

A8 - User Testing

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Introduction

This document outlines the A/B testing plan for two alternative designs of our HealthTrack mobile application prototype.

Design Question

Can prioritizing frequently used features on the homepage with optimized data visualization styles improve user experience, task completion efficiency, within the HealthTrack app?

This combined A/B testing proposal addresses key aspects of our HealthTrack app:

Homepage Information Hierarchy: Similar to Proposal #1, we'll investigate if prioritizing frequently used features with larger buttons/icons on the homepage (Version B) improves user navigation and task completion compared to the current balanced layout (Version A).

Usability & User Experience Considerations:

This combined approach focuses on enhancing overall user experience by:

Reducing decision fatigue: Streamlining the homepage with frequently used features allows users to quickly find what they need.

Improving task completion efficiency: Easier navigation reduces time spent searching for features.

Alternative Designs:

Version A: Current layout with balanced information hierarchy on the homepage and bar chart visualizations on the statistics page.

Version B: The homepage prioritizes frequently used features with larger buttons/icons. Less frequently used features are accessible through a secondary menu. The statistics page utilizes pie charts for data visualization.

Task List

The user testing that we have constructed for this assignment follows a series of tasks. Each task is crucial for exploring all the differences in both versions A and B of the hi-fi prototype. Here entails the tasks from getting welcomed by the app, to signing in, to logging in workout data, to checking the user's stats:

1. Start at the "Welcome Screen"

Participants are going to start the prototype testing by opening up the app from the welcome screen.

2. Navigate to the "Login page"

The user is now going to sign into their account.

3. Navigate to the "Menu Page"

Now the user is going to find and click on the menu page icon

4. Navigate to the "Workout page"

The user is then going to click on the workout page icon.

5. Start workout on "Workout Page"

Next up, the user is going to click the "Start Workout" button to start the process of counting the calories, steps, duration and progress of the workout.

6. Finish workout on "Workout Page"

To complete the workout on the workout page, the user is going to press the "Finish Workout" button. This will lead to the "Post-workout" page

7. Log in workout data on "Post-workout" page

The last part of the workout end of things is to press the “done” button on the “Post-workout page.

8. Navigate to the “home” page

Now the user is going to find and click on the “home” page icon.

9. Navigate to the “menu” page

Now the user is going to find and click on the “menu” page icon on the bottom left hand corner.

10. Navigate to the “User Stats” page

Lastly, the user is going to click on the “User Stats” icon.

Dependent Variable

For this user testing study, using the A/B testing method, the dependent variable is the time that it takes to navigate the menu to log workout data and then view the user stats afterward. We have two versions (A and B) to test and figure out which of the versions has a more efficacious layout and icon structure (for example: version A’s list menu and version B’s icons split between frequently used and other icons with a grid pattern layout). The version B of our hi-fi prototype was designed to test the time efficiency (correlating to aesthetically pleasing icons to help the user perform tasks faster)

Interview Script

Greetings! I’m ----- and I’m conducting an interview and testing our app’s efficiency and level of visual appeal. Thank you for participating in our interview and prototype testing process. We appreciate your help and any feedback you may have for our team to make the app better.

To start things off, my team and I have designed a pre-interaction questionnaire to help understand a bit about your perspective before heading into the interaction.

Ask user to fill out Pre-Questionnaire

We’ll begin by showing you a random design to use and interact with. However, you need to carefully follow specific tasks we have laid out for you. This will help us keep the interactions between every one of you fine participants consistent for our documentation.

Ask the user to complete tasks in task list for the application

Next up, our team would love to learn a bit more about what you think about our app. We have a brief post interaction questionnaire that we will like you to fill out. This questionnaire will help us better understand where we need to improve upon on our application. You have been a great deal of help so far, and I thank you for the opportunity to better understand your thoughts on our app.

Ask the user to fill Post-questionnaire

Pre-Questionnaire

We have created a pre-questionnaire, using “google forms”, that asks for the user's email to start off (very important for the start of the process). Then it will ask participants to pick a number from 1-10, the user's age range in a multiple choice, and a series of other multiple choice and description based questions. At the end, they will have to submit the google form and choose if they want a copy of the responses sent to them.

[Pre-questionnaire google form](#)

Responses

Pre-questionnaire

https://docs.google.com/spreadsheets/d/1f-BqwHO3YKeSFtBvsDET-Gr1aM-MUeS_wzOy_2hCEDA/edit?usp=sharing

Post-Questionnaire

We have created a post-questionnaire, using “google forms”, that asks for the user's email to start off (just like the pre-questionnaire). Then it will ask participants a series of multiple choice and description based questions. At the end, they will have to submit the google form and choose if they want a copy of the responses sent to them.

[Post-questionnaire google form](#)

Responses

Post-questionnaire

https://docs.google.com/spreadsheets/d/1DBwT92IGQ1IsF_xY0ddOROI46UmQIMs-41HpLCxJ0ns/edit?usp=sharing

User Testing Details

Ten participants (five for each version) were asked to evaluate two variations of the HealthTrack app. The testing process followed a structured interview script and a predefined task list. To ensure participant anonymity, we assigned them numbers and requested cameras to be turned off. Zoom served as the screen capture software for recording user interactions.

Interview lengths varied, averaging around 3 minutes. Some participants required additional time for questions and clarifications, while others completed tasks swiftly. Please refer to the provided screen capture videos for a detailed look at user interactions.

▣ A8 Videos - CSE 463 Group

Capturing Dependent Variable

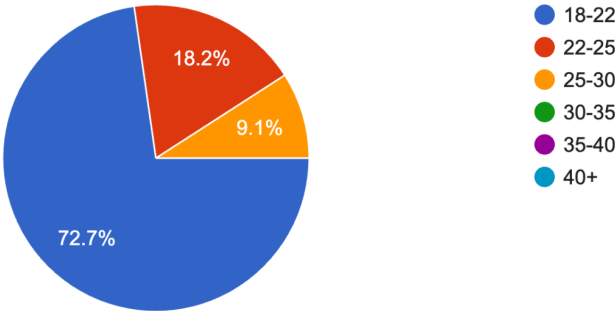
During testing, we tracked the time it took users to complete the list of tasks described above which involves the user navigating our menu to complete the “log workout” section and then navigate the menu again to go to the user stats. To achieve this, we utilized a timer that measured the time taken by the user to interact with the app which excludes the idle time and the time taken by our team members to explain the task.

Analysis of the Questionnaire Data From the Users

Our testing focused on a specific user group: young adults (aged 18-22) mostly students, comfortable with smartphones. This demographic aligns well with the app's high engagement rate, with 40% of users expressing a desire to use it more than four times per week. The positive user experience is further reflected in the recommendation rate, exceeding 70% for both versions. Interestingly, usage patterns show an 80% concentration before noon or early afternoon, suggesting a potential focus on health tracking during the morning routine.

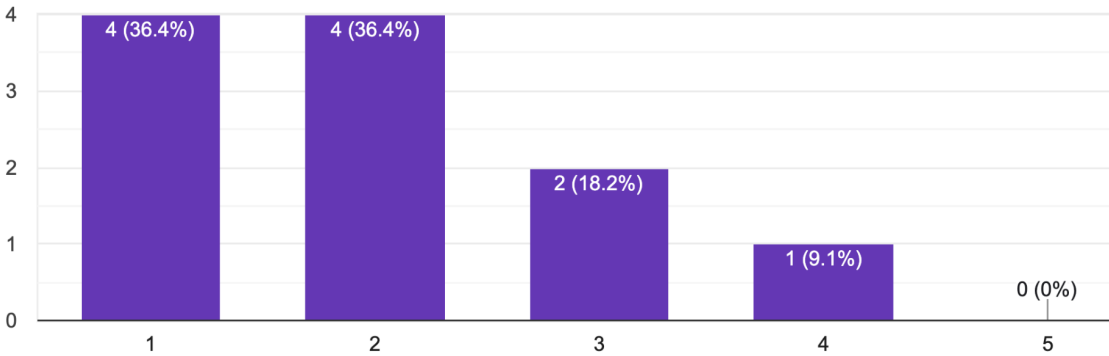
User Age Range

11 responses



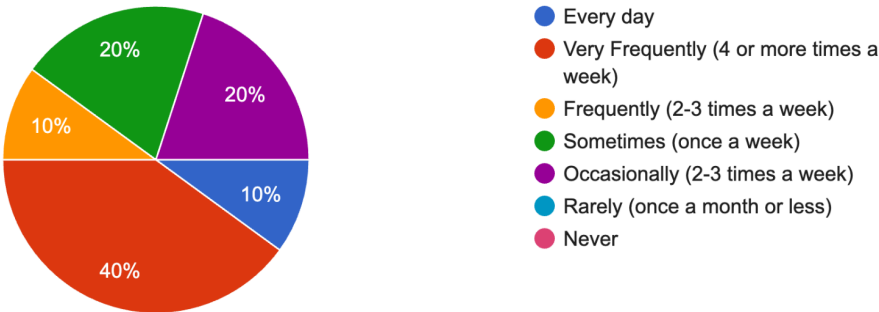
How familiar are you with health tracking apps?

11 responses



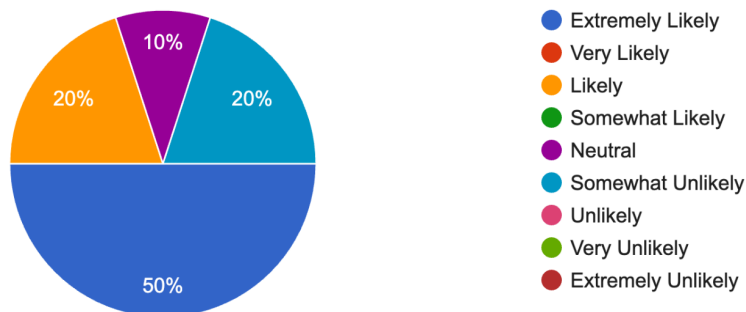
How frequently do you anticipate utilizing this application?

10 responses



What is the probability that you would suggest this application to someone else?

10 responses



T-Test Methodology and Results

Hypothesis testing plays a central role in objectively evaluating Prototype A and Prototype B. This approach goes beyond simple observation, statistically analyzing whether the observed differences in user experience are truly meaningful. The t-test serves as a specific technique within hypothesis testing. This statistical method compares two groups (users interacting with Prototype A vs. Prototype B) to determine if a significant difference exists in a measured variable (time to explore and navigate the menu). By analyzing the collected data (user completion times) through a t-test, we can determine which prototype offers a more user-friendly experience for the task of navigating the menu and logging workout data till reaching the user stats page.

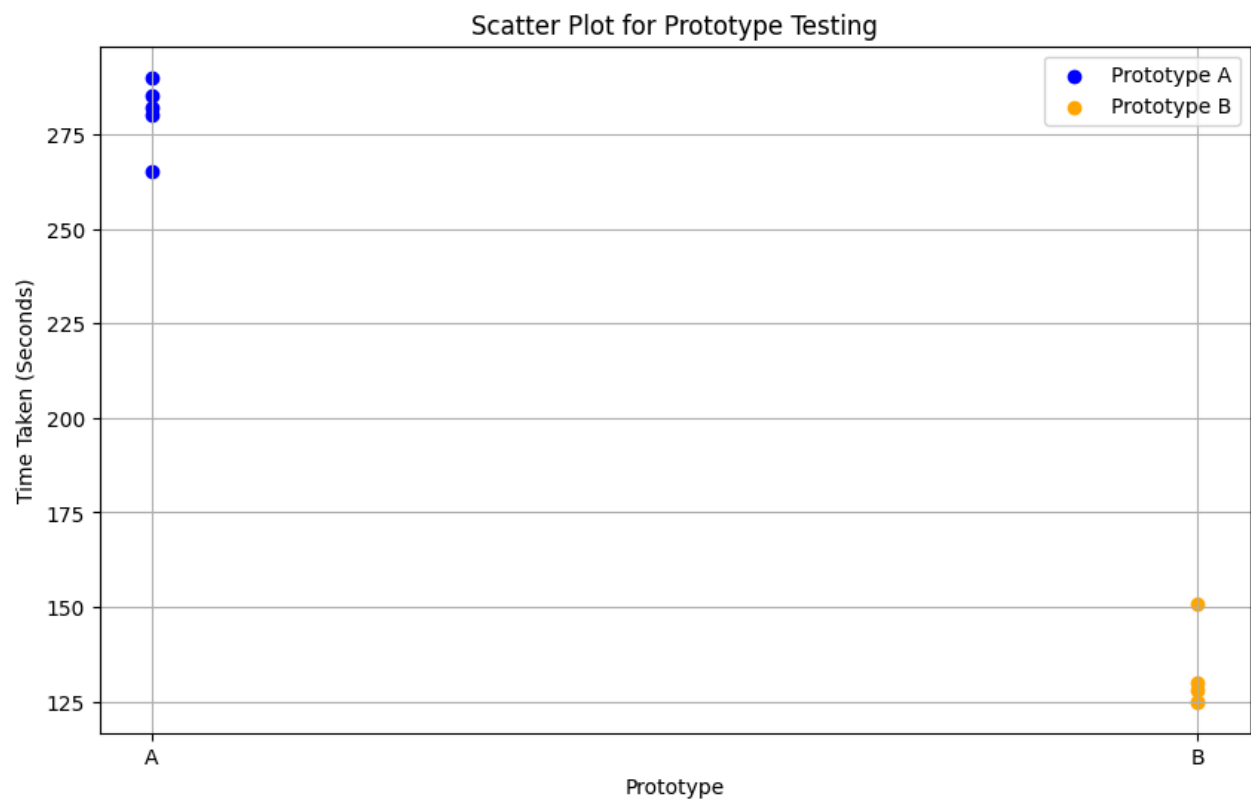
Null Hypothesis (H₀): There is no significant difference in the time it takes users to navigate the menus in Prototype A and Prototype B to log workout data and view user statistics.

Testing Criteria:

- User interviews were conducted with two groups of 5 participants each: one group for Prototype A and one for Prototype B.
- The dependent variable was the total time taken by each user to navigate the menu, log workout data, return to the menu, and access their user statistics.
- We set a significance level of 0.05 for the p-value. If the p-value falls below 0.05 after the t-test, we can reject the null hypothesis.

Users for Prototype A	Time taken for prototype A in Seconds	Users for Prototype B	Time taken for prototype B in Seconds
1	285	6	128
2	282	7	125
3	290	8	151
4	280	9	125
5	265	10	130

Visual Charts for the Data and A/B Testing Results(sangeeth and priya- A/B testing)



T-Test Calculation:

For the given data:

For design A, $N_1=5$; mean $M_1 = 280.4$

$$SS_1 = [(4.6)^2 + (1.6)^2 + (9.6)^2 + (-0.4)^2 + (-15.4)^2] = 353.2$$

$$S_1^2 = SS_1 / (N_1 - 1) = 353.2 / 4 = 88.3$$

For design B, $N_2=5$; mean $M_2 = 131.8$

$$SS_2 = [(3.8)^2 + (6.8)^2 + (19.2)^2 + (6.8)^2 + (1.8)^2] = 478.8$$

$$S_2^2 = SS_2 / (N_2 - 1) = 478.8 / 4 = 119.7$$

Calculating t-value:

$$S_p^2 = [(df_1 / (df_1 + df_2)) * S_1^2 + (df_2 / (df_1 + df_2)) * S_2^2]$$

$$= (4/8) * 88.3 + (4/8) * 119.7 = 104$$

$$S_p^2 = 104$$

$$S_{p1}^2 = s_p^2 / N_1 = 104 / 5 = 20.8$$

$$S_{p2}^2 = s_p^2 / N_2 = 104 / 5 = 20.8$$

$$T\text{-value} = (m_1 - m_2) / \sqrt{s_{p1}^2 + s_{p2}^2} = 148.6 / 6.45 = 23.039$$

For this t - value , and DF = 8 the p-value is <0.00001 which is <0.05 and hence the null hypothesis can be rejected and based on the responses we can conclude that prototype B is better in terms of ease of navigation than prototype A.

Individual Contribution

George Ibrahim had contributed by first fabricating the extensive task list, finding and describing the quantitative dependent variable in our user testing, and produced the interview script. **Priyadarshini Ramakrishnan** worked on creating the Hi-Fi prototype of version B of the prototype and then worked on analysing the t-value of our results and on quantitative analysis of the questionnaire responses. **Sangeeth Santhosh** worked on creating the Google Form for the pre-questionnaire and post-questionnaire, table and visualization for data and A/B testing. **Duc Quang Tran** ran the tests with 5

participants on Version A and recorded, uploaded the videos. **Minh Khang Nguyen** interviewed other 5 participants on Version B with prototyping, and recorded videos.

Prototype Links

Figma Link Version A - [A8 - Version A](#)

Figma Link Version B - [A8 - Version B](#)