13th-February-2025

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MARKETING CAMPAIGN PERFORMANCE ANALYSIS

Data-Driven Approach to Optimizing Marketing Strategies

INTRODUCTION

Marketing campaigns play a critical role in customer acquisition and brand awareness. To optimize performance, it's essential to analyze key metrics such as Click-Through Rate (CTR), Cost Per Click (CPC), Conversion Rate, and Return on Investment (ROI). This analysis evaluates campaign effectiveness across different marketing channels, target audiences, and locations, identifying key success factors and areas for improvement. The goal is to enhance campaign efficiency, reduce costs, and maximize engagement and conversions.
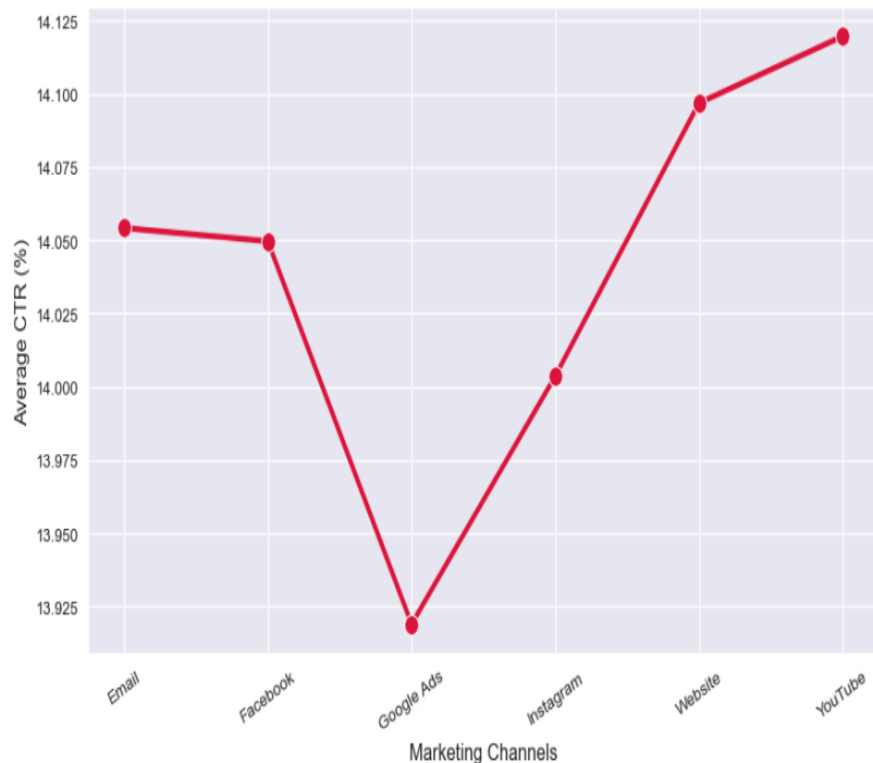
FINDINGS AND INSIGHTS

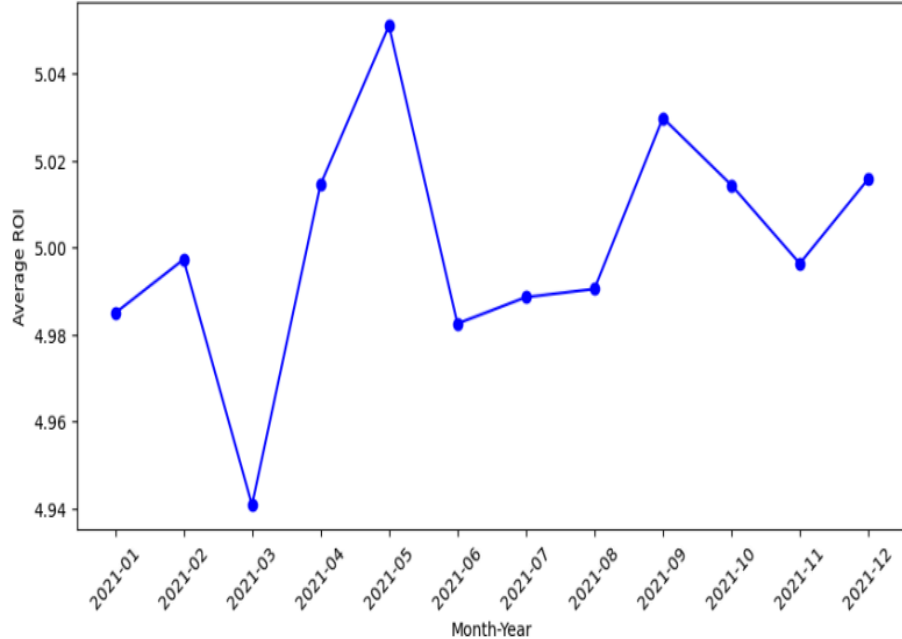CTR, CPC, and Conversion Rate by Marketing Channel
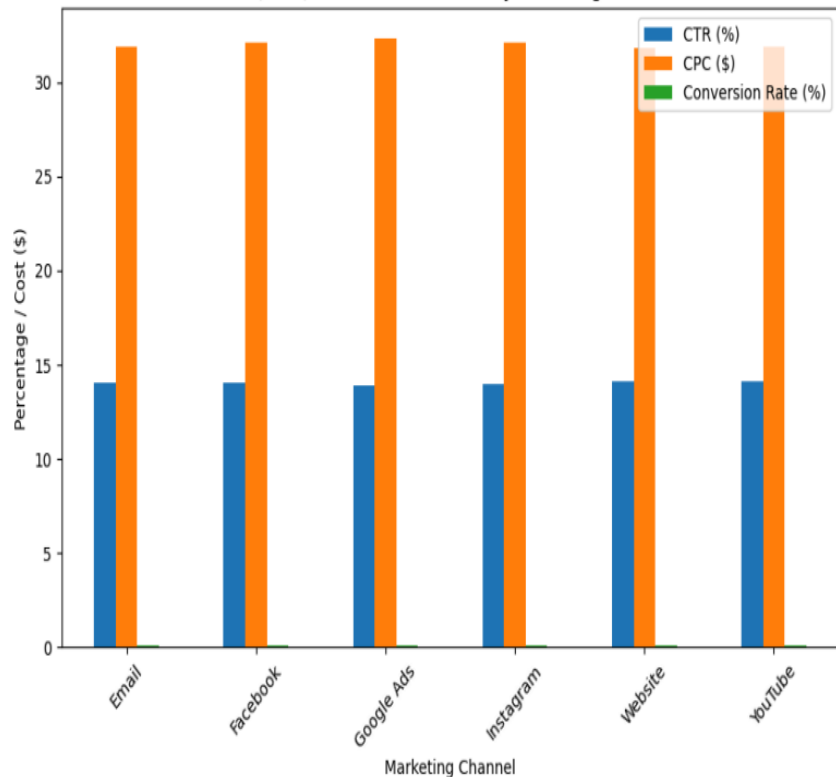
CTR Trend Across Channels
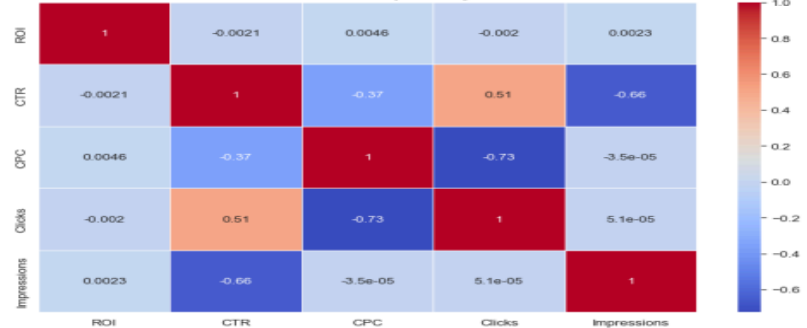
FINDINGS AND INSIGHTS

ROI Performance Over Time

CTR vs CPC by Channel

Correlation Heatmap of Key Metrics

CODES AND METHODOLOGY

Data Preparation: Cleaned and formatted dataset, handled missing values, and converted key columns (e.g., Acquisition_Cost, Duration).

Key Metrics Computation: Calculated **CTR, CPC, Conversion Rate, and ROI**, analyzing performance by **marketing channel**.

Data Visualizations: Created **bar charts, line graphs, heatmaps, scatter plots, and density plots** to highlight trends.

Insights & Findings: Facebook, Google Ads, and Website performed best, while **Instagram & Display Ads** underperformed; **high CPC on YouTube & Google Ads** needs optimization.

```
# Summary statistics
df.describe()
```

	Campaign_ID	Conversion_Rate	ROI	Clicks	Impressions	Engagement_Score
count	200005.000000	200005.000000	200005.000000	200005.000000	200005.000000	200005.000000
mean	100003.000000	0.080069	5.002416	549.774591	5507.307107	5.494673
std	57736.614632	0.040602	1.734485	260.019354	2596.863794	2.872593
min	1.000000	0.010000	2.000000	100.000000	1000.000000	1.000000
25%	50002.000000	0.050000	3.500000	325.000000	3266.000000	3.000000
50%	100003.000000	0.080000	5.010000	550.000000	5518.000000	5.000000
75%	150004.000000	0.120000	6.510000	775.000000	7753.000000	8.000000
max	200005.000000	0.150000	8.000000	1000.000000	10000.000000	10.000000

```
# Summary statistics for new metrics
ctr_cpc_summary = df[["CTR", "CPC"]].describe()
print("CTR & CPC Summary:\n", ctr_cpc_summary)
```

```
CTR & CPC Summary:
                  CTR             CPC
count   200005.000000   200005.000000
mean        14.040504       32.008319
std         13.087980       26.925841
min          1.005429        5.021084
25%          5.860637       15.092037
50%          9.978960       22.773973
75%         16.969848       38.598253
max         99.202393      199.960000
```

Conclusion

The marketing campaign analysis reveals that channel selection, audience engagement, and cost efficiency are key factors in driving success. Facebook, Google Ads, and Website campaigns showed strong performance, while Instagram and Display Ads need optimization. High CPC on certain platforms indicates a need for better budget allocation and audience targeting. By focusing on high-ROI channels, refining targeting strategies, and prioritizing shorter campaigns (15-30 days), businesses can maximize conversions and improve overall marketing effectiveness.

RECOMMENDATION

To optimize marketing performance, businesses should prioritize high-ROI channels like Google Ads, Facebook, and Website, while reducing spending on underperforming platforms like Instagram and certain Display Ads. CPC should be lowered through better audience segmentation and bid adjustments. Additionally, shorter campaign durations (15-30 days) have shown better conversion rates and should be preferred over longer campaigns. Implementing A/B testing, retargeting strategies, and location-based optimization (focusing on high-conversion areas like Chicago and New York) will further enhance marketing effectiveness.