Business challenge
To address open pit mine production scheduling problems, Deswik wanted to develop a software solution that could help users realize greater value from ore deposits.

Transformation
Deswik, an IBM Business Partner, launched a strategic mine planning tool for open pit mines called Deswik.GO. The tool, developed in conjunction with Alicanto Labs and backed by IBM® CPLEX® Optimizer software, helps users to make better decisions on what to mine, when to mine it and where to send material.

Results

Target high-value areas sooner

by understanding the time value of money throughout the planning process

Decreases plan iterations

thanks to optimization techniques that produce a better plan from the start

Reduces manual processing

which frees up staff for other tasks

Deswik

The right questions. The right answers. The right solution.

Deswik (external link), an IBM Business Partner, is a global mining consulting and technology company. The business specializes in integrated mine planning, design and scheduling tools. Deswik has its headquarters in Brisbane, Australia and globally maintains a total of 12 locations spread across five continents.

"Deswik.GO gives users a better understanding of when value is going to come out of the ground. So mines can build their investment and growth cycles with less risk and vulnerability."

—Justin Meade, Head of Product Development, Deswik, an IBM Business Partner

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Too many questions

Mining is more than simply digging a hole in the ground. With millions if not billions of dollars on the line, the level of thought, research and planning that goes into even a "simple" mining project is difficult to imagine. There are countless questions, variables and contingencies that need to be evaluated and accounted for, and effectively navigating these challenges can be the difference between a successful or failed project.

"Price, performance and familiarity—that's why CPLEX was chosen. It is a known technology in the industry, and when you're the first to market with something new, that matters."

—David Fell, Commercial Manager, Deswik, an IBM Business Partner

"Say you have two zones within an orebody," explains Justin Meade, Head of Product Management at Deswik, "but one has a higher concentration of unwanted elements—that you'll need to process or blend out. If the two orebody zones are otherwise the same, you'd mine the one with lower processing cost first. But what if that ore is further down? When does it

become more cost-effective to mine the shallower but higher cost one first? And when you begin to consider whether you need different processing methods for different parts of the orebodies, things only grow more complicated."

To answer questions like these, mining companies have traditionally followed a multi-step strategy that relies on first determining what processing methods are suitable to the orebody, creating pit designs and then developing an extraction sequence with the objective of limiting waste and maximizing profit. However, these efforts often involve a number of manual steps and people-driven decisions, which can result in sub-optimal choices and slow production timelines.

Deswik has found a better way.

Solving simultaneously

"About three years ago, Deswik was looking for an optimization partner and found an opportunity with the University Adolfo Ibañez," recalls David Fell, Commercial Manager for Deswik. "Throughout the open-pit metals sector there's a real focus on global optimization of the mine plan, and the university had initiated a research project to develop algorithms that would answer the mining and processing question at the same time at a high level of detail."

The research proved to be very successful, and Deswik saw an opportunity to commercialize these findings by building a new strategic mine planning solution. However, before it could proceed, the business needed to choose a solving engine to act as the heart of the offering.

Powered by CPLEX Optimizer software, the Deswik.GO solution launched in September 2020. The platform allows users to rapidly automate and better optimize the shape, phases and sequencing for both greenfield mining sites and existing operations. The fast evaluation time allows planners to evaluate multiple options and see the lifetime effects of planning decisions, empowering them to determine the mine plan that will deliver the maximum value.

Supported by Deswik's existing in-house experts and developers, Deswik.GO allows users to:

- Create better optimized pit shells quickly that account for the time value of money

- Help determine the best destination for a parcel of material

- Generate mining phases using mathematical techniques

- Streamline scheduling for the generated or pre-designed phases

- Build destination schedules for existing mining plans, focusing on optimization

- Analyze schedule outputs with integrated reports and visualizations

Using algorithms developed during the research project, Deswik.GO relies on the IBM software to provide solvers for mixed-integer linear programming. And to simplify the rollout of its new offering, Deswik relies on an IBM Embedded Solution Agreement (ESA).

"We'd been an IBM Business Partner for some time," notes Fell. "And we've used their software as a solving engine in another product for at least five or six years with good results, so CPLEX made sense this time as well. We did check other solvers on the market, but decided that CPLEX was the best approach for this offering."

Better models yield better mining

"With Deswik.GO, the time to answer planning questions is greatly reduced," notes Meade. "The new solution eliminates many of the manual steps required by more traditional methods, which means a single mine planner can now run more options in the same amount of time. Being able to run more options allows the business to see what the plan's largest sensitivities are and more effectively manage risk."

"High-level capital costs can also be included," adds Meade. "These can be billion-dollar mining projects, and Deswik.GO gives users a better understanding of when value is going

to come out of the ground. So mines can build their investment and growth cycles with less risk and vulnerability."

Altogether, Deswik is pleased with its choice of IBM software to bolster its new solution. "Price, performance and familiarity—that's why CPLEX was chosen," comments Fell. "It is a known technology in the industry, and when you're the first to market with something new, that matters."

Choosing an ESA has also helped simplify the launch of Deswik.GO, as Meade explains: "When you're in a competitive market, having a stable cost for your third-party components is critical. It is challenging enough to sell to your customers without needing to constantly negotiate with your providers. But having a partner like IBM and having an ESA makes the whole process a lot easier."

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