
Final Report

Capstone Project Report — Campaign Performance Analysis

Week 1: Descriptive Statistics

- **Facebook Ad Campaigns:**
 - *Mean Clicks:* **44.05** (SD: 12.14) per day.
 - *Mean Conversions:* **11.74** (SD: 2.92) per day.
 - Most days had “6 to 10” conversions (128 occurrences).
 - **AdWords Campaigns:**
 - *Mean Clicks:* **60.38** (SD: 14.37) per day.
 - *Mean Conversions:* **5.98** (SD: 1.63) per day.
 - Most days had “6 to 10” conversions (209 occurrences); “1 to 5” conversions on 156 days.
 - **Key Insight:** Though AdWords got more clicks, Facebook delivered nearly double the conversions on average.
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Week 2: Clicks & Conversions Relationship

- **Facebook:**
 - *Correlation between clicks and conversions:* **0.87** (very strong).
 - **AdWords:**
 - *Correlation between clicks and conversions:* **0.45** (moderate).
 - **Histogram comments:** Facebook conversion results are more tightly grouped and predictable, showing higher reliability; AdWords results are more varied.
 - **Key Insight:** Facebook campaigns show a much stronger and reliable link between site engagement and conversion.
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Week 3: Statistical Comparison

- **Mean Conversions:**
 - *Facebook:* **11.74**
 - *AdWords:* **5.98**
- **Statistical Test:**
 - *p-value:* **4.56×10^{-146}** ($\ll 0.05$, highly significant)

- **Conclusion:** Facebook produces significantly more conversions per day vs. AdWords.
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Week 4: Trend Line Modeling & Synthesis

- **Model approach:**
 - Built a linear trend model on Facebook Ad Clicks & Conversions
 - Model summary: Conversions can be strongly predicted by clicks on Facebook.
 - *Number of Model Observations:* 183
 - **Final Recommendation:**
 - Prioritize Facebook in your campaign spend allocation—it outperforms AdWords in conversion efficiency and predictability.
 - AdWords may be used for higher reach, but expect fewer conversions per click.
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Overall Recommendation

- **Invest more in Facebook campaigns** for higher and more consistent conversions.
 - **Monitor AdWords** for reach but focus on optimizing for quality traffic that converts.
 - Use trend modeling to predict and optimize future campaign results.
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