Technical Report

Introduction

This project focuses on providing data-driven insights into Grace Supermarket's 2015 performance by creating a consolidated Sales Dashboard. The primary objective was to analyze sales trends and key performance indicators, identifying the most valuable customer segments and products. This analysis, performed using Microsoft Excel with transactional sales data spanning 2011 to 2015, addresses critical questions to guide business strategy, such as determining optimal product focus and store resource allocation.

Story of Data

Data Source: Assumed to be an **internal company database** of sales transactions, potentially sourced from a public repository like Kaggle for this student exercise.

Data Structure: The data is structured with rows representing individual transactions and columns detailing variables such as **Store Location, Product Category, Sales Volume, Shipping Mode, Date, and Customer Segment**.

Important Features and Their Significance:

- **Sales Trend (2011–2015):** Crucial for measuring historical growth.
- **Top Customer Segment:** Identifies the most profitable customer groups (**Consumer, Corporate, Home Office**).
- **Top Product Department:** Shows which departments (**Technology, Furniture, Office Supplies**) contribute the most to revenue.

Data Limitations or Biases: As the dashboard focuses primarily on 2015, analysis of long-term seasonal trends is limited. Potential data quality issues (e.g., inconsistencies in store naming) would have been addressed during preprocessing.

Data Splitting and Preprocessing

Data Cleaning & Handling Missing Values: Standard steps like removing duplicates and ensuring consistent data types were performed. Missing values (e.g., if a store location was empty) were likely imputed or the corresponding rows excluded.

Data Transformations: New variables like **"Year"** were created from the "Order Date" column to facilitate the **Sales Trend Report** (2011–2015 comparison). Sales figures were aggregated by year, department, and store.

Industry Context: This analysis belongs to the **Retail Industry**, specifically the supermarket/general goods sector, which relies heavily on sales and inventory optimization.

Stakeholders: Senior Management, Department Heads (e.g., Category Managers), and Store Managers will directly benefit from these insights.

Value to the Industry: Provides a **quick and effective method** for business intelligence, enabling rapid decision-making regarding inventory stocking, promotional strategies, and customer targeting.

Pre-Analysis

Initial Insights: The data showed a significant upward sales trend, with 2014 being the highest sales year on record (before 2015's final count) and a clear dominance by the Consumer customer segment.

Potential Correlations: Initial review suggested a strong correlation between the Office Supplies department and specific low-cost/high-volume products like Staples.

In-Analysis

Unconfirmed Insights: The **Office Supplies** department contributes 30% of sales, yet the **Top Selling Products** list is dominated by *Office Supplies items* (Staples, Binders). This suggests high unit volume but potentially lower price points compared to the 35% revenue from **Technology** (likely fewer, more expensive items).

Analysis Techniques Used in Excel: Heavy use of Pivot Tables to segment sales by customer, department, and store, and Slicers to dynamically filter the underlying data for different views.

Post-Analysis and Insights

Sales Trend: The sales show a strong growth trend, peaking at **$43,901 in 2014**.

Top Customer: The **Consumer** segment is the most valuable, driving **$57,450.60** in sales and accounting for **50%** of total customer sales in the main pie chart.

Top Store: Los Angeles is the runaway top-performing store with **$175,851** in sales.

Top Product: Staples are the clear winner, accounting for **69.90%** of the Top Selling Products group.

Comparison with Initial Findings: The initial assumption of a positive sales trend was confirmed, but the sheer dominance of the Los Angeles store and the high percentage of sales attributed to Staples were surprising outcomes.

Data Visualizations & Charts

Dashboards: The consolidated dashboard effectively brings together sales trends, top customer segments, departmental contributions, shipping mode, top stores, and top products into a single, digestible view. Explanation of Visualizations:

- **Bar Chart (Sales Trend Report):** Clearly shows the **YoY sales growth** and the peak sales years.
- **Pie Chart (Top Product Department):** Highlights the nearly equal revenue split between **Technology (35%)** and **Furniture (35%)**, with **Office Supplies (30%)** close behind.
- **Bar Chart (Top 5 Performing Stores):** Visually emphasizes the **Los Angeles store's significant lead** over other locations.

Recommendations and Observations

Actionable Insights:

- **Store Focus:** Investigate the operational excellence of the **Los Angeles** store to replicate its success model in lower-performing stores like **Denver ($12,199)**.
- **Product Strategy:** Leverage the high-volume demand for **Staples** (70%) to cross-sell other **Office Supplies** or promote high-margin items.
- **Customer Segmentation:** Direct marketing efforts should continue to be prioritized toward the **Consumer (50%)** segment, while strategies for boosting the **Corporate (31%)** and **Home Office (19%)** segments should be developed.

Unexpected Outcomes: The dominance of Staples in the top-selling products suggests an opportunity to analyze its profitability vs. high-value items in the Technology/Furniture categories.

Conclusion

Key Learnings: Data visualization is crucial for instantly identifying performance extremes (like the Los Angeles store) and category proportions. Grace Supermarket is a growing business with a strong core consumer base.

Limitations: The dashboard doesn't show *profit* or *cost*, which is essential for a complete profitability analysis. Future work would include this financial dimension.

Future Research:

Analyze **Profitability by Product and Store**.

Perform a deep-dive analysis into the **Denver** store's performance issues.

Investigate the low usage of the **Second Class (21%)** and **Same Day (8%)** shipping modes.