

Enhancing Customer Experience: Data-driven Insights

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Introduction

- **Project Title**

Enhancing Customer Experience: Data-driven Insights

- **Context**

Vanguard, a leading investment firm, has launched an innovative digital interface to elevate client interactions. As part of the Customer Experience (CX) Team, I'm diving into this upgrade, focusing on how it enhances the overall client engagement

- **Objective and Goal**

To evaluate whether the new UI, with its refined design and intuitive prompts, not only enhances user experience but also leads to higher completion rates

Introduction

- **Experiment Setup**

Between March 15 and June 20, 2017, Vanguard conducted an A/B test to compare the effectiveness of its traditional online platform against a newly developed digital interface. Participants in the control group engaged with the current system, while the test group interacted with the enhanced version, both following the same sequence of steps

Data Overview

Data Sets Used:

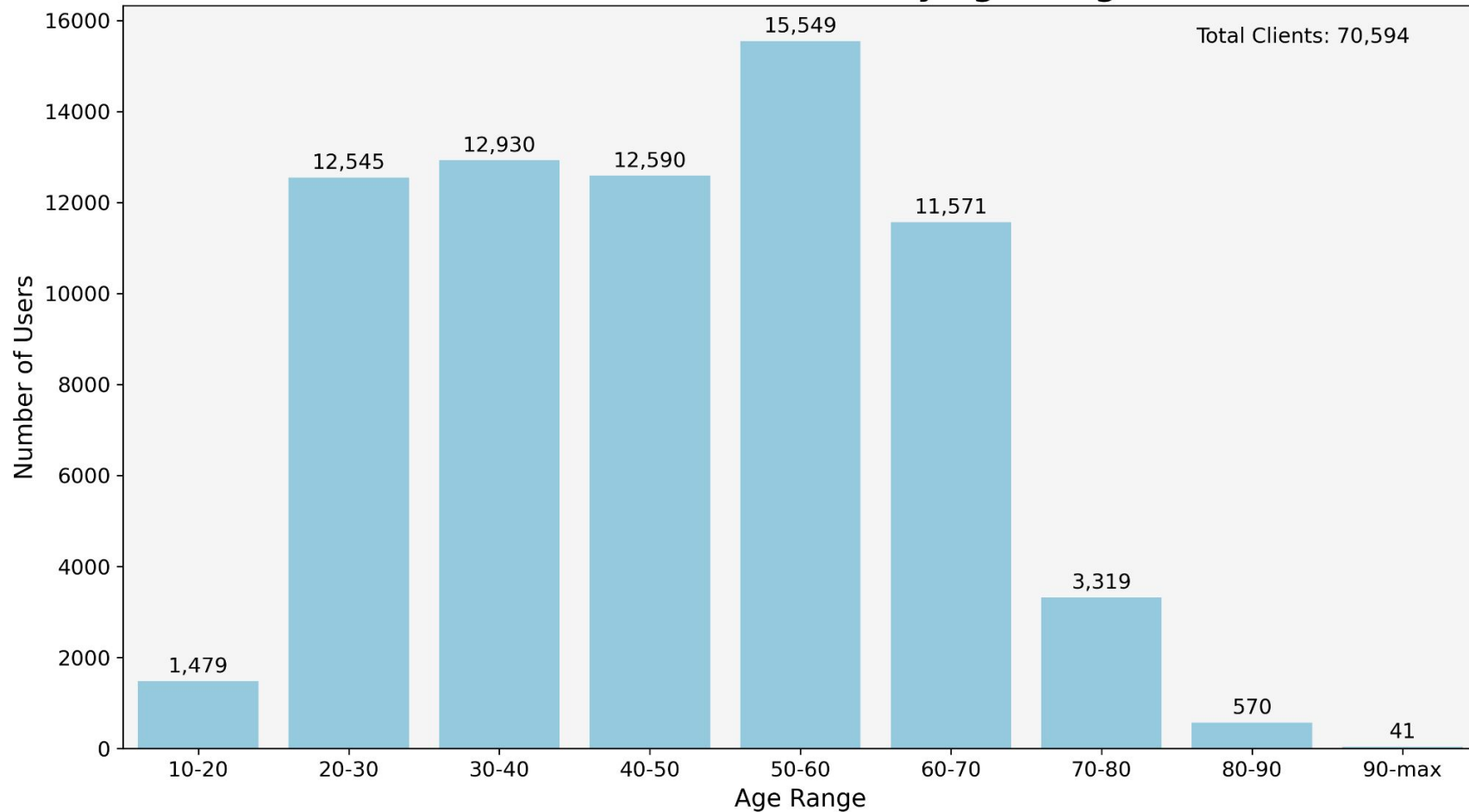
- **Clients profile (df_final_demo):** Demographics like age, gender, and account details of Vanguard's clients
- **Digital Footprints (df_final_web_data):** A comprehensive record of online client activities, segmented into two sections: pt_1 and pt_2
- **Experiment Roster (df_final_experiment_clients):** A directory indicating the clients who participated in the large-scale experiment

Exploratory Data Analysis

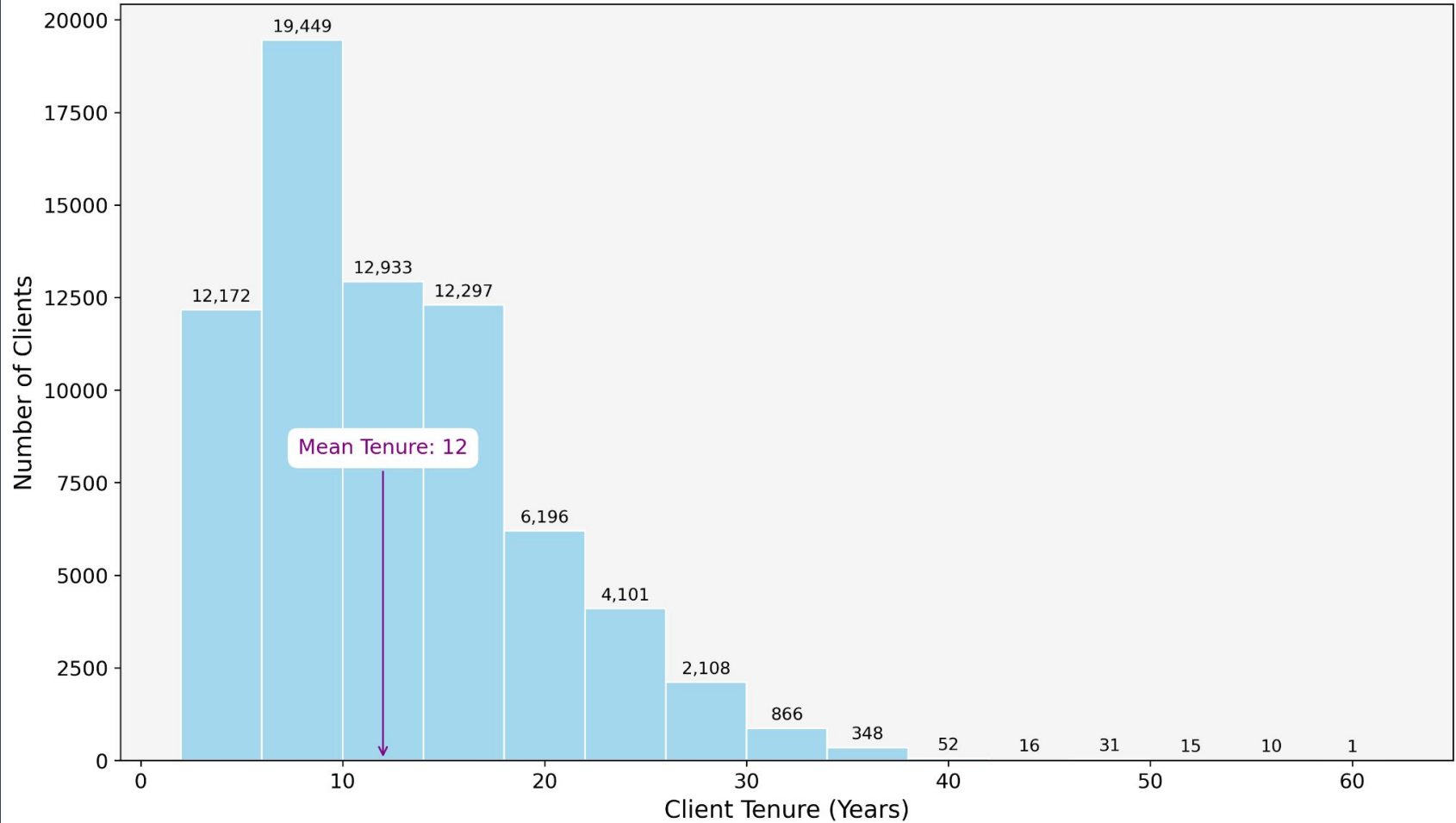
Client behavior Analysis:

- Who are the primary clients using this online process?
- Are the primary clients younger or older, new or long-standing?
- How do the confirmation and visit numbers differ between the test group and the control group?

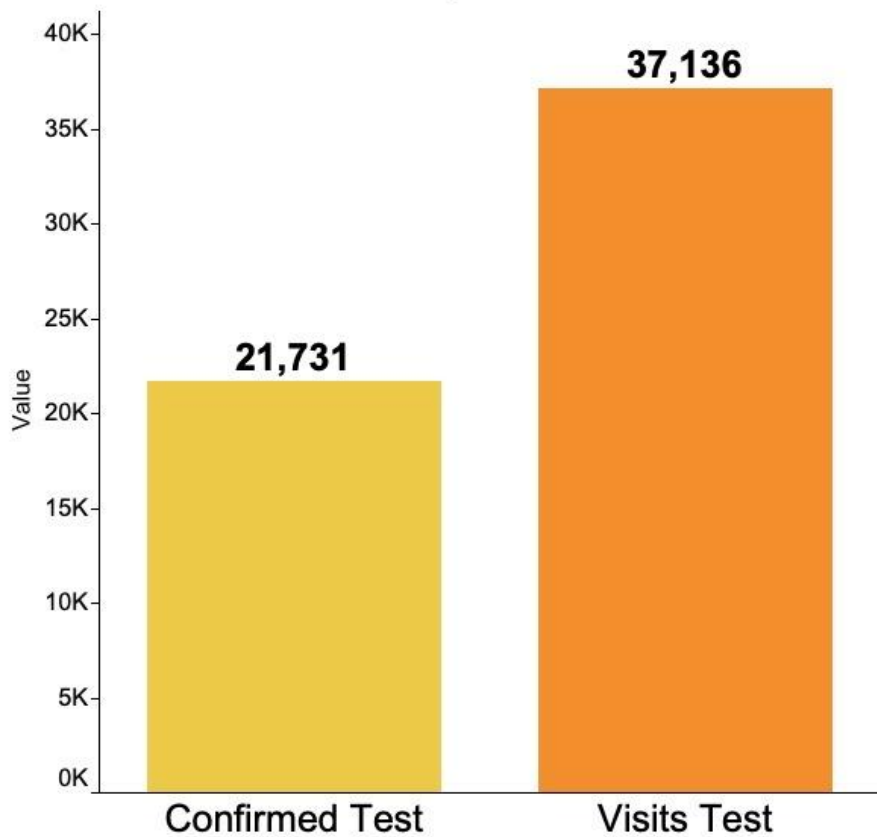
Number of Online Users by Age Range



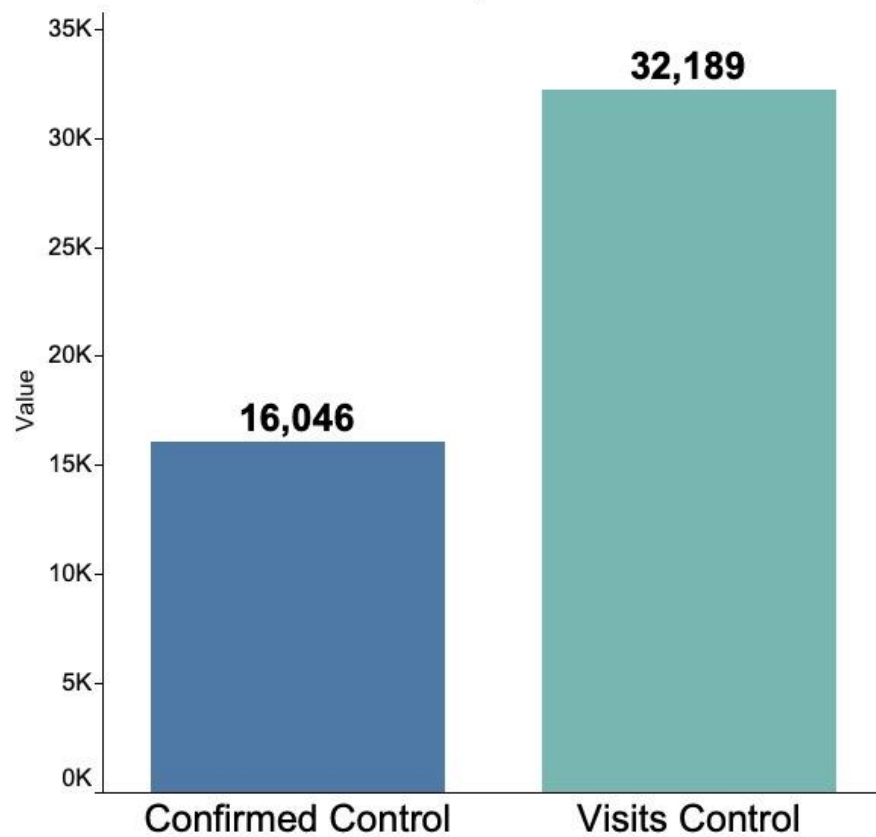
Distribution of Client Tenure in Years



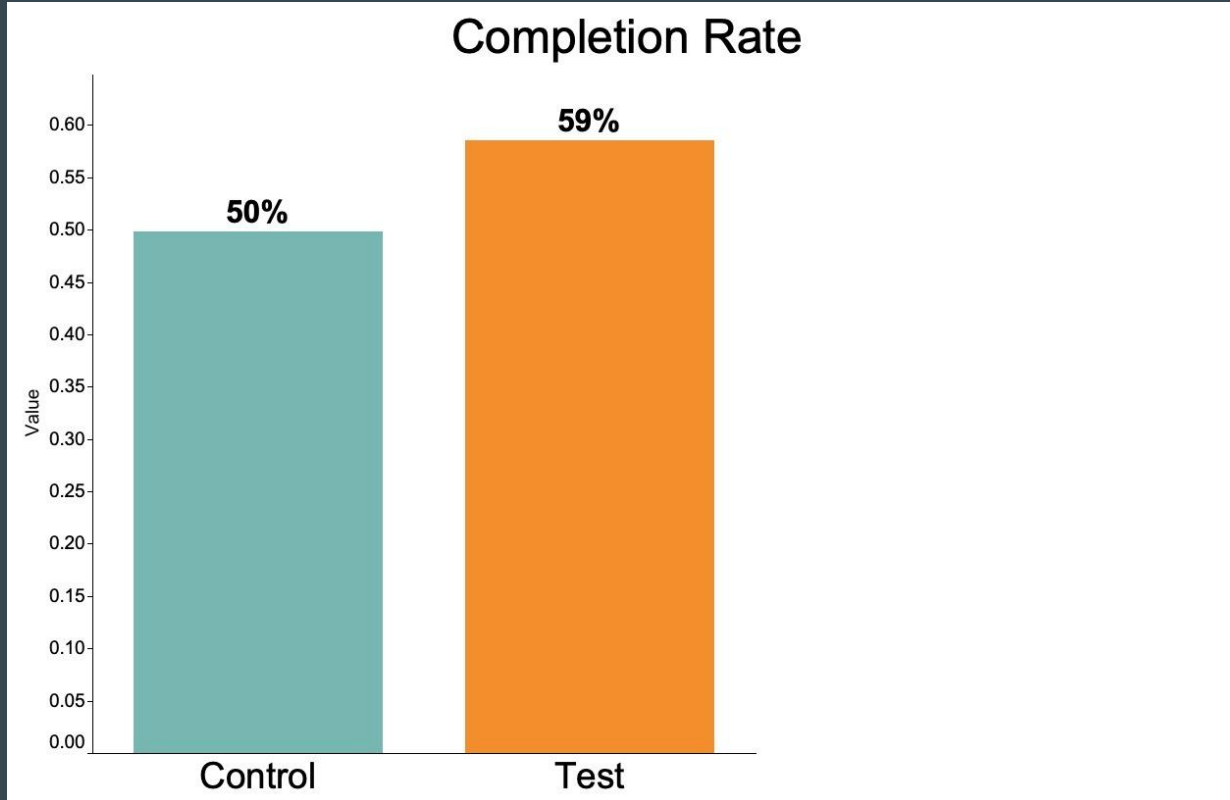
Test Group Metrics



Control Group Metrics



Key Performance Indicator (KPI)



Hypothesis Testing

- **Objective:** Determine if the test group's completion rate shows a statistically significant increase over the control group
- **Hypothesis:**
 - (H₀): Test group completion rate \leq Control group completion rate
 - (H_a): Test group completion rate $>$ Control group completion rate
- **Statistical Test:** Two-sample z-test for proportions
- **Significance Level (alpha):** 0.05

Hypothesis Testing

- **Results:**

The two-sample z-test yielded a p-value of 6.25×10^{-116}

- **Interpretation:** Given that the p-value is substantially below the alpha level of 0.05 ($p < 0.05$), this indicates a statistically significant increase in the completion rate for the test group

- **Conclusion:**

(H₀): Rejected

(H_a): Supported

Cost-Effectiveness Analysis

- **Objective:** Evaluate if the test group's completion rate surpasses the control group by at least 5%, justifying the costs of the new UI design.

- **Hypothesis:**

(H₀): (Test group completion rate + 5%) ≤ Control group completion rate

(H_a): (Test group completion rate + 5%) > Control group completion rate

- **Statistical Test:** Two-sample z-test for proportions

- **Significance Level (alpha):** 0.05

Cost-Effectiveness Analysis

- **Results:**

The two-sample z-test yielded a p-value of 1.98×10^{-22}

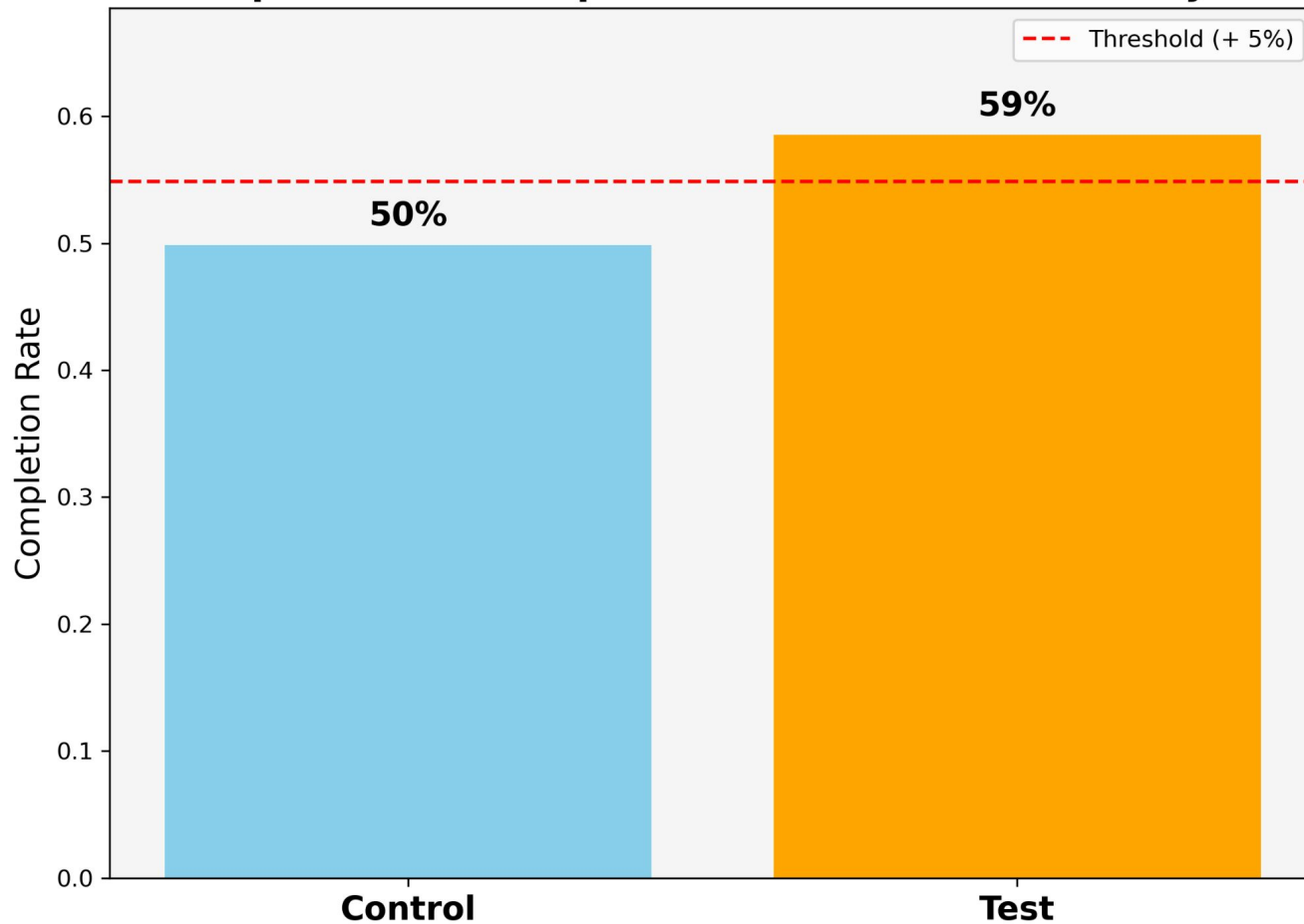
- **Interpretation:** With a 5% threshold applied and a p-value well below 0.05, the test group's completion rate is not only statistically significant but also exceeds the 5% improvement requirement, confirming robust cost-effectiveness.

- **Conclusion:**

(H₀): Rejected

(H_a): Supported

Completion Rate Improvement & Threshold Analysis



Experiment Evaluation

The experiment utilized a structured A/B testing framework to assess the new UI's impact on completion rates, applying a two-sample z-test for analysis. Conducted from March 15 to June 20, 2017, it provided ample data collection time, though a longer duration might offer deeper insights.

Balanced customer distribution across test and control groups ensured insights were attributable to UI changes rather than demographics. Surpassing the 5% improvement threshold, the new UI proved cost-effective and boosted user engagement.

Future analysis exploring how different demographics respond to the UI changes could reveal valuable insights to better meet the unique needs of each user group.

Conclusion

The experiment clearly showed that the new UI design led to a meaningful increase in completion rates, exceeding the set threshold of 5%. This indicates that the UI improvements enhance how users interact with the platform. The results suggest moving forward with the new interface, as it meets the desired objectives of improved user experience and cost-effectiveness

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Thank you!