# 🧾 **CASE STUDY REPORT**

## ****Sales Performance and Shipping Mode Analysis Using SQLite****

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### ****1. Introduction****

This project explores the Sample – Superstore2 dataset using **SQLite** to uncover sales and profit trends, high-performing products, and the impact of shipping modes on sales.

The analysis aims to answer key business questions:

* Which product categories generate the most revenue and profit?
* Which products are performing best or worst?
* Do faster shipping modes influence sales performance?

Dataset fields used include:  
Category, Sub-Category, Product Name, City, Sales, Quantity, Profit, and Ship Mode.

### ****2. SQL Queries and Workflow****

#### ****Step 1: Checking Available Tables****

SELECT name FROM sqlite\_master WHERE type='table';

This verifies the tables within the database to confirm the presence of "Sample - Superstore2".

#### ****Step 2: Previewing the Dataset****

SELECT \* FROM "Sample - Superstore2";

This retrieves all records for initial exploration and data understanding.

#### ****Step 3: Product-Level Aggregation****

SELECT

"Category",

"Product Name",

SUM("Sales") AS total\_sales,

SUM("Quantity") AS total\_quantity,

SUM("Profit") AS total\_profit

FROM "Sample - Superstore2"

GROUP BY "Category", "Product Name"

ORDER BY total\_sales DESC;

**Purpose:**  
To identify the highest and lowest-performing products by total sales, quantity, and profit within each category.

#### ****Step 4: Category-Level Summary****

SELECT

"Category",

SUM("Sales") AS total\_sales,

SUM("Quantity") AS total\_quantity,

SUM("Profit") AS total\_profit

FROM "Sample - Superstore2"

GROUP BY "Category"

ORDER BY total\_profit DESC;

**Purpose:**  
To summarize performance across the main product categories — Technology, Office Supplies, and Furniture.

#### ****Step 5: City and Sub-Category Performance****

SELECT

"City", "Sub-Category",

SUM("Quantity") AS totalquantity,

SUM("Sales") AS totalsales

FROM "Sample - Superstore2"

GROUP BY "City", "Sub-Category"

ORDER BY totalsales DESC;

**Purpose:**  
To analyze city-level performance and identify which sub-categories dominate in specific regions.  
(See Figure 1 in visuals folder: *citywithsales.png*)

#### ****Step 6: Counting Unique Sub-Categories****

SELECT COUNT(DISTINCT "Sub-Category") AS total\_subcategories

FROM "Sample - Superstore2";

**Result:**  
Provides the total number of unique sub-categories sold in the dataset.

#### ****Step 7: Correlation Between Ship Mode and Sales****

WITH encoded AS (

SELECT

CASE "Ship Mode"

WHEN 'Same Day' THEN 4

WHEN 'Second Class' THEN 3

WHEN 'First Class' THEN 2

WHEN 'Standard Class' THEN 1

END AS ship\_mode\_value,

CAST("Sales" AS REAL) AS sales

FROM "Sample - Superstore2"

)

SELECT

(COUNT(\*) \* SUM(ship\_mode\_value \* sales) - SUM(ship\_mode\_value) \* SUM(sales)) /

(SQRT(COUNT(\*) \* SUM(ship\_mode\_value \* ship\_mode\_value) - SUM(ship\_mode\_value) \* SUM(ship\_mode\_value)) \*

SQRT(COUNT(\*) \* SUM(sales \* sales) - SUM(sales) \* SUM(sales))) AS correlation

FROM encoded;

**Result:**  
The correlation coefficient ≈ **0.00548**, meaning there is **no significant relationship** between shipping speed and total sales.  
(See Figure 2 in visuals folder: *correlation.png*)

### ****3. Results****

#### ****Category Summary****

| **Category** | **Total Sales** | **Total Quantity** | **Total Profit** |
| --- | --- | --- | --- |
| Technology | 831,654.03 | 6,939 | 145,454.95 |
| Office Supplies | 719,047.03 | 22,906 | 122,490.80 |
| Furniture | 741,999.80 | 8,028 | 18,451.27 |

✅ **Insight:**  
Technology leads in both sales and profit, followed closely by Office Supplies. Furniture generates high sales but minimal profit — likely due to high cost or discounting.

#### ****Product Summary****

| **Category** | **Product Name** | **Total Sales** | **Total Quantity** | **Total Profit** |
| --- | --- | --- | --- | --- |
| Technology | Canon imageCLASS 2200 Advanced Copier | 61,599.82 | 20 | 25,199.93 |
| Office Supplies | Fellowes PB500 Electric Punch Plastic Comb | 27,453.38 | 31 | 7,753.04 |
| Technology | Cisco TelePresence System EX90 Videoconferencing Unit | 22,638.48 | 6 | -1,811.08 |
| Furniture | HON 5400 Series Task Chairs for Big and Tall | 21,870.58 | 39 | 0.00 |
| Office Supplies | GBC DocuBind TL300 Electric Binding Machine | 19,823.48 | 37 | 2,233.51 |
| Office Supplies | GBC Ibimaster 500 Manual ProClick Binding System | 19,024.50 | 48 | 760.98 |

✅ **Insight:**

* Canon imageCLASS Copier: Top performer with highest profit.
* Cisco TelePresence: Negative profit despite high sales (possible high cost).
* Furniture chair shows zero profit, indicating break-even or mispricing.

### ****4. Insights Summary****

* **Technology** and **Office Supplies** dominate profitability.
* **Furniture** has strong sales but low margins.
* **Shipping speed** does **not** significantly affect sales.
* **New York City** emerges as the top-performing region.
* Some **high-value products** underperform due to cost inefficiencies.

### ****5. Conclusions****

This analysis demonstrates how SQL can efficiently uncover business intelligence from raw data. Using grouping, aggregation, and correlation, the study identified:

* Profitable categories and products
* Underperforming items for pricing review
* Operational insights for shipping and sales optimization

### ****6. Recommendations****

* Reassess pricing and sourcing strategies for low-profit categories (especially Furniture).
* Promote high-profit technology products.
* Maintain current shipping model as it does not impact sales.
* Visualize trends using Python or BI tools like Power BI or Tableau for deeper insights.

### ****7. Next Steps****

* Deploy dataset to **Google Cloud SQL**
* Integrate with **Vertex AI** for predictive modeling
* Build a **web dashboard** to track KPIs in real time

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