

# The Data-to-Decision Pipeline: Transforming Global Superstore's Transactions

Uncovering critical insights to drive profitability and operational excellence across global e-commerce operations

# Project Overview

## The Challenge

Global Superstore, a fictional e-commerce enterprise, maintains vast transactional data across global markets. This comprehensive analysis synthesises over 50,000 records to reveal the hidden patterns that will optimise efficiency and maximise profitability.

Our mission: transform raw data into actionable intelligence that drives commercial success.

## Analytical Focus Areas

- Sales masking underlying profit issues
- Global and regional trend analysis
- Product performance and margin optimisation
- Strategic regional investment opportunities
- Logistical efficiency and cost control



# End-to-End Data Pipeline

01

## Data Engineering

**Python (Pandas)** — Cleaned and normalised 50,000+ transaction records, transforming a single flat table into an efficient Star Schema model with complete data type conversion and integrity validation.

02

## Database Integrity

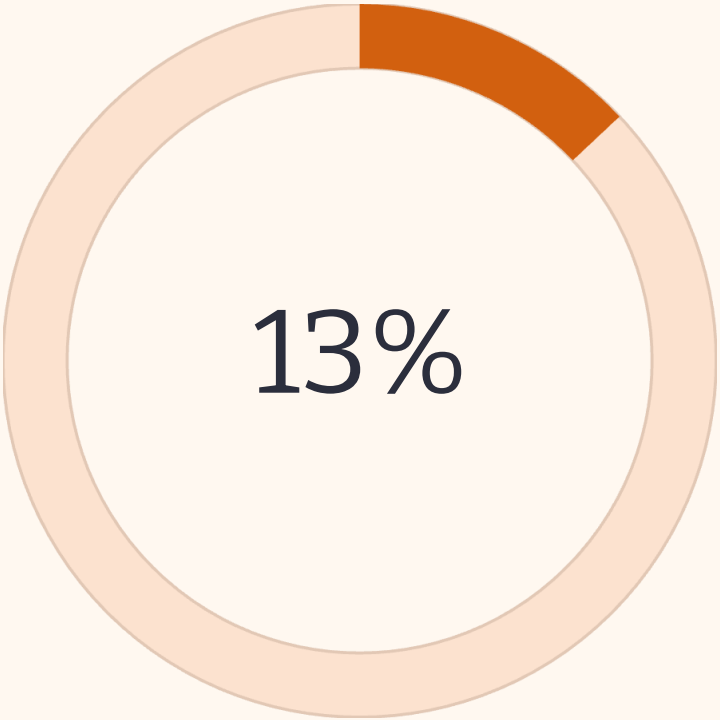
**SQL (DDL & Advanced Queries)** — Enforced primary and foreign key constraints, executed complex analytical queries using Window Functions (LAG, NTILE, RANK) to answer critical business questions.

03

## Visual Storytelling

**Power BI** — Created interactive dashboards and narrative-driven reports that communicate insights to stakeholders, transforming data into compelling business intelligence.

# Critical Finding #1: The Logistics Leak



Profit Consumed

Total company profit lost to shipping costs

## The Cost of Speed

Same Day Delivery is eating profits. Approximately 13% of total profit disappears into expedited shipping costs, primarily driven by this premium service option.

## Strategic Recommendation

Restrict Same Day Delivery exclusively to high-density urban locations where cost-per-delivery is verifiably lower. This targeted approach will preserve crucial profit margins whilst maintaining service excellence where it matters most.

# Critical Finding #2: Sales Masking Profit

## Furniture Category

Leading in sales volume but generating less than half the profit margin of Office Supplies. High revenue is aggressively masking underlying profitability issues that require immediate attention.

## Office Supplies

Despite lower sales figures, this category delivers superior profit margins, demonstrating the critical distinction between revenue generation and actual profitability.

This disparity reveals a fundamental truth: sales volume does not equal commercial success. Margin analysis must drive strategic decisions.





# Critical Finding #3: The Margin Anchors

## Product-Level Profit Killers

Even within the successful Technology category—the company's sales and profit leader—hidden threats lurk at the SKU level.

The **Cubify CubeX 3D Printer Double Head Print** exemplifies this danger: a single product generating a staggering \$9,000 loss, the worst-performing SKU by the largest margin.

## Critical Action Required

Implement continuous, granular margin analysis across all product lines to immediately flag severely underperforming SKUs before they erode category profits.



# Critical Finding #4 Regional Investment Strategy

## Hamburg Success Story

**150% more profit** than Berlin

**65% of Berlin's sales** volume

Superior operational efficiency and pricing power outside the main hub

## The Second-Tier Advantage

Investment initiatives beyond capital cities are yielding exceptional results. These highly efficient markets demonstrate that strategic resource allocation to second-tier cities sustains hyper-profitable growth.

**Strategic Recommendation:** Double down on investment and logistical support in these exceptional second-tier markets to capitalise on their proven efficiency and profitability.

# Critical Finding #5: Sales Trends & Customer Loyalty



## Predictable Seasonality

Global sales exhibit smooth, reliable seasonality across four years of data. The pattern is consistent: low volume in Q1, building momentum through Q2-Q3, and peaking in Q4.

This stability enables confident forecasting and strategic resource planning.

## The Loyalty Imperative

A select group of customers contributes a vital, disproportionate amount to overall profit. Their retention is absolutely critical to sustained success.

## Recommendation

Establish a formal Customer Loyalty Programme to recognise and incentivise these top global patrons, protecting this crucial profit stream.



# Advanced Business Intelligence

Thirteen sophisticated SQL queries unlock deep insights beyond simple analysis:

- Product Profitability Ranking

Top 10 products analysed for sales versus profit margin rank, revealing hidden champions and underperformers

- YoY Profit Growth

Customer segment year-over-year profit growth tracking strategic momentum across market segments

- Customer Lifetime Value

Top 10 CLV analysis identifying most valuable long-term customer relationships

- Cost Efficiency Ratios

Shipping cost as percentage of sales by mode and segment, pinpointing efficiency opportunities

- Geographic Profit Anomalies

Top 5 cities with high discount sales percentage, revealing pricing strategy impacts

- Trend & Volatility Analysis

Quarterly category rankings, MoM volatility detection, and sustained decline identification

# Key Takeaways

1

Control logistics costs

Restrict Same Day Delivery to high-density locations, protecting 13% of profit margins

2

Focus on margins, not just sales

Furniture's high sales mask poor profitability—prioritise margin-rich categories

3

Implement granular SKU monitoring

Continuous margin analysis prevents profit-killing products from eroding success

4

Invest in second-tier cities

Markets like Hamburg demonstrate superior efficiency—double down on these opportunities

5

Protect top customers

Launch a formal loyalty programme to retain the vital customer segment driving disproportionate profits

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