IoT dashboard implementation into mining operations using encrypted wireless mobile telecommunications and cloud infrastructure

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ABSTRACT

The value of timely decision making, system optimisation and continuous improvement is well understood from productivity achievements gained in industries more broadly. Mining operations are increasingly becoming data rich but remain relatively information poor. Getting information to key people who can drive improvements and translate that to value is the critical step in the digital transformation of the industry.

Information systems can now be implemented that allow fit-for-purpose visibility of high value operational issues using one-directional passive flow of information to Internet of Things (IoT) dashboards though encrypted wireless mobile telecommunications networks and cloud infrastructure. This becomes a viable alternative to the trending and historian software solutions typically offered by higher-end Distributed Control Systems (DCSs) for high value data streams. The cloud servers that host the dashboards can be accessed using a non-proprietary intranet browser and are able to generate reports, provide downloadable data and notify key decision makers through a hierarchy of notification. The IoT devices are sensor agnostic and can be easily integrated with legacy equipment commonly found in long life-of-mine operations.

This type of information system can sit adjacent to any existing control or reporting system, provided the site has access to a mobile network. With smaller operations, that may not have an integrated control system or historian type functionality, this adjunct solution allows improvements to be driven at the supervisor or shift level, where anecdotal day-to-day decisions may be made on empirical experience, rather than via evidence-based data analysis.

This paper gives a case example of how this technology was implemented at a small mining operation in central Victoria and discusses the advantages and challenges that were experienced in its implementation and how this technology can be applied more broadly.

Key Words:
Mine Internet of Things, Mine and Process Optimisation, Information Systems, Wireless Technologies, Smart Monitoring Systems