Internship Project on

Retail Business Performance & Profitability Analysis

by Elevate Labs

Retail Business Performance & Profitability Analysis

Introduction

In today's competitive retail landscape, understanding profitability drivers and inventory dynamics is crucial for sustainable growth. This project focuses on analysing transactional retail data to identify profit-draining categories, optimize inventory turnover, and uncover seasonal product trends. By leveraging SQL, Python, and Power BI, we aim to deliver actionable insights that support strategic decision-making.

Abstract

The analysis begins with importing and cleaning retail sales data in SQL, followed by calculating profit margins across categories and sub-categories. Python (Pandas and Seaborn) is used to explore correlations between inventory days and profitability. A Power BI dashboard is built to visualize trends across regions, product types, and seasons. The final output includes strategic recommendations for managing slow-moving and overstocked items, enhancing overall business performance.

Tools Used

- **SQL (MySQL 5.5):** Data import, cleaning, and profit margin calculations
- **Python (Pandas, Seaborn):** Statistical analysis and correlation modeling
- **Power BI:** Interactive dashboard with filters for region, product type, and season

Steps Involved in Building the Project

1. **Data Import & Cleaning**
    - Loaded CSV data into MySQL using `LOAD DATA LOCAL INFILE`
    - Removed null/missing records and standardized formats
2. **Profitability Analysis**
    - Calculated total sales and profit margins by category and sub-category using SQL `GROUP BY` and `ROUND(SUM(...), 2)`
    - Identified top-performing and underperforming segments
3. **Inventory Correlation**
    - Used Python to compute correlation between inventory days and profitability
    - Visualized relationships using Seaborn heatmaps and scatter plots
4. **Power BI Dashboard**
    - Built dynamic visuals for sales trends, seasonal patterns, and regional performance
    - Added slicers for filtering by region, product type, and seasonality
5. **Strategic Insights**
    - Flagged slow-moving items with low turnover and high inventory cost
    - Recommended markdowns, bundling, or promotional strategies for overstocked products

Conclusion

This project successfully demonstrates how data-driven insights can enhance retail profitability. By integrating SQL, Python, and Power BI, we uncovered key performance indicators and inventory inefficiencies. The final dashboard empowers stakeholders to make informed decisions, reduce waste, and improve seasonal planning. Future work may include predictive modeling for demand forecasting and customer segmentation.