

Presented by Constanza & Bru

Enhancing Client Experience

*Evaluating the Impact of Vanguard's
New Digital Interface*



INTRODUCTION

Vanguard, as a leader in investment management, strives to continuously enhance its client experience. In alignment with this mission, the company launched an initiative to modernize its online processes by introducing a redesigned, intuitive User Interface (UI). This updated interface was designed to simplify navigation, provide clear guidance, and create a seamless user experience.

To assess the impact of this new design, an A/B test was conducted. This test compared the traditional interface used by the Control Group with the redesigned interface introduced to the Test Group. The primary objective was to determine if the new interface could drive higher completion rates and ultimately improve client engagement.

Our analysis aims to evaluate the performance of the new UI, offering data-driven insights to guide strategic decisions for optimizing the client experience further.

DATA OVERVIEW

Client profiles

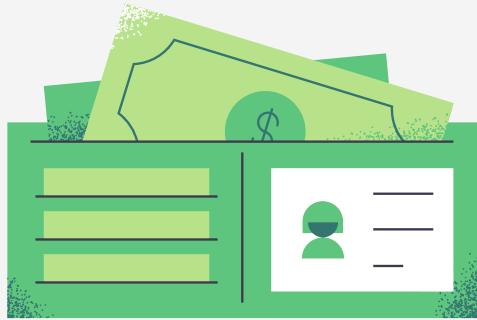


Purpose: Contains demographic and account-related information about each client.

Significance: Helps in understanding client behavior and segmentation.

Key Variables: Client's tenure in years, age of the client, number of accounts held by the client, client's total balance, activity indicators showing client interactions over the last six months.

Digital Footprints



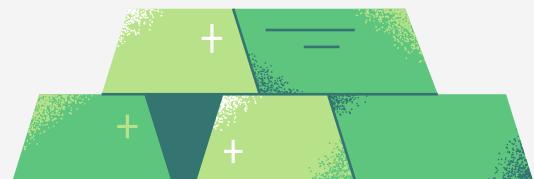
Purpose: Tracks clients' step-by-step journey through the digital process.

Significance: Allows for the identification of bottlenecks, error rates, and completion times across steps.

Key Variables:

- Unique identifier for each client.
- The step in the process the client is interacting with (e.g., start, step_1, confirm).
- Timestamp of the action, allowing for time-based analysis.

Experiment Roster



Purpose: Assigns clients to the control or test group in the A/B experiment.

Significance: Enables the comparison of outcomes (e.g., completion rates) between the two groups, forming the foundation of the experiment's hypothesis testing.

Key Variables: Unique client identifier and Variation: Indicates whether the client is part of the Test or Control group.

DATA CLEANING PROCESS

Before beginning any cleaning or merging, we reviewed the structure, variables, and content of each dataset:

01

Removing Duplicates

- Ensured each client_id appeared only once in the Client Profiles dataset

02

Handling Missing Values

- Replace missing values in the gender column with "Unspecified."

03

Standardizing Formats

- Standardized text entries to avoid mismatches, ensuring consistent naming like "Test" or "Control".

04

Filtering Irrelevant Rows

- Removed records unrelated to the experiment, such as clients not assigned to the Test or Control groups (NaN values in the Variation column).

05

Creating New Features

- Added calculated fields, such as total time spent in each process step, to facilitate analysis.

MERGING PROCESS

After cleaning, the datasets were merged to create a unified dataset for analysis:

01

Merging Final Web Data

- Combined the two parts of the Digital Footprints dataset using client_id as the key.
- Verified there were no discrepancies between the two files, such as overlapping or missing rows.

02

Integrating the Digital Footprints Dataset

- Merged the unified Digital Footprints dataset with the combined Client Profiles and Experiment Roster datasets using client_id and visit_id as keys.

02

Joining Client Profiles and Experiment Roster

- Merged the Client Profiles dataset with the Experiment Roster to link demographic data with the experimental groups.

04

Final Validation

- Checked for mismatched rows or missing entries post-merge.
- Ensured each record in the final dataset had complete information on demographics, experimental assignment, and process steps.



CHALLENGES ENCOUNTER

Handling Large Datasets

- The size of the Digital Footprints datasets required optimization for efficient processing.

Variable Alignment

- Ensuring all columns used in the analysis were consistently formatted and matched across datasets.

EXPLORATORY DATA

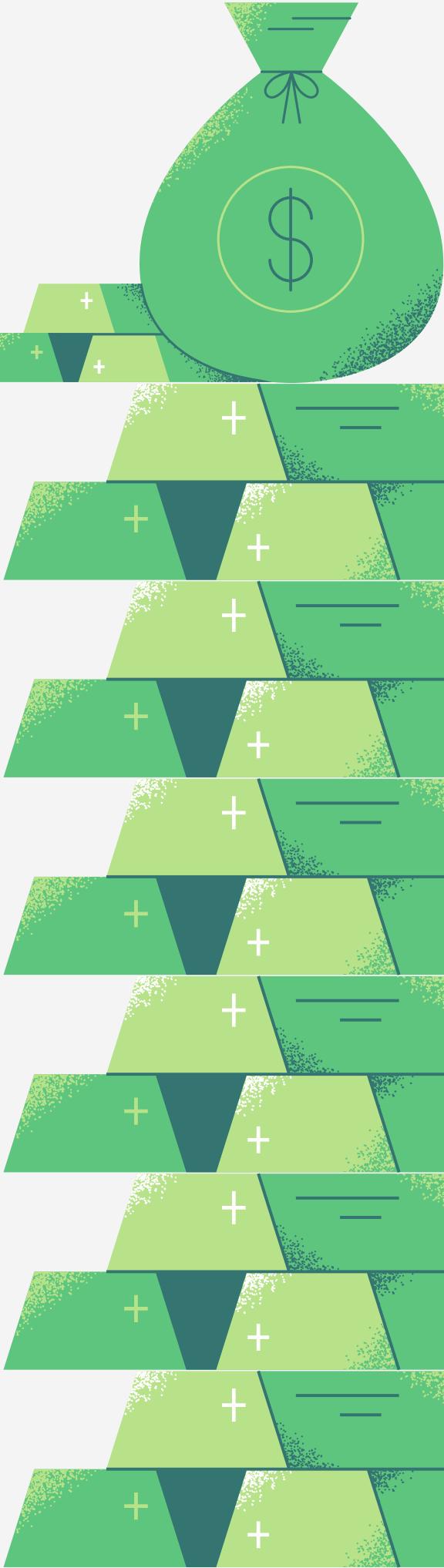
Demographics

Age

- The average age of Vanguard's online clients is approximately 46 years old, with the majority falling within the 40-60 age range.
- This indicates that Vanguard's online process is primarily used by middle-aged clients, who may have established financial portfolios.

Tenure

- The average client tenure is 12 years, demonstrating a long-standing relationship between Vanguard and its clients.
- Many clients have been with Vanguard for over a decade, highlighting loyalty and trust in the company.



EXPLORATORY DATA

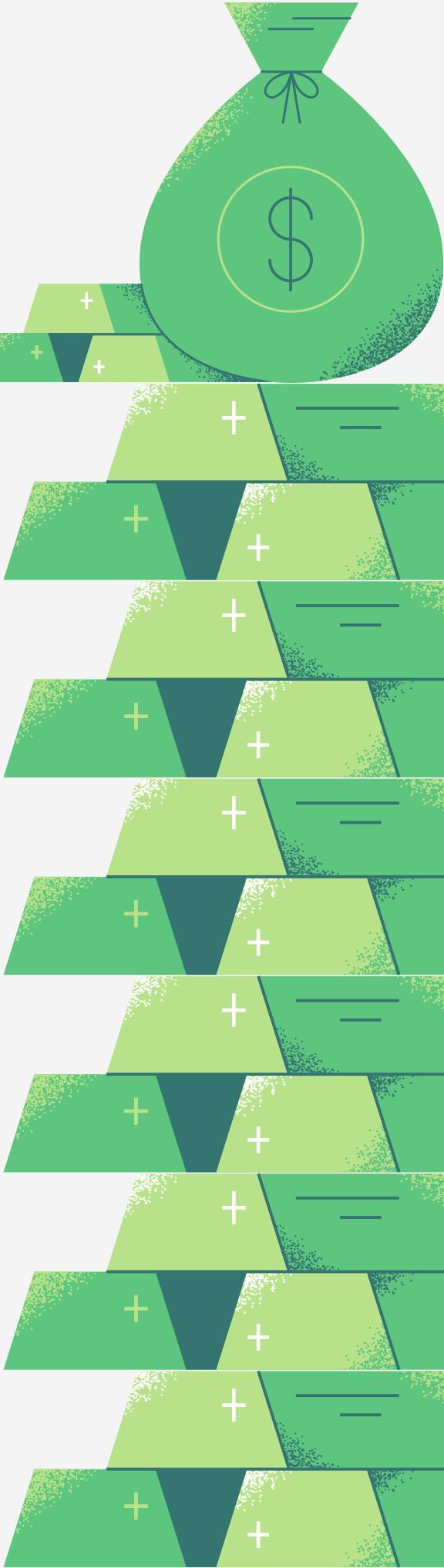
Demographics

Accounts

- Clients typically hold 2-3 accounts on average, indicating moderate diversification in their financial portfolios.

Balance

- The average account balance is approximately \$158,000, with some variation across demographic groups. This suggests that Vanguard serves a mix of moderate to high-net-worth individuals.



EXPLORATORY DATA

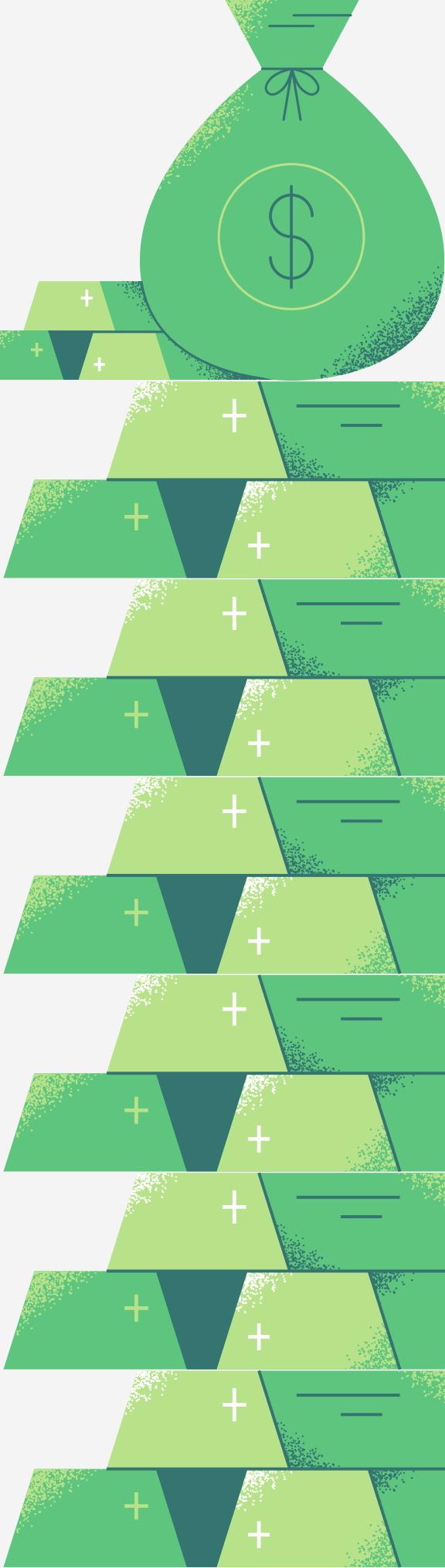
Behaviours

Engagement

- Clients actively engage with Vanguard's platform, with an average of 6 logins in the last 6 months.
- Call center activity is relatively moderate, with clients making an average of 3 calls in the last 6 months.

Digital Interaction

- Clients use Vanguard's online process to manage their portfolios, with a significant proportion completing all process steps successfully.
- However, approximately 29.95% of clients encounter errors, leading to backward steps in the process.



PERFORMANCE METRICS

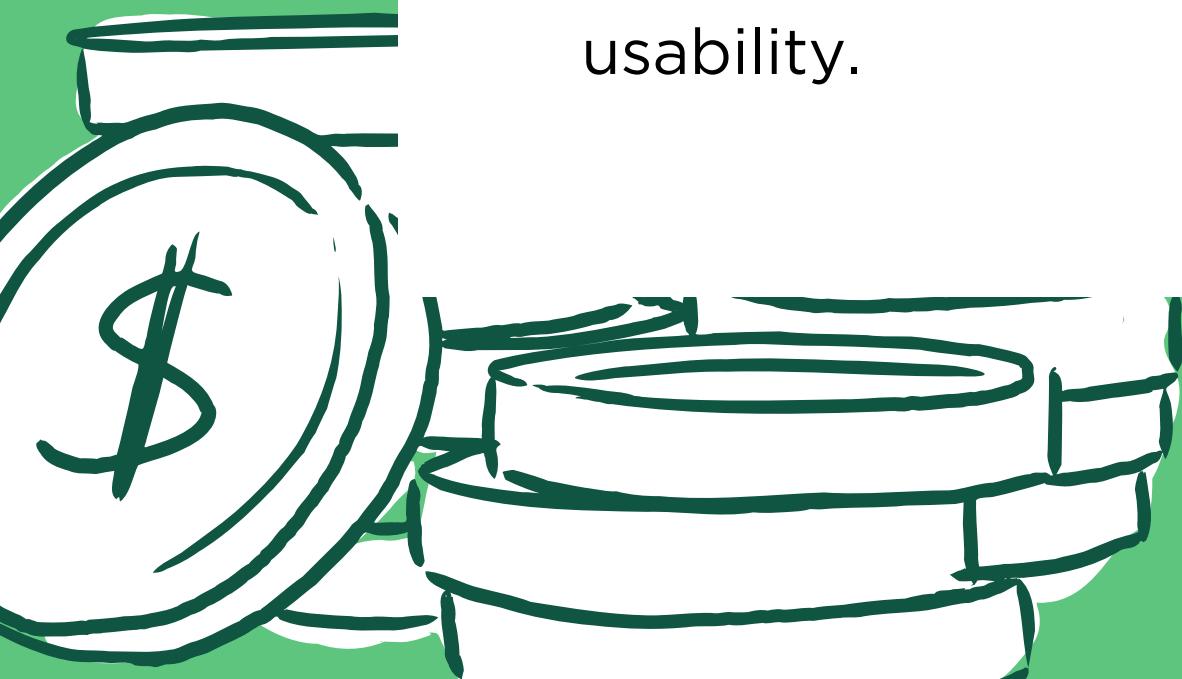
Key KPIs to Measure Design Success

Completion Rate: Percentage of users finishing the process.

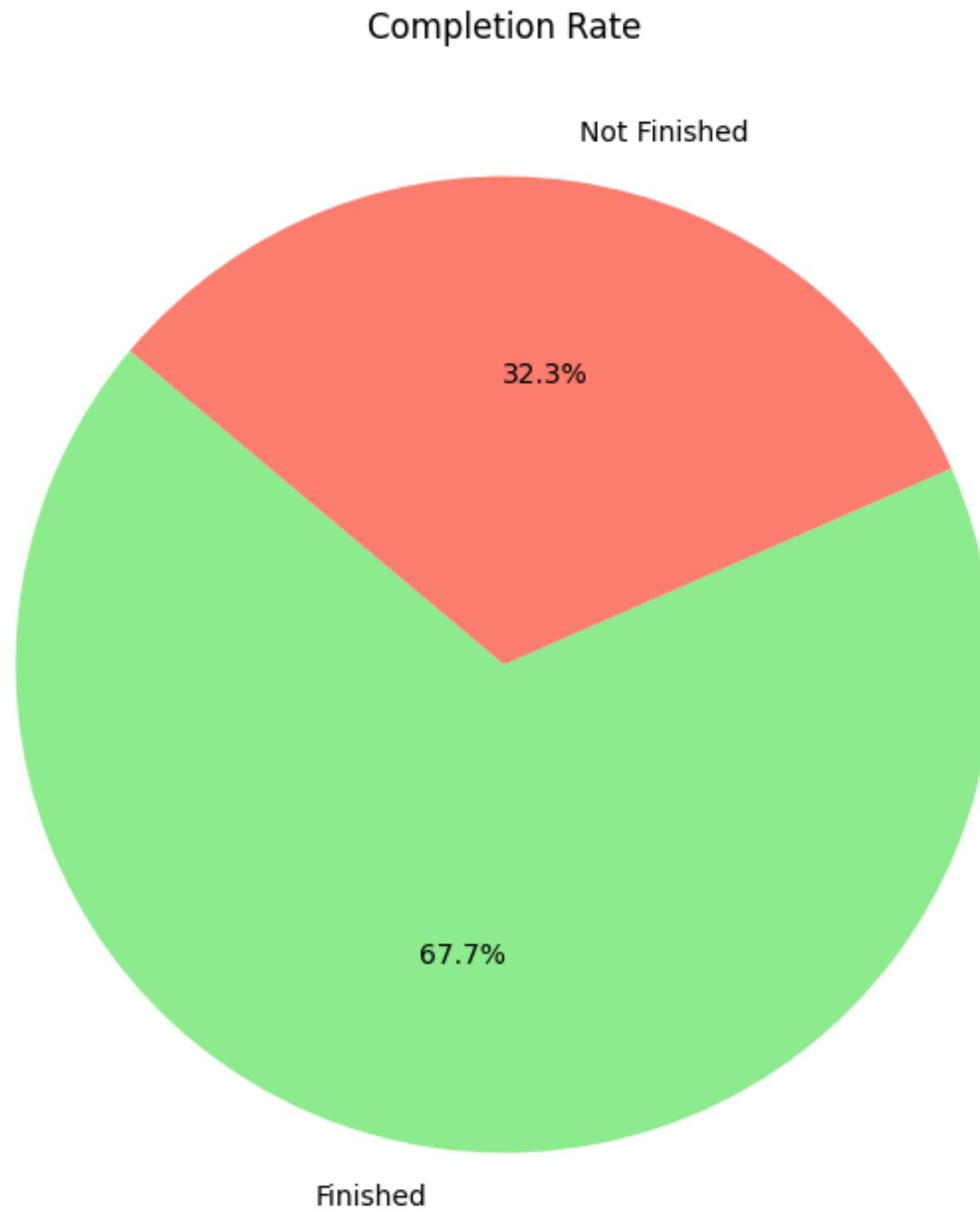
Time per Step: Average time spent on each step.

Error Rate: Frequency of users going back, indicating confusion.

Goal: Increase completion rates, reduce time, and minimize errors for better usability.



PERFORMANCE METRICS - CLIENT COMPLETION ANALYSIS



Total Clients: 70,594 (unique client IDs).

Successful Completions: **47,787 clients reached the final step.**

Completion Rate: 67.7% (47,787 of 70,594).

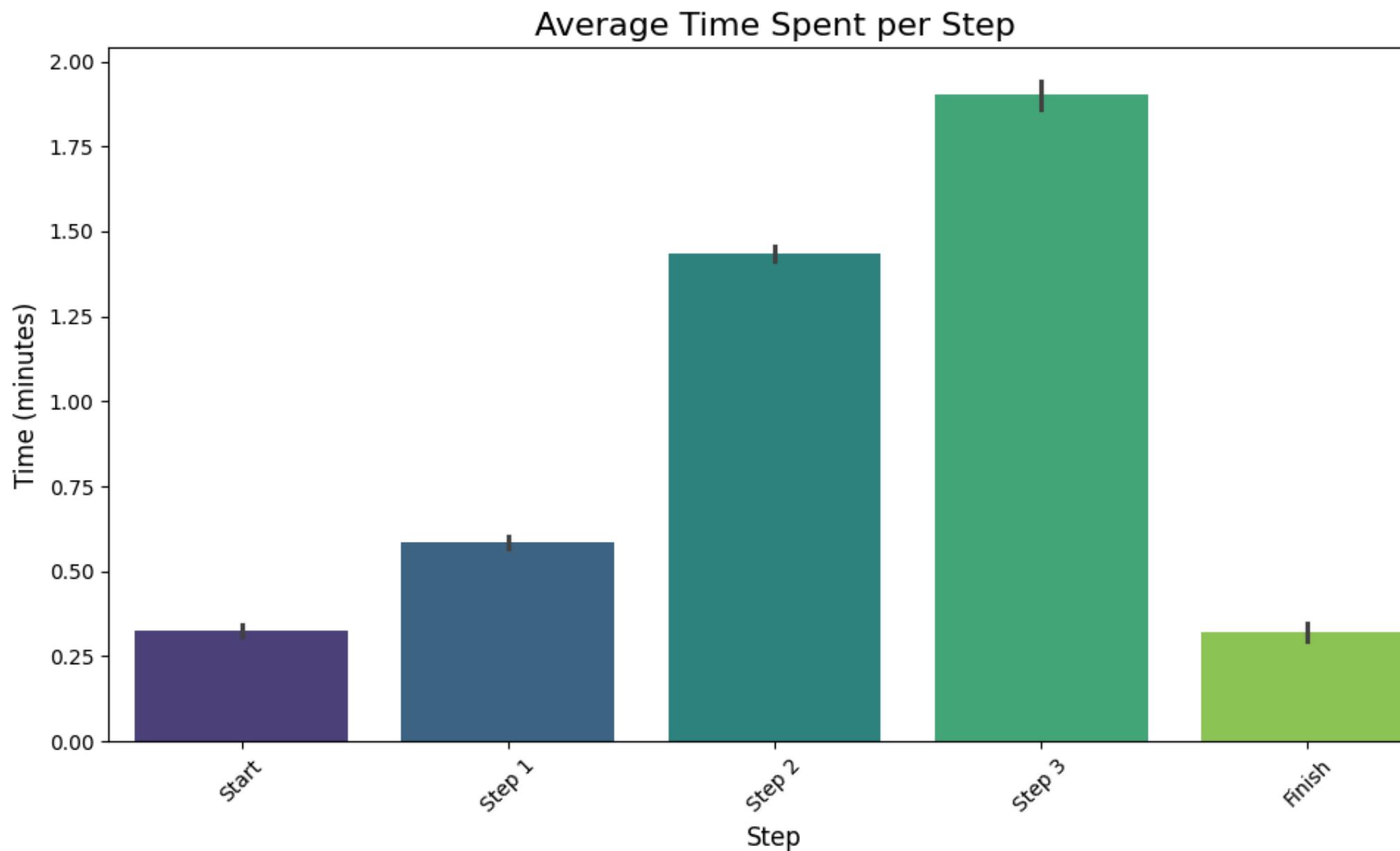
Drop-Off Rate: 32.3% (22,807 clients did not finish).

The results reflect **moderate process effectiveness.**

Improvement opportunity: reducing client drop-offs and streamlining the process would help **reaching a target of 80%+ completion.**

PERFORMANCE METRICS - AVERAGE TIME SPENT PER STEP

Calculated time differences between consecutive steps using timestamp data.



Steps 2 and 3 **require the most time**, suggesting higher effort or complexity.

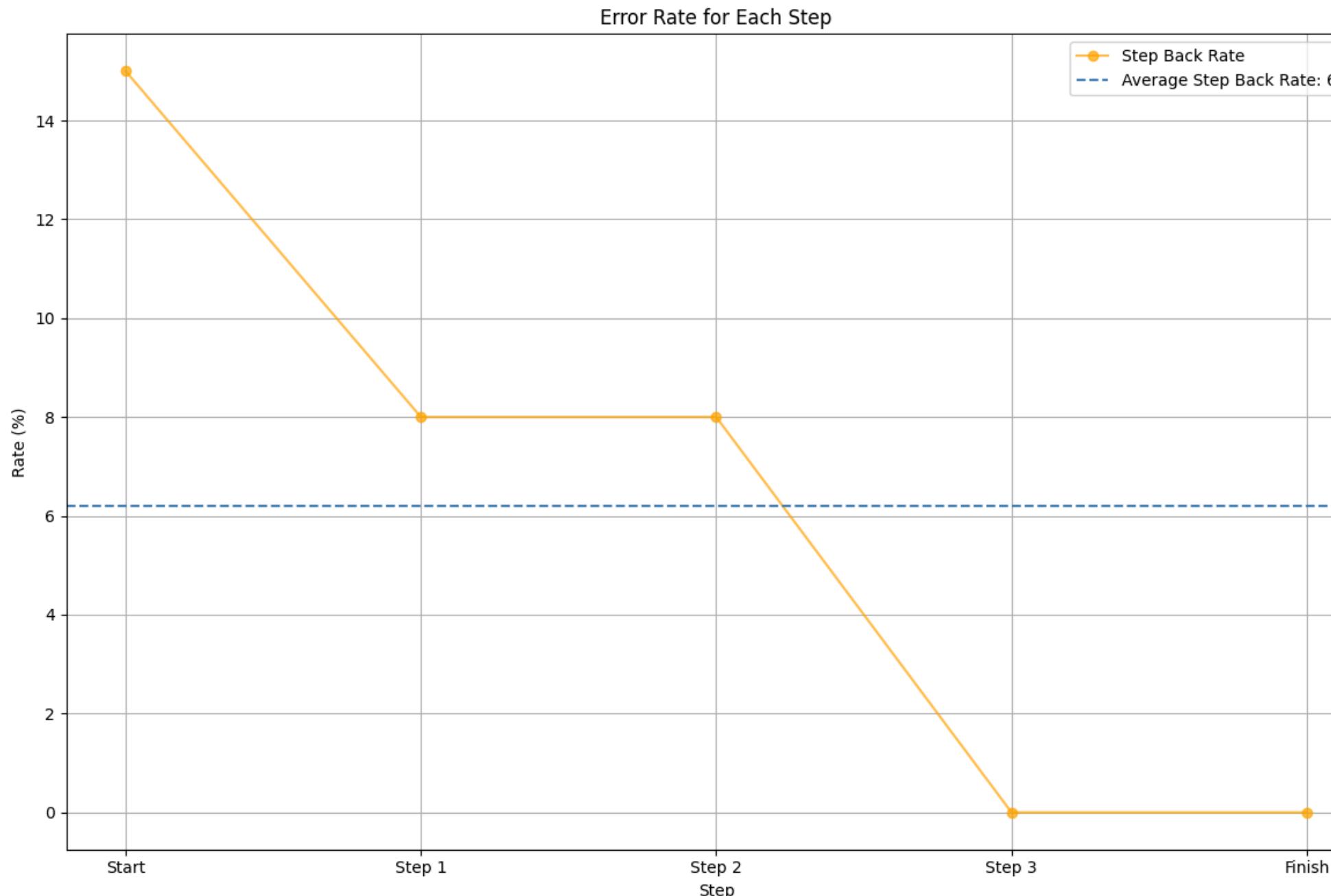
Step 4 takes **the least time**, potentially indicating process completion issues.

Suggestions:

- Optimize Steps 2 and 3 to enhance efficiency and engagement.
- Inspect Step 4 to address potential user experience gaps.

Caution: Step definitions are subjective, potentially impacting analysis.

PERFORMANCE METRICS - ERROR RATE ANALYSIS



30% of clients moved backward at least once, indicating **significant confusion or difficulty.**

8.13% of all steps involved backward movement, reflecting **process inefficiencies.**

High client error rates suggest a need to **investigate problem areas and improve user flow.**

Optimizing the process could **reduce backward steps** and enhance overall user experience.

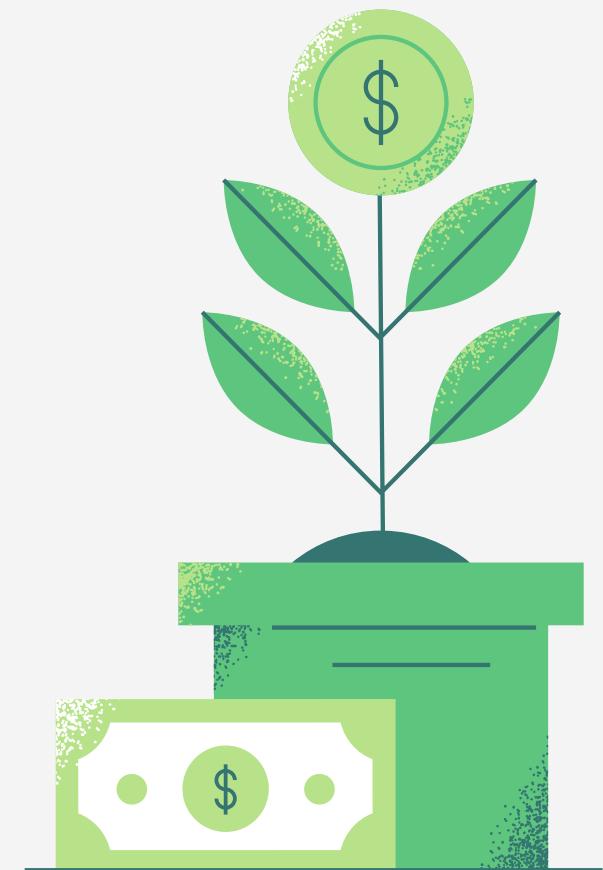
HYPOTHESIS TESTING

Null Hypothesis: The completion rate for the Test group is equal to the completion rate for the Control group.

Alternative Hypothesis: The completion rate for the Test group is not equal to the completion rate for the Control group.

Using a Z-test to compare the proportions

- The calculated **Z-score was 9.82**, indicating a large difference between the two groups.
- The **p-value was extremely low** ($<0.0001 < 0.0001 < 0.0001$), far below the significance threshold ($\alpha=0.05 \backslash \alpha = 0.05 \alpha = 0.05$).



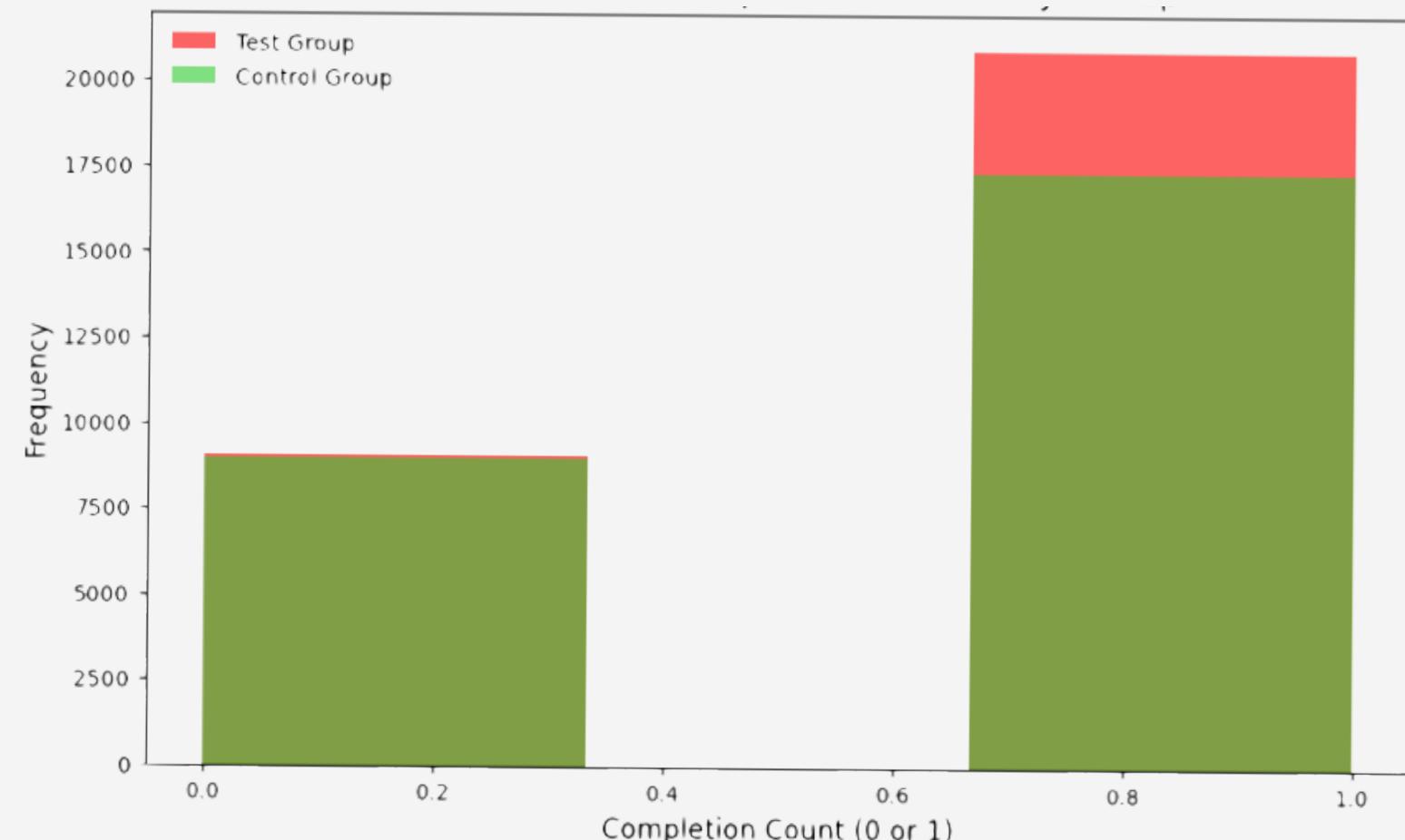
HYPOTHESIS TESTING

Results

We chose a significance level (α) of 0.05 to test the hypothesis, ensuring a 95% confidence level for our results.

- Completion Rate for the Control Group: 65.6% (15,428 out of 23,526).
- Completion Rate for the Test Group: 69.3% (18,682 out of 26,961).

Distribution of Completion Counts by Group



ADDITIONAL HYPOTHESIS

Null Hypothesis (H₀): The average client tenure of those engaging with the new process is equal to the average client tenure of those engaging with the old process.

Alternative Hypothesis (H₁): The average client tenure of those engaging with the new process is not equal to the average client tenure of those engaging with the old process.



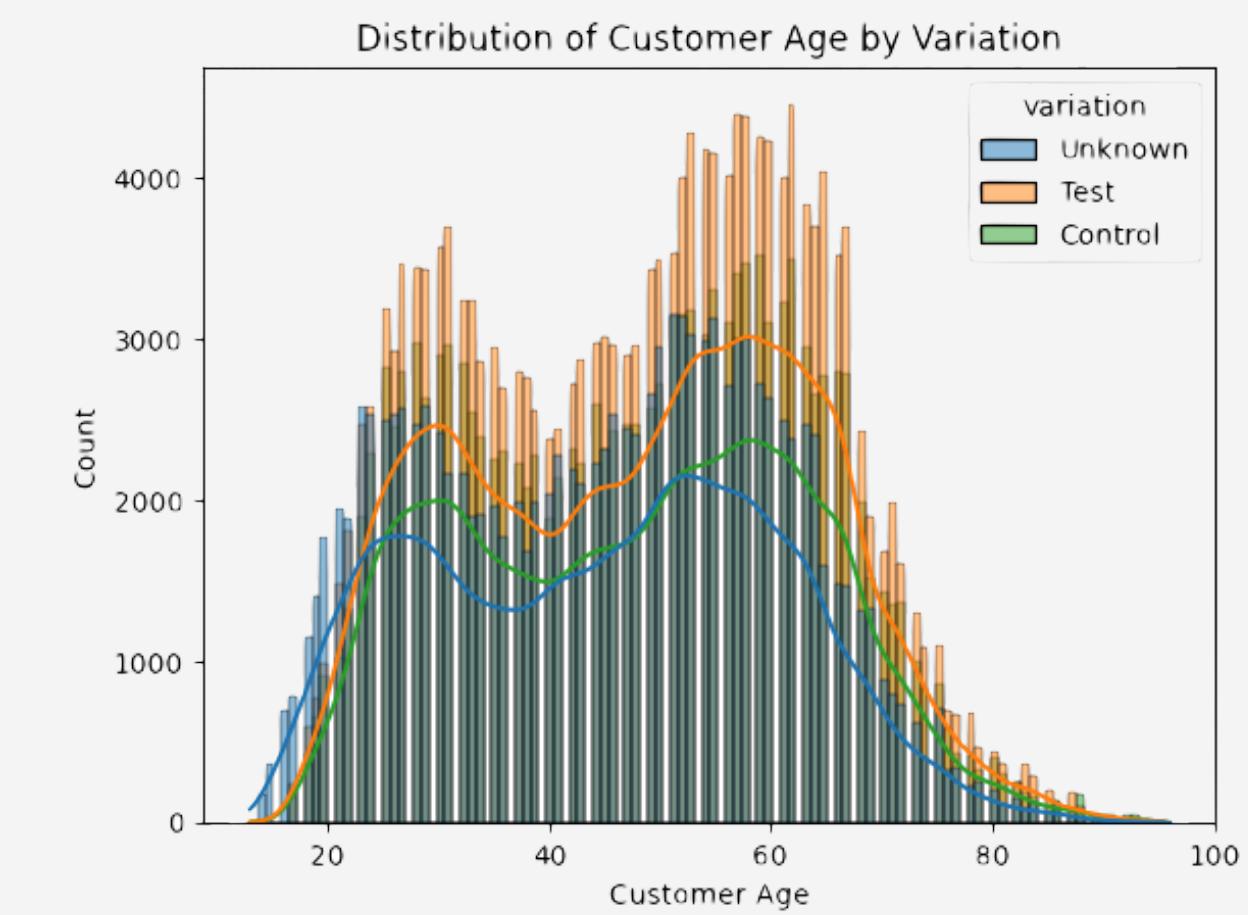
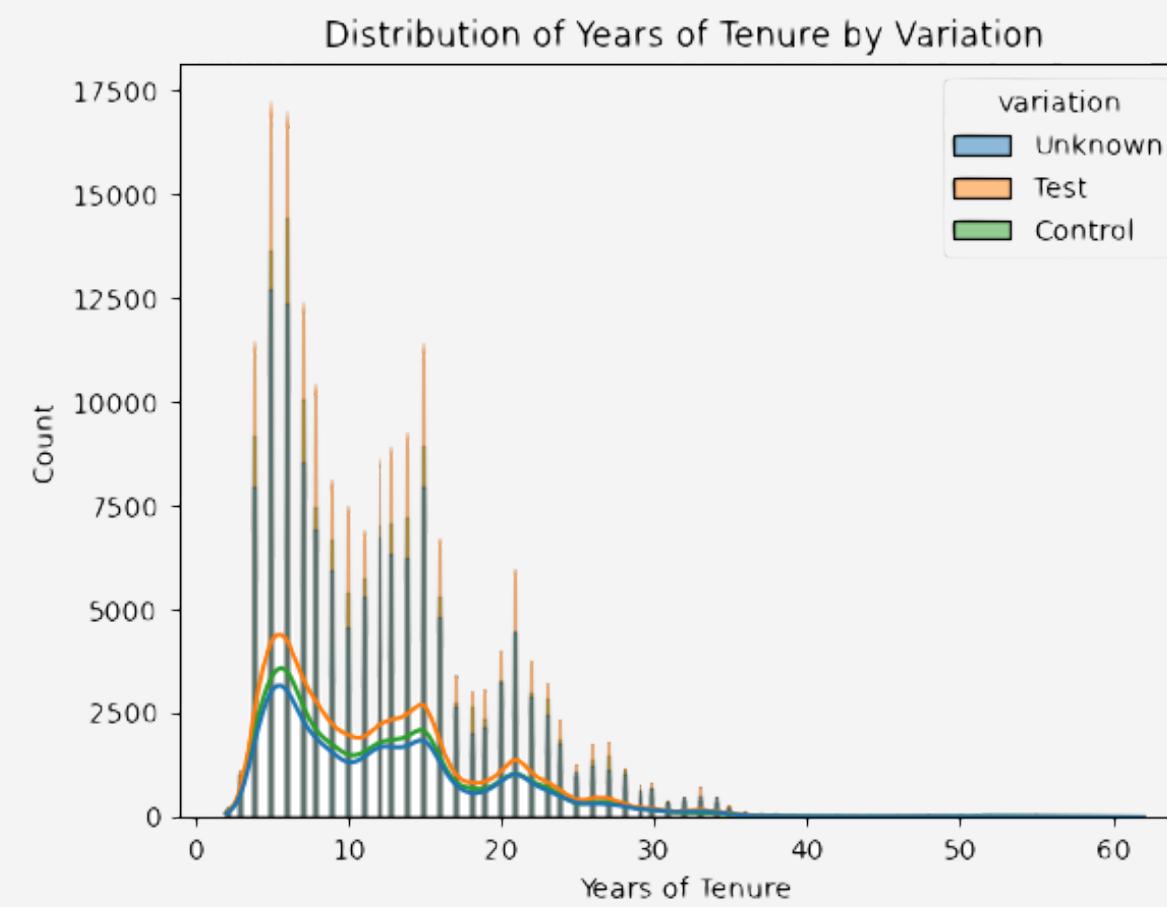
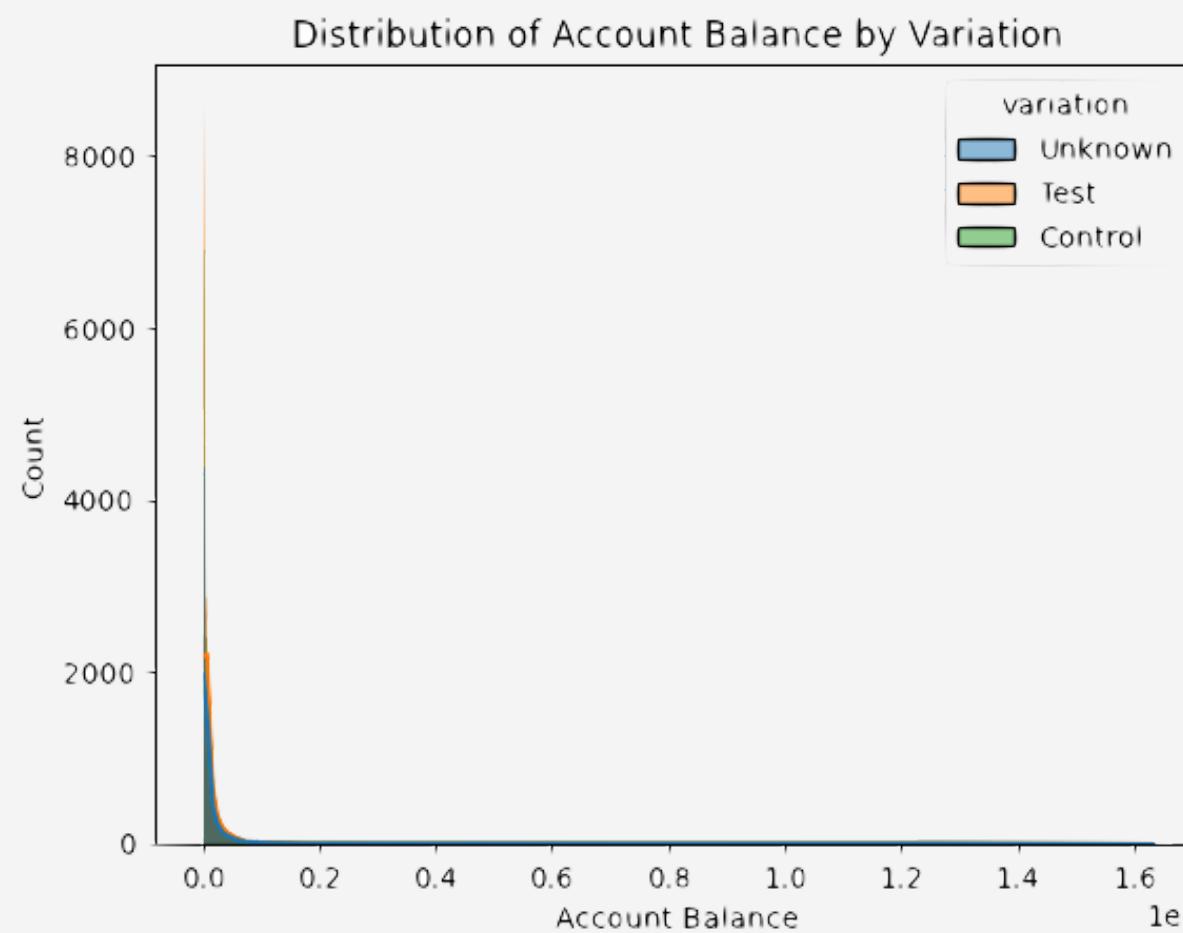
ADDITIONAL HYPOTHESIS

All pairwise comparisons show statistically significant differences in balance between the groups:

Control vs Test

Control vs Unknown

Test vs Unknown



ADDITIONAL HYPOTHESIS

Results

- ANOVA and Tukey confirm significant differences.
- The alternative hypothesis (H_1) is supported.
- The average client tenure differs across groups.
- Clients with greater tenure tend to interact differently with the process, potentially influencing completion rates or error occurrences.



EXPERIMENT EVALUATION

Design Effectiveness & Biases

Experiment Structure

The experiment showed significant differences in balance values, but the Unknown group (clients with unclear group assignment) creates uncertainty and may affect the fairness of the results.

Randomization & Group Assignment

The results suggest that clients were not evenly assigned to groups. The Unknown group had much lower balances, which points to possible issues with randomization.

Biases

The Unknown group's lower balances suggest that group assignments were not transparent, which could lead to biases and impact the study's outcomes.



EXPERIMENT EVALUATION

Duration & Additional Data Needs

Experiment Duration

The three-month timeframe appears adequate.

Additional context would improve accuracy.

Additional Data Needed

- Behavioral Data: Knowing client actions during the experiment would show how balance differences affected behavior.
- Group Assignment Details: More information on how groups were assigned would help clarify the Unknown group and confirm randomization.
- Pre-Experiment Balances: Knowing balances before the experiment could help account for any initial imbalances.
- External Factors: Changes in the market or promotions during the experiment could offer useful context.

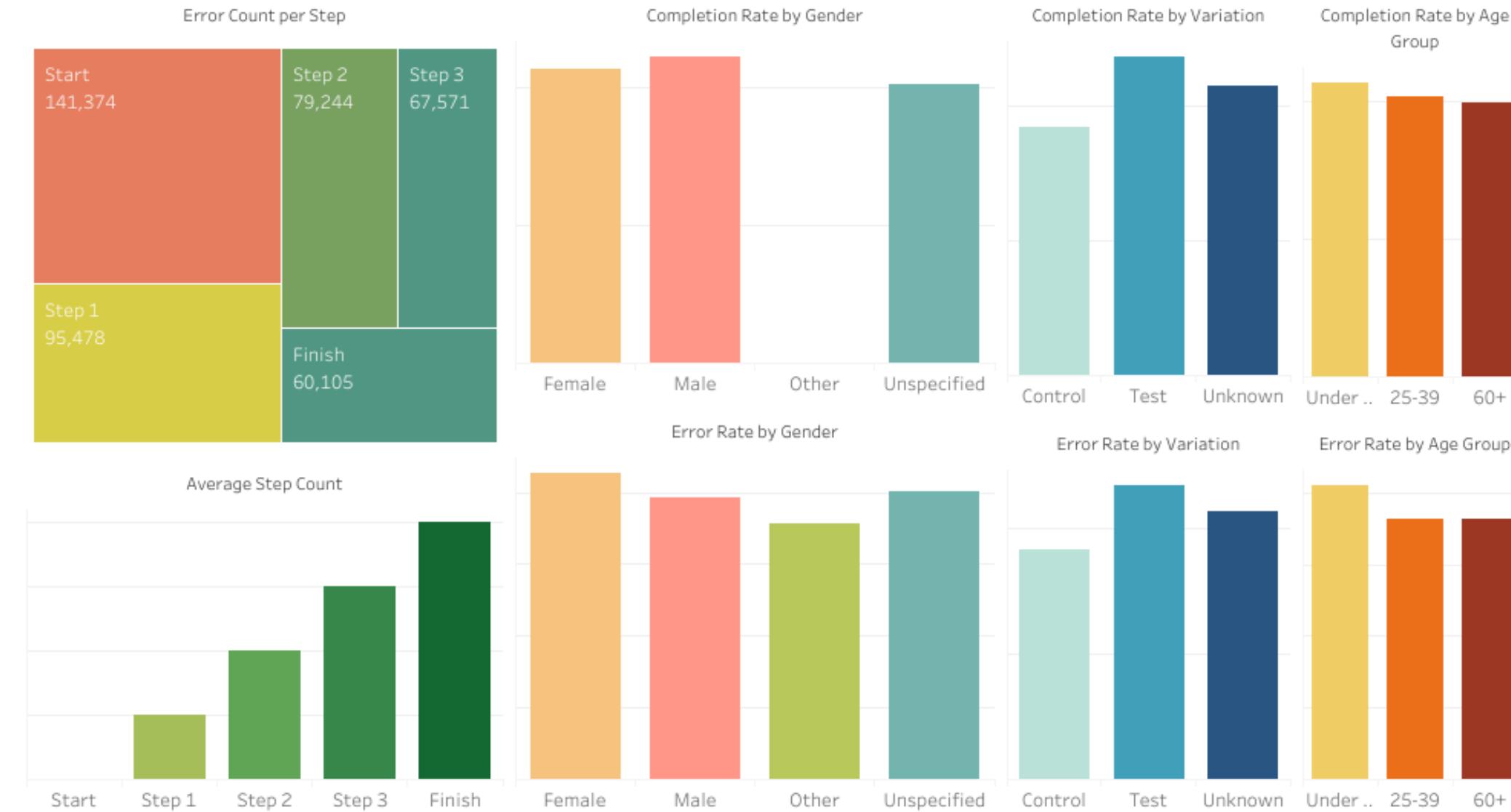
Conclusion

The experiment found significant differences, but unclear group assignments and imbalances raise concerns about fairness. Improving group assignment transparency and adding more data would strengthen future analyses.



FURTHER RESOURCES

We've created an interactive [Tableau Dashboard](#) with dynamic graphs for real-time insights.



Additionally, a detailed analytics notebook is included, outlining all data analysis steps for full transparency and deeper understanding when needed.

TEAM WORK & PROJECT MANAGEMENT

01

Trello

Task organization, daily planning, progress tracking.

02

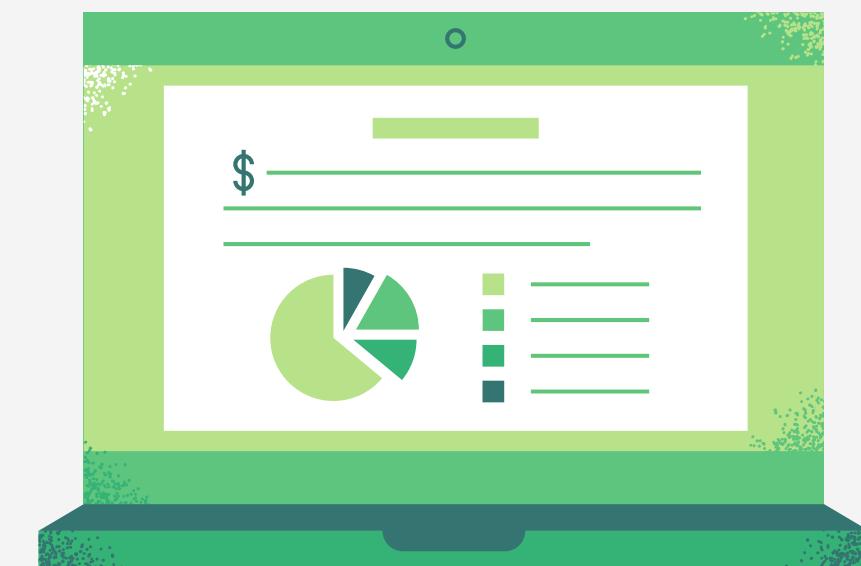
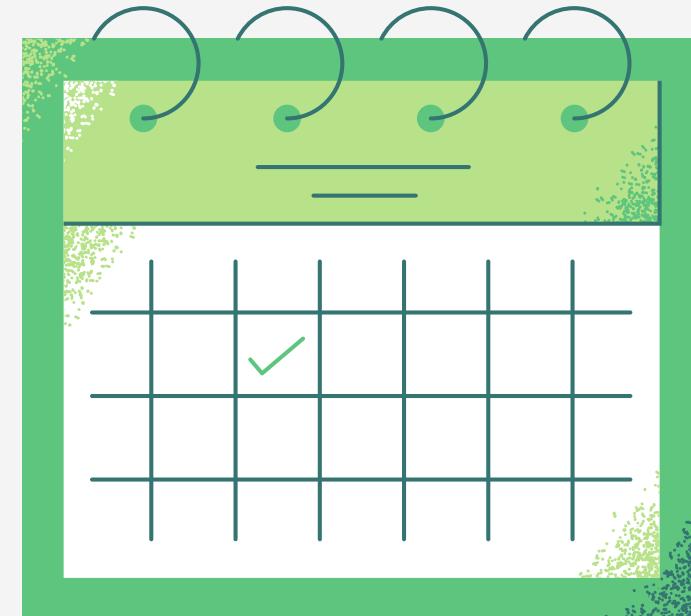
Teamwork

Distributed daily responsibilities among the team to ensure timely progress and meet all deadlines effectively.

03

Ask for help!

Looked for support materials or assistance from our instructors whenever we encountered obstacles in a process. This approach allowed us to avoid getting stuck and ensured we could continue making progress without wasting time.



CHALLENGES



Knowledge

Lack of prior knowledge or practice slowed progress on certain tasks.



New Tools

Adapting to new tools and frameworks required additional learning time.



Data Accuracy

Ensuring data accuracy and integrity throughout the analysis process.



Interpretations

Interpreting complex datasets and translating insights into actionable conclusions.



LEARNINGS



Tasks division

Dividing tasks enhances efficiency and accelerates progress.



Time limits

Setting time limits for solving problems helps prevent wasted effort.



Support

Seeking for help or support materials when needed.



One Step at a Time

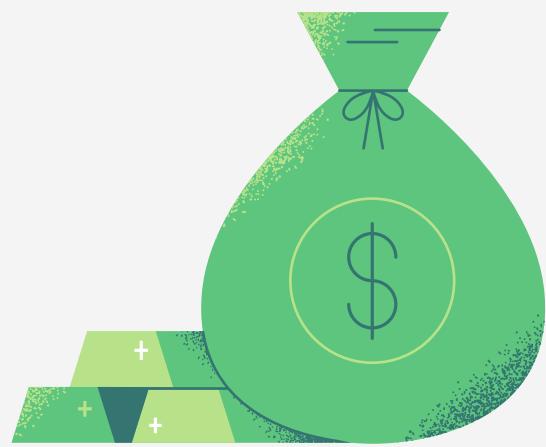
Breaking down complex problems into smaller steps.



Documentation

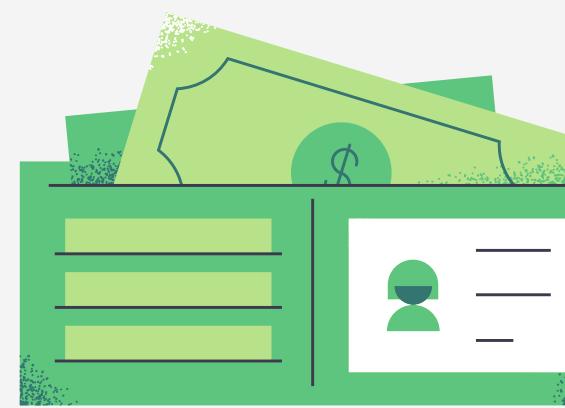
Documenting processes and results, provides clarity for future analysis.

CONCLUSIONS



Primary Clients

The majority of clients engaging with the process are above 40 and long-standing (average tenure of 12 years).



Active clients

Clients who log on frequently and hold more accounts also align with this demographic.



Completion Rates

The Test Group had a higher completion rate (69.77%) compared to the Control Group (65.90%), confirming that the new design improves engagement.



Drop-off Rate

Despite improvements, 32.3% of clients did not complete the process, suggesting further optimization.

CONCLUSIONS

04

Error Rates

Nearly 30% of clients had backward steps, indicating friction in the process.

05

Step Bottlenecks

Steps 2 and 3 require the most time, suggesting they are critical points for improvement.

06

Balance Disparities

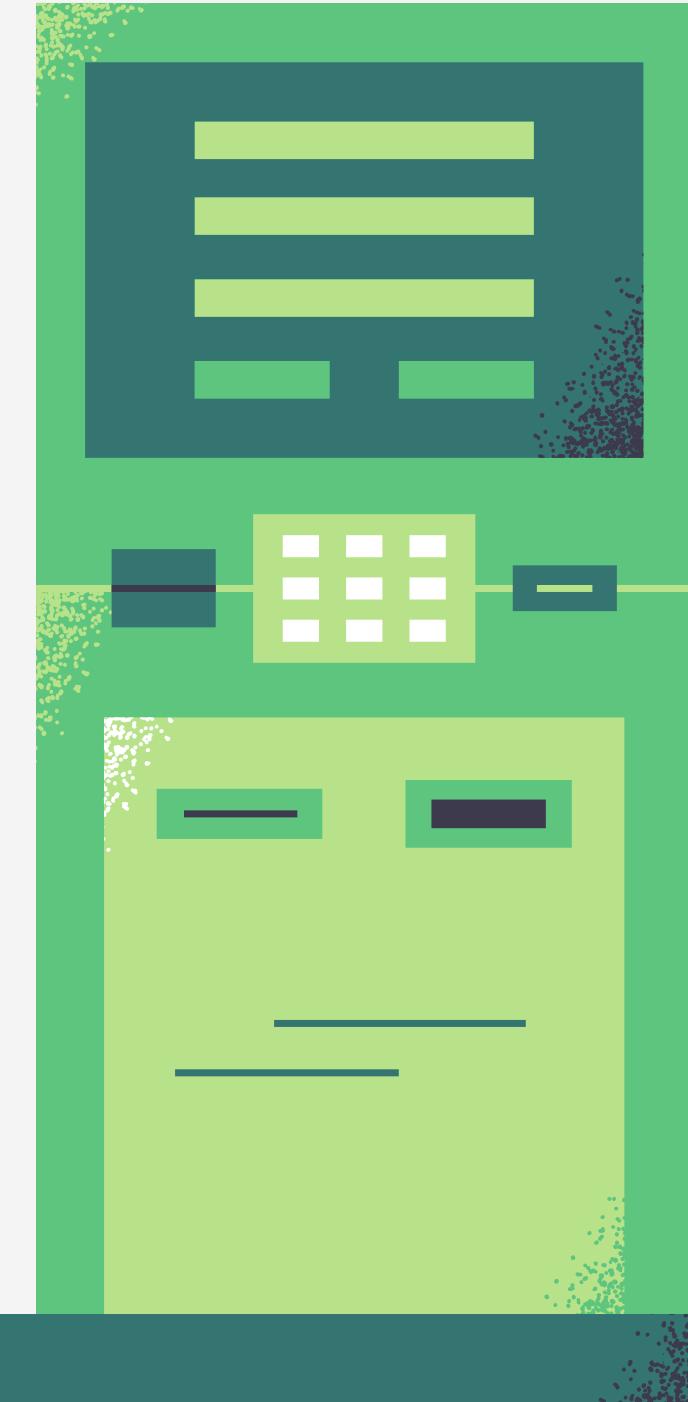
- Test Group has significantly higher balances than the Control Group.
- Unknown Group has the lowest balances.

Implications: These disparities could introduce bias, as client behavior might vary based on their financial standing.





Recommendations



Ensure group homogeneity in future experiments to eliminate potential biases from disparities in variables like balance or tenure.

Adjust analyses with techniques like ANCOVA to account for initial differences.

Explore the relationship between process competition and long-term client retention to assess the strategic impact of the new design.

Thank you!

Página de recursos

