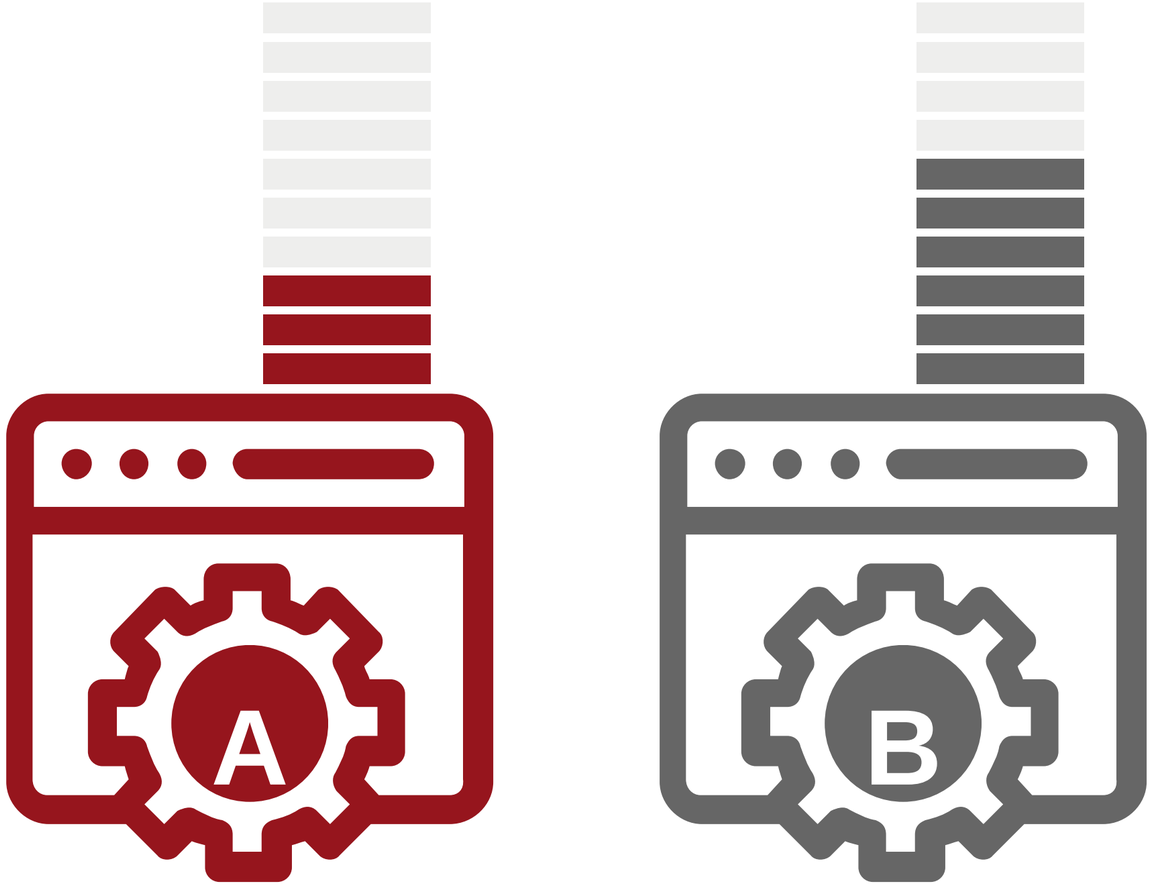
The Digital Challenge

by Ceci and Eliska



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Who is Vanguard?

Investment management company offering low-cost mutual funds, ETFs, and other investment services

Investment funds (mutual funds and ETFs)

Wealth management and financial advisory services

Retirement and savings accounts

Client-Centric Approach enhancing the CX to ensure clients find its platforms intuitive, accessible, and efficient

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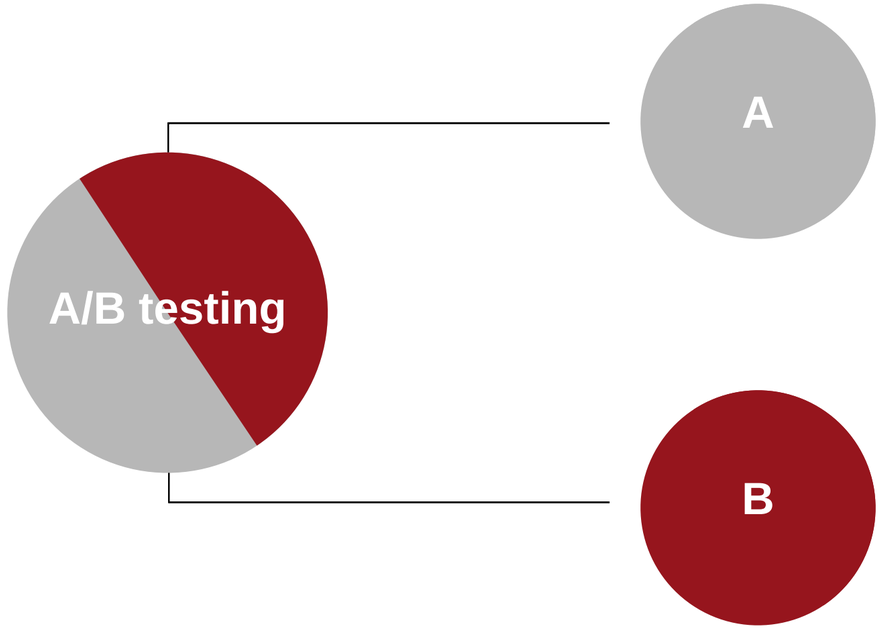
Digital challenge and our role

A/B test to evaluate a new, modernized user interface with in-context prompts to improve the online client journey



Experiment Details:

Control Group: Used the traditional UI
Test Group: Experienced the new, intuitive UI with contextual prompts

Timeline: March 15, 2017 – June 20, 2017
Process Flow: Initial page ➔ 3 steps ➔ Confirmation page

As part of the CX team, **our job is to evaluate whether the new UI leads to better user engagement and higher completion rates** during online processes.

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Did the new UI lead to higher completion rates?

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What data we have been working with?

Client profiles: Demographic and account details (client''s age, tenure, balance ..)

Digital footprints: Online activity logs per steps in client''s journey process

Experiment roster: Indicates client group allocation (Control or Test) based on client_id

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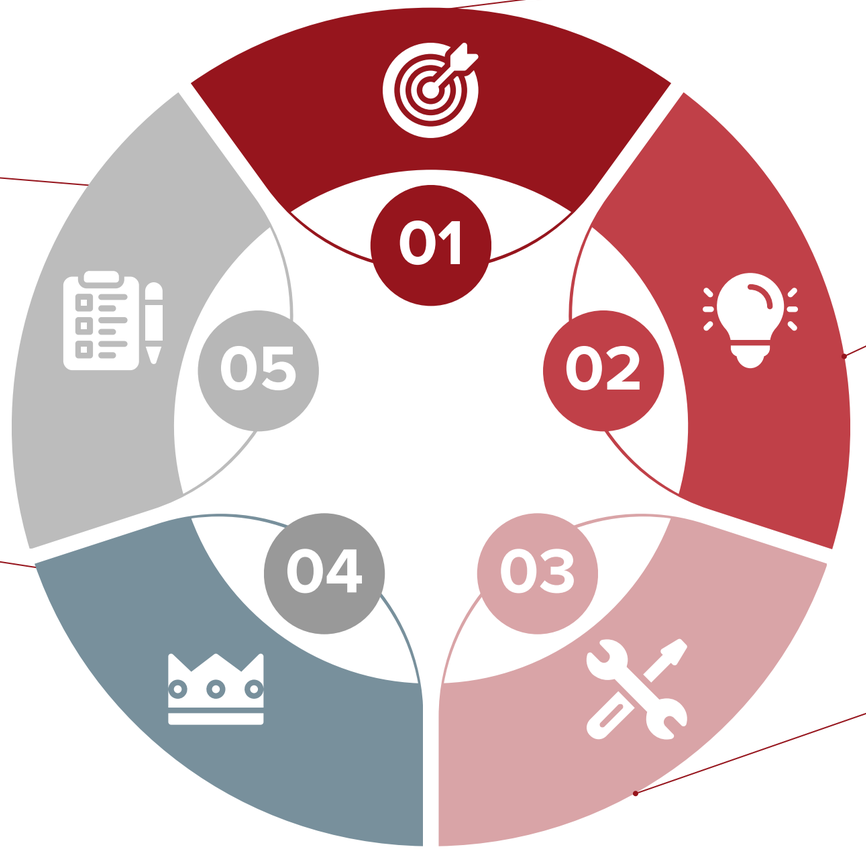
Data cleaning & merging process

Clean datasets

load data, drop missing values, rename columns, remove 'X' gender, map gender codes to labels, ensure proper datetime format



Merge datasets

merge demographic datasets, concatenate web interactions dataset, merge all on client_id

Segment by Experiment Group

split data into control and test groups based on the variation column

Age group categorization

assign age groups based on defined bins for df_merged, control, and test groups

Sort data

sort by client_id, visit_id, process_step, and date_time

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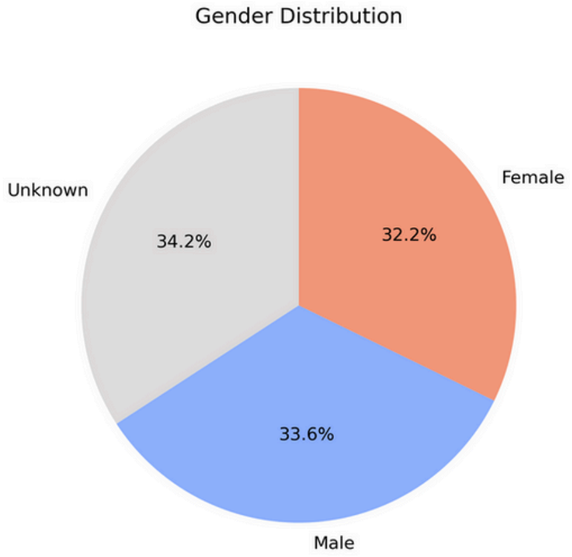
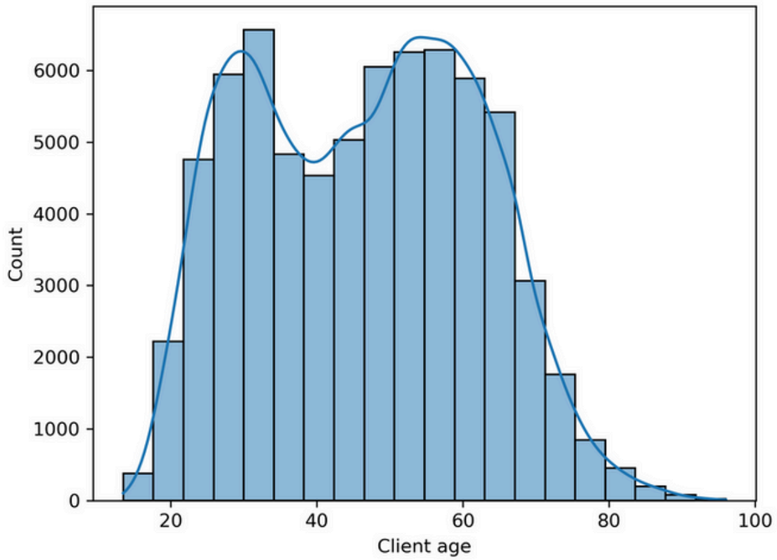
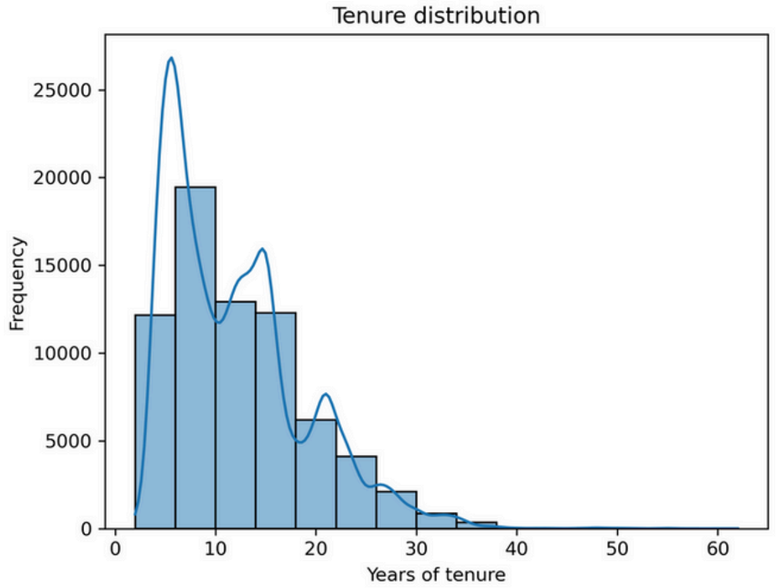
Who are our clients?

for demographic analysis we used a pool of **70591 users after applying cleaning & merging processes**







Group with highest average tenure and balance:

gender	Male
age group	50 and above
client's tenure	16.35
balance	294,239.72$

Average Persona:

gender	Male
age group	30-39
average tenure.	11.65 years
average balance	126,284.41$

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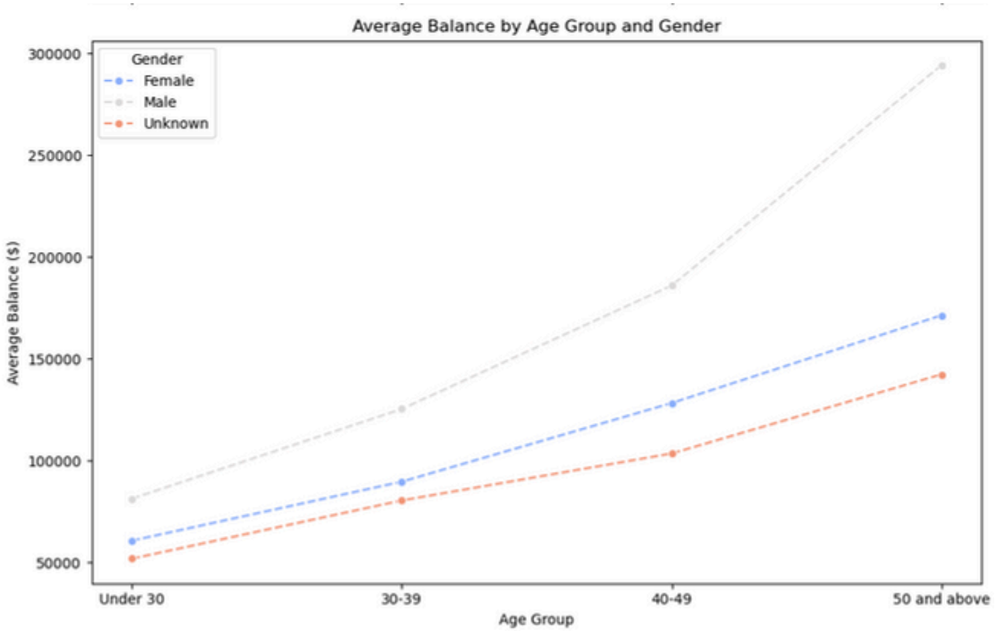
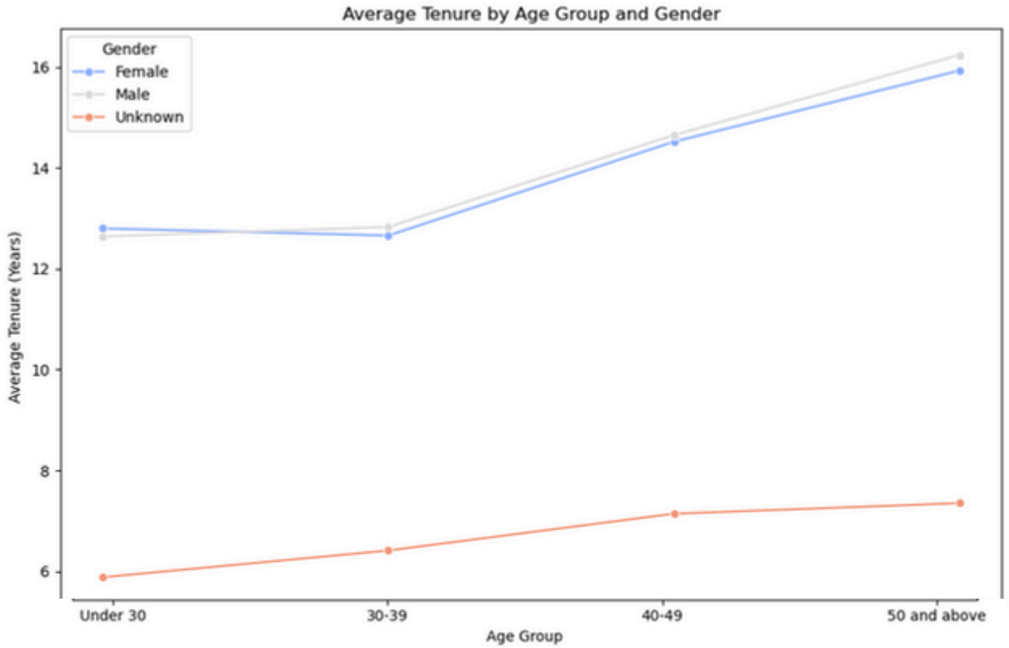
Who are our clients?

Average tenure: **12 years**
Average balance : **147451.82$**





- males generally have higher average balances than females, with the **highest balances observed in the "50 and above"** age group for both genders
- both males and females show similar tenure patterns, with **longer tenures seen in older age groups (50+ years),** indicating long-term clients
- the “Unknown" gender category typically has lower average balances, because potential data gaps or non-disclosure of gender

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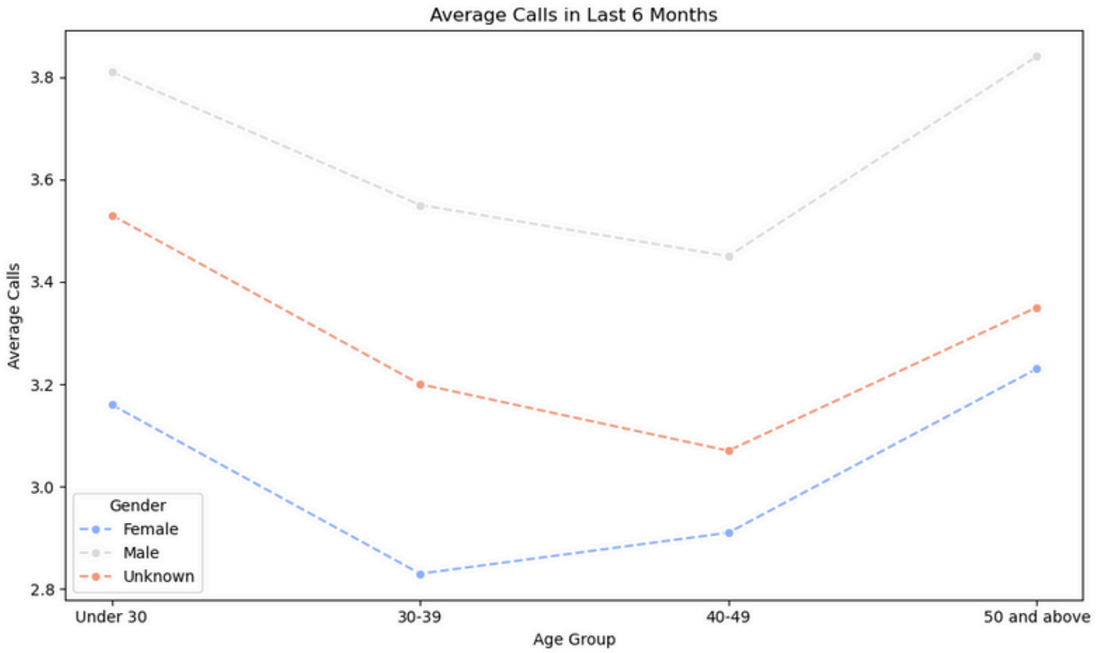
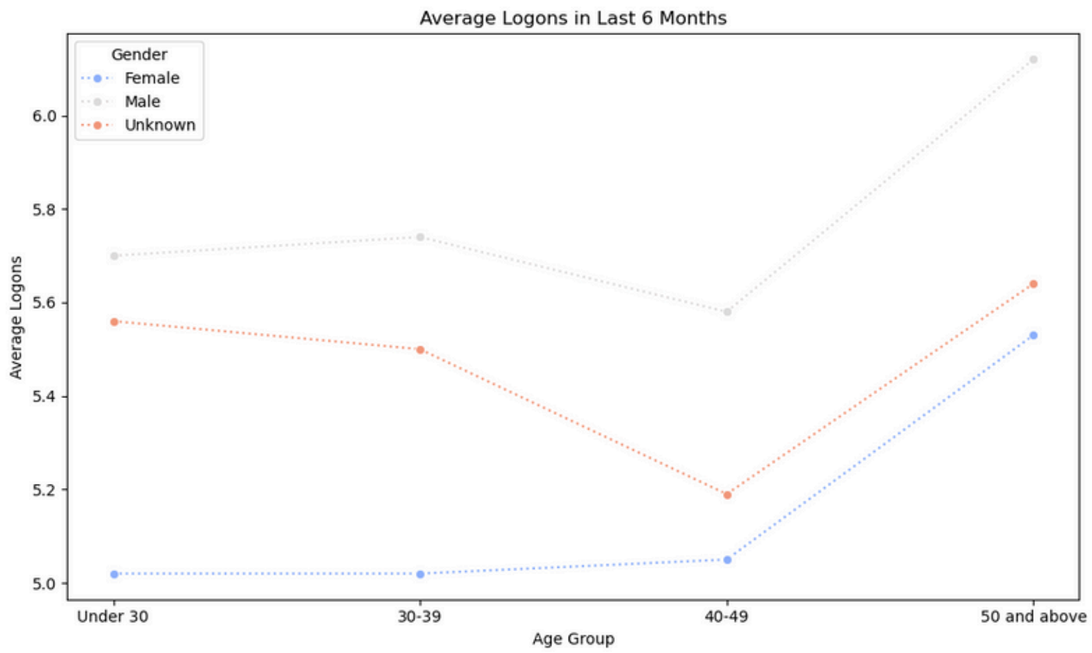
Client's engagement





- clients aged 50 and above have **more frequent calls and logins**
- males tend to show slightly **more active engagement in terms of calls and logins**
- minimal variation in the number of accounts held (usually 2)

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Key performance indicators

Completion Rate

If the Test group shows higher completion rate compared to the Control group it suggests that the **new design has improved user engagement, making it easier for users to complete the process**

1

Time Spent on Each Step

A lower time spent at each step in Test compared to Control would suggest that the **new design is more efficient and that users can move through the process more quick**

2

Error Rates

A reduction in error rates in the Test group would suggest that the **new design is more intuitive and user-friendly, minimizing confusion**

3

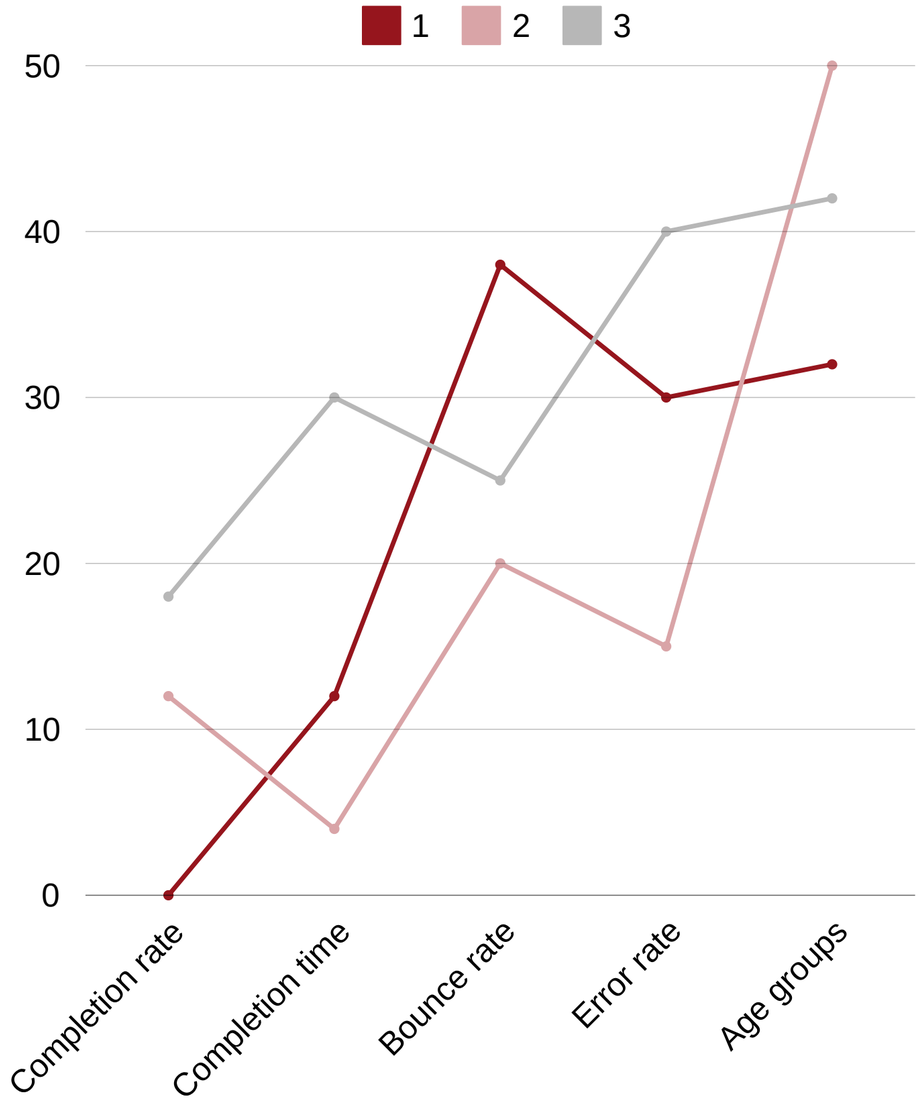
Bounce rates

If the Test group has a lower bounce rate compared to the Control group, it suggests that the **new design is better at keeping users engaged throughout the process**

4

Tableau visuals

https://public.tableau.com/app/profile/eliska.simova/viz/Vanguard_CX/Vanguard_story?publish=yes



Hypothesis testing

Hypothesis: *"Is there a significant difference in the **completion rates** between the Control group and the Test group at each step of the process?"*

- all steps show statistically significant differences in completion rates between the Test group (new UI) and Control group (old UI)
- **p-value of 0.0000** for each step indicates strong evidence against the null hypothesis, two_proportion_z_test
- we reject the null hypothesis at all steps

N**ew design does indeed have a significantly different impact on user completion rates** at each step compared to the old design

Hypothesis: *"Does the introduction of the new UI design result in a minimum 5% increase in the completion rate compared to the existing design, **making it cost-effective**?"*

- H0 = The completion rates of the Control group and Test group are equal
- H1 = The completion rates of the Control group and Test group are not equal
- the completion rate **increase of 9.82%** between the Test and Control, **exceeds the 5% threshold set by Vanguard,** new UI design could be considered worthwhile from a business perspective

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Hypothesis testing

Hypothesis: *"Is the **average client tenure** of those engaging with the new process the same as those engaging with the old process?"*

- Control Average Tenure: **12.09 years**
- Test Average Tenure: **11.98 years**
- **p-value:** 0.0868, **statistic:** 1.7124 (indicates how much the means differ relative to variability), two-sample t-test
- fail to reject the null hypothesis, average tenure is not significantly different between two groups

The lack of significant difference in average tenure **supports the validity of the A/B test results.**

Hypothesis: *"Is the **average client age** of those engaging with the new process the same as those engaging with the old process?"*

- Control average age: 47.50 years
- Test average age: 47.16 years
- **P-value**: 0.0160, two-sample t-test
- p-value is less than 0.05, we reject the null hypothesis

There is a statistical difference in age between the Test and Control group, age differences might introduce a bias

Hypothesis testing

Hypothesis: *"Does the new UI design lead to a **reduction in error rates** compared to the old design, and is this reduction statistically significant?"*

- Control error rate: **19.21%**
- Test error rate: **17.64%**
- Percentage Difference: 1.57%
- **P-value:** 0.0000, binominal hypothesis test
- we reject the null hypothesis that there is no difference between the groups, **new UI has a significantly lower error rate than the old UI**

Hypothesis: *“Is the **bounce rate** of the Test group is lower than the Control group across all steps?”*

- two-proportion z-test
- H0 = The bounce rate of the Test group is equal to or higher than that of the Control group.
- H1 = The bounce rate of the Test group is lower than that of the Control group
- Test group **showed a statistically significant lower bounce rate only at Step 1**
- Steps 0, 2, and 3 show no statistically significant differences between the Control and Test groups

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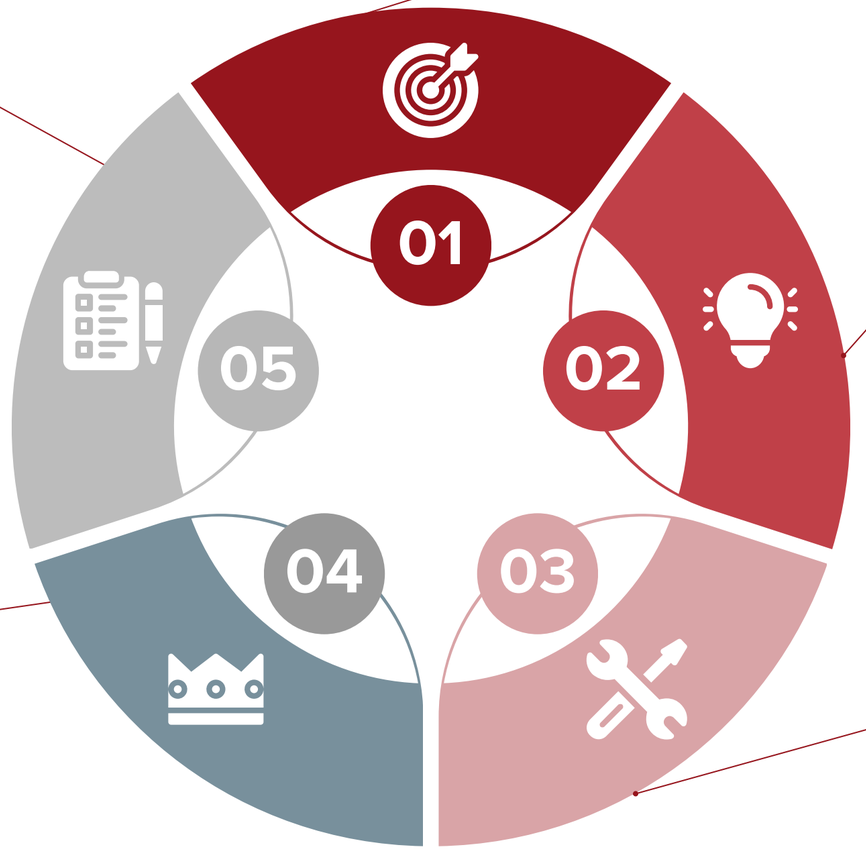
Experiment evaluation

Design effectiveness

experiment was well-structured as well as the randomization between control and test groups, ensuring comparability

Additional Data Needs

user feedback - insights on pain points or satisfaction with the new design
engagement metrics like heatmaps, where do user clicks, what are the confusions
d**evice/platform data** - how performance varies by device or browser



Potential biases

demographic differences like **significant age variations between groups** suggest potential biases that might impact results, especially if older or younger users find the new design easier or harder to use

Duration adequacy

experiment duration (3/15/2017 to 6/20/2017) appears **sufficient to capture meaningful data,** covering a range of user interactions and ensuring diverse user behavior

Randomization & group equality

clients were randomly assigned, but differences in average age suggest the **groups may not be fully equal**, which could affect the result.

Completion rate

Test group’s changes improve within-visit completion rates and that **new UI is more effective at keeping users engaged** and progressing through steps compared to the Control group, confirmed by hypothesis test

23 526

Control group

Completion rate

💡 significant increase (9.82%) suggests that the **new design is cost-effective and justifiable from a business perspective**, as it shows a clear benefit that would outweigh the associated costs of redesigning, testing, and implementation

26 959

Test group

Completion rate

Test group’s completion rates are **8–14% higher** than the Control group at every step

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Error rate

The test result suggests that the **new UI (Test group) reduces error rates,** and this reduction is statistically significant.

23 526 **Control group** **Error rate**

19,21%

26 959 **Test group** **Error rate**

17.64%

💡 it is important to note that the reduction is below the 5% threshold (1.57% reduction), which means i**t may not fully justify the redesign from a cost-effectiveness perspective**

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Completion time

Faster Process in Some Steps

New design has led to **faster completion times in some steps**, particularly in Step 2 and Step 3

User Behavior Insights

The increase in time in Step 1 and Confirm, could be an **opportunity for optimization**

💡 Suggestion: Leverage faster steps

The new UI is faster in Step 2 and Step 3. **Use these improvements as benchmarks** for other areas of the flow and apply successful design strategies elsewhere.

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Bounce rates

Improvements in start and step 1

Test group seems to **outperform the Control group in terms of start and step 1** bounce rates across all age groups

Process optimization

There are mixed results in the latter stages (step 2 and step 3), suggesting that further improvements may be needed to optimize user experience through the entire process

💡 Suggestion: Focus on Improving Step 3 for 50+ Users

50+ age group has a significantly higher bounce rate in step 3 (13.60% vs. 9.22%)

the 50+ age group is a key demographic for Vanguard, addressing step 3 is important

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"Vanguard can confidently move forward with the new design, but continuous monitoring of each step performance and optimization will be important to sustain and further improve the results."

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Recommendations

1

Simplify the Process

all age groups may benefit from a **more straightforward flow**

💡 **reduce unnecessary steps** and minimize user decisions to streamline the experience

2

Provide Contextual Help

high bounce rates may indicate confusion or hesitation, users might benefit from **guidance or support**

💡 **add tooltips, help icons, and live support** to guide users

3

Personalize Experience

users might lose track of where they are in the process or forget to complete it

💡 **offer reminders and allow users to save their progress** for later completion

4

Improve Visual Design

bounce rates at certain steps suggest that **users might find some of the content unclear**

💡 **ensure readability and consistency** in font size, contrast, and button design

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Challenges & Learnings

1. Quite **complex project,** a lot of decision-making
2. **“Crisis solving”** = unexpected issues with github, sick days, trying to choose the propper approach
3. Refining our outcomes and improving the codes
4. Further learning suggested objectives like streamlit brought a whole new level of challenge that was unexpected
5. **Creating an app for visualization** was an issue but manageable even if it took a long time
6. Pushing the **finished app to be seen online** was the final boss of this project

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Thank you for your attention.

Any questions?

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