



Case Study: Transportation & Logistics

Analytics optimizes transportation equipment use

A global mining company relies on our data solution to reduce costly downtime of key equipment.

It's said the shortest distance between two points is a straight line. Tell that to a production supervisor at one of the world's largest mining companies. Moving multiple huge loads of ore across an ever-changing landscape is challenge enough; it's more complex when expensive machinery sits idle for unknown reasons.

Cognizant developed a cloud-based data analytics solution for a global mining company with more than a dozen mines on three continents to address inefficiencies and costs from delays in transporting ore.

At a glance

We helped a global mining company develop a data analytics solution to increase throughput and optimize the efficiency of its high volume ore transportation equipment.

Outcomes

Our client realized:

- An 8% increase in annual tonnage throughput at the pilot site by identifying bottlenecks
- Capital cost reductions of \$30 million annually as a result of higher equipment availability
- Savings of 24 hours in manual equipment management time per site, per week

The challenge

Ore is rock. Moving it from excavation to processing is expensive. Today's average 18-wheeler might move between 10 and 15 tons of merchandise on a highway, but trucks used to haul ore at the world's biggest mines can carry as much as 400 tons up gradients and over rough ground.

Our client's transportation equipment includes haul trucks, shovels and loaders, graders and drills, bulldozers, excavators and scrapers. The equipment is so massive and operations so complex that problems causing bottlenecks are hard to isolate in real time. But if equipment is not working at full capacity, if delays occur due to supply interruptions or component failure, or if trucks are sitting idle in a queue waiting to load, companies are burning money and losing efficiency.

The approach

We established a Center of Excellence to collaborate with our client's management team to address efficiency improvements worldwide. One notably valuable use case was to design and deliver a solution that would gather sensor data on its global installed base of mobile equipment, monitor that equipment's performance and apply algorithmic analysis to improve the efficiency of its use. We sought, in particular, to reduce queuing and idle time for heavy haul trucks, to help ensure a steady stream of ore to refining facilities and transportation hubs at each mine.

Our machine learning solution, developed in a seven-month timeframe, monitors equipment in the field to isolate the major causes of wait times. Our model breaks down the transportation cycle into eight steps—from queuing to loading to unloading and returning—and captures data on equipment location, movement, load, use, speed and efficiency to ensure the right equipment is in the right place as frequently as possible. A dashboard provides real-time monitoring and benchmarking during the eight predetermined stages of the transportation cycle.

Our analytics application enables mine operators to monitor throughput, efficiency and tonnage,

viewing the root cause of lower yields and throughput on a near real-time basis. The pilot project at three different sites took seven months, and phase two extends our solution globally.

Business outcomes

Increasing efficiency in moving ore from mine to processing or transportation hub offers enormous cost savings in energy use, capital costs and mineworkers' time. Worldwide, the company needs 400 haul trucks to run its operations, each costing almost \$4 million. Even an incremental increase of 1% in availability means a corresponding savings of the cost of four trucks—over \$15 million.

Before our solution rolled out, the company used its financial management software to match the availability of each mobile equipment asset against daily transportation needs. One person at each site spent three days a week creating that report. Our solution eliminates the need for manual assignment matching at each of the company's 15 mines, saving 24 hours of weekly manual equipment management time, while also eliminating time spent compiling quarterly reports on equipment status.

Our client can now route trucks in real time to where they are most needed and reduce downtime. It realized an 8% increase in annual tonnage moved due to identifying bottlenecks and optimizing one operation and \$30 million in improvements due to increased equipment availability, which reduces capital costs for essential equipment. Similar savings are realized on its other heavy equipment.

For more information, visit www.cognizant.com/ai.

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