MINE CONTROL AND MANAGEMENT REPORTING

INCREASE PRODUCTION, REDUCE COSTS, AND IMPROVE SAFETY AND BUSINESS INTELLIGENCE CAPABILITIES

Intuitive Mining Solutions

Micromine Pitram
**INCREASE PRODUCTION**

**REDUCE COSTS**

Pitram increases managerial control over mining operations and drives continuous improvements through integrated reporting, planning and optimisation, resulting in increased production and reduced costs.

Pitram is a leading mine control and management reporting solution that records, manages and processes mine site data in real-time. As a scalable solution, it is suitable for open pit and underground mine construction, development and production.

Pitram records data related to equipment, personnel and materials, providing an overall view of the current mine status and increasing clients’ control over their operations. Greater control allows operations to increase production, reduce costs, and improve safety and business intelligence capabilities.

**REDUCE COSTS AND INCREASE PRODUCTION**

Mining operations consist of more than equipment; there are also people, material, processes and systems. Pitram consolidates all data related to these components to generate a comprehensive real-time view of the mine and deliver actionable and meaningful information to the right people, ensuring increased production and reduced costs.

- **Achieve the mine schedule and budget** through the continuous monitoring and optimising of resources and prompt identification of under-performing processes, equipment and operators.
- **Ensure fast and accurate end of month reporting and reconciliation.** Managers and engineers save time through Pitram’s single validated production database and automatically generated management reports.
- **Track material flow** throughout the mining process and monitor current stockpile levels and grades. The system includes support for several stockpile depletion models, and the process of manual adjustments provides reconciliation with a full audit trail of changes.
- **Continually maximise equipment usage.** Equipment is dispatched to the optimum working face, minimising queuing and waiting times, and increasing availability and utilisation.
- **Increase ore security** by ensuring that haul trucks go to the correct dump destination.
- **Reduce fuel consumption and tyre wear** by ensuring that haul trucks take the most efficient routes.
- **Calculate and track production tonnages and consumables** to determine carbon emissions. Carbon emissions are reduced through the optimised use of equipment and the process plant.
- **Ensure accessibility to all staff, regardless of their native language.** Pitram is multilingual and can be deployed onsite in more than one language.
- **Achieve high face utilisation** Pitram’s ability to assist clients achieve high face utilisation is unique to the solution and essential to increasing the rate of mine development and mine production.
- **Track the face utilisation and measure all activities**, both mechanised and non-mechanised. This allows managers to identify and clear bottlenecks.
- **Monitor activity duration and idle time.** When thresholds are exceeded, managers can be warned to either address the operational issue or review the mine shift plan.
- **Notify key personnel of the current mine status**, effectively utilising and coordinating activities, equipment locations and personnel.
- **Provide and maintain a safe working environment** Pitram helps minimise, isolate and eliminate risks, reducing the amount of incidents and accidents that can negatively impact production and the performance of the mine.
- **Track personnel movement** through a centralised control room which can provide assistance and direction in an emergency.
• Only allow qualified personnel to operate equipment and perform hazardous tasks by tracking their qualifications, certifications, work permits and licences. Management is alerted when operator qualifications are insufficient.

• Monitor controlled and barricaded areas by managing access to unauthorised personnel. Pitram also tracks the entry and exit of authorised personnel, and ensures mandatory operator compliance through electronic prestart management of mine equipment.

• Allow Incident and Accident Analysis via historical data analysis.

• Protect personnel and equipment through object proximity detection and exclusion zone monitoring.

• Manage operator fatigue and compliance with HR regulations through the constant monitoring of work hours and rest periods.

• Track personnel exposure time in hazardous work areas.

**Optimise mine development**

Achieving the maximum possible development advance for the firing that meets the design specification is essential to maximising productivity.

• Measure drill and blast consumables, providing a reconciliation of drill and blast activities so that correct drilling patterns and charging methods are used.

• Reconcile survey to claimed values and produce a claim for each cut based on the drill parameters used so that once survey results are made available, the information can be reconciled and used to plan future activities.

• Measure support consumables so that a complete reconciliation of support consumables, shotcrete and concrete can be provided for each cut.

**Comply with mining plans and performance targets**

Pitram’s shift planning functionality enables users to plan and forecast using accurate and timely information. With access to maintenance plans, crew schedules and mining plans, daily production planning can be closely aligned to the weekly and short-term mine plan. Users of Pitram can regularly review the productivity of personnel and equipment, and re-assign resources accordingly.

Pitram allows managers to focus on real business issues by reducing administration and reporting tasks, and providing them with a tool to monitor conformance to plans and KPIs.

• Minimise variations by monitoring the progress of the mine plan in real-time. Supervisors can make informed decisions to meet production targets.

• Achieve the short term mine schedule through the tracking and monitoring of critical tasks. Managers are informed immediately when thresholds such as equipment down time and production rates are not conforming to the mine plan.

• Manage costs by recording time and materials against every activity. Accurate information will improve plans, budgets and overall results.

**Increase control**

A variety of Pitram functionalities and modules have been specifically designed to provide key personnel increased control over the mining operation. Greater control is an essential component in facilitating reduced costs, increased production, and improved safety and business intelligence capabilities.

• Integrate with third party ERP applications. By converting mine production data into meaningful information that can be combined with information from other solutions, sites can increase their business intelligence capabilities, and improve decision support and the running of the mine.

• Allow personnel to visualise the complete mine operation in real time 3D. Pitram provides an exact replica of the operating mine which includes displays of moving equipment. Users can overlay mine objects such as reserve models, wire frames, ore blocks, stopes, rings and the mine fleet.

• Track and reconcile material flow and grades throughout the entire operation using the Grade Control Module.

• Assist sites to meet blending plans by monitoring the correct grade and characteristics of the feed stockpiles.

“Pitram was implemented at Cayeli due to its proven record of introducing operational improvements and helping to increase production. Since its implementation, Pitram has assisted Cayeli to double the amount of mine activities achieving targets. Of the mine activities monitored, there has been a 10% average increase in productivity. Cayeli management is very pleased with the program and the results that it has helped to achieve.”

Phil Jay, Mine Manager
Cayeli Bakır İşletmeleri
Why MicroMine?

With over 12,000 clients in more than 90 countries, MicroMine is a leading provider of intuitive software solutions to the mining and exploration industry. From capturing, managing, visualising and understanding data to controlling and reporting on mine production, MicroMine has a solution for every stage of the mining process.

MicroMine understands the software and consultancy needs of exploration and mining operations around the world. Located in 20 of the world’s major mineral producing capitals, our team is close to your operation. This means MicroMine can provide you with local support and services in your language and time zone.

MicroMine’s intuitive solutions are delivered by a team of specialists who understand the software and how it can be integrated into your operation for maximum results.
THE PITRAM PRODUCT SUITE

Four Pitram products with varying functionalities and capabilities have been developed to ensure that every mine site has access to an application that is relevant to its specific requirements, stage of mine life and budget.

The Pitram suite of products has an upgrade path from the entry level Pitram Report through to the fully automated Pitram Optimum. As an operation grows and becomes more complex Pitram can be configured and upgraded to suit the mine as it expands.

Accurate and timely data collection is critical. Data can be collected via manual log sheets, voice communication or automated methods utilising WiFi, GPS or tagging technologies. Pitram produces a production database comprised of time stamped mine events.

The Pitram suite is comprised of the following four software applications:

**Pitram Report**

Suitable for underground and open pit mining operations, Pitram Report is MICROMINE’s entry-level application within the Pitram product suite. Pitram Report is a manual data entry program which utilises a web platform to deliver management grade control information and performance reports related to equipment and personnel.

**Pitram Control**

Pitram Control is an automated reporting program which provides a single environment, referred to as the Control Room, for managers and supervisors to make informed decisions related to safety and production. Data can be collected and sent to the Control Room as meaningful information through manual log sheets, voice communication or via automated methods.

**Pitram Optimum**

Pitram Optimum is the most advanced program within the Pitram product suite and is suitable for the most complex of operations. Like Pitram Control, Pitram Optimum can be used with or without on-board hardware, meaning that data can be sent to the Control Room via manual log sheets, voice communication or automated methods. Pitram Optimum’s Shift Planner module contains short interval control components which plan and track activities shift by shift for up to a week. This unique capability ensures that clients can forecast the current performance of tasks.

**Pitram Fleet Manager**

Ideal for open pit operations, Pitram Fleet Manager is a basic fleet management program which uses calculations to facilitate the optimal performance of haulage fleets. The solution tracks and monitors the fleet through a mobile computing platform. Data is automatically collected using GPS or tagging technology, providing real-time production reporting and asset tracking.

REPORTING, ANALYSIS AND INTEGRATION

Data obtained from multiple sources is integrated and presented in a timely, accurate and concise manner. The information is easily interpreted so the user can start analysing trends and implementing the necessary improvement programs. User specific reports can be generated on-demand and delivered via the internet, email, dashboards or through a control room. Production performance analysis is conducted using historical data to determine trends, operational weaknesses, KPIs and optimal equipment numbers in order to take corrective measures.
OTHER MICROMINE SOLUTIONS
MICROMINE CONSULTING SERVICES (MCS)
Micromine Consulting Services provides geological and mining consulting services compliant with international reporting standards such as JORC; NI43-101; SAMREC; SEHK (Chapter 18, Hong Kong); and PERC (Pan-European Reserves and Resources Reporting Committee) Codes. Local standards compliance includes the China MLR and Russian, Ukraine and Central Asian GKZ (State Commission on Mineral Reserves) Standards.

All MCS consultants are experienced geologists, mining engineers, metallurgists, surveyors, database managers and GIS specialists with extensive backgrounds in metals, energy and construction.

FIELD MARSHAL
MICROMINE’s Field Marshal solution captures and manipulates exploration and mining geological field data. Compatible with most portable or hand-held devices, Field Marshal ensures field data is valid and reliable, enabling informed decisions. Enter data directly into Field Marshal, saving time, reducing errors and increasing productivity. Inexpensive and easy to use, Field Marshal is a recognised industry standard field data collection solution.

GEOBANK
Geobank is a flexible, reliable and secure Data Management Solution that captures, validates, stores and manages data from diverse sources.

Geobank seamlessly integrates with Micromine to enable mining and exploration companies to maintain the quality, integrity and usability of their essential data.

MICROMINE
Micromine is a modular solution that takes you from exploration through to scheduling and planning. For an exploration geologist, Micromine allows you to capture, manage and interpret critical mining and exploration data. It provides you with an in-depth understanding of your project so you can target prospective regions more accurately, increasing the chance of your project’s success. For miners, Micromine gives you easy-to-use modelling, estimation, and design tools to simplify your day-to-day design and production tasks. As a mining engineer, or short-term planner, Micromine’s scheduling module provides a smart, integrated solution to enable the optimum mineral extraction process necessary to meet corporate objectives.

Micromine comprises eight modules giving you the flexibility to choose what you need as you need it, as your operation expands or your requirements change.

DOME
Dome is a web-based operational intelligence solution designed for the mining industry. The software application is capable of collecting data from existing systems and presenting decision makers with specific, timely and relevant information.

Through the sourcing of data related to a mine’s activities, Dome provides information that supports general data analysis and process improvement methodologies. Mine staff are able to make informed decisions related to the operation; reducing costs, improving resource utilisation and increasing production.

MICROMINE SUPPORT SERVICES
MICROMINE TRAINING
MICROMINE offers training services which ensure you derive the maximum value from your software. Structured to grow with your MICROMINE investment, MICROMINE training builds on your product knowledge and expertise.