

# Using Data to Improve Global Supply Chains

Integrating data silos into a single view

## Summary

Over 60% of the world's global seaborne trade is shipped using intermodal freight containers, and the ports that manage them serve as central points for supply chains – over 90% of global trade is conducted through ports.

Yet while vast amounts of highly detailed data is generated for each intermodal freight container as it traverses the world's sea routes, much of this is scattered across different data silos held by different stakeholders, from shipping companies through agents to the ports themselves.

Never in the history of global shipping has there been a "single pane of glass" view that would have allowed supply chain managers to see how their cargo is moving. Our client, a leader in transportation equipment and logistics, took on the task to change that. It reached out to Starschema to develop a cloud-based, central portal to provide a real-time, unified view of the disparate data sources.

## Challenge

Our client faced some of the biggest challenges encountered in modern supply chain and logistics data processing:

- Information about when cargo would be available was not visible in advance, making it difficult to coordinate the resources necessary to move the goods along the supply chain, such as trucks, equipment and labor.
- Inefficient data sharing and the scattering of data across silos globally added as much as an entire day to the length of the supply chain.
- As a consequence, information was often scattered across multiple web sites, and users needed to access them one by one, manually, to obtain actionable data.
- Information was often inaccurate and/or out of date, making it difficult to know the exact status of cargo.
- Visit times by road carriers inside the harbor yard were unpredictable and unreliable.

## Practice Area

Data Engineering  
Data Visualization

## Challenges

- Large amounts of data scattered across multiple organizations
- Lack of efficient data sharing among stakeholders
- Inaccurate and/or out-of-date data
- Difficult to access data views

## Business Impact

- Increased visibility of shipment statuses
- Increased predictability of shipments
- Increased throughput of cargo flow
- Productivity increase of 8-12% as the solution scales

## Solution

When our client called on Starschema to help develop a Data as a Service application to tackle these problems, we developed a cloud-based software solution that enhanced supply chain performance and predictability by delivering real-time data-driven insights through a single portal to partners across the supply chain. Integrating data from across the port ecosystem, combined with machine learning and deep domain expertise, helps the players along the supply chain in responding to dynamic conditions, align people and resources and proactively communicate across functions – maximizing port throughput and delivery performance. This solution includes:

- **Unified Information Portal:** Digitizes disparate supply chain data and brings together into a single source of truth.
- **Cloud-Based Platform:** Automated data ingestion. SaaS model enables rapid deployment and seamless operation.
- **Flexibility:** API-driven architecture enables easy integration into existing IT systems (operating systems, appointment systems, etc.).
- **Persona-Based Visualization:** Flexible, modern user interface tailored by persona. Users only see their data.
- **Advanced Spatial Analytics and Visualizations:** Mapbox API to obtain geocoordinates to different routes (train and shipping lines via custom GeoJSON, driving routes using OpenStreetMap). Custom, branded vector tile maps for visualizations.
- **Predictive Analytics & Data-Driven Insights:** Real-time vessel & container status, intermodal equipment planning, and empty container returns.

This scalable, cloud-native application uses technologies like AWS, ElasticSearch, Kafka and others to collect, store, cleanse, integrate, consolidate and refine data. It provides various consumption endpoints for customers, e.g. a RESTful API for and a web-based dashboard for business users, and provides data streams to give our client's customers real-time operational information needed to improve performance.

## Results

Starschema's solution is currently being piloted at one of the busiest ports. The port expects to see substantial improvement in four key areas:

- **Increased Visibility:** eliminated cargo speculation with ~14 days of advance visibility.
- **Predictability:** dynamic ETAs driven by predictive analytics based on machine learning and other analytical approaches.
- **Throughput:** facilitated immediate throughput improvements to cargo flow.
- **Productivity:** increase of 8-12% as the solution scales.

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## COMPANY

At Starschema we believe that data has the power to change the world and data-driven organizations are leading the way. We help organizations use data to make better business decisions, build smarter products, and deliver more value for their customers, employees and investors. We dig into our customers toughest business problems, design solutions and build the technology needed to compete and profit in a data-driven world.

## GET IN TOUCH

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