

# Small & Mid-sized Mine & Quarry Optimization Technology



**MISOM**  
TECHNOLOGIES



MISOM: DW, CS, FARA

- ➔ Scalable Data Warehousing
- ➔ Historian Services through OSIsoft Pi MISOM cloud
- ➔ FARA Mobile App: Fleet Management & Forms

Transforming Data into Action through Applied Business Intelligence and Process Change

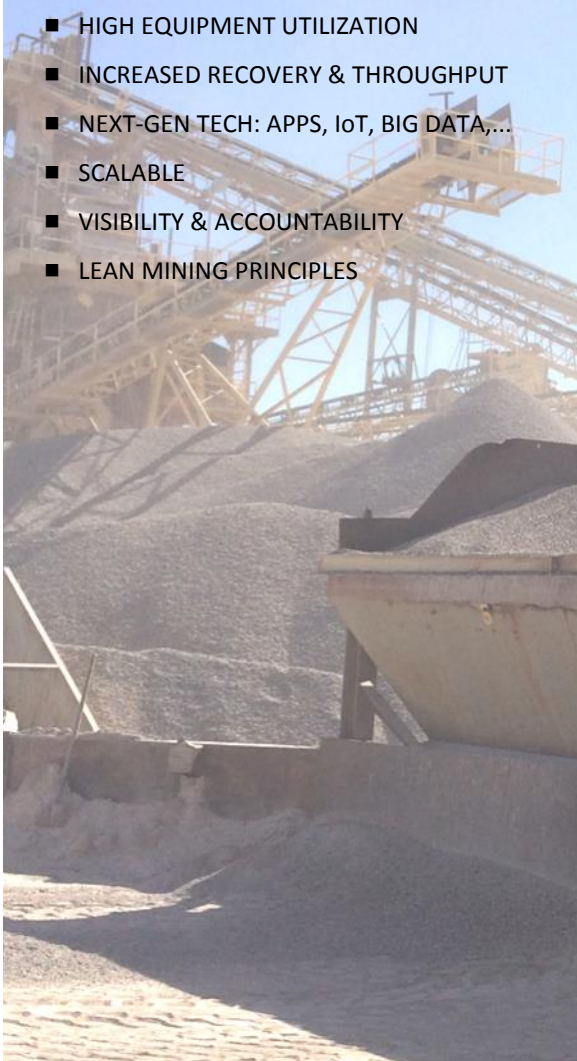


### MISOM TECH IDEAL FOR...

- SINGLE DRAGLINE, A FEW TRUCKS
- QUARRIES & INDUSTRIAL MINERALS
- UNDERGROUND HARD & SOFT ROCK
- MINING CONTRACTORS & CONSTRUCTION

### MISOM TECH ALLOWS FOR...

- TECHNICAL CAPABILITIES OF LARGE MINES
- HIGH EQUIPMENT UTILIZATION
- INCREASED RECOVERY & THROUGHPUT
- NEXT-GEN TECH: APPS, IoT, BIG DATA,...
- SCALABLE
- VISIBILITY & ACCOUNTABILITY
- LEAN MINING PRINCIPLES



## Affordable Technology-driven Optimization

Mine Optimization Technology does not have to be expensive or complicated...

**The accessibility of optimization technology is now open to mines of any size.** Mobile apps, interface design, and the cloud has allowed optimization to reach our every-day lives,... why not our mines? MISOM leverages Web 2.0 technologies, tablets, and the emerging Internet of Things (IoT) to bring similar, and sometimes more capabilities than even the most expensive fleet management systems available,... except we make it more accessible, affordable, and simple to maintain and use.

MISOM's vision is to derive maximum value from data and technology, and identified a enormous unmet need—providing technology solutions that are accessible even to operations and that don't need technical support, often small and mid-sized mines, mining contractors, and quarries.

## MISOM: Mine & Technology Experts

Technological Opportunities have radically changed in the past 5 yrs.

**Mobile:** some key companies have spent billions in R&D to deliver powerful, stable, sensor-laden tablets, ideal for field use, then make it easy for developers to create beautiful interactive easily deployed apps. We use this awesome hardware.

**The Cloud:** virtual servers can be created in the cloud, allowing a complete robust data infrastructure back-end to be set-up in minutes, even within your domain. Furthermore, the virtual environments can be created with amazing software pre-installed and configured, such as OS/soft's Pi system or MISOM's FARA desktop.

**The Internet of Things:** MISOM works directly with makers of new sensors, such as Bluetooth Low Energy (BLE) Beacons, that allow precise positioning and proximity both underground and indoor. This is only the beginning: soon sensors and apps will be interacting with a sensor infused environment...

**Big Data:** MISOM's origins are in data integration. Although mines do not produce the terabytes of data that Big Data clusters were designed to crunch, the NoSQL aspect of Big Data truly facilitates integration.

**Gamification:** An engaging interactive interface is key to modern app design. Social interaction, achievements, points, and micro-awards are all game-design approaches that create an addiction to performance. We use these to create an engaging user experience, subtly but surely increasing performance in safety and productivity.



## Pi CLOUD SERVICES

OSIsoft's Pi is the most widely used historian in mining, it is also out of reach of small to mid-sized operations... until now. MISOM offers Pi Services, where any of your systems can be pulled into the full Pi suite, managed, and supported for you by MISOM experts. Historians are used to monitor and analyze crush plant performance (i.e. SCADA) and other analog type systems.

## FLEET MANAGEMENT APP

MISOM's Field Analysis and Reporting Application (FARA) provides all the fleet management capabilities that larger mines use, at a fraction of the cost, with the very easy up-keep of a tablet-based mobile app.

*Field intelligence:* reports & dashboards

*Optimization:* real-time tracking & coordination of both plant & machines

*Sensors:* tracking personnel & assets underground using ultra-modern tech

## FORMS

All mining operations use paper forms to collect data in the field. Clerks, sometimes even supervisors, then input some of this data into databases or spreadsheets. With digital forms, the data is immediately available from anywhere, including spreadsheets.

## PLANT & DW USE CASE:

Mid-Sized Crush Leach Plant & Contractor Mining  
Sonora, Mexico.

- 1) Connect key tags that measure production, quality, and system health, into a historian and/or transactions logger.
- 2) Apply algorithms to detect key events from signal patterns, such as delays.
- 3) Allow users to easily supplement the detected events with added insight
- 4) Integrate contractor data through DW
- 5) Create Engaging B.I. Dashboard that people look at frequently
- 6) Create a scorecard process that drives change & addition to data
- 7) Provide data through MS Excel for easy access & analysis.



## FLEET MANAGEMENT & FORMS USE CASE:

Aggregate Quarry, Tucson AZ.

- **FORMS:** Key forms such as 5000-23, pre-op checklists, safe work observations, etc... completed on the tablet, uploaded, now it's accessible anywhere and can be counted.
  - Integrate drop-down list from any source or manually update
- **Fleet management app,** can be easily configured to track any activity— hauling, loading, drilling, dozing, etc...
  - Can operate connected or disconnected
  - Asynchronous updates
  - Optional iBeacon sensors
- **Supervisors**
  - View & track personnel in real-time.
  - Can replay one's own shift
- **Business Intelligence**
  - Create Engaging B.I. Dashboards that people look at frequently
  - Create a scorecard process that drives change & addition to data
  - Automate existing manual reporting & data entry including auto-populating MS Excel in real-time

SOFTWARE & APPS  
CONSULTING  
TRAINING

Mining Information Systems and Operations Management (MISOM) Inc. is a systems integration and improvement firm that designs, implements, and supports real-time and historical data warehousing, mobile apps, and business intelligence systems. In our deployments, we focus on process change, ensuring a mine's many technology investments derive maximum benefit.

A significant portion of MISOM's work is creating and supporting continuous improvement programs and implementing more advanced solutions such as Mine to Mill (M2M), Performance Management systems, Enterprise Asset Management (EAM), and Activity Based Costing. All of these programs require large quantities of data, supplied in a continuous and consistent manner.

MISOM has a valued team of highly educated, experienced engineers and programmers with extensive expertise in IT and mining technology. This experience, coupled with a great deal of innovation, creates an unbeatable combination that has allowed us to design best-in-class applied IT solutions and services specifically focused on mining operations and corporations.



Sustainable Process Change

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