

Retail Business Performance & Profitability Analysis

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Tools Used: SQL, Python (Pandas, Seaborn), Tableau

Objective

The goal of this project was to perform an in-depth analysis of transactional retail data to identify underperforming product categories, assess inventory efficiency, and uncover seasonal product trends to enhance overall profitability.

Methodology

- SQL Analysis:

- Imported the retail dataset into SQL.
- Cleaned data by handling missing/null values.
- Calculated profit margins by category and sub-category using aggregate queries.
- Identified top and bottom-performing categories based on profit and sales figures.

- Python Analysis (Pandas & Seaborn):

- Imported and cleaned the data in Python.
- Performed correlation analysis to examine the relationship between Inventory Days and Profit Margin.
- Found that Inventory Turnover data was missing; analysis was adjusted accordingly.
- Generated scatterplots for visualizing profit vs. sales and explored category-wise profitability.

- Tableau Dashboard:

- Created a visually interactive dashboard featuring:
 - * Sales Over Time line graph showing monthly trends.
 - * Sales by Category and Profit by Product and Region bar charts.

- * Profit vs Sales scatterplot to reveal outliers and trends.
- * Filters for Region, Category, and Season for deep dive analysis.

Key Insights

- Technology emerged as the most profitable category, followed by Furniture.
- Several products underperforming in terms of profit despite high sales volumes.
- Sales show seasonal patterns with spikes around spring and winter months.
- Regional differences in profitability suggest tailored marketing or stock strategies could help.
- Inventory analysis was limited due to missing turnover data but should be prioritized in future tracking.

Recommendations

1. Discontinue or promote underperforming products that generate sales but minimal profits.
2. Enhance inventory tracking to monitor Inventory Turnover and reduce Inventory Days.
3. Invest in high-margin categories, particularly in Technology and Furniture.
4. Plan seasonal campaigns in spring and winter when sales are higher.
5. Optimize regional strategies by aligning inventory and promotions to region-specific preferences.

Deliverables

- Tableau Dashboard (Interactive visualization)
- SQL Query File (Retail_Queries.sql)
- Python Script (retail_analysis.py)
- PDF Report (this document)

Conclusion

This project not only provided a detailed overview of current retail performance but also helped create a roadmap for strategic improvements in profit optimization, inventory management, and customer-focused marketing.