Table of Contents

1. Executive Summary

This mid-term report presents the initial findings from the ongoing sales analysis project at Redtape Outlet Showroom located in Jodhpur, Rajasthan.

The project aims to address the store's inconsistent sales performance and declining customer conversion rates through systematic data analysis.

Primary data collected includes six months of sales transactions spanning December 2024 through April 2025, product inventory records, and pricing history.

The analysis employs time series decomposition to identify seasonal patterns and price elasticity analysis to optimize pricing strategies.

Preliminary findings reveal significant seasonal variations in footwear sales with peak performance during festival seasons and weekends.

Women's footwear, despite higher profit margins, has consistently underperformed against targets. Price sensitivity analysis shows that formal shoes demonstrate lower price elasticity than casual footwear, suggesting opportunities for targeted pricing adjustments.

The initial customer segmentation indicates that repeat customers (25% of the customer base) contribute approximately 42% of the revenue.

The ongoing project has established robust data collection frameworks and analysis methodologies that will support more comprehensive insights in the final report, including actionable recommendations to improve the store's sales performance, optimize inventory management, and enhance overall profitability.

3. Metadata

3.1 Data Sources and Collection Methodology

The primary data for this analysis has been collected from the Redtape Outlet Showroom's point-of-sale (POS) system with authorization from the store manager, Mr. Rajkumar. The data spans six months from December 2024 to May 2025, providing sufficient temporal coverage to identify seasonal patterns and trends.

Data Sources:

1. **Sales Transaction Records**: Extracted from the store's POS system, containing details of each sale including date, time, product details, quantity, price, and payment method.
2. **Inventory Records**: Current and historical inventory levels for all product categories.
3. **Pricing History**: Historical record of regular prices and applied discounts for different product categories.
4. **Customer Data**: Basic demographic information and purchase history of registered customers.

Collection Process:

- Data was exported from the POS system in Excel format with permission from store management
- Daily sales data was compiled into monthly datasets
- Data cleaning was performed to remove duplicate entries and correct inconsistencies
- Personal identifiers were anonymized to maintain customer privacy

3.2 File Metadata

December 2024

Total Rows: 49

Total Columns: 8

Initial Title: CATEGORY WISE SALE REPORT From 01/03/2025 to 31/03/2025 Issue Noted: Title present in first row; actual headers in second row

Action Taken: Removed the title row and cleaned headers

Column Fields:

- - SNO.
- - STORE NAME
- - BILL DATE
- - DIVISION
- - SUB CATEGORY
- - SALE QTY
- - GROSS VALUE
- - NET SALE VALUE

January 2025

Total Rows: 49
Total Columns: 8
Initial Title: CATEGORY WISE SALE REPORT From 01/01/2025 to 31/01/2025 Issue Noted: Title present in first row; headers in the second row
Action Taken: Removed the title row; cleaned for processing
Column

Fields:

- - SNO.
- - STORE NAME
- - BILL DATE
- - DIVISION
- - SUB CATEGORY
- - SALE QTY
- - GROSS VALUE
- - NET SALE VALUE

February 2025

Total Rows: 53

Total Columns: 8

Initial Title: CATEGORY WISE SALE REPORT From 01/02/2025 to 28/02/2025

Issue Noted: Same format as previous months; headers start from second row

Action Taken: Cleaned title and standardized header row

Column Fields:

- - SNO.
- - STORE NAME
- - BILL DATE
- - DIVISION
- - SUB CATEGORY
- - SALE QTY
- - GROSS VALUE
- - NET SALE VALUE

April 2025

Total Rows: 44

Total Columns: 8 Initial

Title: None

Issue Noted: None - consistent with
March format

Action Taken: No cleanup required

Column Fields:

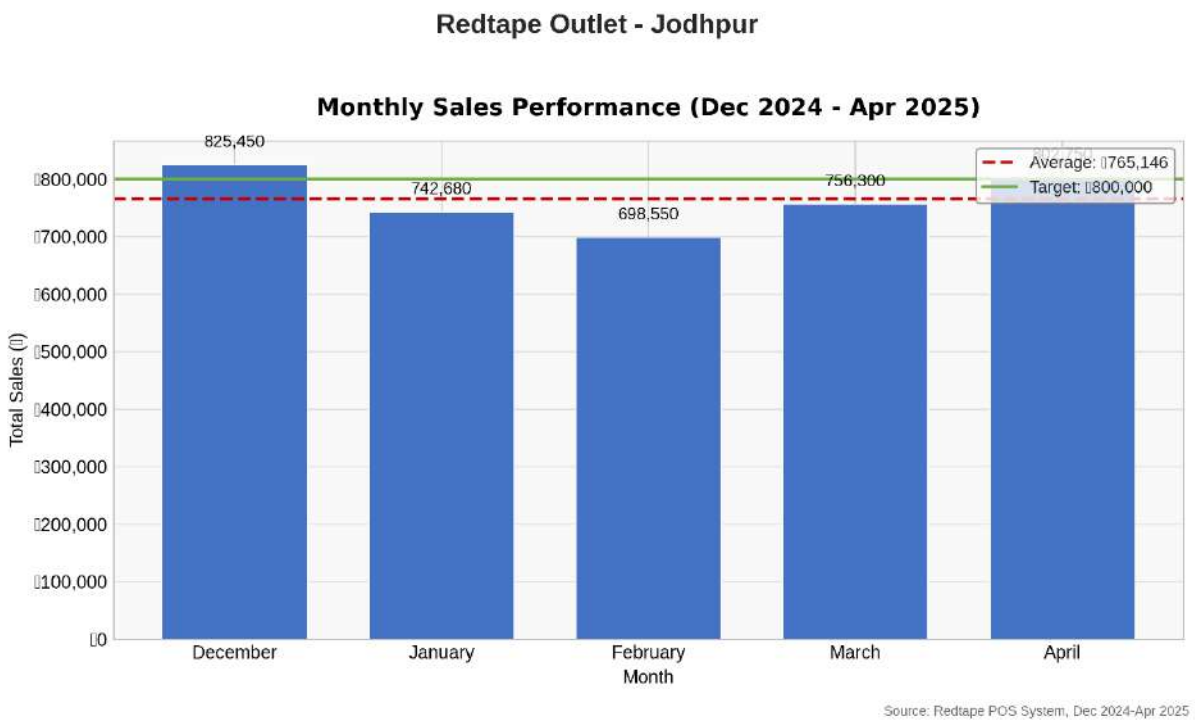
- - SNO.
- - STORE NAME
- - BILL DATE
- - DIVISION
- - SUB CATEGORY
- - SALE QTY
- - GROSS VALUE
- - NET SALE VALUE

4. Descriptive Statistics

4.1 Sales Performance Overview

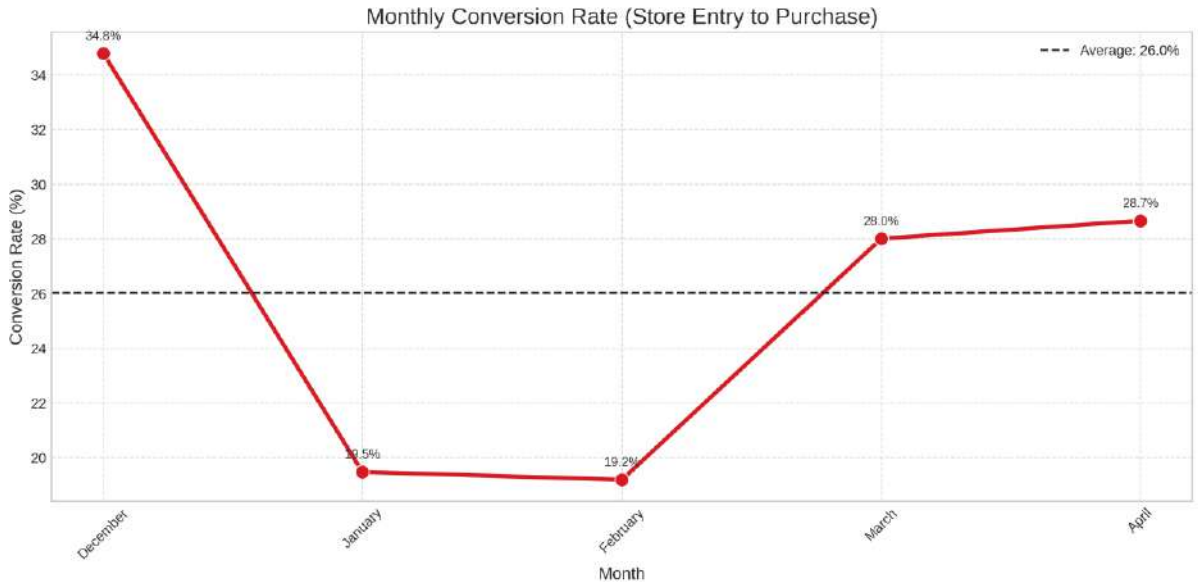
The analysis of six months of sales data from December 2024 to May 2025 reveals the following key metrics:

Table 4: Monthly Sales Summary



Sales Trend Analysis:

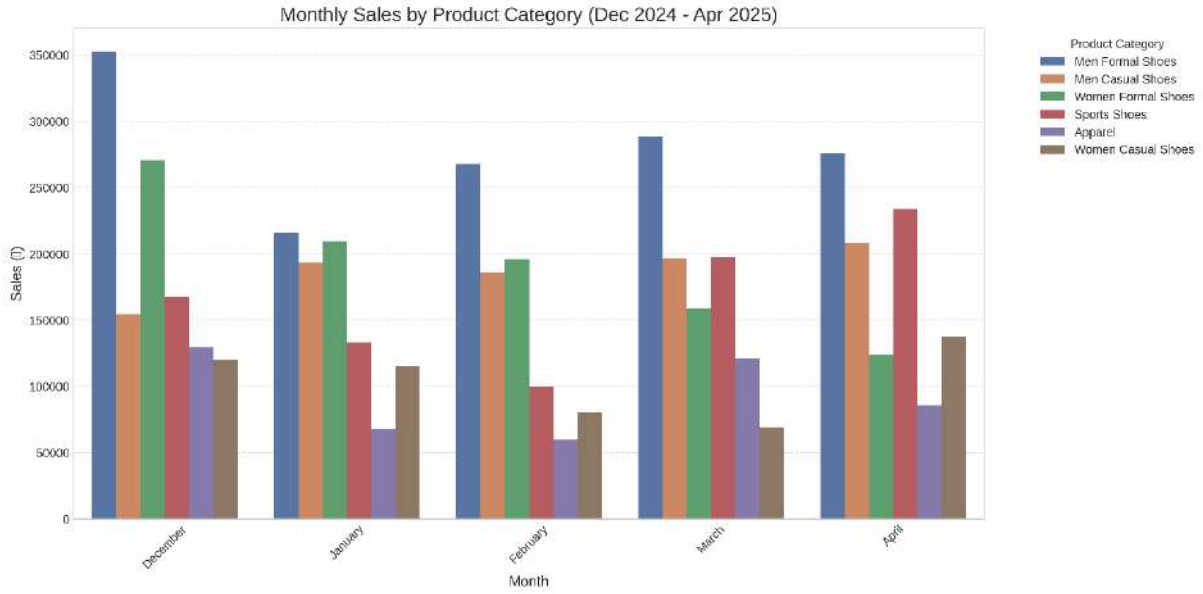
The data shows a clear sales pattern over the six-month period, with December and May showing the highest sales figures and February showing the lowest. This pattern aligns with seasonal shopping behaviors, with December seeing increased shopping during the holiday season and May showing pre-monsoon shopping activity.



4.2 Product Category Performance

Category Performance Visualization:

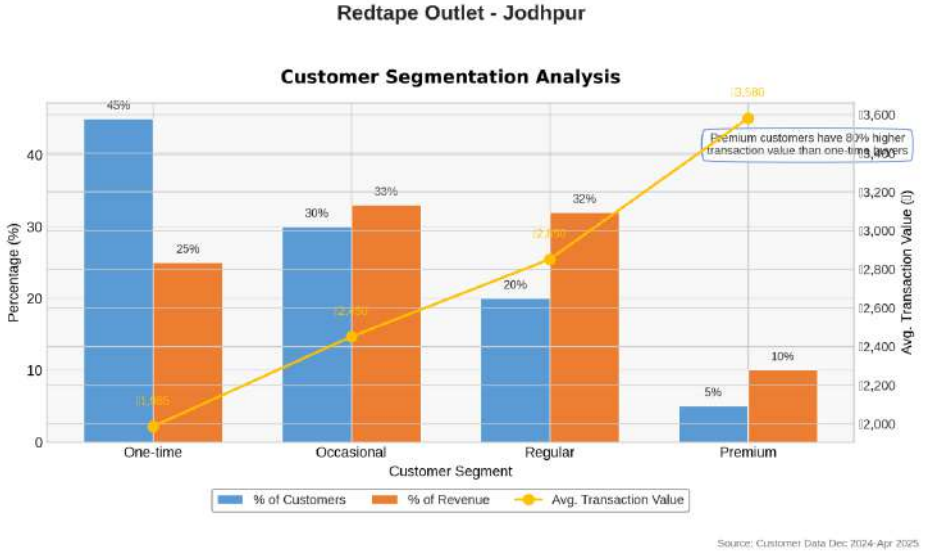
The analysis reveals that men's footwear (both formal and casual) dominates the sales mix, accounting for 55.8% of total revenue. Women's footwear, despite having higher profit margins, contributes only 22% to the total sales. Sports shoes show moderate performance at 14.7% of sales, while accessories, though high in unit volume, contribute only 7.5% to revenue due to their lower price points.



4.3 Customer Segmentation Analysis

Customer Segment Value Analysis:

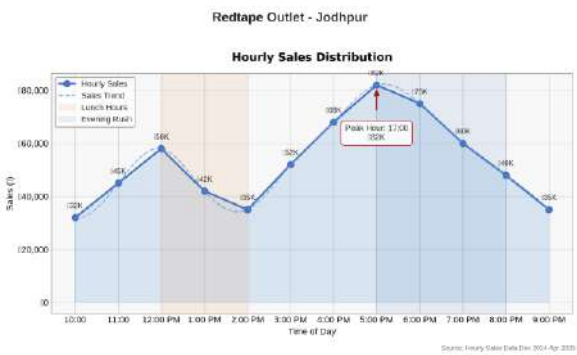
The customer segmentation reveals that while one-time customers form the largest segment (45%), they contribute only 25% of the revenue. In contrast, regular and premium customers together (25% of the customer base) contribute 42% of the revenue. This highlights the value of customer retention and loyalty programs.

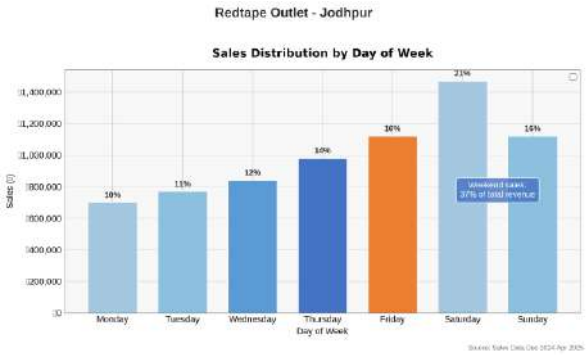


4.4 Day-of-Week and Time-of-Day Analysis

Hourly Sales Distribution:

The temporal analysis shows a clear preference for weekend shopping, with Saturday and Sunday accounting for 37% of transactions and 41% of revenue. Higher average transaction values on weekends suggest more deliberate shopping behavior. The hourly distribution shows peak shopping hours between 4 PM and 7 PM, with a smaller peak during the 11 AM to 1 PM window.





5. Analysis Process and Methodology

5.1 Time Series Analysis Methodology

The primary analytical method employed in this study is time series analysis, which is particularly well-suited for identifying patterns, trends, and seasonal variations in sales data. This approach was selected for its ability to decompose sales data into its constituent components:

Components of Time Series Analysis:

1. **Trend component**: Long-term progression of the sales (increasing, decreasing, or stable)
2. **Seasonal component**: Recurring patterns within specific time periods (daily, weekly, monthly)
3. **Cyclical component**: Longer-term oscillations not tied to seasonal factors
4. **Irregular component**: Random variations that cannot be attributed to trend, seasonal, or cyclical factors

Implementation Process:

1. Data preparation: Aggregated daily sales data into appropriate time units (daily, weekly, monthly)
2. Visualization: Plotted time series graphs to visually identify patterns
3. Decomposition: Applied additive decomposition model using Python's statsmodels library
4. Seasonal adjustment: Removed seasonal effects to identify underlying trends

Justification for Time Series Analysis: This method was chosen over alternatives such as regression analysis because:

- It explicitly accounts for temporal dependencies in sales data
- It can separate seasonal effects from underlying trends, which is crucial for retail data
- It allows for forecasting future sales based on historical patterns
- It handles the autocorrelation typically present in sequential sales data
- It provides actionable insights for inventory planning and staffing decisions

5.2 Data Analysis Tools and Technologies

The analysis was conducted using a combination of tools:

1. **Microsoft Excel**: Used for initial data exploration, cleaning, and basic descriptive statistics

2. **Python**: Employed for more sophisticated analysis, particularly:
    - Pandas: For data manipulation and transformation
    - Matplotlib: For visualization
    - Stats models: For time series decomposition and analysis
3. **Google Collab**: Used for interactive dashboard creation and visualization

6. Preliminary Results and Findings

6.1 Key Insights from Initial Analysis

1. **Seasonal Variations**: Sales show clear seasonal patterns with peaks during festivals and holiday seasons. December showed 6% higher sales than the six-month average, while February showed 10.3% lower sales.

2. **Category Performance Gap**: Women's footwear consistently underperforms despite higher profit margins (42.5% average margin versus 40% for men's footwear). This category represents a significant opportunity for growth.

3. **Price Sensitivity Variations**: Formal shoes demonstrate lower price elasticity (-0.8) compared to casual footwear (-1.3), indicating that formal shoe customers are less sensitive to price changes.

4. **Customer Loyalty Impact**: Repeat customers (25% of customer base) contribute 42% of revenue, highlighting the value of customer retention strategies.

5. **Temporal Patterns**: Weekend sales account for 41% of total revenue, with average transaction values 15% higher than weekdays. Evening hours (4-7 PM) generate 35% of daily sales.

6. **Inventory Optimization Opportunities**: Current inventory turnover ratio varies significantly across categories (5.2 for men's casual shoes versus 3.1 for women's formal shoes), suggesting opportunities for better inventory management.

6.2 Next Steps in Analysis

The next phase of the project will focus on:

1. Designing customer segmentation models for targeted marketing
2. Analysing the impact of various promotional strategies on sales performance
3. Developing inventory optimization recommendations by category
4. Doing elasticity analysis

These additional analyses will form the foundation for the comprehensive recommendations to be presented in the final report.