Autonomous "Pit-to-Port" Value Chain

Orchestrating the Mine Through INSIGHTEDGE™ & 3D&S

A large-scale mining operation had invested heavily in equipment, automation, and digital tools—yet performance remained constrained. The core issue was not capability, but coordination. Disconnected systems across geology, extraction, transport, and logistics prevented the organization from operating as a unified system. Leadership's ambition was clear: move from fragmented operations to a fully synchronized, intelligent Digital Mine.

20%

Asset Utilization

Up to 20% improvement in asset utilization across the value chain

↓

Bottleneck Idling

Significant reduction in idle time across haulage, rail, and port interfaces

⚡

End-to-End Throughput

Optimized throughput with real-time decision visibility across all layers

↓$

Cost per Ton

Structural reduction in cost per ton through system-wide orchestration

> **From asset automation to value chain intelligence — Fortis & Peak**

Fortis & Peak
Shaping What's Next

The Strategic Challenge

The operation was automated—but not orchestrated. Despite significant investment in autonomous assets and digital tooling, the absence of system-level coordination meant that value was consistently lost across every interface in the value chain. Siloed data, reactive scheduling, and idle capacity created a compounding drag on performance that no single point solution could resolve.

The Core Problem

→ Siloed Data

Disconnected data across geology, operations, and logistics with no unified view

→ Uncoordinated Assets

Autonomous assets operating without system-level coordination or shared intelligence

→ Reactive Scheduling

Scheduling decisions disconnected from downstream constraints and port demand

→ Idle Capacity

Wasted capacity across haulage, rail, and port interfaces due to poor synchronization

The Ambition

Leadership recognized that the path to competitive advantage required more than incremental improvements to individual assets. The goal was a fundamental architectural shift—transforming a collection of automated systems into a single, intelligent, self-coordinating operational ecosystem.

This meant unifying every layer of the value chain—from blast and haul at the pit face, through processing and rail, all the way to port scheduling and shipping logistics—under one intelligence platform capable of real-time, end-to-end orchestration.

The operation needed a Digital Mine: a single source of operational truth powered by AI-driven flow optimization.

Transformation Powered by 3D&S + INSIGHTEDGE™

Fortis & Peak deployed their proprietary 3D&S methodology—Define, Design, Deliver, Sustain—as the execution engine, with INSIGHTEDGE™ serving as the intelligence layer throughout every phase. Together, these platforms drove a structured, end-to-end transformation from fragmented automation to orchestrated intelligence.

1

DEFINE

Mapped the entire pit-to-port value chain as a single data-driven system. Unified data from geology, fleet, rail, and port. Identified bottlenecks, idle time, and flow disruptions in real-time. Quantified lost value from uncoordinated decision-making.

2

DESIGN

Architected a central orchestration layer powered by INSIGHTEDGE™. Built predictive and prescriptive scheduling models. Created real-time dashboards linking pit activity to port demand. Established the Digital Mine as a single source of operational truth.

3

DELIVER

Activated autonomous orchestration in live operations. Synchronized haul trucks with rail schedules and port capacity. Deployed AI models to optimize dispatching and routing. Connected all operational layers into a centralized control system.

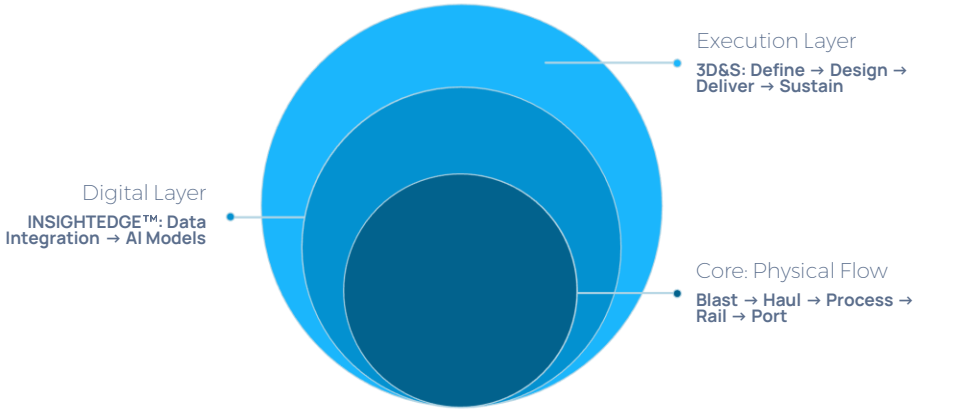
4

SUSTAIN

Evolved the system into a self-optimizing ecosystem. Continuously refined AI models through live operational data. Embedded decision intelligence into daily operations. Built organizational capability in data-driven operational management.

Transformation Architecture & Core Platforms

The solution architecture operates across three integrated layers: a physical flow layer spanning the full pit-to-port journey, a digital intelligence layer powered by INSIGHTEDGE™, and an execution layer governed by the 3D&S methodology. Each layer reinforces the others, creating a continuously improving, intelligence-powered value chain.



This architecture ensures that every physical movement in the mine is governed by real-time intelligence and executed through a disciplined transformation methodology—eliminating the gap between operational data and operational decisions.

INSIGHTEDGE™ — The Intelligence Layer

- **Unifies data across geology, extraction, transport, and logistics**
- **Powers predictive and prescriptive analytics across the value chain**
- **Enables real-time visibility and autonomous decision-making**

3D&S — The Execution Engine

- Define: Diagnose flow inefficiencies across the value chain
- Design: Architect the Digital Mine and orchestration layer
- Deliver: Deploy orchestration at scale in live operations
- Sustain: Embed continuous optimization and capability building

Measurable Impact & Strategic Positioning

The transformation delivered measurable, structural improvements across every dimension of the value chain. By replacing fragmented automation with orchestrated intelligence, Fortis & Peak unlocked performance gains that no individual technology investment had been able to achieve in isolation.

Up to 20% Improvement

In asset utilization across the full pit-to-port value chain

Idle Time Eliminated

Significant reduction in idle time across haulage, rail, and port interfaces

Full Synchronization

With downstream logistics and shipping schedules via real-time orchestration

Lower Cost per Ton

Structural cost reduction achieved through system-wide intelligence and optimization

> Competitive advantage in modern mining is not built on autonomous assets—it is built on orchestrated systems powered by intelligence.

INSIGHTEDGE™

Enterprise intelligence platforms delivering end-to-end data unification, predictive analytics, and real-time decision-making across the full value chain.

3D&S Methodology

Execution-driven transformation methodology that delivers system orchestration—not point solutions—from diagnosis through continuous optimization.

Digital Mine Leadership

A firm that builds intelligent industrial ecosystems and Digital Mines, setting the standard for orchestrated, AI-powered mining operations globally.

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