
- The use of IoT devices ensures that the weight of minerals is auto captured in more than 1300 despatch points every day, ruling out the possibility of manipulation or duplication
- The solution enables verification of clearances, validity and returns, generation of e-permit, system generated e-transit pass, electronic verification and surveillance check

gates on identified routes

- It operates round the clock, recording every single transaction in the mining value chain

I3MS as Light House To Futuristic Automation

Solutions like i3MS stand out from the clutter as they intersect technology and policy narrative to deliver outcomes. So, be it Ease of Doing Business (EODB), setting new paradigms in safe and sustainable mining or preparing the ground for [Industry 4.0](#), an i3MS fits into any vision.

An automated system for mineral management can help achieve pit-to-port optimization, enhancing productivity, streamlining processes and strengthening regulatory oversight.

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— Priyadarshi Nanu Pany (@NanuPany) [April 6, 2021](#)

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Such interconnected systems can be enhanced with intelligent technologies like Robotic Process Automation (RPA), [Data Analytics](#) (Predictive, Descriptive, Diagnostic and Prescriptive) and scenario modeling. These technologies will reinforce autonomous capabilities ‘inside out’ of any mining activity by enabling understanding of data flowing through operations, building situational awareness and developing near real time insights. From exclusive connected systems to inclusive insight driven outcomes, mining needs a deeper dive in automation. Let’s create that ecosystem of ‘digital oneness’. The posterity will remember us for how efficiently we ‘mined’ over ‘matter’.



AUTHOR:

Priyadarshi Pany

CEO & President