

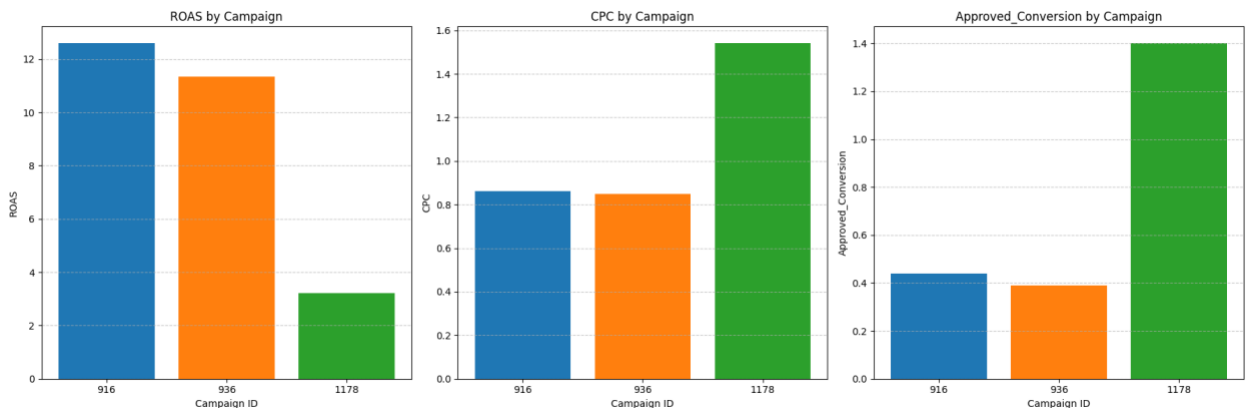
# Business Recommendation Report: Ad Campaign Performance Analysis

## Executive Summary

Our recent A/B testing compared three ad campaigns (916, 936, and 1178) across key performance metrics: Return on Ad Spend (ROAS), Cost Per Click (CPC), and Approved Conversions. The results show that Campaigns 916 and 936 deliver strong, efficient performance, while Campaign 1178, despite higher approved conversions, is significantly less cost-effective.

## Key Findings

- Campaigns 916 and 936:
  - o High ROAS (12.59 and 11.35, respectively): Indicates excellent return on ad spend.
  - o Low CPC (0.86 and 0.85, respectively): Shows efficient use of marketing budget.
  - o Consistent, reliable performance across all metrics.
- Campaign 1178:
  - o Higher Approved Conversion rate (1.40): Appears to convert more clicks.
  - o Low ROAS (3.21): Much lower return on ad spend compared to other campaigns.
  - o High CPC (1.54): Significantly more expensive per click.
  - o Less cost-effective overall.



## Technical Appendix

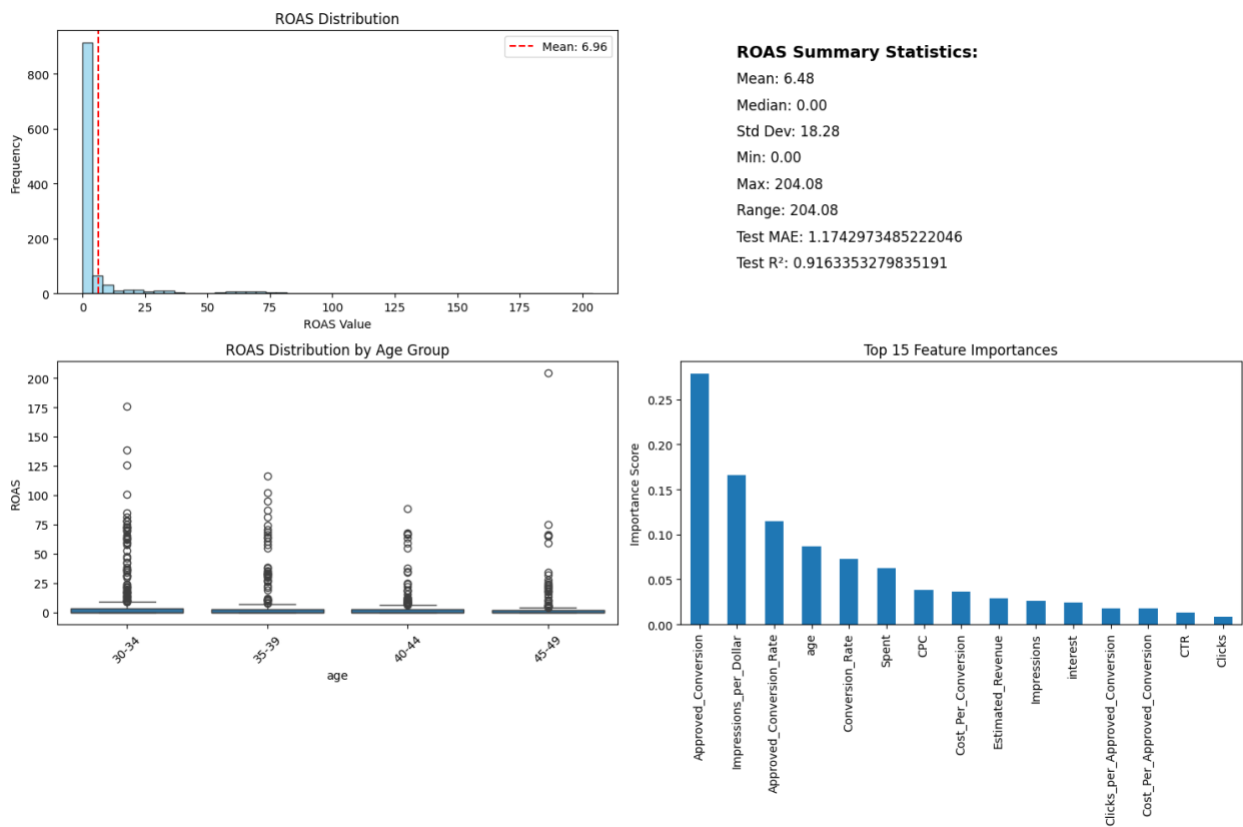
### A/B Test Methodology:

We compared the performance of three ad campaigns (IDs: 916, 936, 1178) using pairwise t-tests on key metrics: ROAS (Return on Ad Spend), CPC (Cost Per Click), and Approved Conversions. Statistical significance was determined at the 95% confidence level ( $p < 0.05$ ).

### Modeling Approach:

An XGBoost regression model was trained to predict ROAS using campaign features. Feature importance analysis identified the top drivers of ROAS, with Approved\_Conversion, Impressions\_per\_Dollar, and Approved\_Conversion\_Rate as leading factors.

Model Performance:



A/B Test Results Summary

Metric	916 vs 936	916 vs 1178	936 vs 1178
ROAS	Not Significant	Significant	Significant
CPC	Not Significant	Significant	Significant
Approved_coversion	Not Significant	Significant	Significant

Interpretation: Campaigns 916 and 936 perform similarly. Campaign 1178 is statistically different from both, with lower ROAS and higher CPC, despite higher approved conversions.

Limitations & Future Work

- Sample Size:
  - o Results may be sensitive to the number of campaigns and the period analyzed. Larger or more recent datasets could yield different insights.
- External Factors:
  - o Seasonal effects, creative changes, or audience shifts were not controlled for and may have influenced the outcomes.
- Model Generalizability:
  - o The model is trained on historical data; future campaign performance may vary.
- Next Steps:
  - o Expand A/B testing to new campaign creatives and audience segments.
  - o Integrate additional business KPIs (e.g., Customer Lifetime Value).
  - o Monitor ongoing campaign performance for emerging trends.

### Recommendation:

- Reallocate ad budget toward Campaigns 916 and 936, which deliver higher ROAS and lower CPC.
- Optimize or pause Campaign 1178 unless its high conversion rate aligns with a specific strategic goal.
- Continue data-driven experimentation to refine targeting and creative strategies.

### Call to Action

Review the visualizations and summary table to guide your next marketing decisions. Focus on the most efficient campaigns and use ongoing experimentation to drive continuous improvement.

This streamlined approach keeps your report clear, actionable, and avoids repetition while covering all key points for stakeholders.