

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

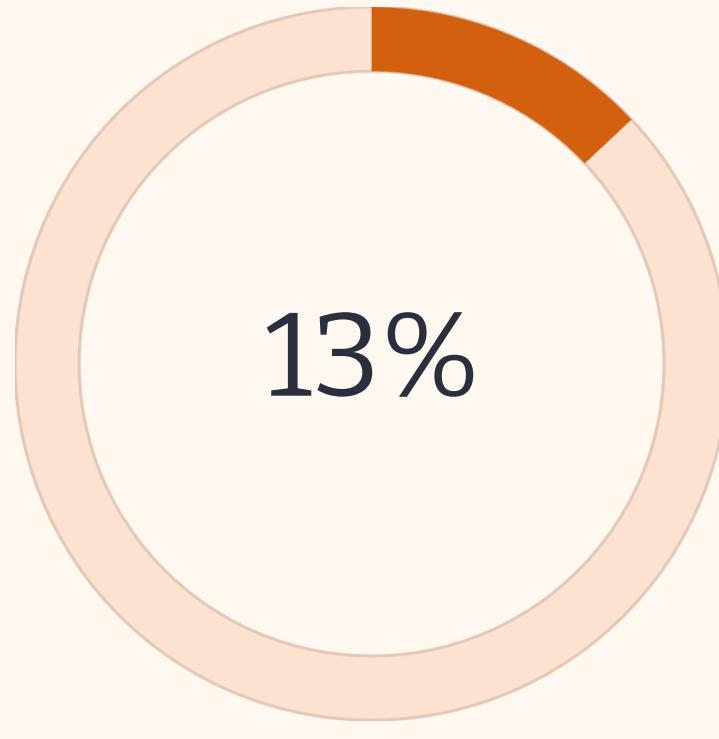
SQL (DDL & Advanced Queries) — Enforced primary and foreign key constraints, executed complex analytical queries using Window Functions (LAG, NTILE, RANK) to answer critical business questions.

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



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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