

FREE SUMMARY ▪ MATHEMATICAL OPTIMIZATION

Why Optimization Is Now Essential for Modern Operations

How operations leaders in mining, supply chain, and logistics are replacing manual planning, and the ROI they're seeing.

DOCUMENTED RESULT ▪ MINING ▪ GUROBI OPTIMIZER

+5%

Gross margin improvement

over a 30-year planning horizon. A leading global mining company used the Gurobi Optimizer to integrate pit planning, blending, and multi-site logistics into a single optimal strategic plan.

Source: *Gurobi Optimization / Polymathian case study* — gurobi.com/case_studies

THE PROBLEM

Manual Planning is Failing Visibly, not slowly.

Operations teams across mining, supply chain, and logistics are making critical decisions on spreadsheets built for a world that no longer exists.

Hours-long planning times

Teams rebuild spreadsheets instead of executing. Planning is the bottleneck.

Throughput left on the table

Hand-built schedules reflect estimates, not what the operation can actually handle.

Decisions that can't be replicated

Planning lives in people's heads. Hard to audit, train or scale.

Fragility under volatility

Tariff shifts, supplier failures, demand spikes, manual plans collapse instantly.

THE SOLUTION

Mathematical optimization solves what manual planning can't.

Solvers like Gurobi and IBM CPLEX evaluate millions of scenarios in seconds, considering cost, capacity, constraints, and risk simultaneously.

AI Predicts. Optimization Decides.

Together they create a closed-loop system: forecast → decide → execute → improve.

DOCUMENTED RESULTS

50%

Reduction in S&OP Planning Cycle Time

Lumileds • IBM ILOG CPLEX

ibm.com/products/ilog-cplex-optimization-studio

+5%

Gross margin improvement, 30yr horizon

Mining • Gurobi Optimizer

gurobi.com/case_studies

Seconds

Payback period for CPLEX deployment

Banque de France • IBM ILOG CPLEX

ibm.com/products/ilog-cplex-optimization-studio

INSIDE THE FULL PLAYBOOK

Go deeper with the complete guide.

- The four hidden costs of manual planning, with the numbers behind each one.
- How AI and optimization work together as a closed-loop decision system.
- Getting Started: upskilling, governance, and where to begin.
- Case studies with source links: mining, manufacturing, and financial services.
- Typical ROI ranges and why constraint industries see payback fastest.

Read the full playbook.

Explore real use cases, ROI scenarios, and what it takes to get started.

modaai.com/playbook

Or Talk to our team today.