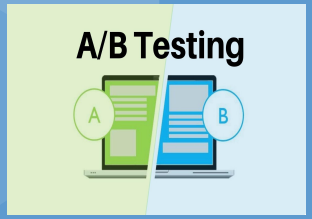
Project Vanguard A/B



Tamara - Adam

Introduction

- Vanguard tested a new UI and in-context prompts to improve the online client experience.
- The project involves analyzing client interaction data

- Business question: Did the new UI lead to higher completion rates?
- Therefore A/B test was used

Data Overview

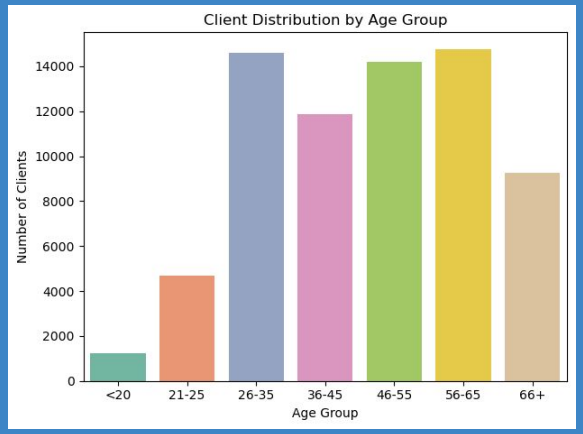
To analyse the dataset we used 3 different databases:

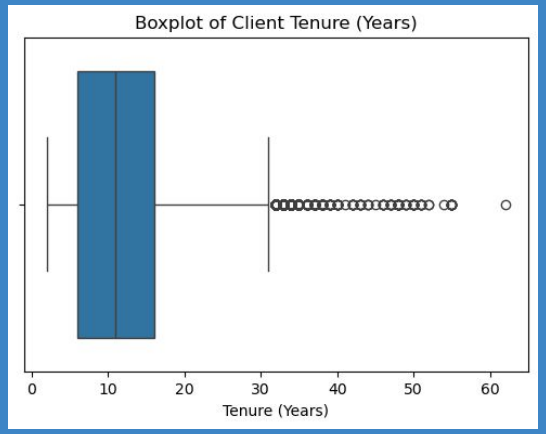
- Client Profiles: contained client info like *client_id, age, tenure, gender*
- Digital Footprints: contained all the digital variables and actions like: *visit_id, visitor_id, process_step*
- Experiment Roster: defined Control and Test groups

We prepared our analysis based on visit_id and joined the tables based on client_id

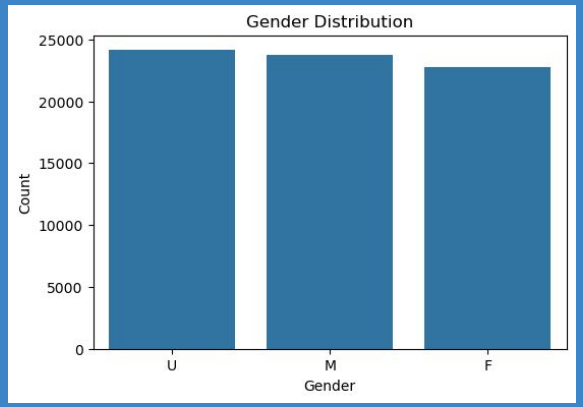
We removed duplicates from the database

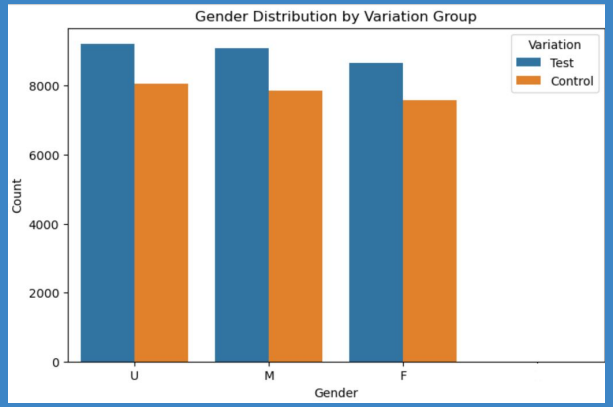
Exploratory Data Analysis (EDA)





	Age	Tenure
Mean	*46,4*	*12,0*
Median	*47,0*	*11,0*
Mode	*58,5*	*6,0*





Performance Metrics

KPI 1	KPI 2	KPI 3
Completion Rate	*Time Spent on Each Step*	*Error Rates*
Visitors reached confirm: *89 826* Visitors did NOT reach confirm: *68 269* Completion Total: *56.8%* Completion Control: *49.8%* Completion Test: *58.5%*	Average Time per Step (seconds) Variation / Control / Test process_step confirm 188.30 255.53 start 66.86 61.48 step_1 50.51 60.79 step_2 92.04 88.88 step_3 137.33 129.60	Total visits: *158 095* Visits with errors: *40 469* Visit-level Error Rate: *25.6%* Error rate Control: *20.8%* Error rate Test: *27.2%*

Hypothesis Testing – Completion Rate Comparison

Objective: Evaluate if the new design improves the completion rate compared to the old one.

Hypotheses:

- **H_0 (Null): There is no difference in completion rates between the Test and Control groups.**
- **H_1 (Alternative): There is a difference in completion rates between the Test and Control groups.**

Method: Two-proportion Z-test

Results:

- **Z-statistic: 19.516**
- **P-value: 3.96×10^{-85}**

✅ Conclusion:

The extremely low p-value allows us to reject the null hypothesis.
This confirms that the increase in completion rate with the new design is statistically significant and not due to chance.
The new UI is effectively driving higher user engagement.

Hypothesis Testing – Cost-Effectiveness Threshold

Objective: Check if the improvement in completion rate exceeds the 5% threshold set by Vanguard.

Hypotheses:

- **H_0 (Null): The increase in completion rate is less than 5%.**
- **H_1 (Alternative): The increase in completion rate is 5% or more.**

Method: One-sample Z-test

Results:

- **Z-statistic: 8.2613**
- **P-value: 7.20×10^{-17}**

✅ Conclusion:

We reject the null hypothesis (H_0) based on the extremely low p-value.
The uplift in completion rate is statistically significant and exceeds the 5% threshold.
Therefore, the redesign is cost-justified and likely to deliver meaningful business value.

Hypothesis Testing - Average Age Comparison

Objective: To determine whether the average age of clients differs between the Control and Test groups.

Hypotheses:

- **H_0 (Null): There is no difference in average age between the Control and Test groups.**
- **H_1 (Alternative): There is a difference in average age between the groups.**

Method: Two-sided T-test Results: T-statistic: 7.83, P-value: 4.77×10^{-15}

Result: We reject H_0 — the average age differs significantly between Control and Test groups (statistically).

Practical Significance:

Despite the statistically significant result, the visual inspection of the age distributions shows no meaningful difference.
To confirm this, we calculated Cohen's d = 0.028, which indicates a negligible effect size (≪ 0.2).

✅Conclusion

While the difference in average age is statistically significant, it is not practically meaningful — suggesting that the redesign attracted a similar age profile of users.

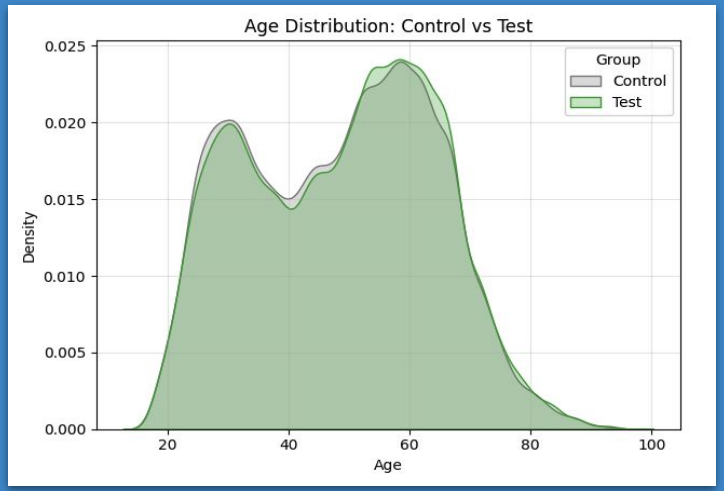


Tableau Visualizations - 1

[Dashboard Link]

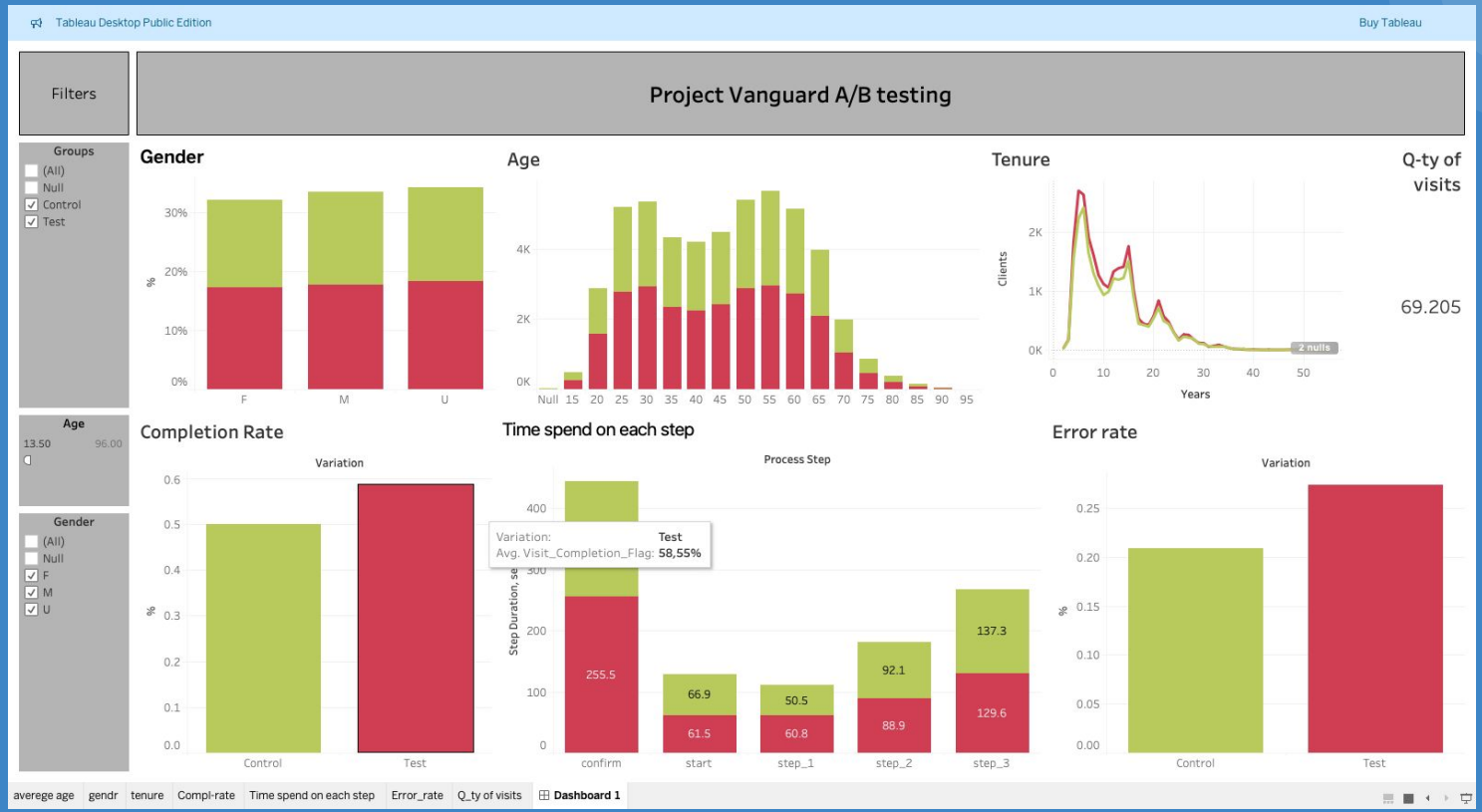
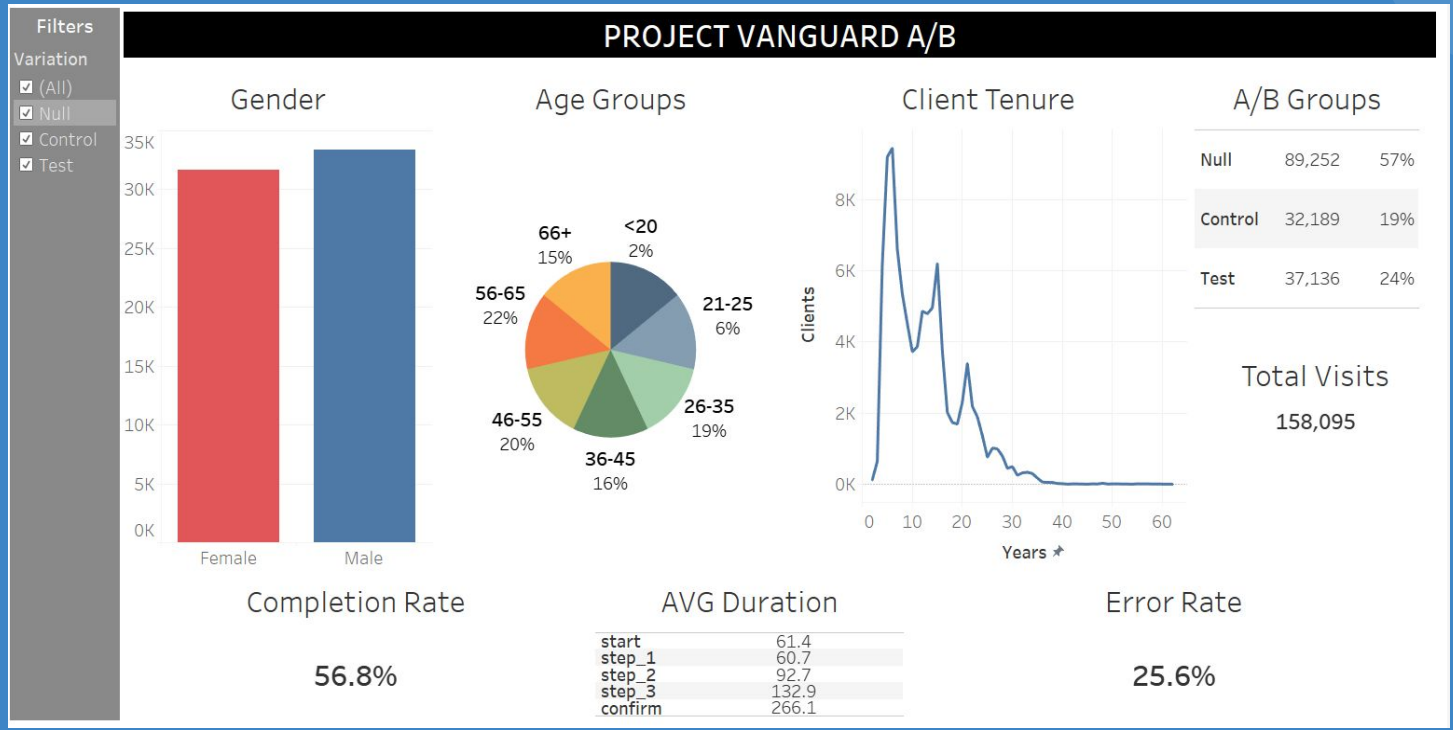


Tableau Visualizations - 2

[Dashboard Link]



Teamwork & Project Management

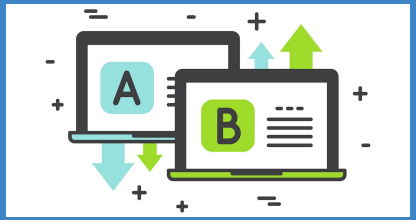
- Collaborated effectively by discussing next steps and aligning on project goals and analysis priorities.
- Compared and reviewed statistical results and data analyses to ensure accuracy and consistent interpretation.
- Shared technical tips and best practices for data cleaning, merging, and visualization in Tableau to optimize workflow.

Challenges & Learnings

- The project required careful planning in both analysis and visualization. We faced many data-related challenges (such as missing values and combined datasets with many records) during the visualization phase.
- Data visualization in Tableau can be time-consuming, so it is important to allocate sufficient time for planning and execution.
- Hypothesis tests showed a statistically significant difference in age between the groups, even though the practical difference appears small. This may be due to the large sample sizes or other factors such as data variability or measurement precision.

Conclusion

- The completion rate for the Test group (new digital interface) was significantly higher than for the Control group.
- The observed uplift exceeded the 5% cost-effectiveness threshold, suggesting the new design delivers measurable benefits.
- The new digital interface is statistically and practically effective, demonstrating a meaningful improvement in user completion rates.



✅ ***We recommend the implementation of the new design across the full platform, as the data supports its effectiveness.***

THANK YOU!

Tamara - Adam