

A/B Test Analysis Report

Introduction

This report summarizes the process and results of an A/B test conducted to evaluate the effectiveness of a new website feature. The goal was to determine whether the new feature led to a statistically and practically significant improvement in conversion rates compared to the existing version.

Steps Taken

1. Data Understanding & Setup:

- Generated synthetic data for 10,000 users (5,000 control, 5,000 treatment).
- Each user had data on page views, clicks, and whether they converted.

2. Data Cleaning:

- Verified group assignment (no user appeared in both groups).
- Ensured Clicks \leq PageViews for logical consistency.
- No missing values or outliers were detected.

3. Metric Calculation:

- Control Conversion Rate: 9.58%
- Treatment Conversion Rate: 11.80%
- Observed Uplift: +2.22%

4. Statistical Testing:

- Used a two-sided Z-test for proportions.
- Z-statistic: 3.5924
- p-value: 0.0003
- 95% Confidence Interval: (1.01%, 3.43%)

5. Interpretation:

- The difference in conversion rates was statistically significant.
- The new feature led to a clear improvement in user conversions.

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6. Practical Significance:

- The observed uplift of 2.22% is meaningful in business terms.
- Could result in thousands of extra conversions monthly for a large site.

Conclusion

The A/B test results show a statistically and practically significant improvement in the conversion rate for users exposed to the new feature. The Treatment group outperformed the Control group by 2.22%, with a very low p-value (0.0003) confirming the result is not due to chance.

Recommendations

Based on the strong evidence, it is recommended to roll out the new feature to all users. Further segmentation analysis (e.g., new vs. returning users) may help fine-tune the experience for specific user groups and amplify the benefits observed.