

Case Study

Predictive AI & data platform for maritime logistics

Client:

A global 3PL and maritime freight provider in the UK specializing in vessel chartering and managing 25 million metric tons of cargo annually.



Challenge

The company’s operations were severely bottlenecked by unstructured, disconnected data spanning vessel telematics, port schedules, and independent surveyor reports, creating major operational risks:

Inventory blind spots

Data latency across 40 global warehouse locations deprived downstream clients of real-time supply chain visibility.

Margin erosion

A lack of predictive visibility into weather and port congestion caused inefficient routing and millions lost to demurrage (port wait-time penalties).

Manual document overhead

Processing complex, multi-page shipping manifests and international customs forms required thousands of hours of manual effort, delaying cargo releases.

Engineering bandwidth constraints

The lean internal IT team lacked the specialized AI/ML capacity to build a custom predictive platform on Google Cloud

Solution

ZONE3000 acted as the client’s dedicated AI engineering partner, delivering rapid innovation without expanding internal IT headcount:

AI data platform architecture

Built a scalable Data Lakehouse on Google Cloud (BigQuery, Vertex AI) with automated pipelines via Apache Airflow to ingest vessel tracking, vessel chartering, and warehouse data into a single source of truth.

Intelligent document processing

Deployed custom OCR models and NLP pipelines using LangChain and OpenAI API to extract structured data from customs forms.

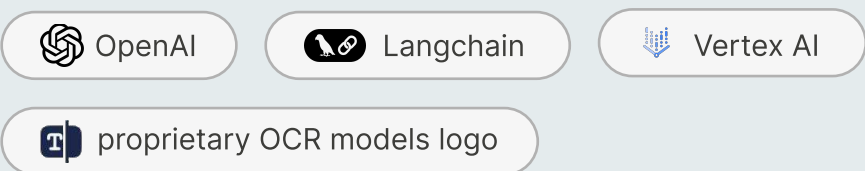
PoC-to-production AI scaling

Built a custom Voyage & Routing Optimization machine learning model analyzing live maritime traffic and historical freight data to recommend optimal vessel speeds and improve arrival forecasting.

3. Technology used

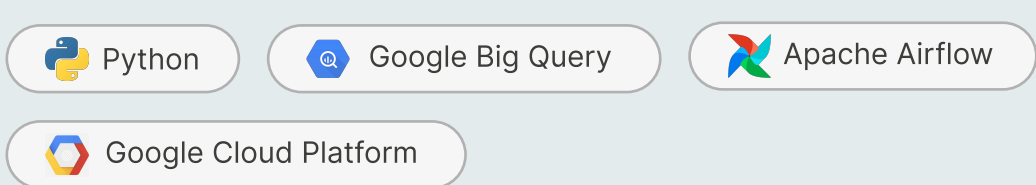
1 AI & Machine Learning

OpenAI API, LangChain, proprietary OCR models, Vertex AI.



2 Data Engineering

Python, Google Cloud Platform (BigQuery), Apache Airflow.



Results

The custom predictive platform modernized the client’s global supply chain and secured margins while keeping the internal team lean



34% reduction

in demurrage costs and port penalties in the first year via predictive vessel routing.



1,800+ operational hours

saved per month by automating international shipping document extraction.



99.9% real-time cargo visibility

across 40 global warehouses, eliminating data latency.



8.5% improvement

in freight management margins through optimized scheduling and fuel reduction.

This case study demonstrates how ZONE3000 transformed fragmented supply chain data into a predictive AI system, enabling full visibility and improved operational efficiency without expanding the internal engineering team.