Final Capstone Project Report

# 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.