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Need For Mobility In Mining

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Abstract

Productivity improvements have become the top priority for the Mining Industry. This is a consequence of a steady weakening in commodity prices and the fact that newly explored ore bodies are difficult to exploit and are found in remote locations. This has been compounded by a rash of factors like rising energy costs, increased focus on Health, Safety & Environment compliance, pushing the cost of mining the ore north. In response, the industry is adopting Digital Mining concepts that include assessing a variety of technologies that improve collaboration and productivity, and increase safety and security several fold. The growing role of mobile technologies in this scenario cannot be undermined. Investments in mobile technologies could very well be the focus of the next phase of investments for the industry.

Introduction

The Mining Industry could take a page out of the learnings of other industries where mobile technologies have been at the core of innovative solutions to productivity improvements. Embracing mobile technologies has several direct and indirect outcomes. These range from better integration of functions across the enterprise, creating a more responsive organization and the ability to operate, monitor and manage remote sites with lowered risk.

We believe that there are five key factors that will contribute to mobile adoption across the industry

Improved work-life balance in the mining industry:
A mobile-savvy workforce is emerging. This workforce wants to use mobile technologies to improve efficiency and productivity.

Anytime, anywhere access to information:
Workforces are always on the move. They need access to information, regardless of where they are.

Demand for instant collaboration
Today, roles and functions are getting specialized. There is a need for virtual collaboration to leverage the collective intelligence within and outside the organization.

Growing safety and security concerns:
Mining operations must continuously improve safety and security conditions in order to lower risk to employees and meet regulatory requirements.

Productivity and business process improvements:
The industry must deliver higher shareholder value and must, therefore, address cost savings and improve productivity.

The foundation for mobile adoption rests on the organization's ability to create mobile platforms that can scale and operate securely across devices and heterogeneous networks while allowing systems to work online as well as off line. Regardless of which solution is adopted, it must be integrated with legacy enterprise applications for it to be effective and have impact (see Table: "Impact of Mobile Technologies in Mining").

Impact of Mobile Technologies in Mining

Exploration	Operations
• Personnel and activity tracking	• Production performance tracking and reporting
• Online access to geo maps	• Quality inspection, audit and reporting
• Sample Management and Reporting	• Stockpile Management
• Posting field observations and annotations	• Activity co-ordination, sequencing, updates
	• Ore transportation tracking

Improved Work-life Balance in the Mining Industry

Employees are using mobile devices in their personal lives to manage their shopping, banking, social interactions, information and entertainment needs. They have become comfortable with the technology. Now they want the same with their enterprise applications. They want to connect to anything and everything to improve efficiency in the workplace while staying mobile.

The mining industry recognizes this. It has begun to embrace the Bring Your Own Device (BYOD) culture to improve

(Note: sequence does not signify the importance)

environments for a tech-savvy generation of employees. With BYOD, employees can work without disrupting their personal lives while gaining access to enterprise data, applications and processes, thus creating a work-life balance.

Embracing mobile technologies has two positive outcomes. First, it makes the business more responsive and competitive. Second, it brings down employee dissatisfaction and churn.

BYOD processes also reduce the burden of capital on the business as employees bring their own mobile devices. They can now be willingly moved away from dedicated office space and equipment. For the business it means the cost of managing and maintaining desktops and related infrastructure are dramatically reduced.

Anytime, anywhere Access to Information

With mining operations being geographically dispersed, the industry has traditionally faced a challenge to accurately aggregate data and share it across the enterprise. The lack of real-time reporting has hampered the execution of mine planning, collaboration and accurate decision making.

To overcome this, the industry created portals to provide access to data. However, these required employees to be present at fixed points (at home or at their work station) in order to access the data. The new trend is to make these portals available over mobile devices. Employees don't have to be constrained by their geographical location. They can communicate, collaborate and track operations using dashboards on their mobile devices anytime and from anywhere. Any deviations in productions or operations can be flagged as real-time alerts to users.

The mobile applications are simple and leverage touch-screen technology for ease of use. They can be downloaded from a central app store and can be administered, re-configured, upgraded, managed and deleted by a central team using a Mobile Device Management (MDM) tool. Role-based rules ensure that the necessary applications are available to users with measures for the security of data and the end-point device in place.

Demand for Instant Collaboration

The rapid flow of information across projects in mining can enable teams to collaborate more efficiently. For example, an unexpected disruption in production would mean locating the right team to analyze and address the problem and alert the logistics team to adjust ore transport accordingly. Without mobile technologies, this could take hours or even days to address, resulting in inefficiencies and loss of production.

Today, mobile applications can be used to chat with remote teams of experts, conduct audio and video conferences with them, expose them to the nature of the problem at the remote mine through video and seek their diagnosis. Documents, images, video, data, business information, etc. can be shared instantly over mobile devices using cloud-based hosting services and collaboration tools such as MS Lync 2010, Skydrive, etc.

These mobile technologies make it possible for field teams to report using images of "before" and "after" completion of work for verification and approval. They can be used to connect diverse teams of executives, managers, supervisors, operators, technicians, specialists and lab staff from multiple locations to solve problems faster and at significantly lowered costs. And they can be used to seek real-time approvals and permissions (for business decisions, operational assessments, leave approvals, travel approvals, etc.) from team members who may not be physically present at the site.

Growing Safety and Security Concerns

With growing social and political concern, health, safety and environment (HSE) are becoming increasingly important to mining operations. HSE standards have become more stringent and a new generation of mobile solutions to help meet the standards are on their way. Some of these solutions include:

RFID-based wristband for emergency healthcare and worker safety

These wristbands are used to store emergency contacts, details of medical and allergy conditions of field workers. In a medical emergency, the wristbands can quickly download the medical history on to a mobile scanning device.

Workforce tracking

With the growth in contractor labor, supervision and real-time tracking of the workforce has gained increased importance. Mobile technologies can help track labor in relation to time of entry and exit, location and production.

GIS fencing

Unsafe areas such as mining pits, blast zones, hazardous gas burst zones, etc. can be geo-fenced on GIS maps with mobile alert systems as a safety measure for employees.

Security incident reporting

Employees should be able to report potential security threats via mobile applications for quick action.

Environment monitoring

This will help to continuously monitor the temperature, carbon dioxide, methane, suspended particles, noise level etc. to ensure compliance with HSE norms.

Productivity and Business Process Improvements

Traditional mining processes have several inherent inefficiencies. These inefficiencies result in employee turnover, productivity loss, HSE incidents and breach of regulatory requirements. These can be managed using mobile technologies in a variety of ways:

Avoid ore theft and ore loss during transportation: Integration of weighbridge with backend systems avoids human errors while recording data on ore being transported using trucks, tippers and railways. RFID-based entry/exit tracking combined with weighbridge data helps track the payload. Route diversions, unauthorized ore loss, slow movements, accidents, etc. can be tracked through GPS and GPRS-based vehicle tracking system with geospatial analytics.

Asset management:
Mobile solutions for Asset Tracking, Inventory Management, Maintenance Management and work inspection eliminate error-prone manual processes in the geographically dispersed mining industry.

Production tracking:
Mobile solutions eliminate multiple paper-based entries of data. They also allow quick validation of the data at the time of making the entry and for quick distribution of the data.

Stockpile management:
Mobile applications can provide stock updates, quality surveys/inspection reports, ore grade/assay information, thus eliminating paper-based manual processes.

In exploration by field geoscientists:
Mobile applications can assist geoscientists to directly upload their site sample data from instruments and observations to a central server. This reduces the need for expensive and error-prone double entry of data. Mobile technologies can also be used to collect the data working off line where there is no connectivity and later sync the data with the server.

Conclusion

It is imperative that the mining industry adopt mobile technologies to improve productivity at a time when it is facing several pressures that are not within its control. But the good news is that mobile technologies present not only an opportunity to solve productivity issues but also open the doors to future innovation around creating competitive advantage, enabling cost-effective talent training and retention as well as enabling higher safety standards at work.

About the Author

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"Vasuki Upadhya" is a domain Architecture Practice Head, working with Wipro Energy, Natural Resources, Utilities, Engineering & Construction industry segment. He has 17+ years of experience in various Energy & Utilities domain areas and technology transformations, innovations and can be reached at vasuki.upadhya@wipro.com

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