Decision Intelligence Foundation for Large-Scale Infrastructure Operations

Author: Lamia Ghozy

Context

Large infrastructure programs depend on telemetry data to manage cost, risk, and performance. Yet when machine-generated data arrives fragmented and inconsistent, leaders lose trust — and decisions stall.

Problem

Operational data from multiple tunnel boring machines could not be analyzed holistically due to inconsistent formats, missing-value conventions, and ingestion assumptions. This prevented leadership from confidently comparing performance, detecting anomalies, or planning long-term optimization.

Intervention

I designed and implemented a decision-grade data foundation that:

- Normalized heterogeneous machine data
- Preserved analytical precision
- Enabled scalable querying via Hive and Impala
- Created a single, trusted operational dataset

Outcome

The organization moved from fragmented telemetry to a **unified source of truth**, enabling:

- Confident cross-machine comparisons
- Faster analytical cycles
- Reduced operational and analytical risk

- A scalable foundation for future real-time analytics

Strategic Insight

Data infrastructure is not a technical asset — it is a **decision asset**.
This project demonstrates how thoughtful data design directly accelerates executive decision-making.