



Connected
workers in the
mining industry



Mining companies are looking to improve the productivity, safety, and efficiency of mine operations with the help of readily accessible digital technologies. Digital devices such as tablets, smartphones, smartwatches, hands-free wearable AR with access to IoT and analytics platforms help in capturing real time data and communicating with appropriate systems. Many companies initiating connected worker programs have a range of initiatives with a strong focus on mobility for operations staff. However, a connected worker program is more than a mobility program. It is a true digital transformational program requiring alignment of the business strategy for connected workers and the technology to make it happen.

Use cases in the mining industry:

The following section covers two key aspects of adopting digitally connected workers in the mining industry. The first one is improving operational efficiency, and the second one relates to worker health and safety.

Operations: Availability of key equipment is very important to improve production and maximize the yield of all resources. The connected worker solution can play a major role in reducing maintenance time, so that equipment is up and available for production faster. Here are some scenarios where the connected worker solution can help in reducing maintenance cycle time:

- Report visualization (photograph and video) of field issues to experts to figure out error points in the central command center and take immediate corrective measures
- Remote assistance in terms of two-way audio/video to field workers on a maintenance work request
- Real time process data to field team to verify performance of equipment
- Digital check list for the maintenance work order

- Digital copy of instructions, workflow, schematics and manuals to carry out field jobs
- Online data entry of checklist for equipment field inspection
- Capturing plod cards data entry in operations and shift logs

Environmental health and safety: Below are some of the scenarios where worker health and safety can be addressed by smart wearables and a connected worker solution:

- Monitor and track employee health and fitness parameters and notify when there is a deviation
- Create audit and compliance trail for employees
- Notify in the event of safety violations by workers, like helmet removal
- Employee location tracking and sending alerts when an employee enters a restricted area such as blasting site, in order to ensure that only authorized workers operate in high-risk areas
- Monitor employee alertness and fatigue level in real time, with the goal of reducing workplace accidents
- Send safety alerts to field employees in case of hazardous environmental conditions like gas leak detection, leakages in tank, spillage, etc.
- Alert ERT (Emergency Response Team) for safety interventions in case of incidents, by providing safety coordinators immediate details on location and status of workers

Implementation journey: The guidelines and implementation journey of the connected worker solution is explained below:



The connected worker solution can play a major role in reducing maintenance time, so that equipment is up and available for production faster.

Foundation	Quick wins	Integrated	Enhanced	Value realized
<ul style="list-style-type: none"> • Site survey • Validate worker collaboration and connectivity requirements • Assessment of IT infrastructure • Technical options evaluation • Dominated by PoC and pilots of user experience (UX) • Recommended strategy and framework for both short (quick wins) and long term scenarios • Basic security and authentication in place 	<ul style="list-style-type: none"> • Worker awareness and audio-visual communication • Field mobility inspection, information access for maintenance and operations • Operations Data entry (shift logs, plod cards, etc.) and data viewing • Safety deviations and alerts • High level of UX and work experience • Mobility authentication and windows integration • Process performance is visible along with basic reporting on work KPIs 	<ul style="list-style-type: none"> • Foundation business practices and technology in place • Offline data storage and synchronization • Two-way peer to peer field status from workers and supervisors such as short interval control, dispatch instructions, etc. • Fully integrated to backend platforms of IoT, Analytics, Business Systems (ERP/EAM, OHS, Content Management, etc.) • Basic workflow embedded between related systems 	<ul style="list-style-type: none"> • Enhanced health monitoring with fitness and bio sensors for fatigue, etc. • Enhanced sensors for monitoring environmental conditions (noise, dust, etc.) • Image analysis of material for hazardous disposition and related alerts • Proximity detection capabilities with sensors • Enhanced with position and location tracking sensors • Augmented Reality enabled digital twins 	<ul style="list-style-type: none"> • Matured levels of connected worker development and Operations • Continuous improvement of UI and usability of applications • Edge communication between connected worker and machines via edge technologies • AI enabled technologies embedded with enhanced compute • Benefits tracked and KPIs measured

Key levels Level 0 complete ▲ Level 1 complete ▲ Level 2 complete ▲ Level 3 complete ▲ Level 4 complete ▲

Some key considerations:

The following points are important guidelines while adopting the connected worker solution:

- Identification and prioritization of use cases
- Use of an agile approach to ideate, implement and support. Start with a PoC based solution before implementing the full blown solution
- Availability of IT infrastructure such as servers, networking, internet, deployment platform (public cloud/Intranet based)
- Ensure data security measures are in place
- Appropriate selection of smart devices, which need to be battery powered, rugged, dust proof and best suited to the mining industry environment
- Ensure battery life, compatibility and connectivity of smart devices
- Ensure well defined user experience (UX) design is in place
- Identify the platform for deployment, like public cloud or internet cloud

Benefits:

The following key benefits have been identified in a connected worker program:

- Improved safety of field workers leading to reduction in safety incidents
- Providing the right information to enable field workers
- Digital records of data increases productive time by removing the need to travel to central locations for guidance and communication
- Improves opportunities for storage, compliance monitoring and data use

- Enhances real-time collaboration between field workers and office workers whether at site or headquarters, thereby increasing the efficiency of both

Conclusion:

In order to implement a connected worker program successfully in the mining industry, these factors need to be considered:

- Use of Agile implementation approaches for design, implementation, test and support
- The value proposition of the use cases being implemented
- The benefits these use cases will bring
- Embedding these use cases into the day-to-day operational workflow
- The usability and utility of the apps and technology provided to users
- The proper change management program being in place
- Security not being compromised

Connected worker platforms are being implemented in mining, as well as O&G, utilities and other industries. Companies in mining should be looking to the connected worker use cases and technology developed in other domains to learn from their experience in implementing successful connected worker programs and broadening the number of use cases potentially utilized in mining.

Connected worker program enhances real-time collaboration between field workers and office workers whether at site or headquarters, thereby increasing the efficiency of both.

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Leon has over 30 years of experience in the IT industry, which includes over 20 years in the Mining, as well as 4 years as a geologist.

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References:

<http://reports.weforum.org/digital-transformation/wp-content/blogs.dir/94/mp/files/pages/files/dti-executive-summary-website-version.pdf>

<https://ohsonline.com/blogs/the-ohs-wire/2017/12/the-connected-worker.aspx>

<https://www.soti.net/resources/blog/2017/five-things-holding-your-business-back-from-a-competitive-mobility-edge/>

<http://blogs.webspiders.com/5-reasons-why-enterprise-apps-fail-2/>

<https://www.vaadata.com/blog/2017-statistics-web-based-attacks-mobile/>



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