FINAL REPORT

Strategic Product Placement Analysis: Unveiling Sales Impact with Tableau Visualization

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1. Introduction

Retail businesses often struggle to understand how product placement inside a store affects sales performance.

The objective of this project is to analyze product category performance, customer demographics, promotion impact

and store placement effectiveness using data visualization techniques.

This project uses Tableau for dashboard and story creation and integrates the dashboard into a web application using Flask.

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2. Problem Statement

Retail managers lack clear insights on:

- Which product category generates highest sales
- Which store position (Front, Aisle, End-cap) performs best
- Impact of promotions on sales volume
- Customer demographic contribution to revenue

Due to lack of structured visualization, decision-making becomes difficult and inefficient.

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3. Proposed Solution

To solve this problem, an interactive Tableau dashboard and story were developed to:

- Compare sales across product categories
- Analyze store placement effectiveness
- Evaluate promotion impact
- Study demographic contribution to sales
- Compare competitor pricing vs product pricing

The dashboard is embedded into a Flask-based web application for browser-based access.

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4. Dataset Description

The dataset contains:

- Product Category (Clothing, Electronics, Food)
- Store Position (Front, Aisle, End-cap)
- Average Sales Volume
- Price & Competitor Price
- Promotion (Yes/No)
- Customer Demographics (Young Adults, Families, Seniors, College Students)
- Foot Traffic

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5. Data Preprocessing Steps

The following preprocessing steps were performed:

1. Checked for missing values
2. Removed duplicate records
3. Standardized category names
4. Converted numerical columns into proper data types
5. Verified promotion values (Yes/No consistency)
6. Validated price columns
7. Aggregated sales volume where necessary
8. Cleaned demographic labels

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6. Dashboard Overview

The Tableau dashboard contains:

- Avg Sales Volume vs Product Category (Bar Chart)
- Consumer Demographics vs Sales Volume (Donut Chart)
- Competitor Price vs Product Price (Bar Chart)
- Promotion Impact on Sales (Comparison Chart)
- Product Category vs Price (Pie Chart)
- Product Category by Store Placement (Tree Map)
- Seasonal Sales Analysis

These visualizations help in understanding business performance clearly.

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7. Key Insights

- Clothing category shows highest average sales volume.
- Products placed at the Front of Store generate higher sales.
- Promotions increase sales volume significantly.
- Young Adults and Families contribute major sales share.
- Competitive pricing impacts product performance.

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8. Web Integration (Flask)

A Flask web application was developed to:

- Host the Tableau dashboard
- Provide browser-based access at:
  http://127.0.0.1:5000
- Display embedded Tableau dashboard and story

Project structure includes:

- app.py
- templates folder
- static folder

- Embedded Tableau public link

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9. Testing

The following testing was performed:

- Functional testing of dashboard filters
- Verification of data visualization accuracy
- Flask server startup testing
- Embedded dashboard loading validation
- Browser compatibility check

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10. Conclusion

This project successfully demonstrates how data visualization and analytics can support retail decision-making. By analyzing product placement, promotions, pricing, and customer demographics, businesses can make strategic decisions to increase sales performance.

The integration of Tableau with Flask enhances accessibility and provides a simple web-based deployment model.

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11. Future Scope

- Real-time data integration
- Predictive sales modeling
- Cloud deployment
- Automated recommendation system
- Advanced customer segmentation using ML