

CASE STUDY

Quantifying the Benefits of Intended Upgrades to an Iron Ore Supply Chain

SOLO

Type
Port Capacity

Module
Simulation

The Customer

The customer operates a vertically integrated supply chain for their iron ore operations in the Pilbara region of Western Australia. The supply chain includes a transshipment operation where vessels are loaded at the port and then transfer their loads onto ships waiting offshore in deeper waters.

The Challenge

At current production levels, the customer was having stockpile capacity issues due partly to the misalignment of product flowing in and out of the stockyard, shipping delays, and weather patterns. When the stockyard's stockpiles reach capacity, upstream operations must stop resulting in lost production and revenue.

The customer was considering improvements to their supply chain to increase product delivery reliability. However, before investing in the acquisition of more vessels or CAPEX upgrades to their conveyors and other equipment, they wanted to understand how the specific upgrades would impact their operations.

About SOLO

SOLO is an online optimisation decision support toolkit that uses industrial mathematics to increase throughput, minimise demurrage, reduce pilot fatigue and assess network capacity.



The Value



Visibility

More detailed model of their supply chain resources, capabilities and constraints



Accuracy

Objective, data-driven analysis of multiple scenarios in a complex supply chain



Confidence

Quantifiable and demonstrated impact of upgrades in a virtual setting





The Solution

The customer engaged Polymathian's simulation experts to deliver a feasibility study to provide quantifiable, data-driven answers and recommendations on their expansion options.

Polymathian modified the customer's existing model using the latest simulation techniques and technology, expanding both the scope and the level of detail. Before testing the proposed upgrades, the enhanced model was revalidated using historical data to replicate current stockyard inflow fluctuations.

In 30 days, Polymathian designed scenarios to answer specific questions, processed the outputs, then presented the insights to the customer. Insights evolved with more test cases and further analyses, which eventually were used in the customer's feasibility study.

The Benefits

Full operational overview

Increasing the model's scope and level of detail eliminated supply chain 'black boxes' for more precise answers.

Unlimited scenarios

Scenarios were run exhaustively until all possible outcomes were considered, allowing the best solution to be discovered.

Upgrade assessment

Make upgrade and procurement decisions based on which would be most beneficial to the customer.

Buffer use efficiency

The right balance of buffer stock minimises ship waiting time and keeps production running.

Risk mitigation

An accurate model provides data-backed justification and ROIs for capital expenditures.

Decision Support

- Will this additional infrastructure increase capacity?
- Will the increase in capacity justify the capital spend on the infrastructure?
- Will the additional infrastructure reduce the potential risk of full stockpile events?
- Will we reap more benefits from acquiring more barges or a second tramp shipper vessel?
- How will upgrades to stackers and reclaimers affect loading and out loading rates?
- How can we order stacked and reclined product to get the most use out of our stockyard capacity?