

Case Study

Newcrest



Optimize hard-rock underground operations with real-time shift and fleet management.



Maximize productivity

Simulations demonstrated 10% improvement to mine productivity.



Efficacy

Rapid development to prove real-time dispatch tool's efficacy.



Optimization

Powered by a combination of optimization and simulation algorithms.

Using optimization and simulation to maximize mine productivity.

THE CUSTOMER

Newcrest is one of the world's largest gold mining companies with operations in Australia, Papua New Guinea and Indonesia. Newcrest owns and operates the Cadia Valley underground block cave gold mine in New South Wales, Australia. This site produces roughly 600,000 ounces of gold and 62,000 tonnes of copper a year.

[Demonstrated a 10% improvement to mine productivity by combining optimization and simulation algorithms.](#)

THE PROBLEM

Underground mines, in particular block caves, are valuable assets that can be used for decades after their initial development. As a mine operator, it is critical that the productivity of these assets remain as high as possible, to maximize its value and lifespan.

Newcrest had found that their Load Haul Dump (LHD) loaders had become the operational bottleneck of their mine, resulting in a decrease in potential mining productivity and efficiency due to congestion and under-utilization of the materials handling system. Through engaging with Deswik, it was identified that a block-cave specific real-time LHD dispatch tool had the potential to alleviate these issues. Before building such a system, it was important to show that it would outperform the existing manually generated planning processes.

THE SOLUTION

After consulting Newcrest and understanding their caving systems, Deswik developed an optimization tool that was able to orchestrate and dispatch the fleet of LHD loaders based on a real-time cave state. The solution minimized congestion, matched the underground materials handling system capability all while conforming to geotechnical constraints.

Deswik then built a detailed discrete event simulation tool that could simulate a real-time cave state over a 24-hour period. Simulations were run using both the optimization tool and the output of the existing manual planning process for dispatch

decisions. These simulations were able to robustly test the dynamic variability of the day-to-day operations against both processes, proving what value the real-time optimization tool would bring.

THE BENEFITS

The simulations demonstrated the potential for a 10% improvement in mine productivity, which provided enough justification to proceed with configuring and deploying a fully integrated real-time dispatching tool. The tool has since evolved into the world's most advanced underground mining optimization tool, called ORB, which has provided a 20% increase in mine productivity.

DESIGN TO DELIVERY: 11 WEEKS



Discover how real-time shift and fleet management can optimize your hard-rock underground operations.

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