



Grove: Low-Fi Prototyping and Testing

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INTRODUCTION

Mission Statement

Our mission is to give post-grads the tools to turn new connections into deeper friendships as they navigate their post-college communities.

Value Proposition

Cultivate your post-grad community.

Problem/Solution Overview

From our user interviews, we discovered that post-grads are suddenly faced with the often-overwhelming challenge of building and retaining friendships amidst a sea of new connections. Grove allows post-grads to focus on the enjoyable and exciting aspects of building community by simplifying the stressful aspects of inviting, planning, and following up with new friends. Through a platform that automatically suggests activities for post-grads to do with their new acquaintances and allows users to document fun memories, maintain regular correspondence, and hang out regularly, Grove helps ensure that new friendships deepen into lasting friendships without the anxiety that currently accompanies post-grad community building.



SKETCHES

Overview

We created sketches to explore how our solution could be enabled by different technological mediums like a VR app, a mobile app representation, a native tablet realization, a wearable and an AR app.

Concept Sketches

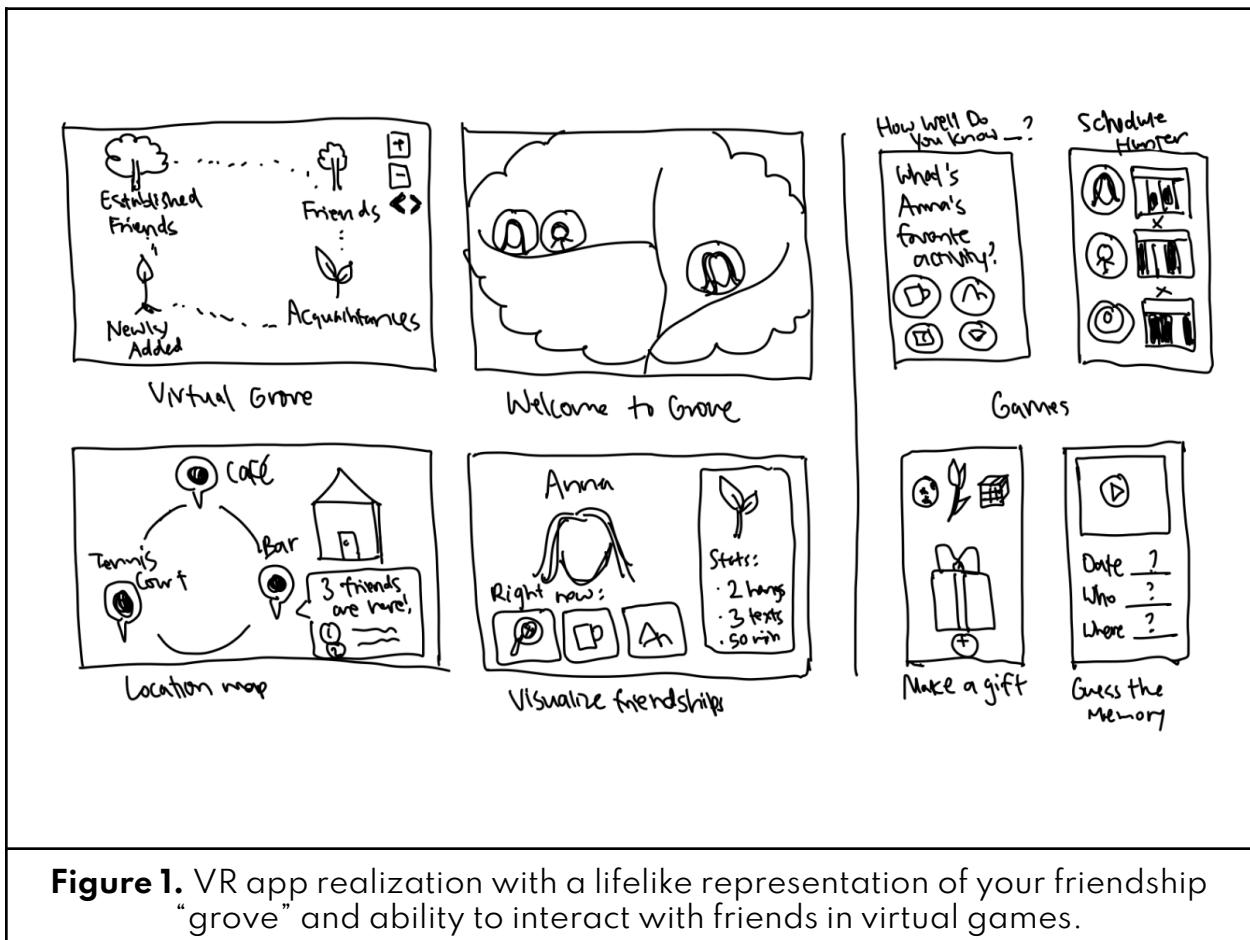


Figure 1. VR app realization with a lifelike representation of your friendship "grove" and ability to interact with friends in virtual games.

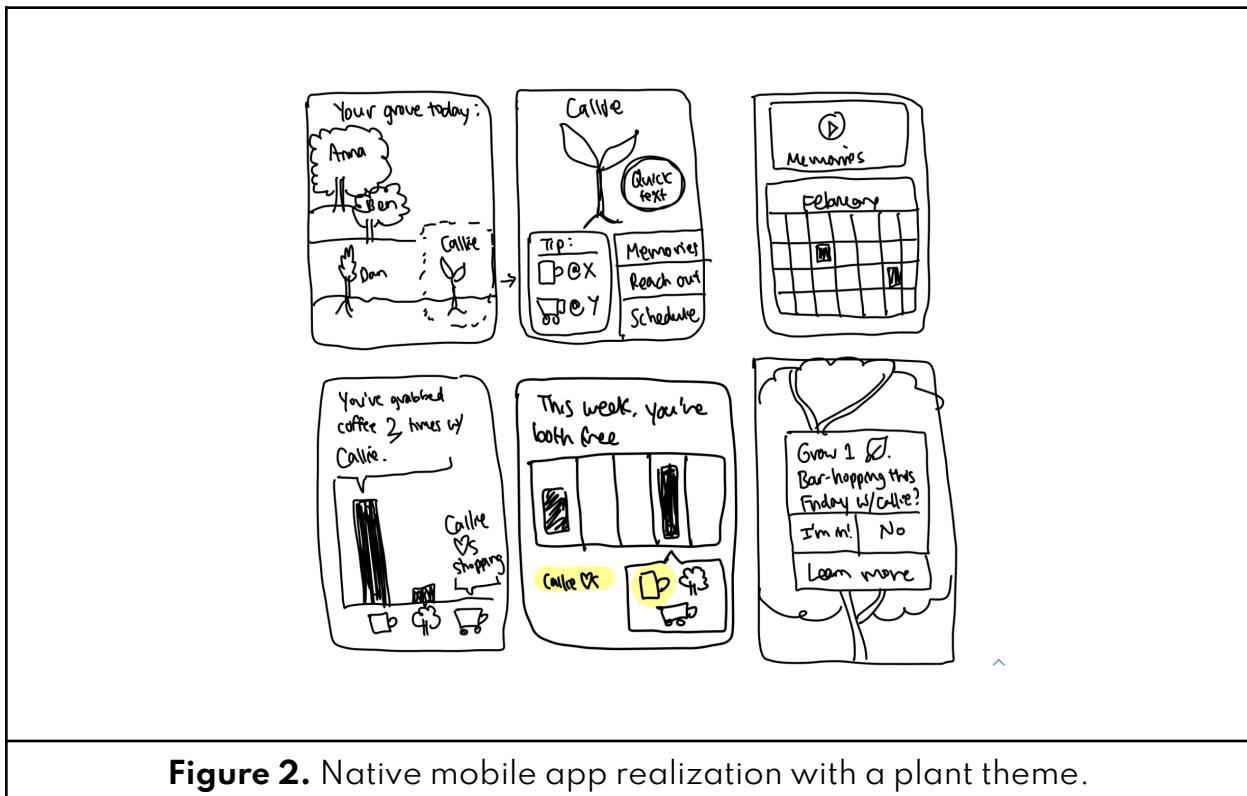


Figure 2. Native mobile app realization with a plant theme.

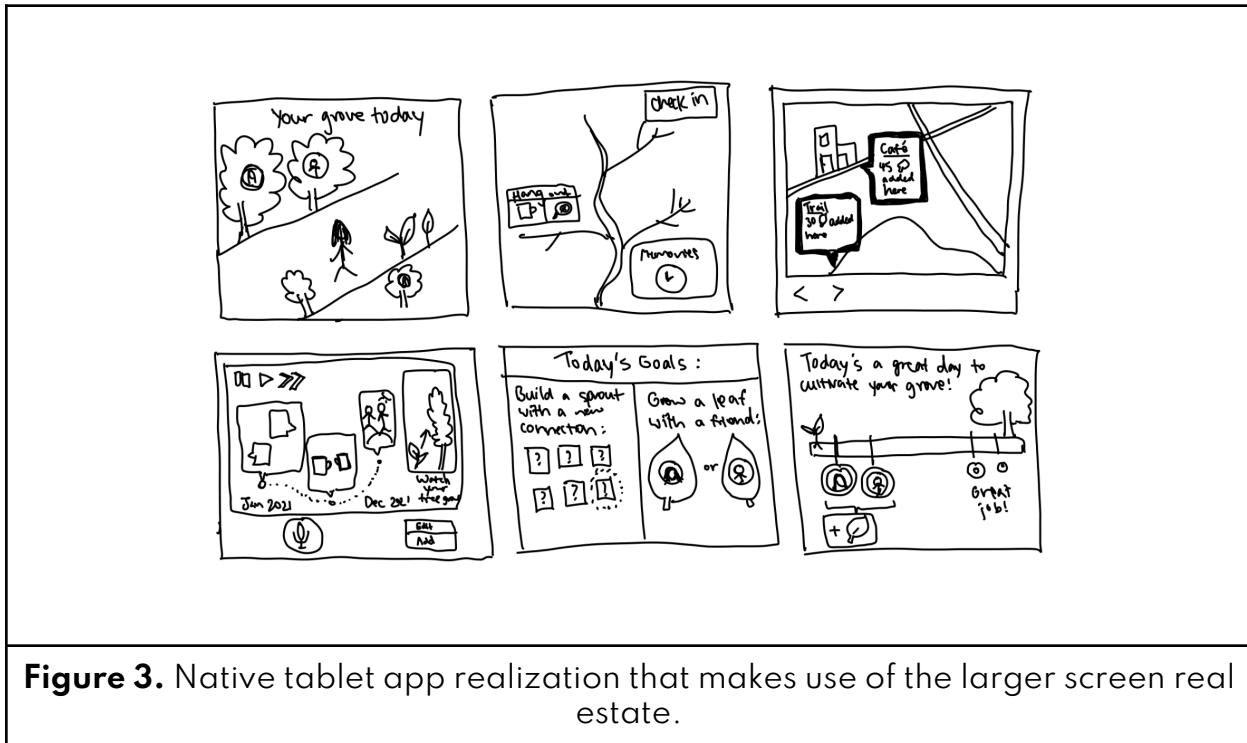


Figure 3. Native tablet app realization that makes use of the larger screen real estate.

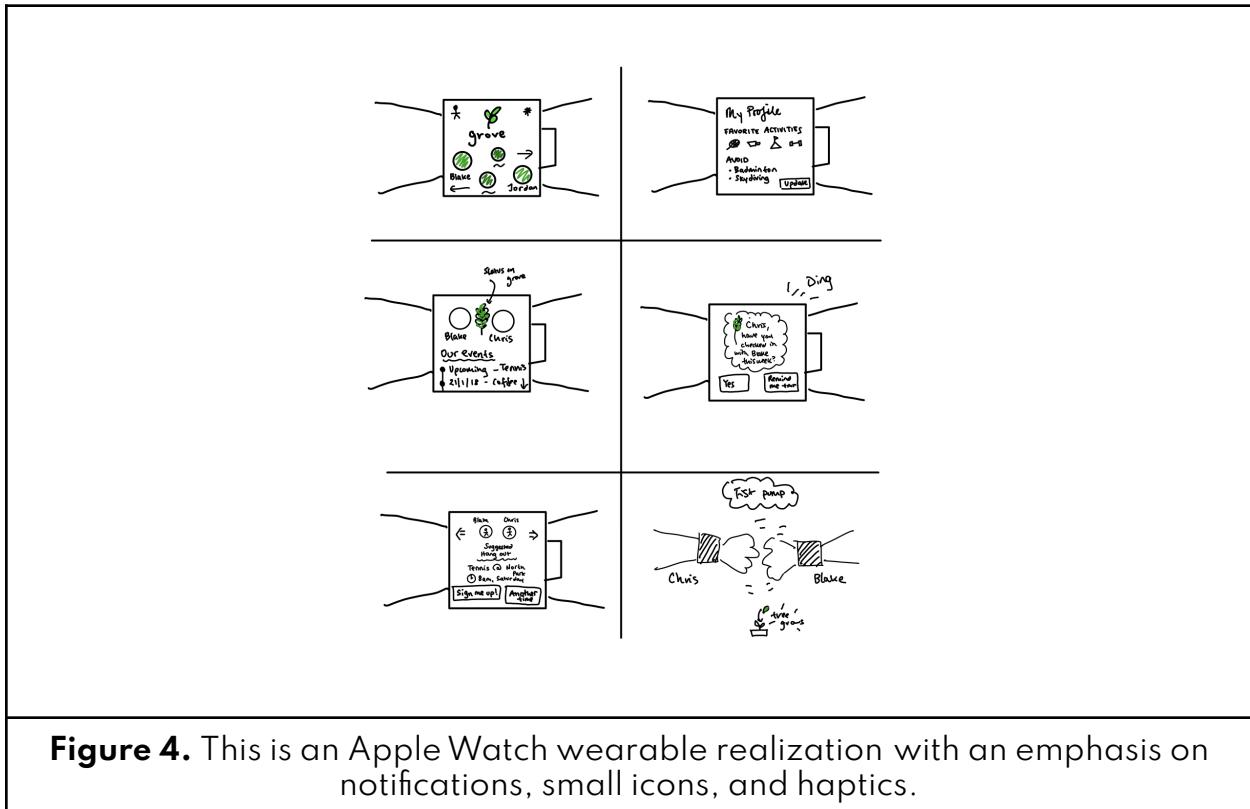


Figure 4. This is an Apple Watch wearable realization with an emphasis on notifications, small icons, and haptics.

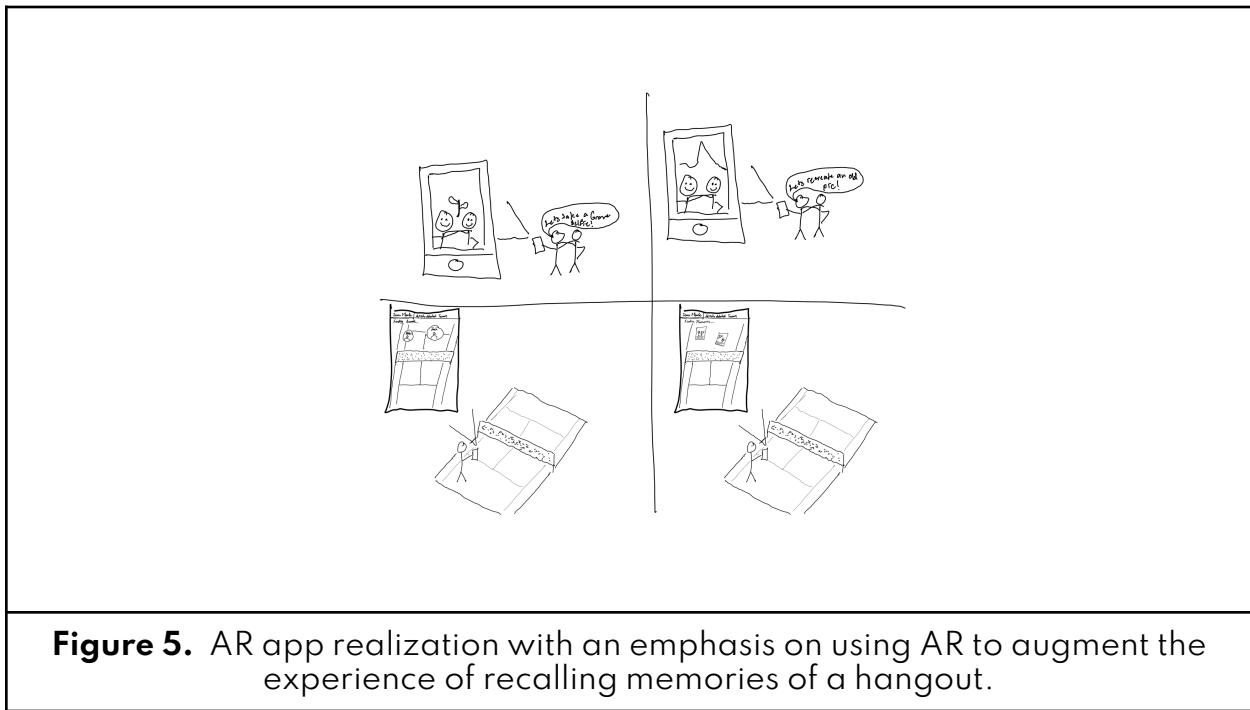


Figure 5. AR app realization with an emphasis on using AR to augment the experience of recalling memories of a hangout.



Top 2 Designs

We chose to move forward with the mobile app and wearable realizations based on the results of our above sketches.

Storyboard 1 - Mobile App

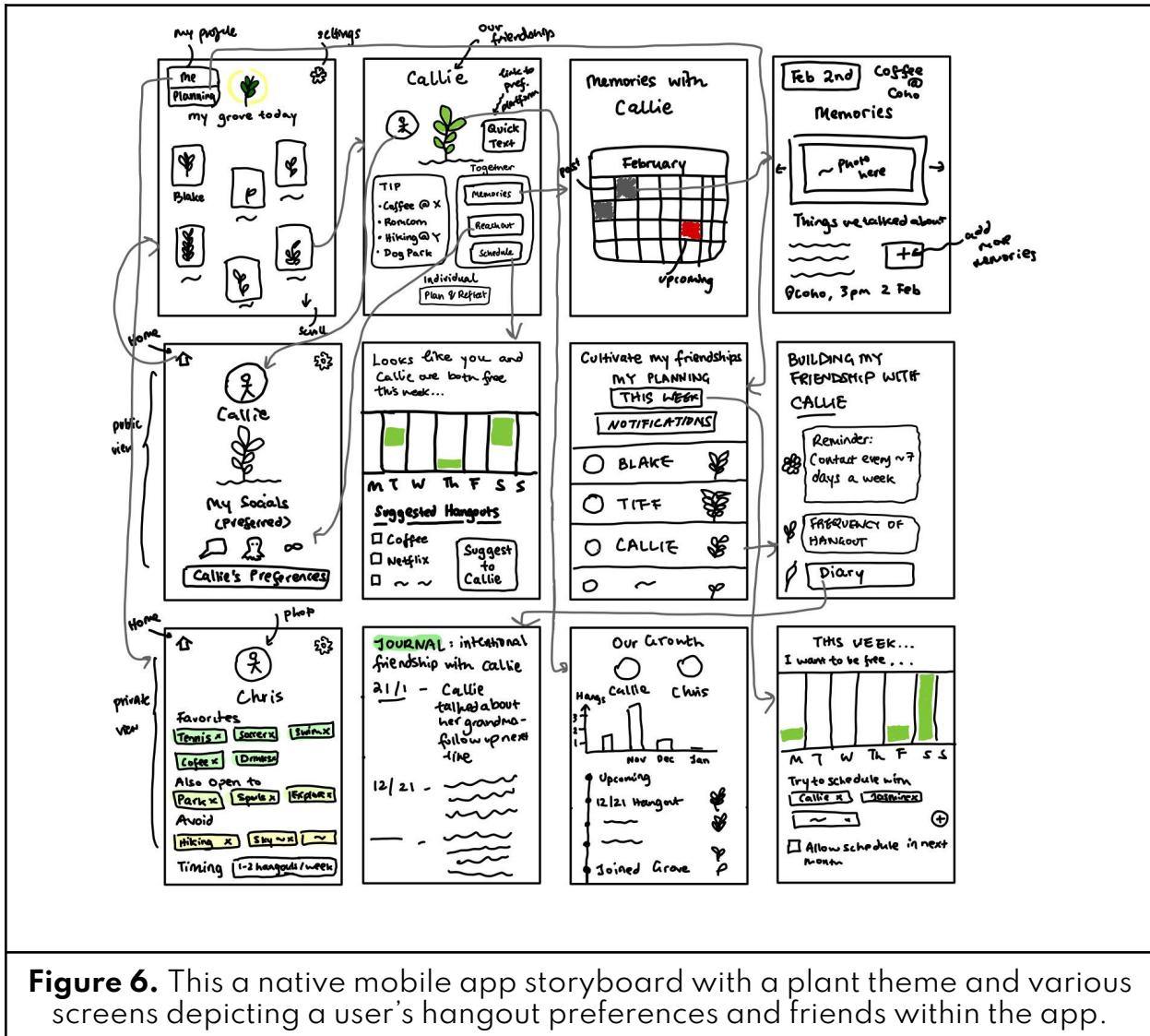


Figure 6. This a native mobile app storyboard with a plant theme and various screens depicting a user's hangout preferences and friends within the app.



| Pros | Cons |
|--|--|
| <ul style="list-style-type: none"> • Highly visual interface • Can combine audio, visual, and haptic interactions for higher engagement • Commonly used around the world, so easier integration into people's daily lives • Allows for a wide range of tasks | <ul style="list-style-type: none"> • Hard to design for different operating systems • More levels of functionality may make it less user-friendly and harder to update |

Storyboard 2 - Wearable

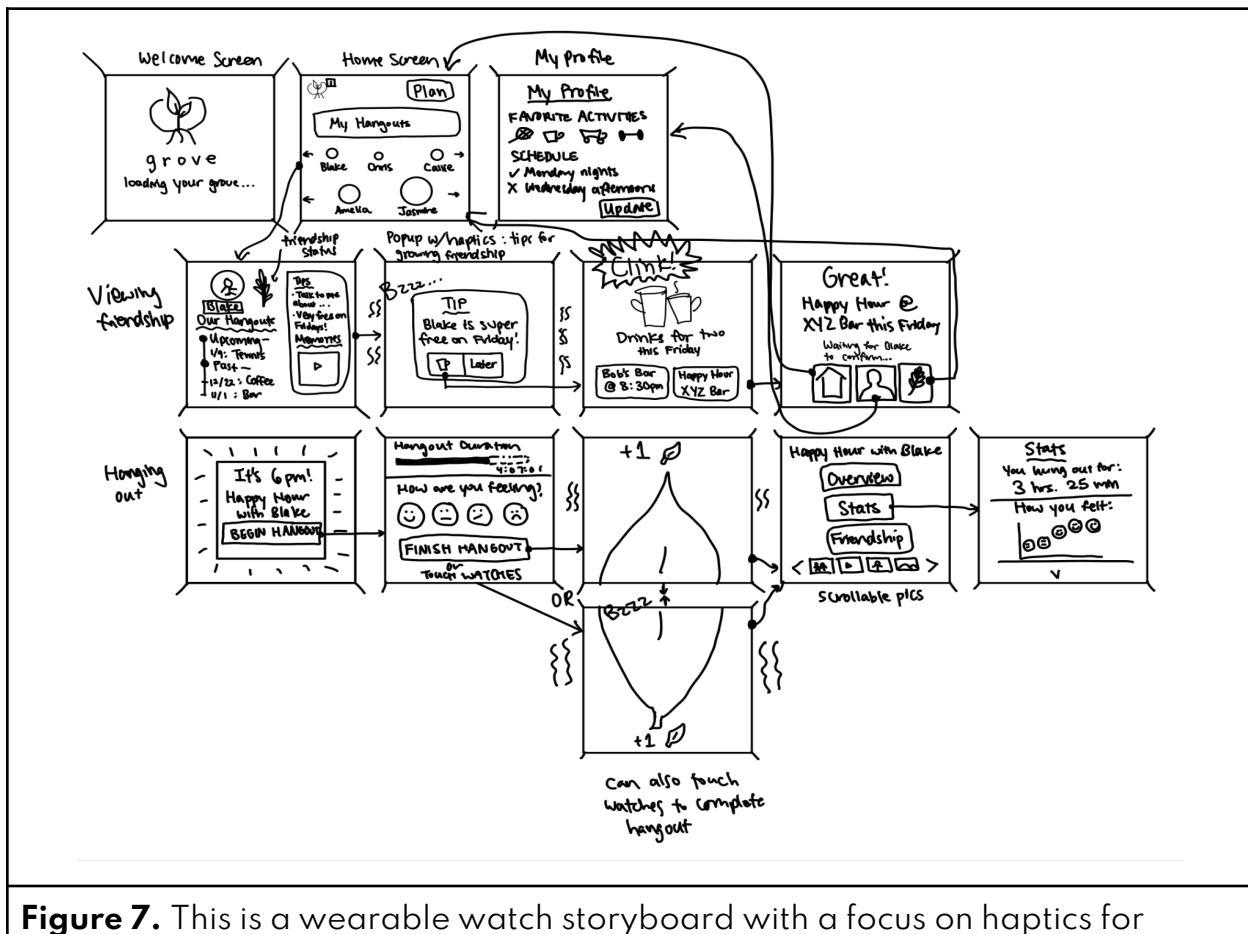


Figure 7. This is a wearable watch storyboard with a focus on haptics for enhanced user experience, as well as more real-time hangout logging.



| Pros | Cons |
|---|--|
| <ul style="list-style-type: none">• Easier to document moments throughout a hangout• Perpetual access to real-time information• Straightforward user interface• Hands-free and more portable | <ul style="list-style-type: none">• Short battery life and hassle to remove wearable to charge it• Less space to display visual and textual information on screen• Typically requires both wearable and mobile app together for complete functionality |

SELECTED INTERFACE DESIGN

Ultimately, we decided to pursue the mobile app interface. Though the concept of the wearable was unique and offered opportunities for more granular tracking of real-time data, we opted for the mobile app due to its more universal usage. We also thought that a mobile app would be less intrusive in comparison to the wearable, which requires the user to constantly be engaged rather than fully immersing themselves in their hangouts.

LOW-FI PROTOTYPE

We drew our low-fi prototype on an iPad, and then wired the sketches on Figma such that clicking specific buttons drawn on the sketches would bring the user to the next screen. A detailed breakdown of each screen of the low-fi prototype can be found in the appendix.

The user is first shown the home screen, and then after completing a task, is taken back to the home screen to begin the next task. The first task involves setting your activity and time preferences and then accepting a hangout based on those preferences (Fig. 8). The second task involves setting a cadence for future communication for individuals you want to get to know better (Fig. 9). The third task involves posting an activity that you want to do when you don't have anyone to do it with (Fig. 10). The final task involves reflecting and reporting on the successfulness of a recent hangout (Fig. 11).

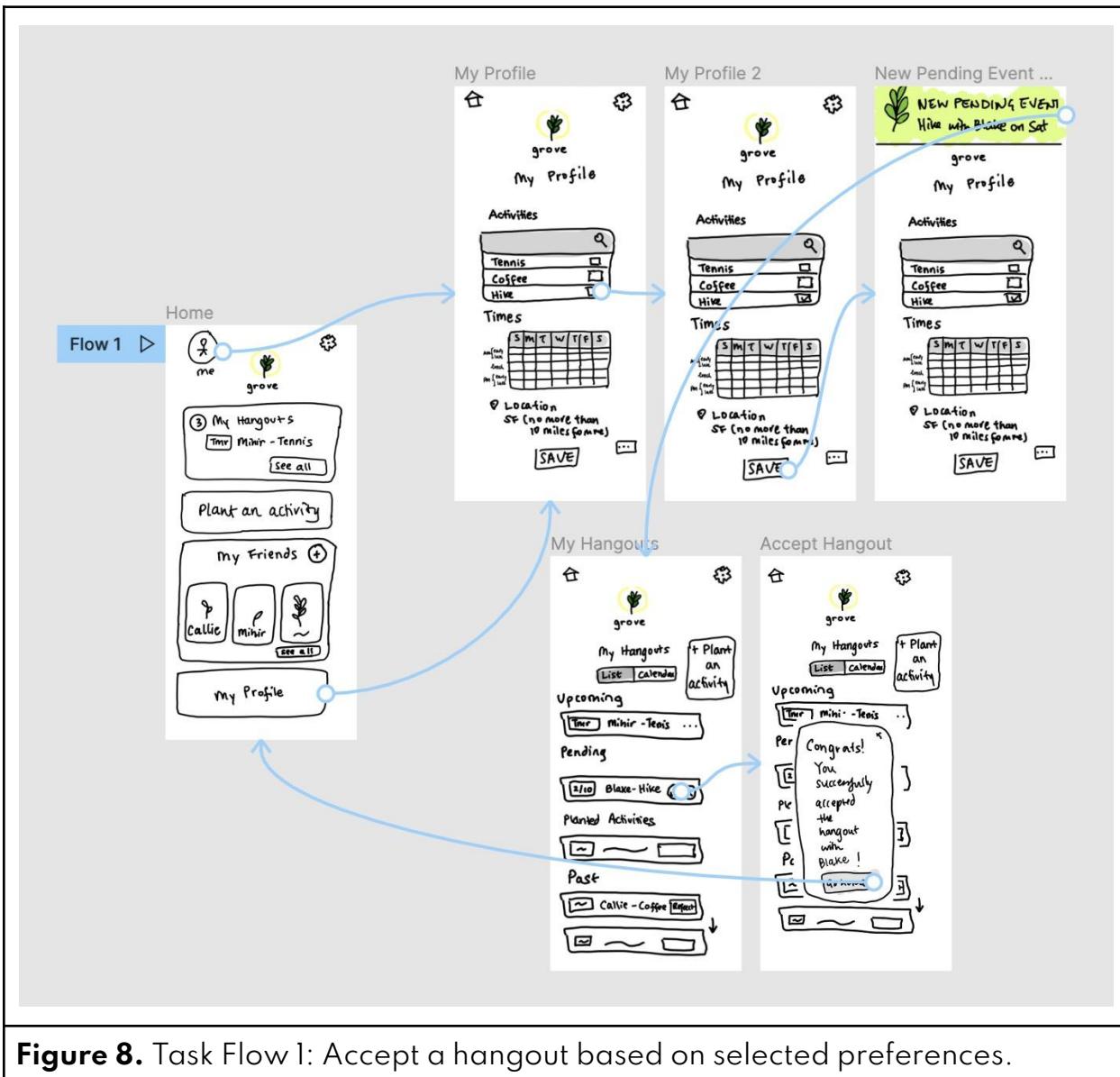


Figure 8. Task Flow 1: Accept a hangout based on selected preferences.

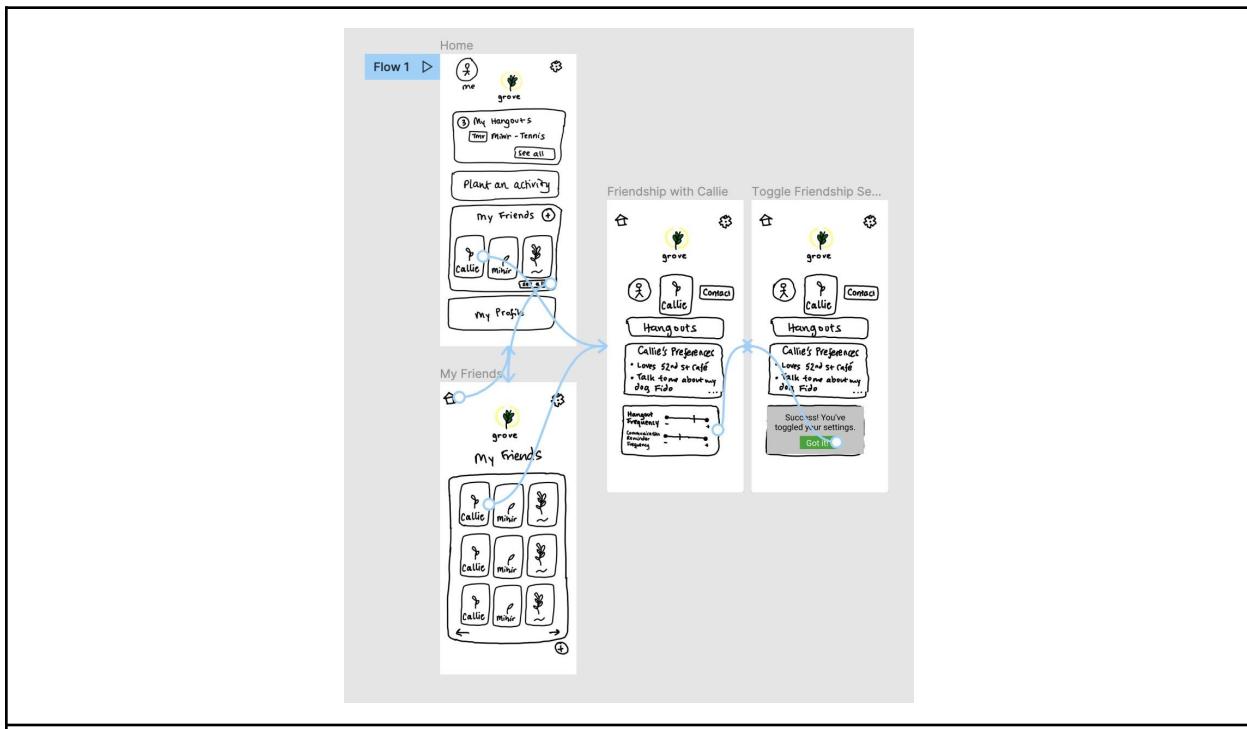


Figure 9. Task Flow 2: Set a cadence of future communication with someone you want to get to know better.

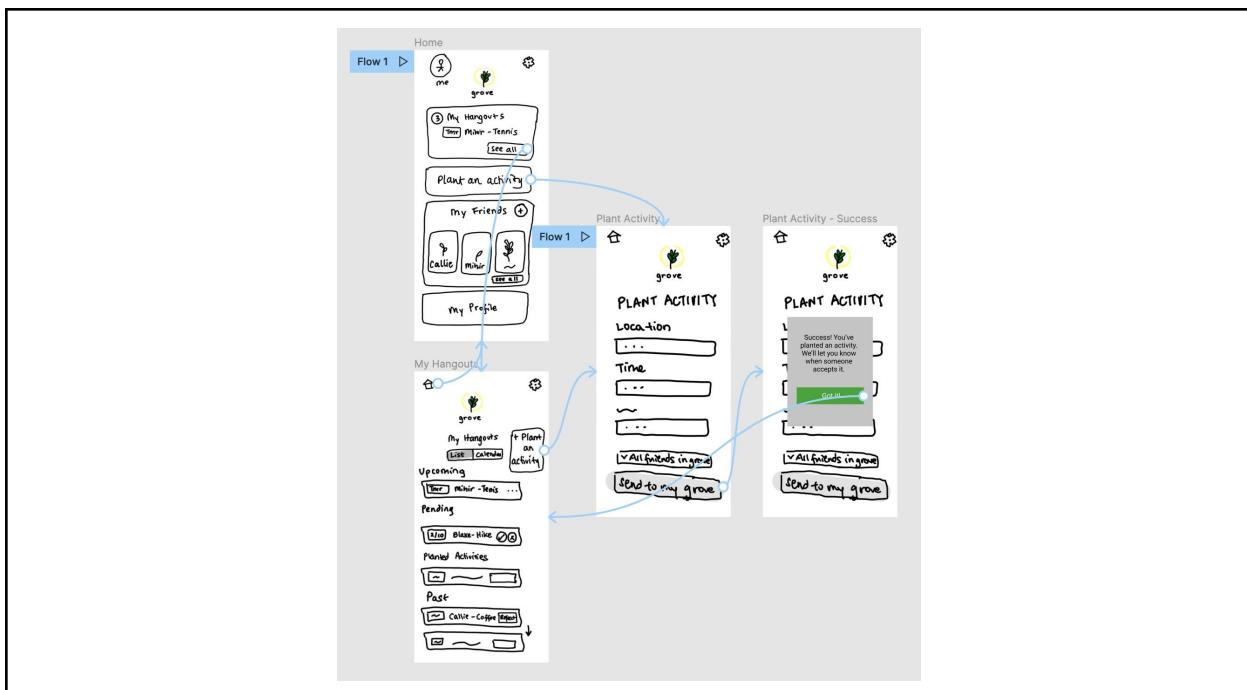
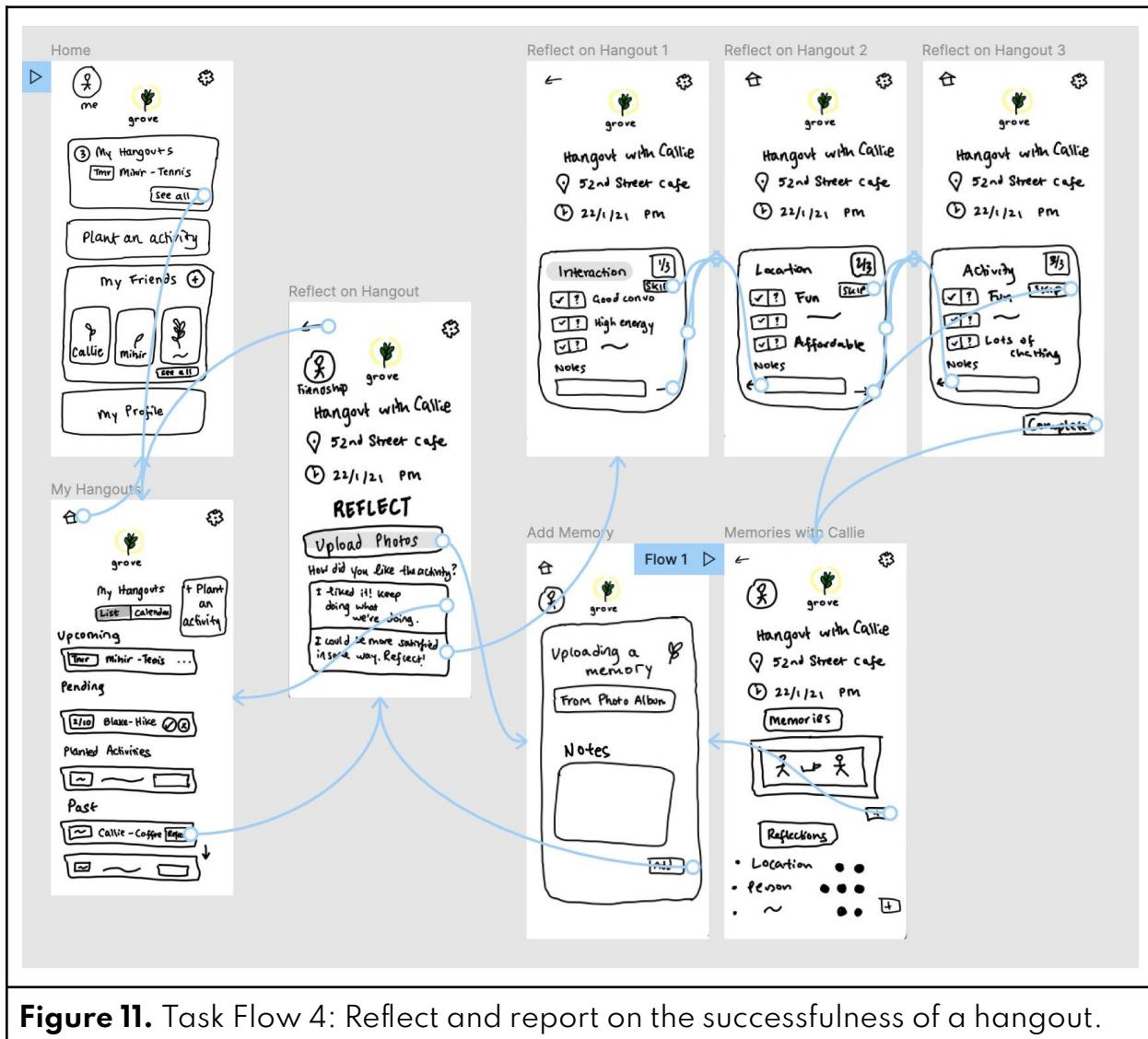


Figure 10. Task Flow 3: Post an activity you want to do.



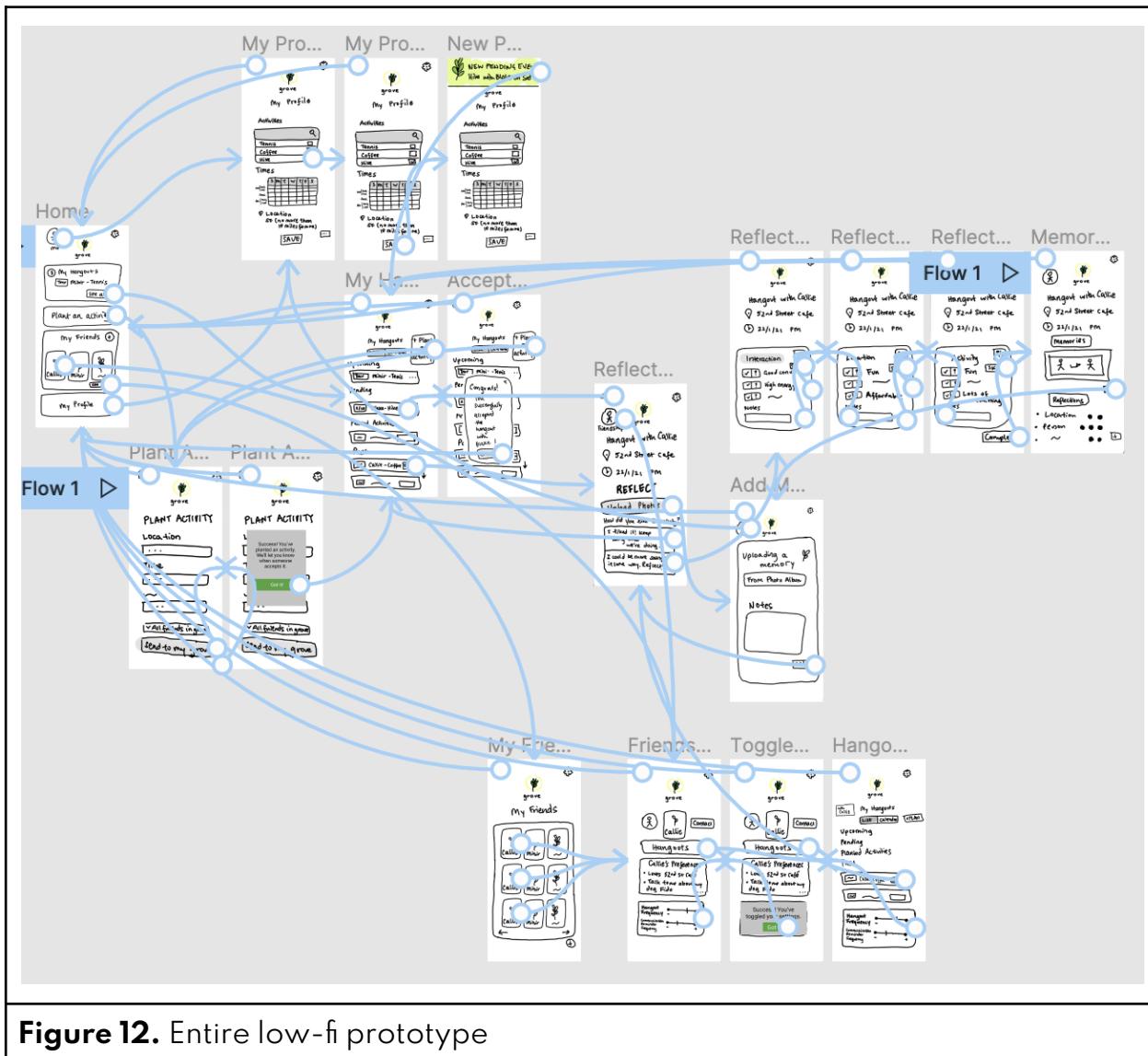


Figure 12. Entire low-fi prototype

TESTING METHODOLOGY

Participants

We interviewed four participants whom we sourced through word-of-mouth. We selected these participants who were diverse in various aspects, including where they are in their postgraduate journey, their university, their location, and their postgrad personal and career goals. Participants did not receive compensation, but our team made sure to express our appreciation for their time.



- **Participant 1:** Stanford coterminous masters' student, searching for jobs outside of California in academia
- **Participant 2:** USC Senior from Kansas, first-generation American, interested in design
- **Participant 3:** University of Utah upperclassman studying computer science
- **Participant 4:** Brigham Young University Senior, moving to New York after graduation to work in consulting

Environment

We conducted our tests over Zoom. Each participant interacted with our prototype on Figma and shared their screen so our team could watch the interaction. This allowed us to simultaneously monitor their progress, listen to their spoken thoughts as they navigated the prototype, and observe their facial expressions during the process.

Tasks

1. **Simple:** Set your activity and time preferences, and then accept a hangout that aligns with those preferences.
2. **Medium:** Plan an intentional cadence of future communication and hangouts with individuals in your grove.
3. **Medium:** "Plant an activity": Post an activity that you want to do
4. **Complex:** Reflect and report on the successiveness of a hangout across various aspects—activity, location, person.

Usability Goals

- **Robust:** users are able to complete the tasks with minimal error rates.
- **Efficient:** users are able to complete the tasks quickly—simple tasks in <1 min, medium tasks in <1.5 mins, complex task in < 2 mins

Procedure

1. Introduce the team, give background on the class and project, and obtain signed consent.
2. Give a basic demonstration of the Figma prototype and context about Grove.
3. Have participants complete all 4 tasks.
4. Solicit post-experiment feedback from participants.



Test Measurements

- **Success:**
 - Tasks completed without difficulty or confusion
 - Verbal and physical signs of understanding, enjoyment
- **Failures:**
 - Incorrect or unexpected actions
 - Verbal or physical signs of confusion, frustration, concern

Team Member Roles

- **Greeter:** Amelia W.
- **Computer:** Chris M.
- **Facilitator:** Jasmine R.
- **Observer:** Tiff L.

RESULTS

All four participants:

- Completed each of the simple (< 1 min), medium (< 1.5 mins) and complex tasks (< 2 mins).
- Were able to understand the tasks given a brief explanation from us and completed tasks with little to no redirection.
- Did not select the intended button 'My Profile' to change their automated hangout settings, going instead to either 'Plant an Activity' or trying the profile icon or settings icons in the top bar.
- Expressed that they liked the app's functionality and concept overall.

Three participants:

- Found the various 'to do' buttons on the hangout screen unintuitive or too small to be easily identifiable or noticeable.
- Didn't find the toggle reflections section easy to find or navigate.

Two participants:

- Needed a rephrasing of our simple task to understand the difference between inputting preferences for an automated hangout versus planting an activity.
- Expressed concerns about the anonymity of reflections.
- Expressed that they did not think the app's current format of collecting reflection about the other person would enhance their friendship.



One participant:

- Didn't understand what "frequency of communication" referred to in the context of friendship in Grove.
- Wanted an easy way to update settings about things they might want friends to ask them about or hangout locations they enjoyed.
- Wished there was a way to schedule an activity with multiple mutual Grove members.

DISCUSSION

Overall, users found the app intuitive and easy to navigate. In particular, the “Grove” concept and its related plant metaphors were clear to all participants. One participant even instantly remarked: “My grove is a plant nursery of friends.” Tasks were generally completed correctly and quickly. Multiple participants thought it was cool that the app knew what their friends’ preferences were to alleviate the awkwardness in setting up more hangouts, remarking that this was very “usable.”

However, we also discovered several important ways to improve our design. One major feature that we should rethink is the “reflection” functionality of our app. A few users were unclear about its purpose and worried that their friends would see the way they rated a hangout. The most surprising insight came from one participant who felt that reflecting on a hangout too deeply could actually harm the growth of the friendship. They remarked that it would be better to keep things “low-stakes” rather than adding unnecessary pressure on the friendship by overthinking through in-app reflection.

Another major feature that we learned needs improvement is the “My Profile” screen. To begin, every participant tried clicking some other button first to complete Task 1 (e.g. Settings or Plant an Activity) before realizing they should click on My Profile. One participant pointed out that the name “My Profile” implies a more static profile that you create once and likely never look at again. However, if the idea is for users to regularly update the type of activity they want to do and the times they are available, some sort of different wording or grouping of screen elements should be used.

We also heard several ways that our design layout intuition could be improved. Multiple participants found that some of the buttons for important tasks like accepting a pending hangout or reflecting on a hangout were not large enough to draw the eye easily. One participant further emphasized a wish for to-do buttons or other clickable items to all be recognizable by a single color or some other thematic indication.



We received some other suggestions about how to make the app more compelling, including displaying mutual connections beyond a user's specific grove. Notably, one user said that she'd be more likely to want to hang out with friends whom she shares several friends with, and allowing a user to see mutual Grove friends could provide an organic way of making new friends. A user also expressed interest in a group hangouts feature that could help organize a small potluck or a basketball game, while still maintaining focus on deepening 1-1 friendships. The users we tested really enjoyed the overall function of Grove to deepen 1-1 post-grad friendships, and appreciated its straightforward, user-friendly design.

Word Count: 1466

APPENDIX

Script

Hello! Thanks so much for taking the time to run through this with us.

We're students taking a human computer interaction course at Stanford, and are testing a mobile app concept named Grove that helps new college grads build friendships from new acquaintances.

As you test our app, we'd like you to participate in the "talk aloud" process, where you mention out loud what you're thinking and doing as you perform the various actions. There are no wrong answers; we're just trying to learn how people interact with our app so please tell us as you go what you're thinking as you use the app, what you expect to happen, and any surprises that occur.

For this scenario, imagine that you've downloaded the mobile application, Grove. Let's say you've added a couple of new people that you've just met to the platform and you're using Grove to help turn those initial connections into real friendships.

You're trying to figure out how to do different things with this mobile app, and you're welcome to tap, swipe, or scroll anywhere on the screen.

To start off, your first task is:

- **Simple:** Set your activity and time preferences, in this case you want to go hiking, and then accept a hangout with one of your friends that aligns with those preferences.
- **Moderate:** Let's say you want to update your settings for how often you want to hang out with Callie. How would you go about doing that?



- **Moderate:** Let's say you have an activity in mind that you want to do this Saturday, but don't know who you would do it with. Post a hangout in the app so that Grove can find a person to do it with you.
- **Complex:** Let's say you just completed your hangout with Callie. Reflect and report on the successfulness of that hangout in the app. How would you do this if you didn't like the hangout?

That's the end. Thank you so much for participating! Feel free to let us know if you have any questions or feedback.

Blank Consent Form

| |
|---|
| <p>Consent Form</p> <p>This student team is interviewing and observing as part of the coursework for Computer Science course CS 147 at Stanford University. Participants provide data that is used to understand the possible opportunities of the design. Data may be collected by interview, observation and questionnaire.</p> <p>Participation in this experiment is voluntary. Participants may withdraw themselves and their data at any time without fear of consequences. Concerns about the experiment may be discussed with the researchers (Tiffany Liu, Chris Moffitt, Jasmine Rodriguez, Amelia Woodward) or with Professor James Landay, the instructor of CS 147:</p> <p>James A. Landay CS Department Stanford University 650-498-8215 landay at cs.stanford.edu</p> <p>Participant anonymity will be maintained by the separate storage of names from data. Data will only be identified by participant number. No identifying information about the participants will be available to anyone except the student researchers and their supervisors/teaching staff.</p> <p>I hereby acknowledge that I have been given an opportunity to ask questions about the nature of the research and my participation in it. I give my consent to have data collected on my behavior and opinions in relation to the research of the team listed above. I also give permission for images or audio/video recordings of me being interviewed to be used in presentations or publications, as long as I am not personally identifiable in the images/video. I understand that I may withdraw my permission at any time.</p> <p>Name _____</p> <p>Participant Number _____</p> <p>Date _____</p> <p>Signature _____</p> <p>Witness name _____</p> <p>Witness signature _____</p> |
|---|

Figure 13. Blank consent form



Critical Incident Log

Key

1. User progressed seamlessly
2. User hesitated or clicked an incorrect location before the correct one, slight confusion
3. User had issue progressing to next step, clicking multiple incorrect locations before the correct one, medium level confusion
4. User had to ask for help to progress, explicit concerns
5. User could not progress / needed to be prompted

| Participant 1 | | |
|---------------|---|--------------|
| Task | Incident | Incident log |
| 1 | To adjust activity settings, clicked on “Plant an activity” (incorrect) and then tried profile (correct) next | 2 |
| 1 | After correctly selecting “hiking”, seamlessly accepted hiking hangout | 1 |
| 2 | Confusion about going to general setting page (incorrect) or Callie page first (correct) to update communication settings with Callie | 2 |
| 3 | To post an activity, selected “Plant an activity” first, verbalized wanting to edit location/time fields, and then sent to her grove | 1 |
| 4 | Recognized past hangouts with Callie on hangouts page, clicked “Reflect” to reflect on hangout | 1 |

| Participant 2 | | |
|---------------|---|--------------|
| Task | Incident | Incident log |
| 1 | To adjust activity settings, clicked on “Plant an activity” (incorrect). Wasn’t sure where to go next, so we had to clarify that you needed to first “update your activity settings” which led her to trying settings (incorrect) and then profile (correct) next | 4 |



| | | |
|---|---|---|
| 1 | Once on profile page, selected hiking and clicked on notification about a new activity with Blake seamlessly | 1 |
| 1 | Did not know that she had to select the “check” next to pending activity in order to officially accept it. Thought that clicking on notification was sufficient completion of the task | 5 |
| 2 | Went to profile first, then noticed that probably wasn’t right and so quickly went back to home. Then seamlessly navigated to my friends, Callie, and toggled frequency preferences | 2 |
| 3 | Went to “Plant an activity” – seemed to select that due to familiarity with that page from when it was wrongly selected during task 1–verbalized wanting to edit location/time fields, and then sent to her grove | 1 |
| 3 | Verbalized understanding that posted activity would show up on hangouts page in correct location | 1 |
| 4 | Navigated seamlessly to Callie, then clicked on Hangouts. Saw past hangouts and then clicked reflect. | 1 |
| 4 | Excited about posting a photo and writing notes to document a hangout | 1 |
| 4 | Confusion about where the photo went–wanted to know if there was a log or photo album to view posted photos | 2 |
| 4 | Concerned about anonymity. Felt that she couldn’t be honest when reflecting on an activity if there was a chance the information could be leaked to the person she hung out with. | 4 |
| 4 | Reflection section had too much information–wasn’t sure what it meant to reflect on the separate categories (location, activity, person) | 3 |

| Participant 3 | | |
|---------------|--|--------------|
| Task | Incident | Incident log |
| 1 | Immediately clicked on the “Me” icon (instead of My Profile). Checked “hiking” for his preference, and | 1 |



| | | |
|---|---|---|
| | thought through how he would add his time preferences | |
| 1 | Commented that he didn't know why there was a "My Profile" tab and a profile icon that takes you to the same place | 2 |
| 1 | Mentioned that he "didn't see the save button initially" but only noticed it after it lit up due to Figma | 2 |
| 1 | Saw the notification to hang with Blake, and immediately clicked it. | 1 |
| 1 | Slightly hesitated in trying to interpret the difference between "upcoming" activities versus "pending" activities | 2 |
| 2 | Immediately clicked on Callie to go to her page and then adjusted the settings for hangout frequency successfully | 1 |
| 2 | Commented that he didn't know what "Communication Frequency" referred to | 2 |
| 2 | Also commented that he was slightly confused because he didn't know a way to set his own preferences like appear on Callie's screen. (ex: "talk to me about Star Wars") | 2 |
| 3 | Immediately clicked "plant an activity" and immediately understood how to fill out the "plant" page | 1 |
| 4 | Immediately navigated to the hangouts page by clicking "My Hangouts" | 1 |
| 4 | Couldn't read the "reflect" button and asked if it said "reject" | 4 |
| 4 | Commented that open-text feedback might be more helpful for the reflection of how a hangout went rather than the binary options | 2 |
| 4 | First thought that the feedback would be sent to Callie, but then realized that it would probably just be going to Grove to improve the matching algorithm | 2 |



| Participant 4 | | |
|---------------|---|--------------|
| Task | Incident | Incident log |
| 1 | Tried clicking on 'settings' button before my profile | 2 |
| 1 | Push notification - tried to go back instead of clicking on the notification | 2 |
| 1 | Medium-length hesitation when accepting hangout on the friends page | 3 |
| 2 | Went through main home page rather than friends page (could cause difficulty if the friend isn't one of the few people on the home screen) | 2 |
| 2 | Immediately figured out how to increase the frequency of communication using the toggle bar | 1 |
| 3 | Noticed that they could choose which friends they wanted to send a potential 'planted' activity to | 1 |
| 4 | Went through the individual friend page to find reflection option rather than through hangout | 1 |
| 4 | Notice that they could type things in the notes section | 1 |
| 4 | Struggled to toggle around the reflections option; expressed lack of confidence in wanting to fill in the reflections form; questioned whether this might be overthinking the hangout | 4 |
| 4 | Double checked with us that the notes were anonymous; wouldn't want these shared with the other person | 4 |

Low-Fi Prototype Details

Our interface consists of five main screens with text-based buttons and tree-themed image icons. We incorporated buttons, push notifications, toggling, and upload and writing functionality.

- 1) **My Hangouts.** This screen gives the user a comprehensive view of all their hangouts. These include Upcoming (confirmed and scheduled), Pending (waiting to be accepted by the user), Planted (waiting to be accepted by someone in the user's grove), and Past hangouts.



Subscreen

- **Reflect.** Users navigate to this screen when they click “reflect” on a hangout. Here, users can answer add pictures, notes, and give feedback on the hangout

2) My Grove. This screen gives a user a view of all of their friends. Each friend is represented by a growing tree that symbolizes the extent of the friendship.

Subscreen

- **Friend Screen.** Users navigate to this screen when they click on a particular friend in their grove. Here, they can see the status of their friendship and their friend’s preferences. Here they can also update their own preference for how often they want Grove to generate hangouts with that friend.

3) Plant an Activity. This screen is where users can post a specific activity they want to do and share it with their grove so someone can accept it and have it turn into an upcoming hangout.

4) My Profile. This screen is where a user would update their preferences regarding activities they enjoy, times they are available, and their current location.

Potential UI Improvements

- Remove or differentiate general Settings cog with specific friend settings.
- Refactor My Profile button with the static profile icon.
- Remove binary choices on reflections and make it clear the binary reflections are to assist the hangout generation algorithm.
- Clarify use cases and privacy settings for different types of collected data for the user.
- Rethink size and types of buttons and notifications for important user actions like accepting a hangout or toggling activity preferences.
- Workshop wording on frequency of communication settings.



- Rethink spacing of page elements (e.g. make save button on My Profile page stand out more or have automatic saving).
- Continue to develop the plant theme with a straightforward, intuitive design and color scheme.