A/B Testing Comparison: Facebook vs. Instagram

Presenter
Name

Agenda


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Problem Statement

- As a marketing agency, our primary objective is to maximize the return on investment (ROI) for our clients' advertising campaigns.
- We have conducted two ad campaigns, one on Facebook and the other on Instagram, and we need to determine which platform yields better results in terms of clicks, conversions, and overall cost-effectiveness.
- identifying the most effective platform, we can allocate our resources more efficiently and optimize our advertising strategies to deliver better outcomes for our clients.

Research Queston

Which ad platform is more effective in terms of conversions, clicks, and overall cost-effectiveness?

Data Overview

The dataset comprises a collection of data comparing the performance of two separate ad campaigns conducted throughout the june 2024 to may 2025. Specifically, the data covers a Facebook Ad campaign and an InstagramAd campaign. For each day of the june 2024 to may 2025, there is a corresponding row in the dataset, resulting in a total of 365 lines of campaign data to analyze. The dataset includes various performance metrics for each ad campaign, providing insights into their effectiveness and efficiency over time.

Key features included in the dataset are as follows:

Date: The date corresponding to each row of campaign data, ranging from 1 june 2024 , to 31 may 2025.

Ad Views: The number of times the ad was viewed.

Ad Clicks: The number of clicks received on the ad.

Ad Conversions: The number of conversions resulting from the ad.

Cost per Ad: The cost associated with running the Facebook ad campaign.

Click-Through Rate (CTR): The ratio of clicks to views, indicating the effectiveness of the ad in generating clicks.

Conversion Rate: The ratio of conversions to clicks, reflecting the effectiveness of the ad in driving desired actions.

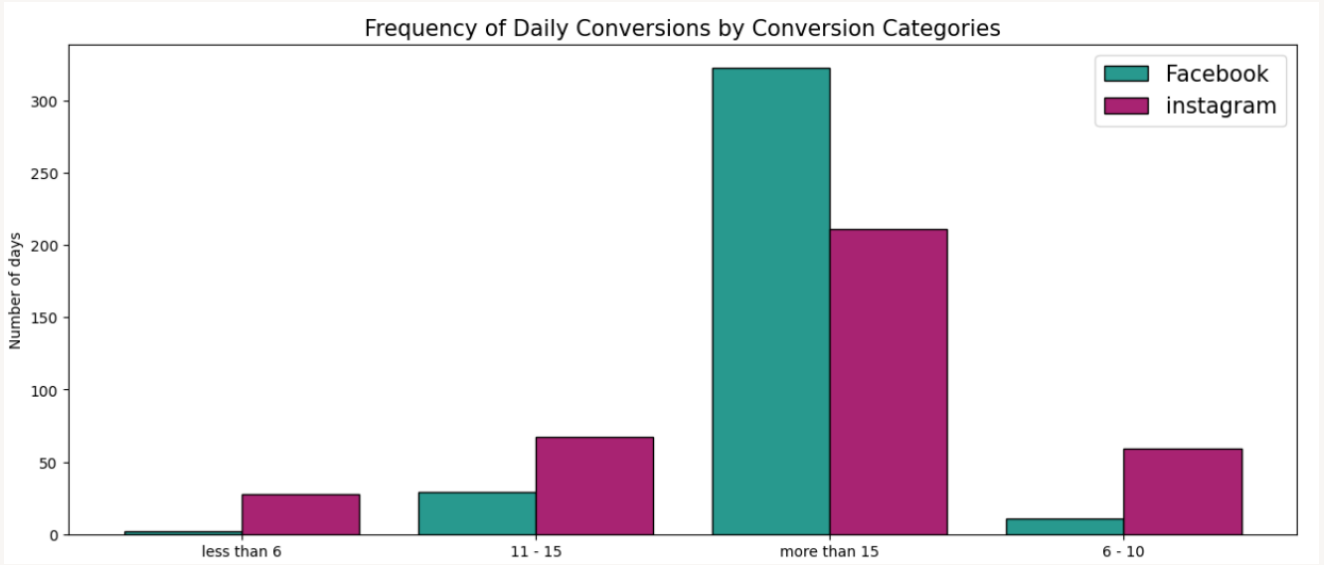
Cost per Click (CPC): The average cost incurred per click on the ad.

Methodology

Steps	Description
Descriptive Analysis	Checking correlation between Instagram and face book click and conversion
AB testing	Conducted an Independent Welch's T-test to evaluate the relationship between advertising platform and conversion volume, testing the hypothesis that Facebook ads influence higher conversion amounts compared to Instagram ads.
Regression Analysis	How many Facebook ad conversions can I expect given a certain number of Facebook ad clicks

Journey

- The data suggests Instagram had more frequent higher conversion days than Facebook, which either had very low conversion rates (less than 6) or moderate ones (6-10).
- There's a significant variance in the number of high-conversion days between the two different campaigns.
- The absence of any days with conversions between 10-15 and more than 15 in Facebook indicates a need to review what strategies were changed or what external factors could have influenced these numbers.



	category	Facebook	Instagram
2	6 - 10	11	59
1	11 - 15	29	67
3	less than 6	2	28
0	more than 15	323	211

Do more clicks on the ad really lead more sales?

- Both platforms show **strong alignment** between clicks and conversions.
- Instagram demonstrates a **marginally higher correlation**, possibly due to its visual and engagement-focused format.
- **Recommendation**: Continue investing in both, but consider creative and targeting adjustments to further leverage Instagram's conversion efficiency

	Instagram Ad Conversion	Instagram Ad Clicks
Instagram Ad Conversion	1.000000	0.961974
Instagram Ad Clicks	0.961974	1.000000

	Facebook Ad Conversion	Facebook Ad Clicks
Facebook Ad Conversion	1.000000	0.944693
Facebook Ad Clicks	0.944693	1.000000

Hypothesis:Advertising on Instagram will result in a greater number of conversions compared to advertising on Facebook

Null Hypothesis (H0): There is no difference in the number of conversions between Facebook and Instagram, or the number of conversions from Instagram is greater than or equal to those from Facebook.

H0: μ_Facebook ≤ μ_Instagram

Alternate Hypothesis (H1): The number of conversions from Facebook is greater than the number of conversions from Instagram.

H1: μ_Facebook > μ_instagram

Findings

- - The mean number of conversions from Facebook ads (39.99) is substantially higher than the mean number of conversions from Instagram ads (20.93). This suggests that, on average, Facebook advertising is more effective in generating conversions compared to Instagram advertising.

- - The T statistic (13.6606) is a measure of the difference between the means of the two groups relative to the variation within the groups. A larger T statistic indicates a greater difference between the means of the two groups.

- - The p-value (0) is extremely small, indicating strong evidence against the null hypothesis.

- - The results strongly support the alternate hypothesis, indicating that the number of conversions from Facebook advertising is indeed greater than the number of conversions from Instagram advertising.

- - Facebook advertising appears to be a more effective channel for generating conversions compared to AdWords advertising, based on the sample data analyzed.

- - Given the significant difference in conversion rates between Facebook and Instagram, consider reallocating resources towards Facebook advertising efforts. This could involve increasing ad spend, expanding targeting efforts, or experimenting with different ad formats to capitalize on the platform's effectiveness in driving conversions.

Regression Analysis

Research Question: What will happen when I go with the Facebook Ad? How many facebook ad conversions can I expect given a certain number of facebook ad clicks?

- - The model has a reasonably good predictive power, with an R2 score of 76.35%. This suggests that it can effectively predict Facebook ad conversions based on the number of Facebook ad clicks.

- - With the insights provided by the Linear Regression model, businesses can make informed decisions about resource allocation, budget planning, and campaign optimization.

- - For instance, knowing the expected number of Facebook ad conversions based on a certain number of Facebook ad clicks can help in setting realistic campaign goals, optimizing ad spend, and assessing the ROI of Facebook advertising efforts.

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Accuracy (R2 Score): 89.24 %
Mean Squared Error: 58.86
Intercept: 0.07
Coefficient: 0.5458
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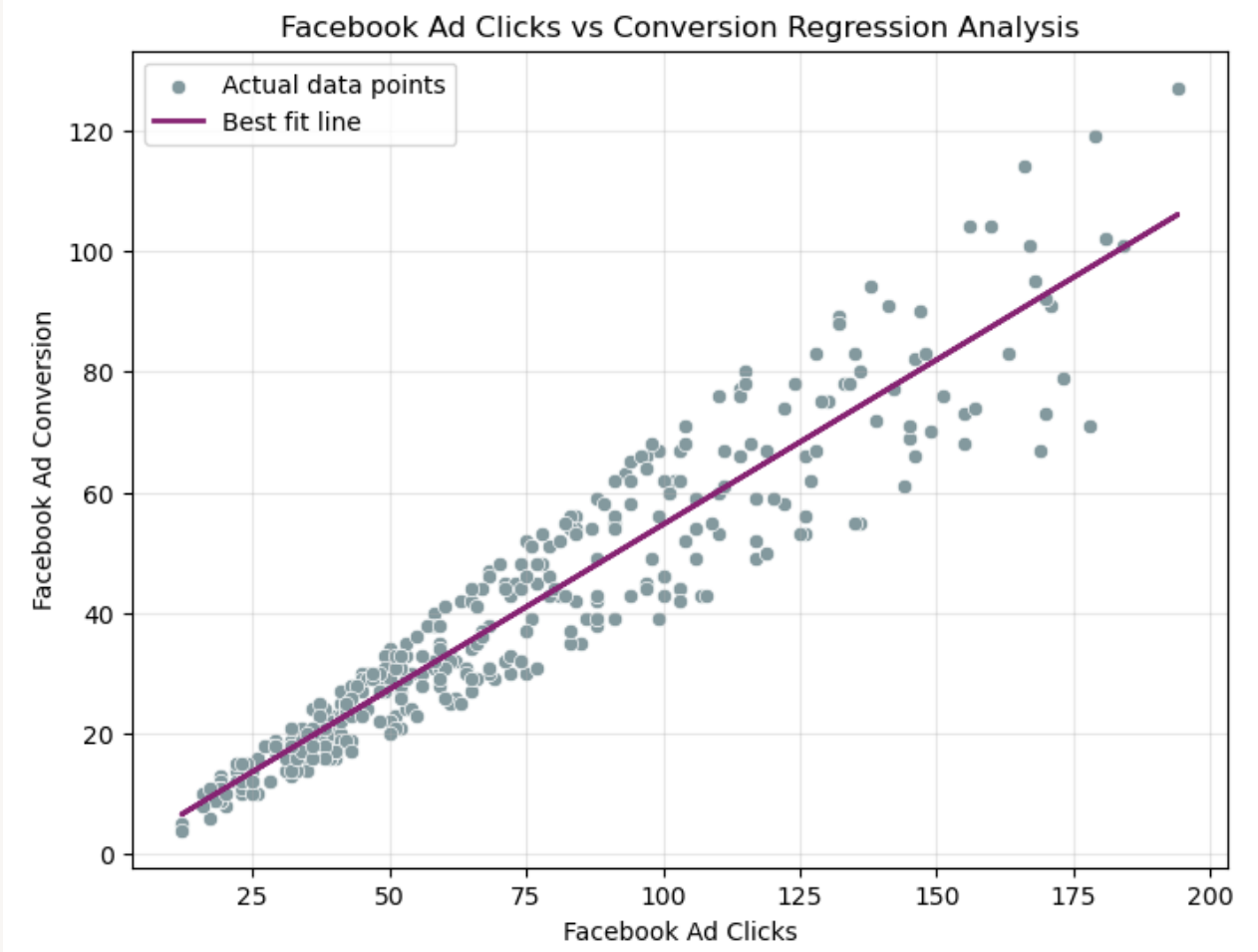

Thank you