

# Final Capstone Project Report

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## Project Title

Customer Purchase Behavior in Retail Using Data Analytics (Excel, SQL & Power BI)

## Problem Statement

Retail companies accumulate large volumes of transactional data but often fail to convert that data into actionable insights. Business leaders struggle to identify:

- Which products are performing well or poorly
- Which customers bring the most value
- Where inventory is underutilized
- Which stores and employees are top contributors

This lack of data-driven decision-making leads to missed revenue, overstocked/understocked products, and poor customer retention.

## Objective

To develop a unified retail analytics solution using Excel, SQL, and Power BI to:

- Clean and organize data
- Perform advanced querying
- Visualize trends and patterns
- Automate and simplify reporting for stakeholders

## What We Did

### Excel Phase (Power Query, Pivot Tables, Macros)

Goals:

- Clean the raw data from multiple sheets
- Build a dynamic pivot-based dashboard
- Automate report generation

Key Actions:

- Used Power Query to clean and transform tables
- Created Pivot Tables and bar charts
- Applied VBA Macros to refresh and export reports automatically

Insights:

- Top-selling product generated over 555,558.61

- Baldwin Bikes was the highest-grossing store
- 14 products were never sold

### SQL Phase (MySQL Workbench)

Goals:

- Perform complex data queries
- Derive key performance metrics
- Export insights for dashboard use

Key Queries:

- Total Sales by Product
- Sales by Store & Category
- Products Never Sold
- Customer Frequency & Staff Performance
- Delivery Delay Analysis

Insights:

- Store sales exceeded 6,662,615.24
- Marcelene Boyer handled 521 orders worth over 2,405,217.85
- Melanie Hayes was top customer (27,050.72)
- 14 products had zero sales

### Power BI Phase (Dashboard)

Goals:

- Create interactive and visual dashboards
- Enable slicer-driven analysis for stakeholders

Key Visuals:

- Bar/Column charts for stores and products
- Donut chart for category contribution
- Tables for customer and staff ranking
- KPI cards for unsold products and revenue

Features:

- Slicers for product, store, and category
- Clean layout with interactive drill-downs

### Key Insights (Combined)

- Majority of sales came from few products and stores
- Many customers are first-time buyers
- Several SKUs are stagnant with no movement
- Staff performance varies significantly
- Delivery timelines can be optimized

## Recommendations

- Clear unsold inventory (14 stagnant SKUs)
- Launch loyalty/reward program to retain customers
- Provide support and incentives for staff
- Promote high-performing stores and shift stock strategically
- Fix fulfillment and shipping delays
- Automate reporting with Excel Macros and Power BI

## Final Deliverables

- Excel Workbook (.xlsm) with macro-enabled dashboard
- SQL Report Document with query insights
- Power BI Dashboard File (.pbix)
- CSV exports of all SQL query results
- Auto-generated PDF summary from Excel macro

## Conclusion

This project leveraged Excel, SQL, and Power BI to deliver an end-to-end data analytics solution. It enabled structured cleaning, robust querying, and dynamic dashboards. Stakeholders can now access real-time metrics to drive smarter decisions across sales, staffing, and inventory.