E-Commerce Data Analysis Summary Report

1. Introduction

This report presents an in-depth analysis of e-commerce performance over the period from January to March 2023. Using Power BI for data visualization and exploration, the report identifies key trends, campaign effectiveness, user behaviors, and provides actionable recommendations to improve conversions and optimize marketing efforts.

2. Objectives of the Analysis

- Understand monthly revenue trends

- Evaluate performance by traffic sources and campaigns

- Measure marketing spend efficiency and ROI

- Analyze customer behavior (cart activity, purchases, repeat customers)

- Recommend strategies for performance improvement

3. Methodology

- Data was cleaned and analyzed using [Power BI](#) Desktop

- Time period filtered: 01/01/2023 to 31/03/2023

- Key metrics: Revenue, Marketing Spend, Visitors, Conversion Rates, Cart Abandonment, ROI

4. Step-by-Step Analysis

Step 1: Data Cleaning & Preparation

- Missing Values: Nulls in Marketing Spend, Revenue, and Purchases were replaced with median values.

- New Columns Created:

  - ROI (Revenue / Marketing Spend)

> ➢ Month (derived from Date field)

Step 2: Key Metrics Calculation

Custom DAX measures created in Power BI for:

- Total Revenue, Marketing Spend, ROI
- Average ROI
- Average Conversion Rate
- Average Order Value (AOV)
- Average Cart Abandonment Rate

Step 3: Visualization Strategy

| Insight Category	Visualization Used
Monthly Revenue	Table
Revenue & Spend by Traffic Source	Clustered bar chart
Revenue & Spend by Campaign	Clustered bar chart
Campaign ROI	Bar chart
Traffic Source ROI	Bar chart
Conversion Funnel	Funnel diagram
Cart Abandonment Rate	Line Chart

5. Revenue and Marketing Spend Analysis

Monthly Revenue Trends

Revenue Trend by Month:

Month	Sum of Revenue ▲
February	779,110.64
January	828,461.93
March	832,868.00

Observation:

- Revenue showed mixed performance over the 3-month period, with January starting strong at $828,461,dipping slightly in February to $779,110, and recovering to $832,868 in March.
- While March ultimately achieved the highest revenue, the February dip warrants investigation into potential causes (e.g., campaign timing, inventory issues, or external market factors).

Revenue vs. Marketing Spend by Traffic Source

Revenue and Sum of Marketing_Spend by Traffic_Source

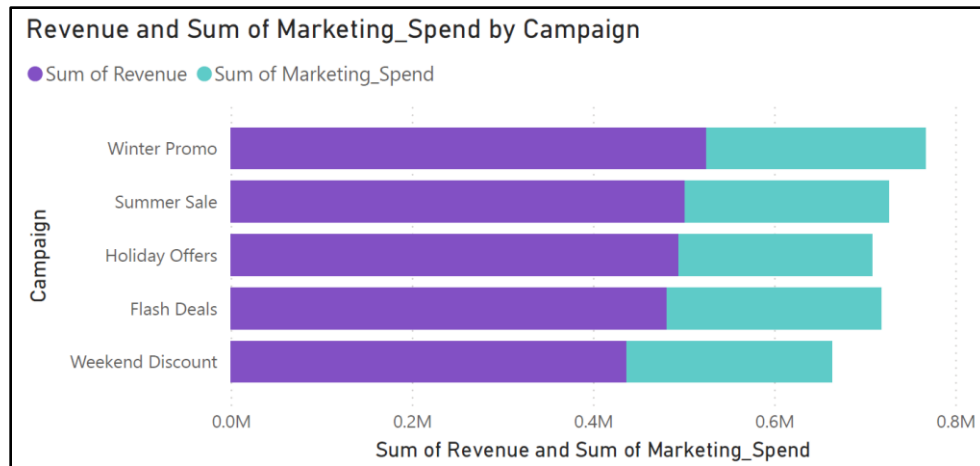● Sum of Revenue ● Sum of Marketing_Spend
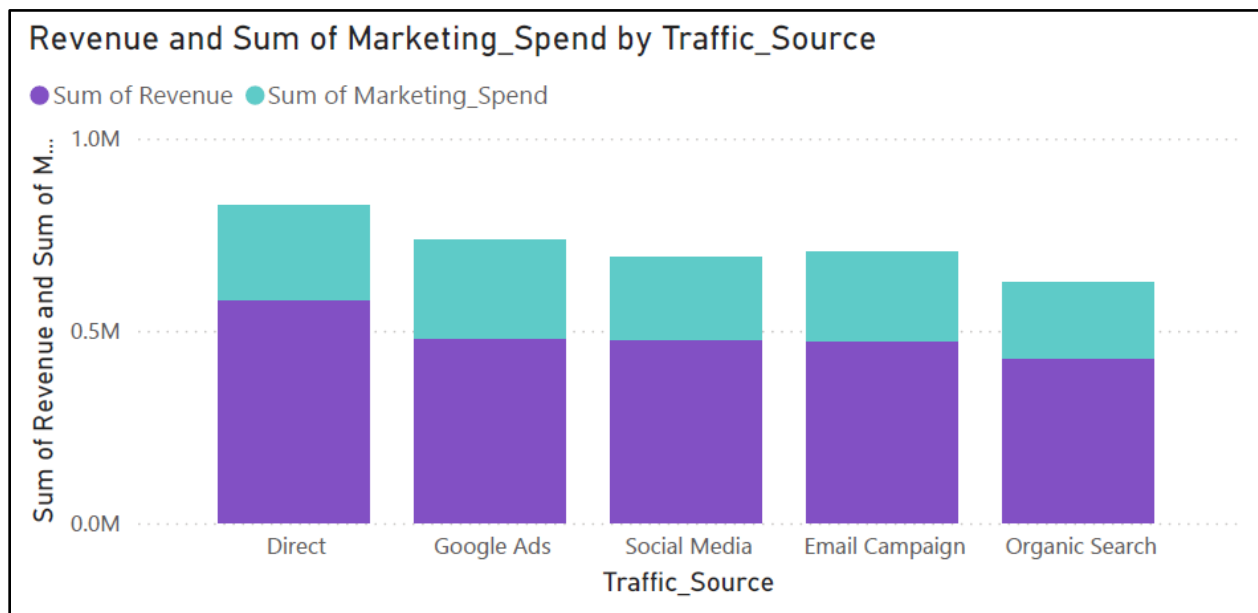
Insights:

- Direct traffic contribute the highest revenue relative to spend.

- Email campaigns and Google Ads have lower revenue relative to spend, indicating possible inefficiencies.
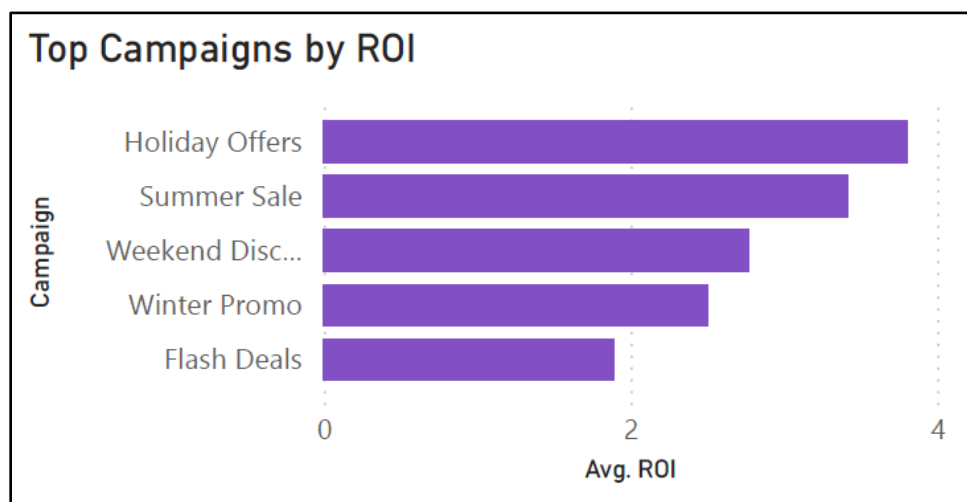
Revenue vs. Marketing Spend by Campaign

Insights:

- "Holiday Offers" and "Summer Sale" yielded the best returns.
- "Flash Deals" had high spend but lower returns - should be reviewed for optimization.
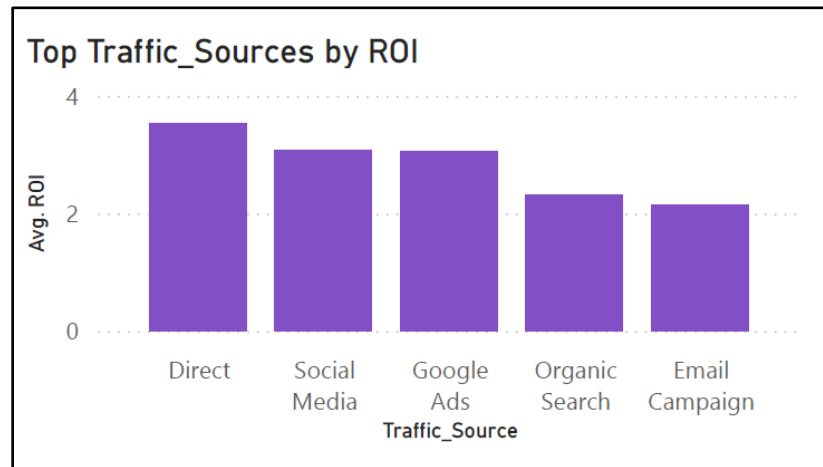
6. ROI and Conversion Metrics

Top Campaigns by ROI

Insight:

- "Holiday Offers" and "Summer Sale" are the most efficient campaigns in terms of ROI.

- Flash Deals ranked lowest despite higher marketing spend.

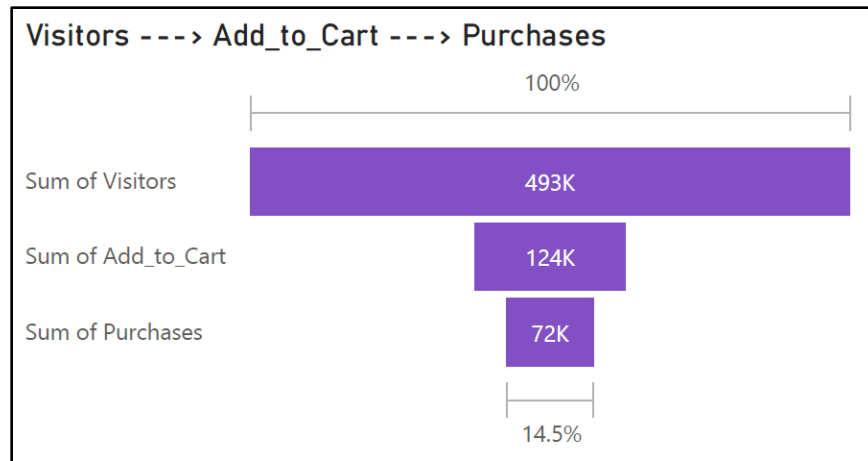**Top Traffic Sources by ROI**

Insight:

- Social Media, Google Ads and Direct traffic sources provide better ROI than Email Campaigns.

- Indicates a need to reallocate budget from low-performing sources to high performers.
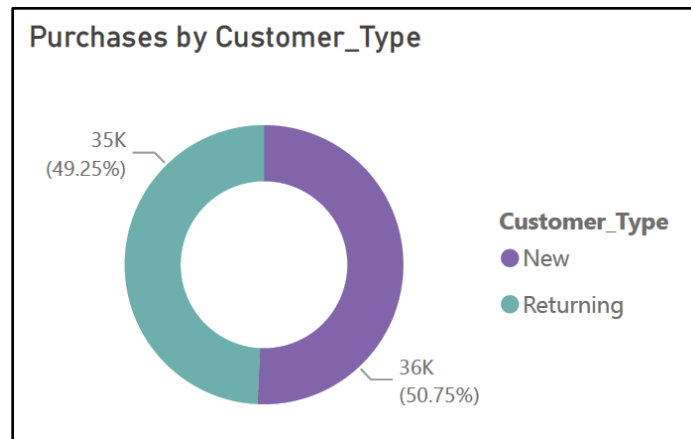
7. Customer Behavior Analysis

Conversion Funnel

Visitors - - - > Add_to_Cart - - - > Purchases

Observations:

- Only 25.15% of visitors added items to cart, and only 58.06% of those made a purchase.

- Implies room for improvement in product-page optimization and checkout process.
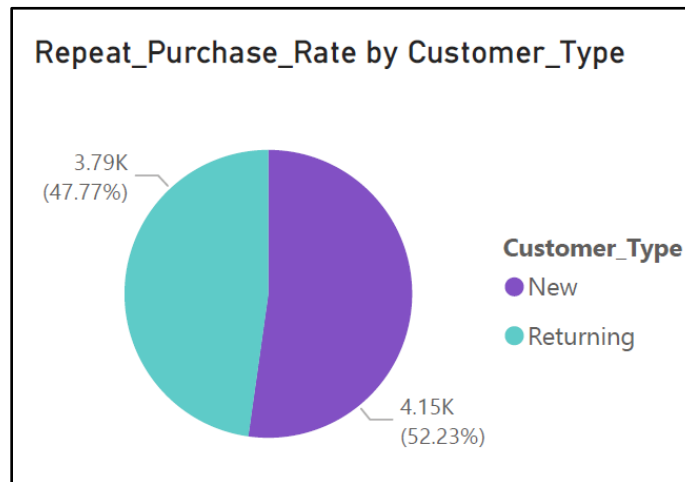
Purchase Distribution by Customer Type

Purchases by Customer_Type

Insight:

- Purchases are nearly evenly split between new and returning customers.

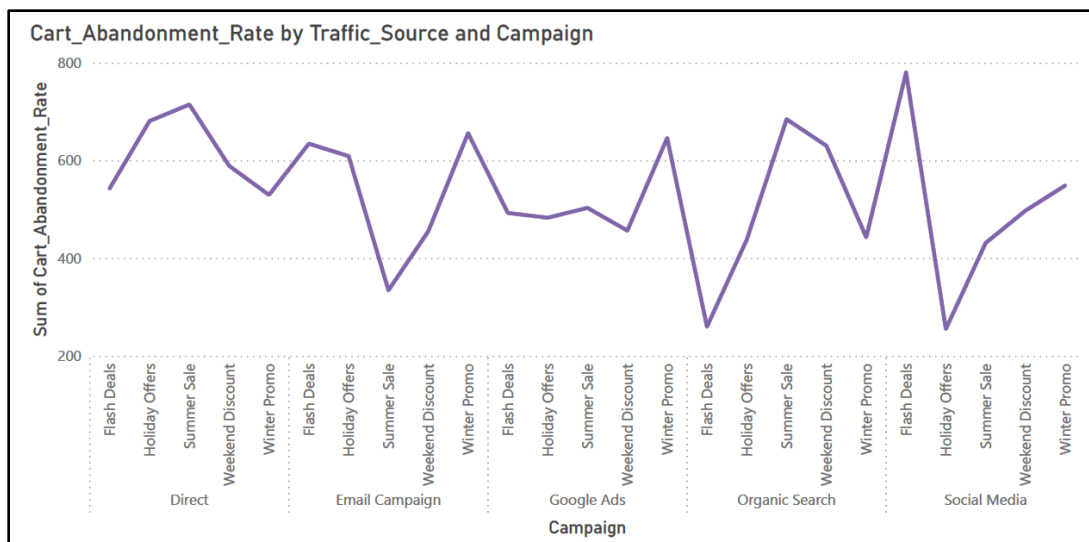- Indicates a healthy balance in customer acquisition and retention.

Repeat Purchase Rate

Insight:

- New customers have a slightly higher repeat purchase rate.

- Opportunity exists to develop loyalty programs targeted at both segments.

8. Cart Abandonment Analysis

Insights:

- Flash Deals through social media have the highest cart abandonment rate.

- Indicates potential friction points where campaign expectations don't align with the on-site user experience.

9. Summary of Key Insights

- March showed the highest revenue, indicating upward momentum.

- "Holiday Offers" and "Summer Sale" campaigns delivered strong ROI.

- Organic Search and Direct traffic sources are most cost-effective.

- High cart abandonment in Flash Deal campaigns needs further review.

- Funnel conversion is suboptimal - significant drop from visitors to purchases.

10. Recommendations

1. **Optimize High-ROI Campaigns**: Invest more in Holiday Offers and Summer Sale strategies.

2. **Review Underperforming Campaigns**: Rework or discontinue Flash Deals.

3. **Improve Cart Abandonment Rates**: Test better checkout flows for high-drop campaigns.

4. **Enhance Conversion Funnel**: Use A/B testing on product and checkout pages to reduce friction.

5. **Boost Customer Retention**: Implement targeted loyalty and remarketing programs for both new and returning users.

6. **Refine Email Marketing**: Evaluate email content and design to align with user expectations.

11. Conclusion

This report identified key performance trends and user behaviors across traffic sources and marketing campaigns. Through targeted optimization and strategic reallocation of spend, there is strong potential to increase ROI and customer satisfaction. Continuous monitoring and iterative enhancements will drive sustained e-commerce growth.