



# Supply Chain Resilience & Risk Control Tower

## Transforming 180K+ Global Transactions into Strategic Operational Intelligence

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**Focus:** SQL-Optimised Analytics & Risk Mitigation Framework

# From Raw Data to Executive Insight



## Dataset Scale

Leveraged the DataCo Smart Supply Chain dataset from Kaggle, encompassing 180,519 global transactional records for comprehensive analysis.



## Architecture

Developed a full-stack pipeline utilising Python (Pandas) for data orchestration, PostgreSQL for high-speed aggregation, and Tableau for dynamic visualisation.



## Optimisation

Pre-aggregated complex Key Performance Indicators (KPIs) in SQL to ensure real-time dashboard responsiveness, effectively managing massive data volumes.

# Quantifying Operational Inefficiency

## Primary KPI Failure

The current **On-Time In-Full (OTIF) rate is only 45.17%**, indicating that over half of all deliveries are at significant risk of delay or failure.

## Financial Impact

An estimated **\$20,125,635** in total revenue is categorised as "Revenue at Risk" due to systemic logistical delays and inefficiencies.

## Visibility Gap

Previously, data was siloed, preventing the clear identification of specific city-to-city bottlenecks and high-margin fraud patterns that undermine profitability.

# High-Risk Geographic Zones



## Late Delivery Peak

Regions such as **Western Europe** and **Central America** exhibit delay rates exceeding 55%, posing substantial operational challenges.



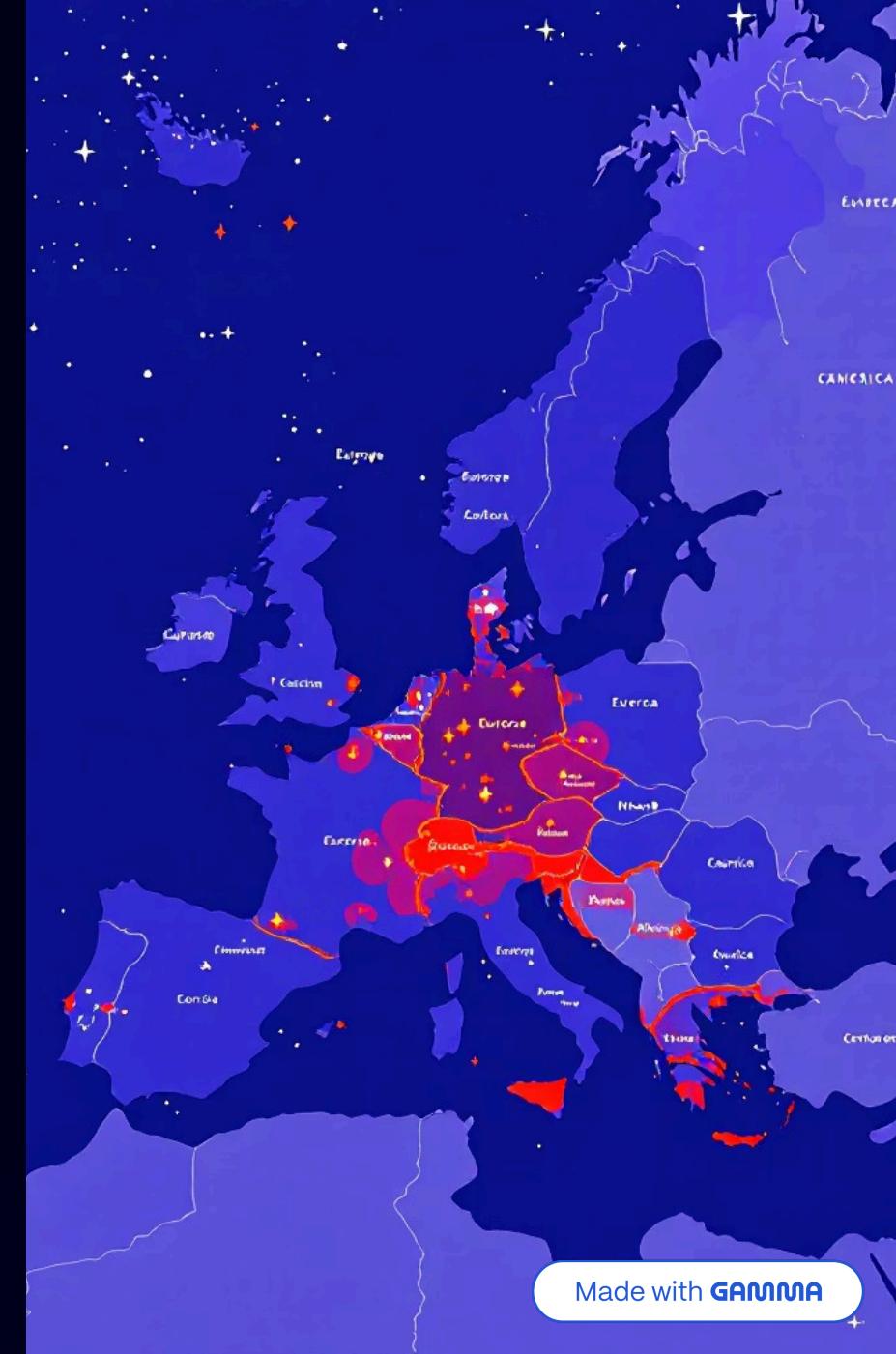
## Magnitude vs. Severity

Some regions, despite having lower delay percentages, command higher total order volumes, making their revenue protection a critical priority.

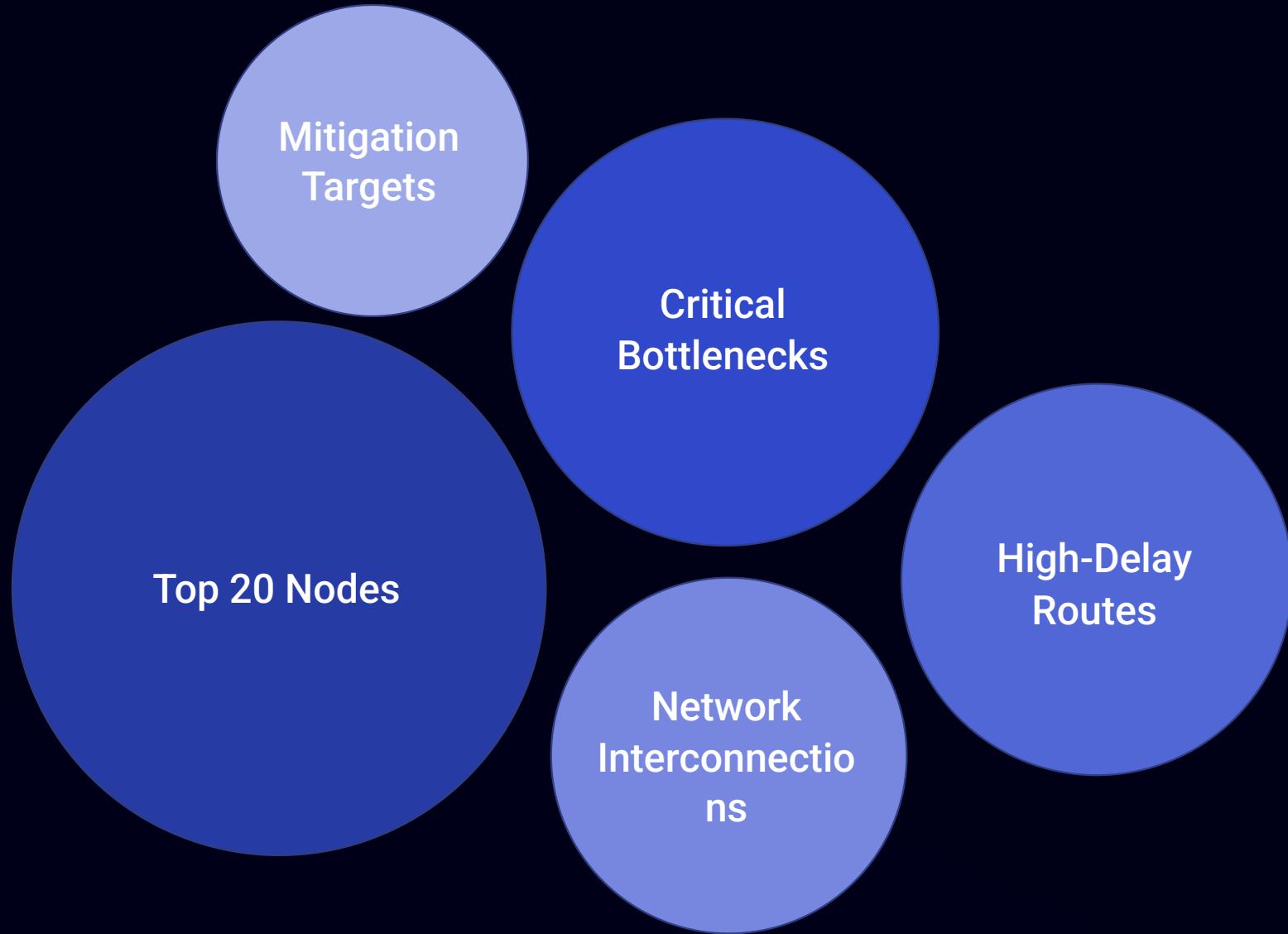


## Critical Stat

The global average late delivery risk stands at a critical level, directly threatening consistent customer retention and market trust.



# The "Top 20" Critical Route Failures



This analysis isolated routes where actual shipping times consistently exceed scheduled windows by **2+ days**. The "Top 20" routes represent a disproportionate amount of total delays, significantly impacting the global OTIF percentage. Resolving these problem lanes is crucial for improving overall efficiency.

## Key Offender

The **Velsen to Caguas** corridor has been identified as a primary bottleneck, necessitating an immediate carrier audit and strategic intervention.

# Protecting High-Margin Revenue

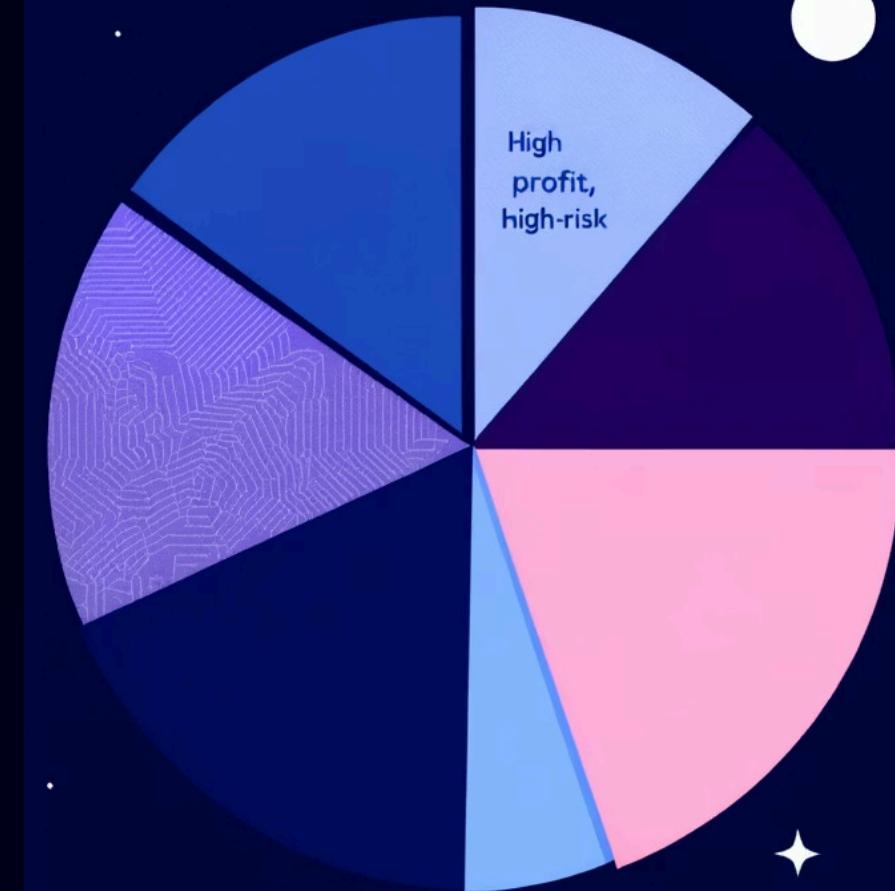
## High-Profit/High-Risk

**Computers and Electronics** categories generate the highest profit per order, yet they suffer from the highest rates of suspected fraud and cancellations, eroding potential gains.

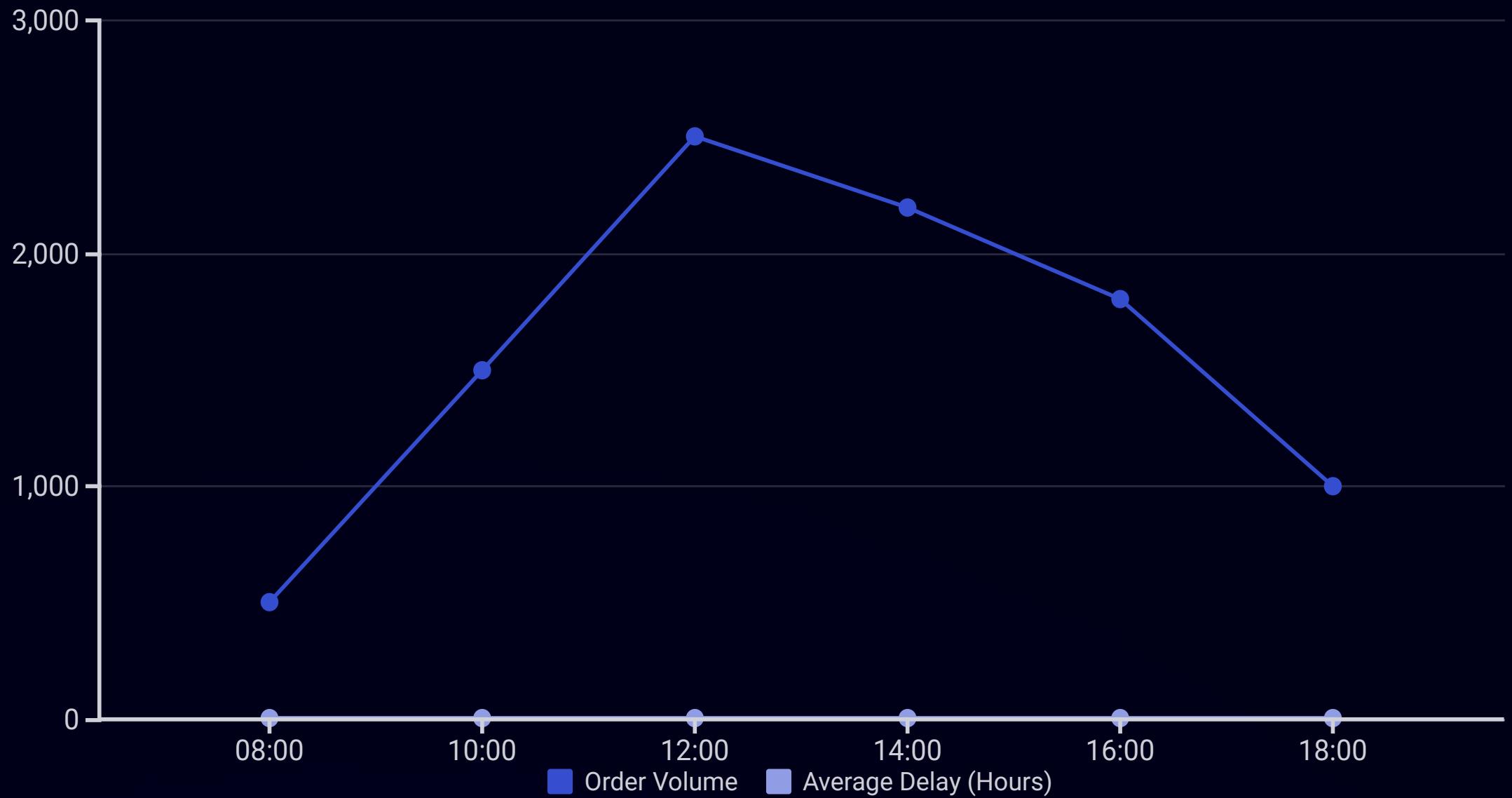
**Data Point:** Categories with order volumes exceeding 100 were rigorously analysed to ensure statistical significance in fraud detection, providing actionable insights.

## Objective

The strategic objective is to balance sales boosts in these lucrative categories with the implementation of stricter manual review and enhanced authentication protocols to mitigate losses.



# Correlating Demand Peaks with Delays



The line chart illustrates that order volume significantly spikes between **10:00 AM and 4:00 PM** across all weekdays. This peak demand window directly correlates with increased average delivery delays, suggesting a clear operational lag. Current manpower allocation does not optimally align with these volume surges, leading to processing backlogs.



# Strategic Roadmap for 2026

01

## Carrier Renegotiation

Utilise the identified Top 20 Bottlenecks to audit carrier Service Level Agreements (SLAs) and diversify partners for failing lanes, improving delivery reliability.

02

## Fraud Prevention

Implement a "High-Risk Tier" verification protocol for orders in the **Computers** category, minimising losses from suspected fraud and cancellations.

03

## Labor Optimisation

Shift warehouse staffing schedules to precisely match the **10 AM – 4 PM** peak window, ensuring efficient processing during high-demand periods.

04

## Continuous Monitoring

Deploy the Tableau "Control Tower" for weekly executive reviews of Revenue at Risk, enabling proactive decision-making and performance tracking.

# Targeted Growth & Reliability



Addressing regional bottlenecks aims to recover a significant portion of the at-risk revenue, directly impacting profitability.

Targeting an increase in the OTIF rate from 45.17% towards a 90% benchmark through route-specific optimisation and strategic interventions.

## Closing

DataCo is now equipped with a proactive, rather than reactive, logistical framework, enhancing operational efficiency and fostering sustainable growth.