

## D2

# Requirements Gathering, Establishing Requirements & Developing Design Alternatives

CS-PSYC 6755 / HCI Foundations

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# 01 Requirements Gathering

## 1.1 Research Methodology

### 1.1.1 Semi-Structured Interviews

#### Individual Interview

To develop a deep understanding of how our users' attitudes towards remote fitness might differ from those identified during our literature review, we conducted 2 individual semi-structured interviews with users who exercised virtually with their friends. We touched on whether our users currently exercised (and if so, how), their goals and motivations, as well as any challenges they had encountered. One team member would run the interview, and another team member would take notes during the interview. Each interview was held remotely through Google Meet. Once the interview was over, team members would go back through the recordings, timestamping when the interviewer asked particular questions, and writing down the interviewee's paraphrased responses. User responses were then reduced into simple, directed statements, which were then transformed into sticky notes on an affinity map.

#### Group Interview

In addition to the individual semi-structured interviews we held, we also conducted one semi-structured group interview with four participants who were already exercising remotely together. We wanted to understand the format they were using, how they discovered it, how they formed a routine, and how they felt it was working for them. One team member asked questions to the users while another took notes. The entire session was held on Zoom. Post-interview analysis was identical to that of the individual interviews: interview questions were timestamped, interviewee responses were paraphrased, and all responses were then reduced into simple directed statements. Lastly, the resulting statements were placed onto the affinity map and analyzed to yield the findings we discuss below.

### 1.1.2: User Feedback Sessions

After coming up with ideas that we thought satisfied the needs we identified in our semi-structured interviews, we held 5 one-on-one feedback sessions with users that fell into our target age range (21-35). We wanted to engage our target users and stakeholders in our design process, as well as identify what specific aspects of our ideas they thought were successful and unsuccessful. These feedback sessions were conducted over Microsoft Teams (or Google Meet) and Mural. Each session was recorded. First, the user was given roughly 15 minutes to examine each project idea and storyboard and ask any questions they had. Their questions and feedback were jotted down in the Mural. Afterwards, the users were asked to rank each idea in

order of preference (1 being favorite, 10 being least-favorite), and explain why they preferred those ideas over others.

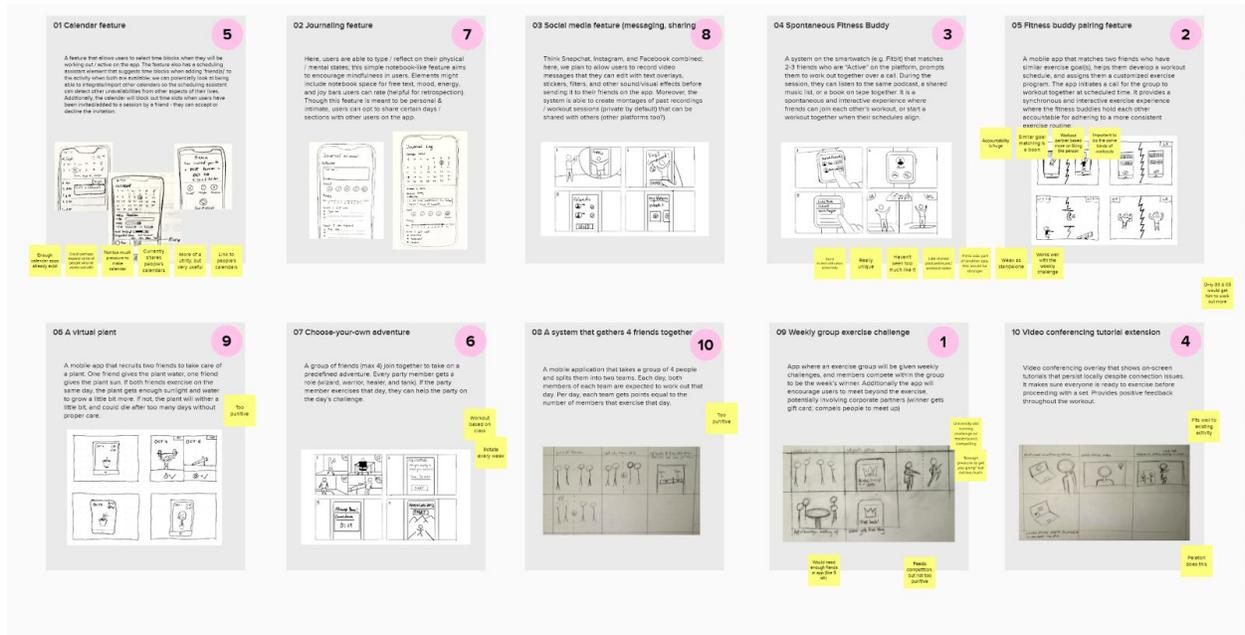


Figure 1.1.2. Screenshot of a feedback session conducted on Mural

All of our user feedback and scores were consolidated into one central Mural (**Appendix A**), and from there we found that some modifications to our requirements were necessary to better fit their needs. We used user affinity as one of the metrics to decide our top two ideas.

## 1.2 Research Instruments

For video conferencing, we employed [Zoom](#), [Microsoft Teams](#) and [Google Meet](#) to communicate with users. Since Google Meet does not have meeting recording built in, we used [Open Broadcaster Software](#) to record the Google Meet conferences. Lastly, we provided visual references for each idea through [Mural](#).

### 1.2.1 Semi-Structured Interview Guide

#### Individual Interview Script

##### Introduction

Hi [*participant name*]. Thank you for taking part in this study. I'm [*interviewer name*] and I will be conducting the interview, while [*notetaker name*] here will be taking down notes. Our goal is to *learn about our workout routines, goals, needs, obstacles, as well as your experiences participating in remote workout sessions.*

Before we start, please make sure you are in a comfortable position for the session; I will be referring to the script occasionally to make sure I cover everything. Please feel free to interject me anytime if you have any concerns or issues.

I want to emphasize that **our aim is to understand users like you: your experiences, pain points or struggles, and goals when trying to workout routinely**. So, feel free to be candid with your answers – there are no wrong answers here. Do you have any questions for me before we get started?

Today's session will be recorded, but your input and identity will be kept confidential. If that is alright with you, can we get a verbal confirmation from you? We can email you a digital consent form if you would prefer that.

### Demographic Info

Before we start, we would like to gather some information for user demographic purposes. May we know,

1. Your age?
2. Which areas do you currently live / work?
3. How often do you workout on a weekly basis (if you can recall)?
4. How/where/when do you usually workout? (Do you currently have a consistent workout routine?)
5. What are factors that affect your current workout plan?
6. Would you like to develop a more consistent workout routine?

### (Scenario-based) User Persona

#### *I. User Characteristics*

1. Do you have a workout routine already?

#### **[For people who *are* in a routine already]**

1. How did you develop the routine? Do you follow a professional routine or did you develop it yourself?
2. What motivated you initially to stick with your routine? Were there any difficulties at the start? How about after you'd been doing it a while?
3. What kind of workout resources do you have access to?
4. Have you ever been knocked out of a routine and had to climb back on the horse? Could you describe that experience?

#### **[For people who are not in a routine, but would like to be]**

1. Is there any particular reason why you're not?
2. Have you worked out consistently in the past? (If yes) What has changed?
3. What kind of workout resources do you have access to?
4. Have you ever worked out with other people before? Did you enjoy the experience?
5. How do you feel about working out in general?
6. What resources would motivate/help you to work out more consistently?

## *II. Motivations, Goals & Needs*

1. Why do you want to work out?
2. What kind of workout do you usually do?
3. Do you prefer to workout alone or with other people?
4. Do you think working out with others help you maintain a routine?
5. What motivates you to work out on a regular basis?
6. Are you having trouble maintaining routine? Is it a recent development?
7. When do you usually have free time?
8. Where do you work out? If at home, do you have sufficient workout equipment?

## *III. Tasks (Scenario Based)*

Depends on interviewee's current workout routine/ the kind of routine they would like to establish, probe about how they commit to/complete the task:

1. Walk us through from scheduling to completing the workout: The process, pain points, obstacles
2. What do you like about the current process?

### **[Scenario 1. Remote workout]**

### **[Scenario 2. In-person]**

### **[Other Scenarios]**

## *IV. Social-technical Context*

1. What obstacles are you facing? If you're currently working out over the internet, what problems are you experiencing?
2. What technologies do you find effective?
3. Do you like to work out with friends? What's the best part of working out with friends?
4. Do you work out harder when you're with friends?
5. If you work out with friends, is this the only time you communicate regularly with your friend?
  - a. How do you normally like to communicate with friends?
6. What apps/platforms do you use to work out (remotely with someone else)?

## Group Interview Script

### Introduction

[Same as individual interview above]

### Demographic Info

Before we start, we would like to gather some information for user demographic purposes. May we know,

1. Your age?
2. Which areas do you currently live and/or work?

### User Characteristics, Goals, Current Tasks

1. How did this group get started? What were your motivations and goals?
2. How long have you been doing it?
  - a. Before COVID, what kind of workout routine did you have?
3. How often do you workout as a group on a weekly basis (if you can recall)?
4. How do you like utilizing home space to work out so far?
  - a. What do you find particularly effective?
  - b. Any obstacles?
5. How consistent are these workout sessions?
6. What do you like/dislike about the remote workout format?
  - a. Are they effective in helping you achieve your fitness goals?
7. Does having an exercise group with friends help you develop a more consistent exercise routine?
8. Do you see yourselves continuing remote exercise over Zoom after COVID?

### **[Before each workout session]**

1. How do you schedule your daily workout sessions?
  - a. What technologies/devices are involved in conducting the sessions?
  - b. Methods of communication between friends/ group members.

### **[During the workout session]**

1. Do you talk with each other during the workout?
2. What digital devices and physical equipment do you use for your workouts?
3. Are there any problems you encountered with this remote workout process?

### **[After the workout session]**

1. What do you usually do after each workout session?

## 1.2.2 User Feedback Session Guide

### User Feedback Session Script

#### Objective

Assess popularity of 10 design concepts with real users

#### Introduction

Hi [*participant name*]. Thank you for taking part in this study. I'm [*interviewer name*] and I will be conducting the interview and taking down notes.

#### **[Briefly explain our project, help participant understand context]**

To help motivate young (working) adults to exercise more regularly in their home space, with long-distance friends (to provide social support).

#### **[Goal for today's session]**

Our goal is to introduce 10 design ideas we have to make online group workout sessions more engaging. We want your honest feedback on these concepts - there are no wrong or right answers here, we seek to know what might work or not work for our users like you.

#### **[Important Note]**

- a. Emphasize that the sketches are there to help visualize ideas, and should not affect their decision in ranking ideas!
- b. The ideas are not organized in any particular order. The number associated with each idea is just to help us (the team) keep track.

Today's session will be recorded, but your input and identity will be kept confidential. If that is alright with you, can we get a verbal confirmation from you?

At any point, if you have any questions or concerns, or want to drop out from the study, please feel free to interject me and let me know. Do you have any questions before we get started?

#### Participant Info

#### **[No need to go in depth, just to get a general idea]**

1. Do you currently exercise regularly?  
    [If yes] What is your current exercise routine? Do you exercise at home?  
    [If no] What major obstacles?
2. Do you use remote/interactive exercise resources (YouTube videos, games, remote classes)? What do you use?

#### Feedback Session Procedures

1. **[Give participants time to read ideas + look at sketches]** ~ 8 mins

**2. [Let the participant ask questions] 5-10 mins**

**3. [Ask participant to rank ideas, 1 = favorite, 10 = least favorite]**

- c. Emphasize that the sketches are there to help visualize ideas, and should not affect their decision in ranking ideas!
- d. The ideas are not organized in any particular order. The number associated with each idea is just to help us (the team) keep track.

**4. [Ask follow-up questions on each participant's TOP 3 ideas]**

- a. Why do you think this feature would be effective in helping you exercise more regularly?
- b. What do you like about this idea? (Explain in details)
- c. In what scenarios do you see yourself using this?

[Feel free to ask other Qs based on conversation flow]

**5. [Wish Lists] In addition to the features presented in the 10 ideas, what other features do you wish to have to help you exercise more regularly? What other exercise goals do you have that are not addressed/supported by current design ideas (all 10)?**

**6. [Thank participant] Thank you for your time and insightful feedback!**

User Feedback Session Mural Board

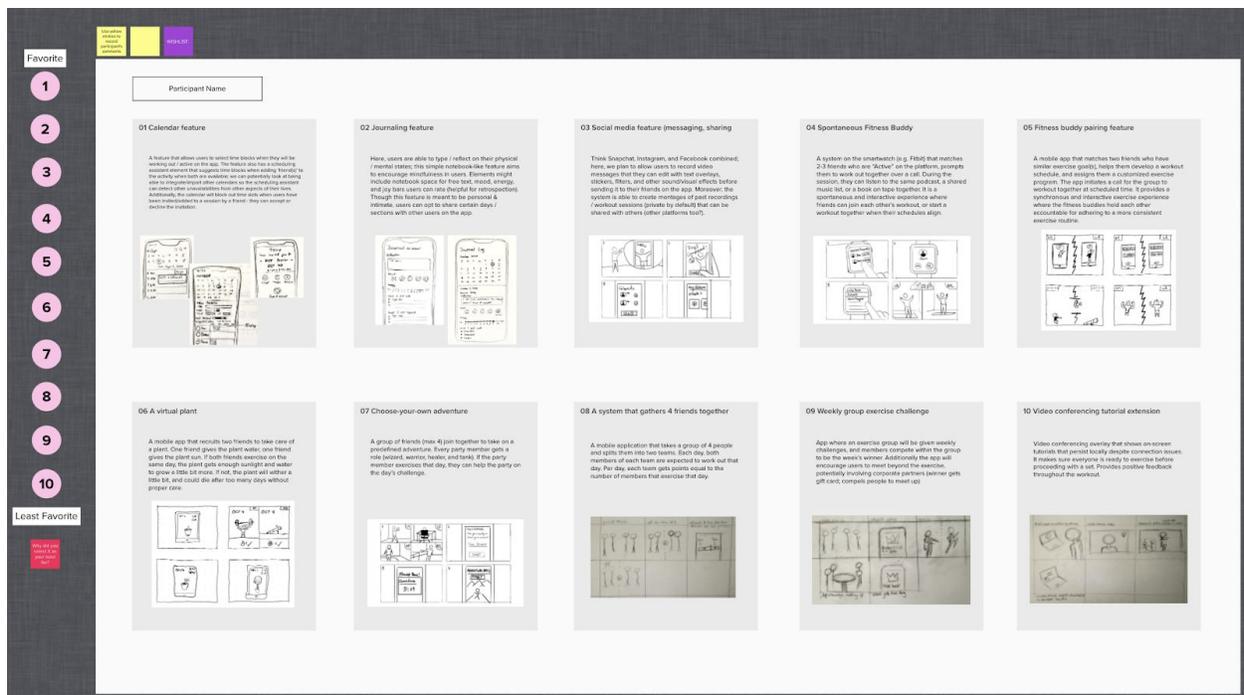


Figure 1.2.2 Screenshot of a feedback session conducted on Mural

## 02 Findings

Upon completing our user interviews, we organized our notes into an affinity map to reveal commonalities and higher level traits shared by our users (see **Appendix B**). Below, we have synthesized our user research with our literature review and competitive analysis.

### 2.1 Users find that working out in groups motivates more consistency

Corroborating our literature review, our users consistently say that working out with a partner motivates them to exercise more consistently [2]. They note that making a commitment to another person compels them to stick to their schedule, and that the prospect of meeting friends again keeps them anticipating their next workout. One user even noted how the fact that their friends were exercising compelled them to start themselves.

### 2.2 Users work more intensely when they work out in groups

Also consistent with the literature, users reported that they worked out more intensely with others [1]. Our interviews indicated that this was a result of both an internal desire to keep pace (i.e. a user will persist through a challenging workout because they see their friend doing it) and from users actively cheering their partners on. In fact, every user we interviewed said that they cheered their group mates on, and suggested that this was the main form of communication they would engage in during group exercises.

### 2.3 Users don't socialize much during exercise, but do after

In our initial report, we speculated that in group exercises, users might socialize more than they exercise. However, as we noted above, our interviewees said that they mainly just cheer each other on during workouts. Indeed, they even explicitly said that they only socialize once the workout is over, so it seems that if users plan on exercising together, they'll be compelled to stick to that plan. We should still be cognizant of social loafing in our designs, but it seems that it might not be as pernicious as we expected.

### 2.4 Users maintain a better lifestyle when consistently exercising in a group

Beyond the group exercise sessions themselves, users reported that the social circles they created around exercise compelled them to eat healthier and share exercise tips even when they're on their own. According to our users, this behavior was mainly brought about by exercise group chats, which served as both a means of scheduling group exercises as well as this lifestyle improvement channel.

### 2.5 Users enjoy working out in groups

A mundane observation, perhaps, but a critical one: users simply enjoy working out with others. Granted, our participant pool was limited to users who already engaged in group workouts, so

this is to be expected, but it's worth noting that our interviewees didn't engage in group workouts solely as means of keeping themselves accountable or some other utilitarian end, they just genuinely enjoy the activity. While this may not be the case for everyone, our research suggests that there is a population of users for which group exercise is intrinsically compelling, meaning that users may not need a significant source of external motivation to engage in exercise.

## 2.6 Users have technical issues when working out online

As expected, users encounter technical issues when conducting remote synchronous workouts, primarily with internet connection. Our users employed video conferencing apps to conduct their remote workout sessions, and internet connection issues are a standing issue with these solutions. Even with modern connections, users can't guarantee they'll have fast, reliable internet. In the context of group exercise, this can mean an interruption in the flow of an exercise, which may be difficult to recover from. Setting up the video call also appeared to be a pain point; one user mentioned that it usually took several minutes to set up their audio when they started a call.

## 2.7 Work and academics complicate our users' schedules

Several users pointed to their work and school obligations as being the biggest limiting factor in their exercise schedules. These obligations can be fluid and unpredictable, but users said that their exercise schedules were built around them, rarely the other way around.

## 2.8 Users like to track their progress

Several users reported using exercise tracking apps. Following from our previous research into gamification it's clear that users enjoy seeing their progress and consistency visualized, and like to see how effectively they're accomplishing their goals.

## 2.9 Some users like to have distractions while they exercise

Our research indicates that users may want to listen to music or podcasts in the background while they exercise. Given that users don't socialize much during the exercise itself, it seems reasonable that they might want more than just dead air for ambience.

## 2.10 Users tend to do bodyweight workouts or use simple home equipment when working out from home

All of our interview participants noted that they primarily exercise with either bodyweight exercises or with common household objects. Makeshift equipment from household objects varied greatly from user to user.

## 2.11 Insights from sketch user feedback session

These insights were gleaned from the user feedback session we conducted on our design sketches. While they were discovered after our ideation and sketching, they were still valuable in determining how we chose which designs to move forward with.

### 2.11.1 Gamification may be a valuable motivator

In our first report, we researched gamification as a potentially valuable design feature for motivating exercise. We only began to consider it seriously after we had already conducted our interviews, so we couldn't get direct user data on it at the time. However, the research we had was compelling enough that we decided to explore the subject in our ideation and design sketches. Given the reactions we received at the user feedback session, it seems that users found gamification to be conceptually compelling. The most highly rated sketch, the group exercise choose your own adventure (see section 5.2.7 for details), was the most gamified of all the ideas. Participants reported that the adventure game seemed fun and motivating, and reacted positively to the game components of other ideas.

### 2.11.2 Competition can be motivating, but may be off-putting

Several users responded positively to the idea of competitive exercise groups, believing it to be an effective means of motivating consistent exercise and personal progress. However, another user noted that competition may not be compelling to him, and it was even off-putting to have winners and losers. We will bear in mind these different user profiles in our design moving forward.

## 03 Hierarchical Task Analysis

3.1 Users want to *schedule* a remote, synchronous, at-home workout session with one or more friend(s) using Zoom calendar invite.

Since our target users live in different cities or even time zones, scheduling a time to exercise together over Zoom is an important task. This process usually involves multiple digital touch points: first, users need to reach out to their friends via a messaging app. By now, our users have already identified a group of friends they would like to exercise with, and created a group chat as their main communication channel. Hence, the goal becomes finding a time that ideally works for everyone, or at least for most people. Next, everyone discusses their availability and decides on a date and time for the group workout session. Since individuals' work schedules vary, the session is usually scheduled early in the morning or late in the evening. However, some users currently live in their parents' house, while others share an apartment with roommates. To minimize inconveniences, users need to be mindful of the schedules of those sharing the living space. Once everyone agrees on a meeting time, one person creates a calendar invite on Zoom and sends the invite link in the group chat.

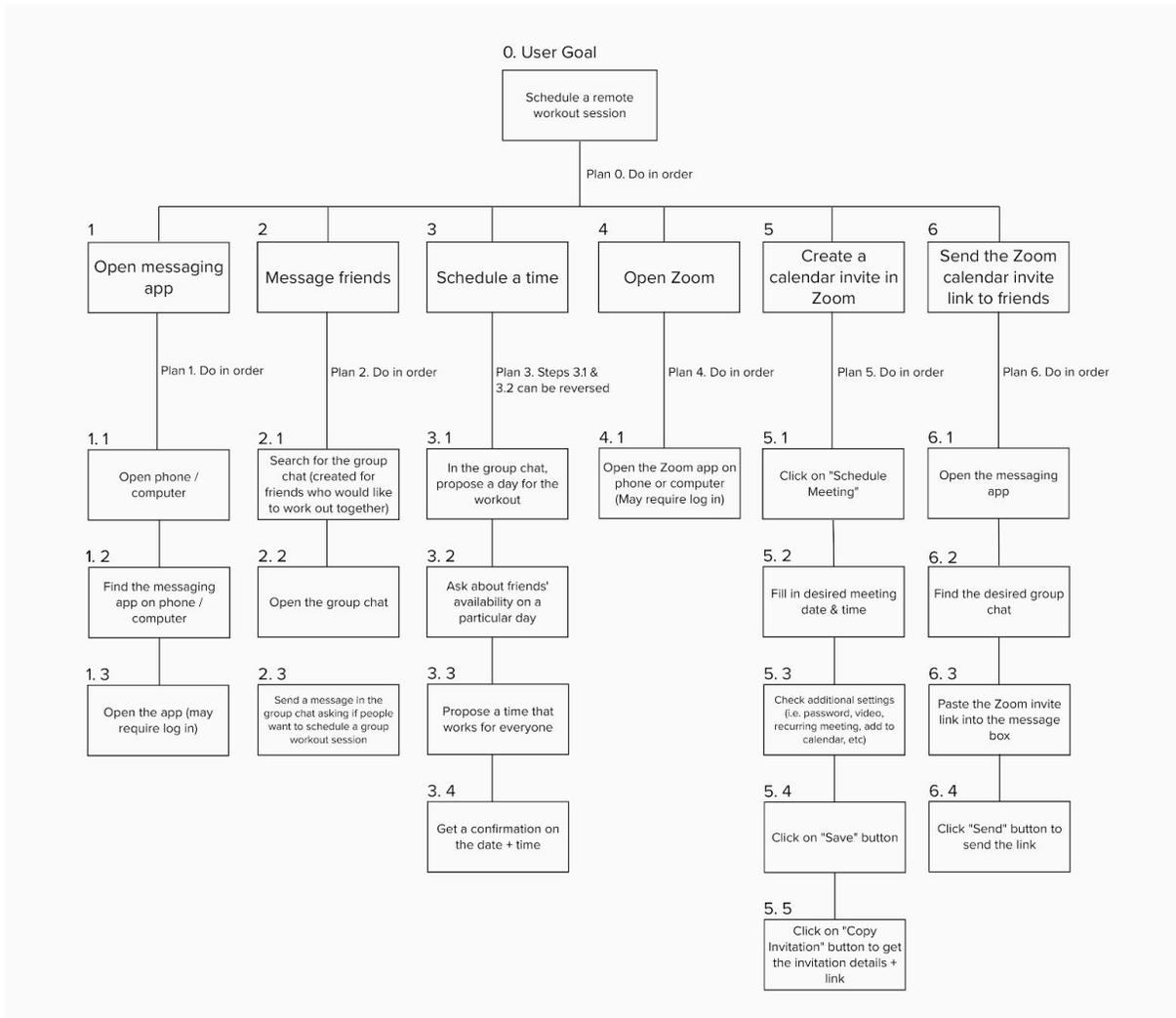


Figure 3.1. HTA for “Scheduling a remote, synchronous, at home workout session with friends using Zoom calendar invite.”

### 3.2 Users want to *get ready to participate* in a remote, synchronous, at-home workout session with a long-distance friend over Zoom video conferencing feature.

Right before a scheduled, remote workout session, users need to go through a series of preparations to ensure the exercise can be successfully carried out in their physical environment, with the support of available hardware and software.

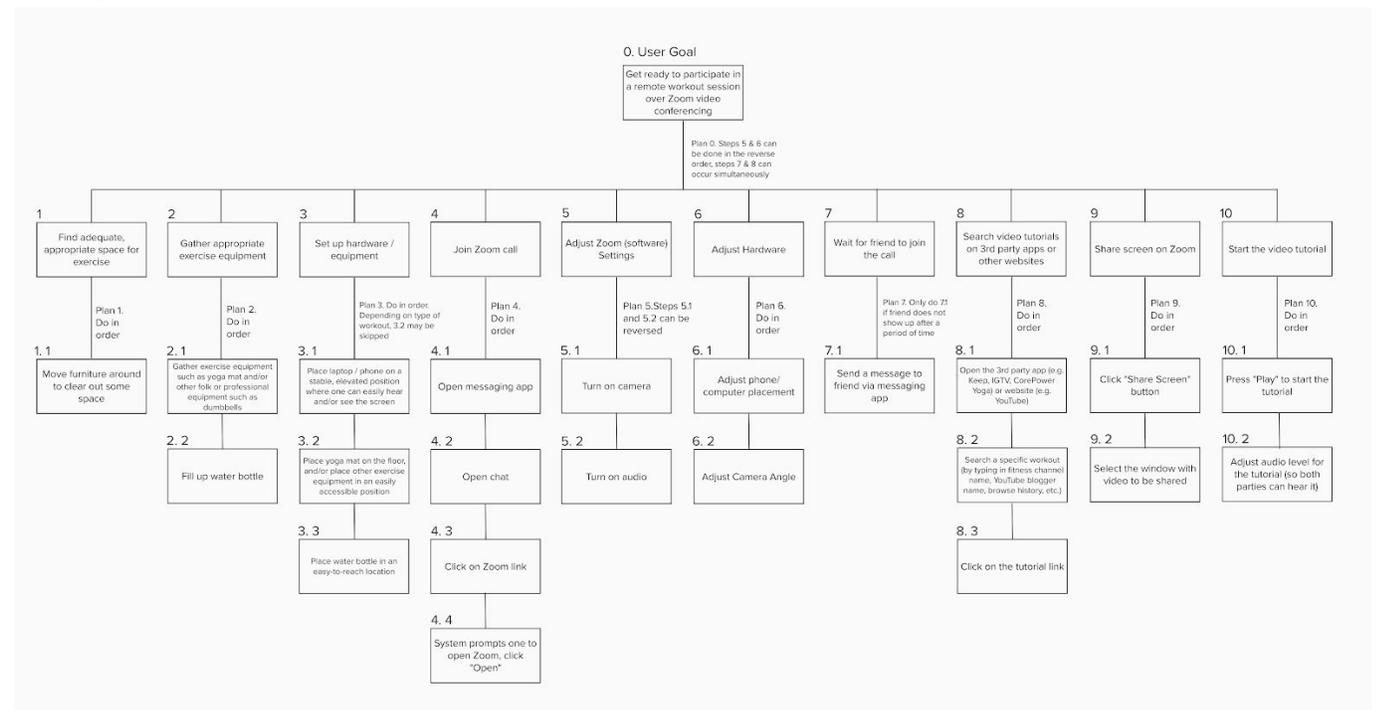
First, users need to find an appropriate space for exercise. Many users primarily utilize their own bedroom to avoid taking up shared home space (such as the living room), unless their roommate(s) would like to join the workout. Those who currently live with their parents utilize the backyard for reasons such as minimizing noise. Users often need to re-arrange furniture to maximize the space for movements and prevent injuries. Then, users gather and set up

exercise equipment such as yoga mats and dumbbells. From our interviews, we learned that our target users have been creative with available home objects, turning water jugs and brooms into makeshift exercise equipment. Some users also like to have their water bottle in an easy-to-reach location.

Once the equipment has been set up, the users join the Zoom video call, adjust software settings on the digital device(s) used for the workout session, and place the device(s) at a safe and secure location. The digital devices include smartwatches for monitoring workout intensity, and occasionally smartphones or tablets as a replacement of computers for using Zoom and playing exercise tutorials. While they don't usually look at the screen throughout the entire workout, our target users like to turn their cameras on because it feels more engaging when they can see each other. However, they noted difficulties with adjusting the camera angles due to limited space and the wide range of motions performed during exercise.

Users sometimes remind their friends on the day of, or the day before the scheduled workout session. If the friend does not show up at the scheduled time, they wait a few minutes and send a message reminder.

While some users select workouts via text message prior to the session, others spend time searching and selecting new workouts at the beginning of a session. While some users follow tutorials on fitness apps such as *Nike Run Club*, others use websites such as *YouTube* and *Bilibili*. Online fitness resources have become increasingly abundant as fitness studios and professional trainers adapt to share their expertise on digital platforms. Our target users utilize online tutorials to guide their workout sessions. The "Share Screen" feature on Zoom has made the process easy since everyone can follow along the tutorials synchronously. The users usually need to adjust the video tutorials' volume to ensure both parties can hear the audio. In addition, our target users noted that they like to briefly catch up before and after the workout session.



*Figure 3.2. HTA for “Getting ready to participate in a remote, synchronous, at-home workout session with a long-distance friend over Zoom video conferencing feature.”*

## 04 Design Implications

Initially, we started with different system requirements but they have since been changed to reflect more crucial user needs and priorities. The refined requirements in the following two sections (4.1 and 4.2). These are the initial system requirements:

### **Functional:**

- The system must promote remote synchronous exercise
- The system must facilitate scheduling for synchronous exercise
- The system promotes consistency of exercise through group accountability (working out at the same time, present & doing exercise alongside)
- The system facilitates exercise itself with interactive scaffolding

### **Non-functional:**

- Must be adaptable / usable in limited space with limited equipment
- The overall vibe of the system should be warm, inviting, friendly, encouraging to casual exercisers
- The system should have a simple interface and is easy to learn and use by fatigued users
- The system should work on mobile devices
- The system should be robust in supporting connection interruptions, and help users maintain in-session flow during the workout

This change was brought about by the insights we gained from the feedback sessions with users; their comments, insights, needs, and goals were highlighted which led us to re-evaluate and refine our requirements to suit user priorities.

## 4.1 Functional Requirements

### 4.1.1 The system promotes consistency of exercise through group socialization regarding exercise

This requirement refers to our exploratory interviews in D1 wherein users revealed that accountability and socialization amongst friends are the main factors in keeping their workouts consistent. Consistency is a key topic as many users in our target population mentioned the inability to adhere to their exercise routine (in the exploratory interviews) which ultimately impairs their ability to effectively exercise and maintain fitness. Additionally, our target users consist of young adults; in D1 research we found that many of their friends and/or close social support are geographically scattered around the country or globe. Thus, this requirement is key to enable our users to connect with friends or social support so that their established relationship can help make their workouts more consistent and forceful.

Additionally, our findings in this phase of the research saw users ranked these related design concepts higher, i.e. 3rd and 4th out of our ten design concepts tested. This indicated a high user need for this requirement.

A high-level description to measure successful implementation of this requirement could include measurement of the number of times users launch and complete workouts on this app; this would be a software / application data analytics measure.

#### 4.1.2. The system supports asynchronous workout, but highly encourage synchronous workout

This requirement refers to our findings during the second phase of research, in our design concept feedback sessions with users. Users expressed concerns about scenarios where they might not have enough / any friends to workout with if the product only supports group workouts. Although our problem statement chiefly targets group (i.e. more than one) workouts together, we realized, based on user feedback, that this was an element of the experience that we should not completely overlook. Hence, we decided to incorporate this requirement without negating our main problem statement, that is to facilitate group workouts for users who cannot be in the same physical space at the same time.

A high-level description to measure successful implementation of this requirement could include measuring the number of times or ratio that users launch the product (e.g. for a minimum period to constitute a workout e.g. 10 minutes) without launching group workout features e.g. group call, versus the number of times that they launch the app and use group workout features. Similarly, this would be a software / application data analytics measure.

#### 4.1.3 The system should introduce users to the notion of remote synchronous workout

This requirement relates to learnability, consistency, and familiarity. Despite the proliferation of video conferencing usage during the pandemic, the technology is still relatively novel, especially outside a work context. Based on exploratory market (desk) research, we found that remote/virtual synchronous workouts are relatively unique to current times; before the global pandemic, most people would be attending in-person classes, the gym, or the outdoors to carry out their exercises. Hence, we surmised that in order for our solution to encourage remote synchronous workouts, it would need to contain features / elements that are consistent with general user expectations (and mental frameworks), learnable, and acts consistently with the rest of the system behaviors. This is so that users can effectively learn and understand the process of setting up a remote workout using an existing video conferencing.

A high-level description to measure successful implementation of this requirement could include deploying a quick user rating survey once the user utilizes this feature for 3-5 times; some questions might include their impressions, attitudes, likes, and / or dislikes about this feature.

#### 4.1.4 The system keeps track of user workout progress

This requirement refers to our findings in D1 as well as second phase user interviews and design feedback sessions. Users mentioned in our exploratory interviews that having visible UI or features that allow them to track their activity and / or performance would be meaningful to understand their progress more deeply. They alluded that this deeper understanding would mean a higher engagement and more motivation when they see their improved progress; they might also be able to have a more targeted approach since they have deeper insight into their own actions and activities. These insights were repeated in our second phase interviews and design feedback sessions whereby users repeated this sentiment that tracking their activity and progress would be helpful and meaningful. Thus, we surmised that this would be a key system requirement.

A high-level description to measure successful implementation of this requirement could include deploying digital surveys to obtain user feedback on the helpfulness, efficacy, and accuracy of this requirement. The digital survey could include questions that ask about the usage, importance, and accuracy of the feature / elements that relate to this requirement. Users might have the option for free text answers at the end of the survey too.

## 4.2 Non-Functional Requirements

### 4.2.1 Involves bodyweight workouts exclusively

Insights from D1 and D2 user interviews have uncovered user pain points in terms of finding equipment at home to supplement their workouts. Thus, these users resorted to workouts that leveraged on their body weight as resistance during the exercises. Sometimes, users get creative with household things and create makeshift dumbbells out of milk containers filled with water or sand, or weighted bars by fixing filled gallon bottles at the ends of a broom stick. However, these creative methods vary tremendously from one individual to the next. Hence, we concluded that relying on bodyweight exercises would be the most generalizable workout for our target population, who have also expressed this priority in our research findings.

The main usability elements we plan to target in this requirement would be learnability and effectiveness; we target that the features / elements related to this requirement would be relatively easy for users to **learn** how to access and use, and that they will be relevant and highly **effective** for our users' goals and needs.

A high-level description to measure successful implementation of this requirement could include a quick survey (e.g. schedule to be deployed after a month of using the system) to obtain user

feedback on their impressions e.g. **effectiveness** and **ease of use** of the features / elements of this requirement.

#### 4.2.2 The system should work on mobile devices

Our research findings from the explorative user interviews informed us that users are currently often using multiple devices due to their need for multiple applications for group workouts virtually. Additionally, the physical and active nature of working out often result in users needing to utilize a more portable device while working out. Moreover, exploratory literature review and market research has widely indicated the ubiquity of mobile devices usage for workouts and communication amongst social groups. Thus, we justified that this would be a key requirement for our system to support the **familiarity**, **memorability**, and **efficiency** of the user experience for our target population.

A high-level description to measure successful implementation of this requirement could include heuristic evaluation to gauge that the system's UI and UX works as designed on key mobile systems e.g. Android, iOS.

#### 4.2.3 The interface should be clearly visible so users can act towards their intended goals

This non-functional requirement refers to knowledge we gathered from class readings (Interaction Design 4th Edition by Rogers et al.), class lectures, and exploratory desk research; we found that system clarity could reduce cognitive load and build user confidence as they achieve their goals. Thus, it is vital that our system consist of elements and features that clearly convey **predictability** when a user carries out specific actions on the system and **observability** in terms of feedback and user clarity on the internal behaviors of the system so that their cognitive frameworks and expectations are not thrown off. Our findings convinced us that a system with **clarity** and **consistency** would build confidence in our users as they learn and continue to use the system.

A high-level description to measure successful implementation of this requirement could include usability tests with click trackers and user stories / scenarios to test how users are interacting with the system based on given scenarios and goals.

#### 4.2.4 Promotes accessibility by accommodating different exercise needs

Our next non-functional requirement is based on exploratory desk research, class lectures, and analysis of D1 and D2 user interviews; our findings showed us that within our target population, our users had varied skills, experience, and needs in their workout routines. Our users need a system that caters to their unique needs and goals as exercising is rather personal and varies from one individual / group to another. Thus, we concluded that this would be one of our system's non-functional requirements so that our users' unique goals would be met (**flexibility** and **accessibility**).

A high-level description to measure successful implementation of this requirement could include a digital survey to gauge user feedback on the features / elements of this requirement. We would ask questions related to users' impressions and attitudes about using those features after about one or two months.

4.2.5 The vibe of the system should be friendly and inviting; exercise should feel rewarding and promote camaraderie

Our exploratory research as well as user interviews (D1 and D2), we found that social friendliness and psychological safety were key to establishing an inviting workout environment (**utility, effectiveness, and accessibility**); some users expressed self-consciousness and insecurity as high barriers to workouts for them. We gained insight that working out with others, even friends, can be an intimidating experience for some of our users. Hence, we decided to include this as a key system requirement - that the system created would exude a feeling of inviting friendliness to users; the system would be rewarding rather than punishing, and it would also promote camaraderie instead of hostility amongst users.

A high-level description to measure successful implementation of this requirement could include digital analytics into the number of times users use the group feature and test the consistency of that usage. This could be supplemented with accessing customer support logs on user complaints or reports that relate to this requirement if it is not met.

# 05 Design Brainstorming

## 5.1 Brainstorming Process Description

### 5.1.1 Divergent Thinking

With the key findings from semi-structured user interviews and a list of initial design requirements in mind, each team member came up with five design ideas independently. At this stage, we emphasized that the ideas should be generated quickly to minimize attachment to ideas. We transferred our one-sentence idea descriptions as sticky notes onto a Mural board. In the second stage, we focused on adding depth and diversity, and developing a sense of shared ownership of ideas. Following the spirit of the “Yes...and...” technique, each of us took a set of five ideas that were not our own, and built on top of them. We went through two rounds of further developing and diversifying ideas before moving on to the next stage. The third stage is to align our understanding of existing ideas. We set a 10-minute timer for everyone to read through the ideas, and wrote down their questions on sticky notes. As a team, we then read each idea out loud, went through all of the questions, and clarified any confusions. Once our expectations were aligned, we were ready to start narrowing down ideas.

### 5.1.2 Convergent Thinking

To select our initial ten ideas, we decided to utilize Mural’s anonymous voting feature. This process took three rounds. In the first round, we filtered out ideas that did not get any votes (and we were left with 13 ideas). In the second round, we selected six ideas that got the most votes. In the final round, we selected four ideas out of the remaining ones. Once we had a mutual agreement on the ten ideas, we began preparing idea descriptions and sketches for user feedback sessions. We hoped to gauge our target users’ opinions on the ideas before making a final decision on which two ideas to pursue further.

## 5.2 Initial Ideas (10)

### 5.2.1 Calendar feature

The calendar feature allows users to select time blocks when they will be working out (i.e. active) on the app. The feature also has a scheduling assistant element that suggests time blocks when adding ‘friend(s)’ to the activity when both are available; we can potentially look at being able to integrate/import other calendars so the scheduling assistant can detect other unavailabilities from other aspects of their lives. Additionally, the calendar will block out time slots when users have been invited/added to a session by a friend - they can accept or decline the invitation.

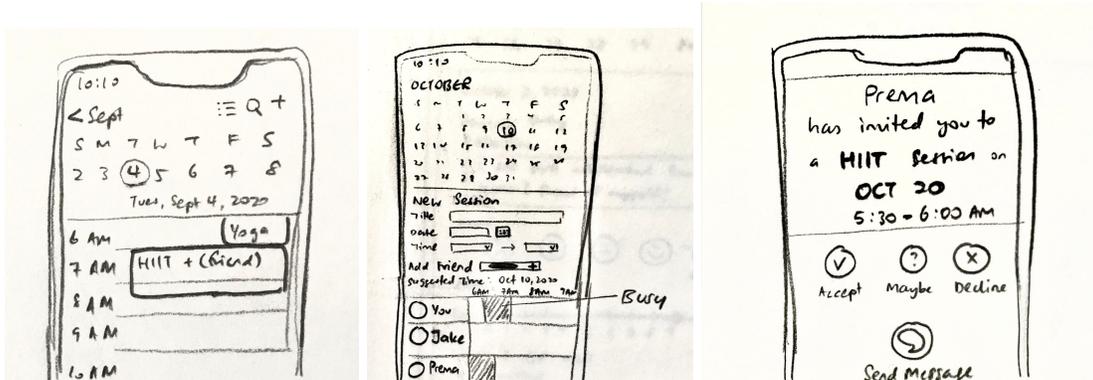


Figure 5.2.1 Sketch of calendar design idea

### 5.2.2 Journaling

Here, users are able to type and reflect on their physical, emotional, and mental states; this simple notebook-like feature aims to encourage mindfulness in users. Elements might include notebook space for free text, mood, energy, and joy bars users can rate (helpful for retrospection). Though this feature is meant to be personal & intimate, users can opt to share certain days or sections with other users on the app.

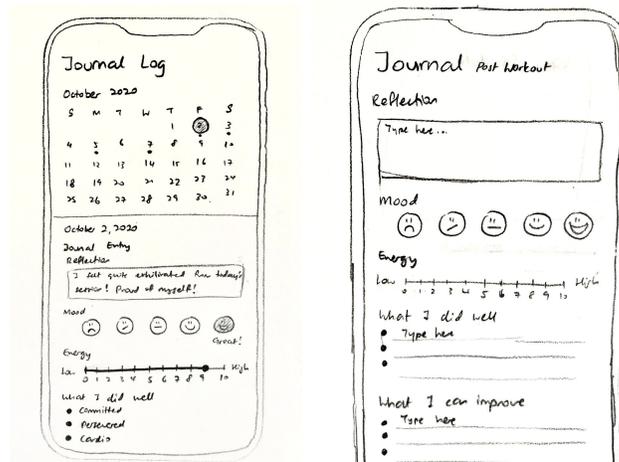


Figure 5.2.2 Sketch of journaling design idea

### 5.2.3 Social media and video recording

Think Snapchat, Instagram, and Facebook combined; this design concept plans to allow users to record video messages that they can edit with text overlays, stickers, filters, and other sound/visual effects before sending it to their friends on the app. Moreover, the system is able to create montages of past recordings or workout sessions (private by default, settings can be changed) that can be shared with others (and on other social platforms too).

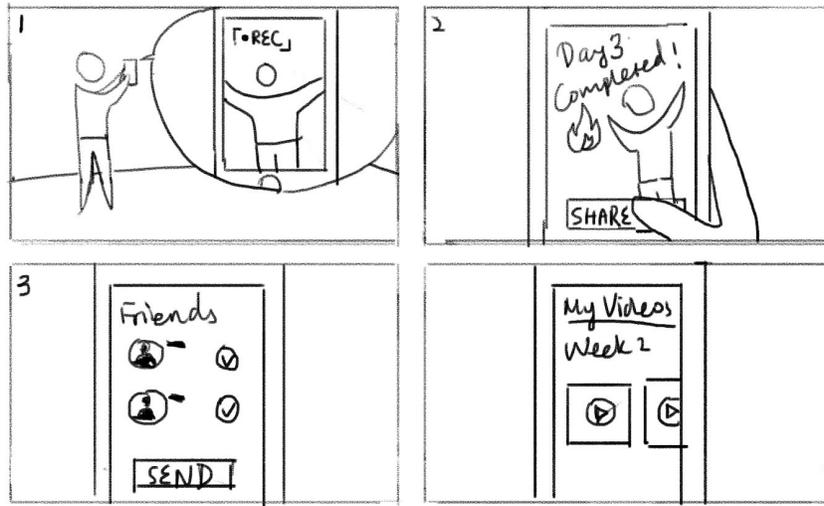


Figure 5.2.3 Sketch of social media and video recording design idea

### 5.2.4 Spontaneous fitness buddy

A system on the smartwatch (e.g. Fitbit) that matches 2-3 friends who are “Active” on the platform, prompts them to work out together over a call. During the session, they can listen to the same podcast, a shared music list, or a book on tape together. It is a spontaneous and interactive experience where friends can join each other’s workout, or start a workout together when their schedules align.

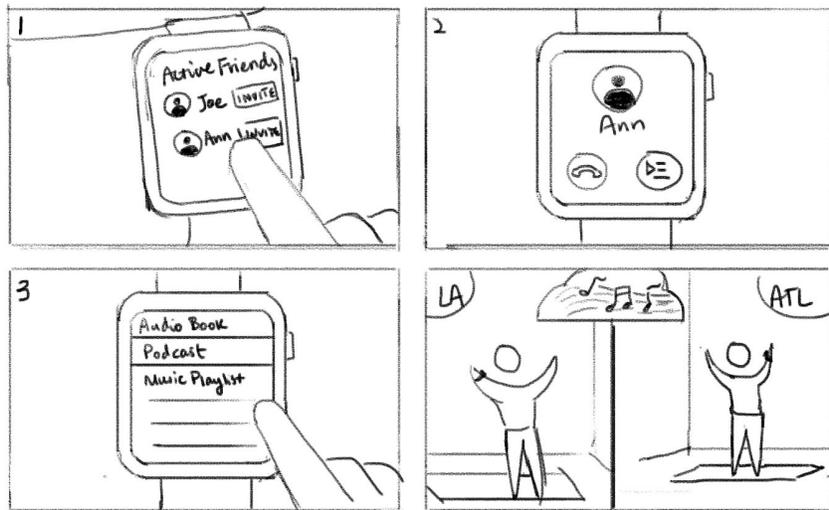


Figure 5.2.4 Sketch of spontaneous fitness buddy design idea

### 5.2.5 Fitness buddy pairing feature

This would be a mobile app that matches two friends who have similar exercise goal(s), helps them develop a workout schedule, and assigns them a customized exercise program. The app initiates a call for the group to workout together at scheduled time. It provides a synchronous and interactive exercise experience where the fitness buddies hold each other accountable for adhering to a more consistent exercise routine.

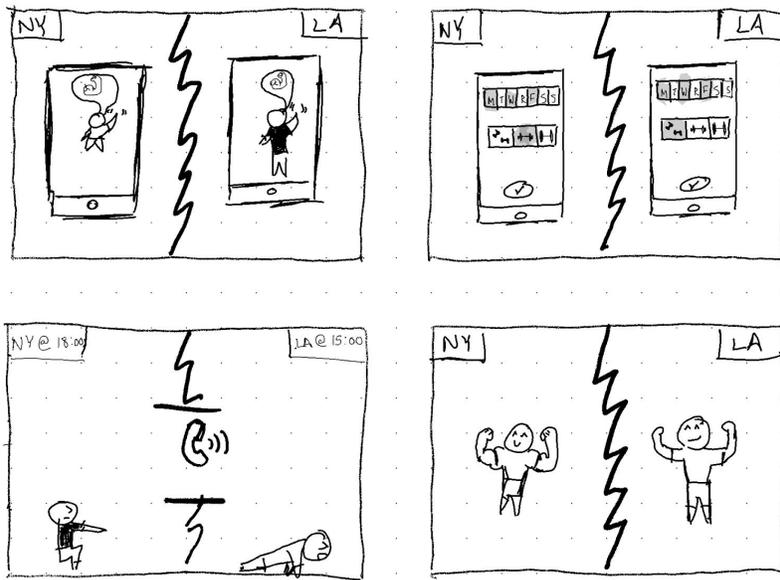


Figure 5.2.5 Sketch of fitness buddy pairing design idea

### 5.2.6 Nurture a virtual character

This would be a mobile app that recruits two friends to take care of a virtual character (e.g. a plant.) One friend gives the plant water, one friend gives the plant sun. If both friends exercise on the same day, the plant gets enough sunlight and water to grow a little bit more. If not, the plant will wither a little bit, and could die after too many days without proper care.

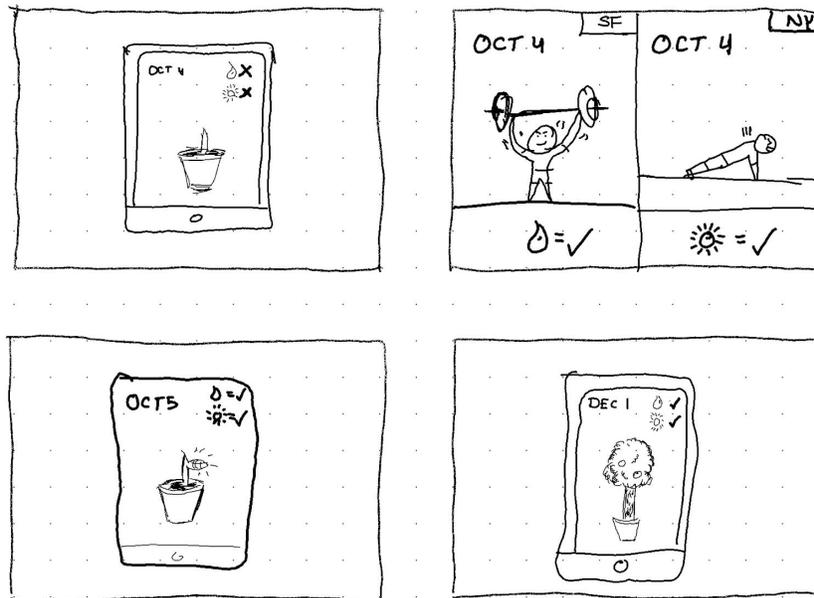


Figure 5.2.6 Sketch of nurture a virtual character design idea

### 5.2.7 Choose-your-own-adventure

A group of friends (max 4) join together to take on a predefined adventure. Every party member gets a role (wizard, warrior, healer, and tank). If the party member exercises that day, they can help the party on the day's challenge.

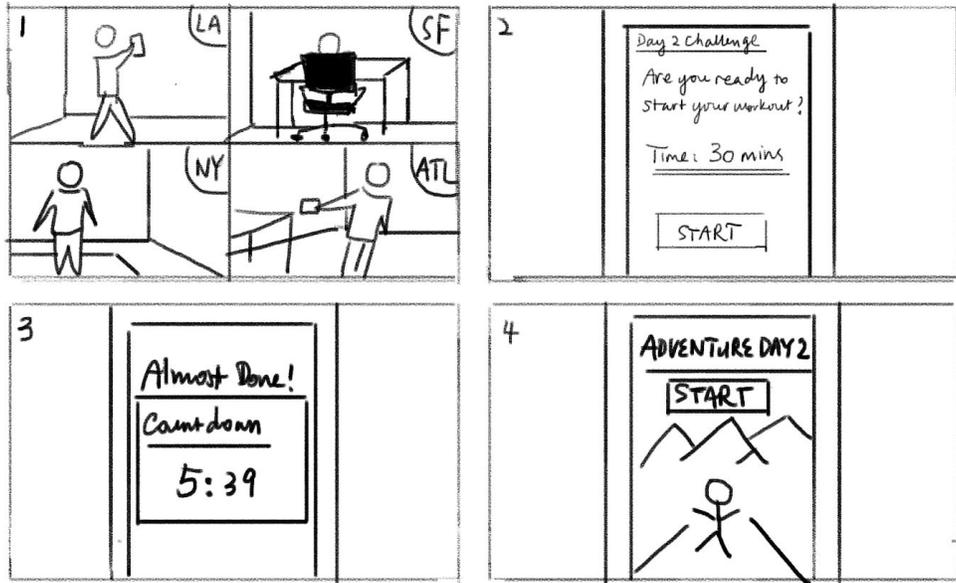


Figure 5.2.7 Sketch of choose your own adventure design idea

### 5.2.8 A system that gathers 4 friends together

A mobile application that takes a group of 4 people and splits them into two teams. Each day, both members of each team are expected to work out that day. Per day, each team gets points equal to the number of members that exercise that day.

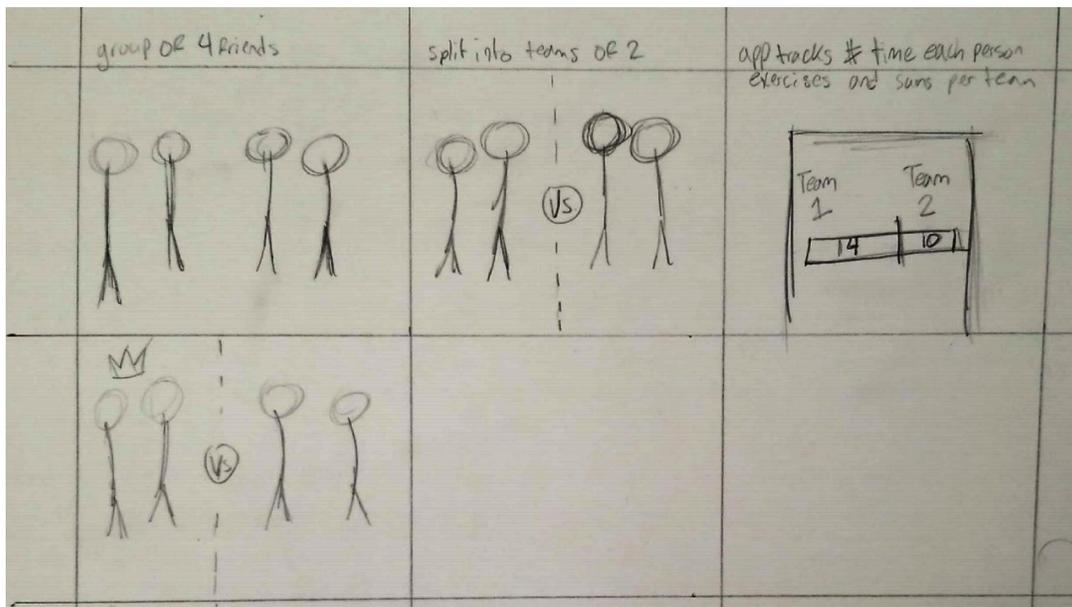


Figure 5.2.8 Sketch of system that gathers 4 friends together design idea

### 5.2.9 Weekly group exercise challenge

A mobile application where an exercise group will be given weekly challenges and members compete within the group to be the week's winner. Additionally the app will encourage users to meet beyond the exercise, potentially involving corporate partners (winner gets gift card; compels people to meet up).

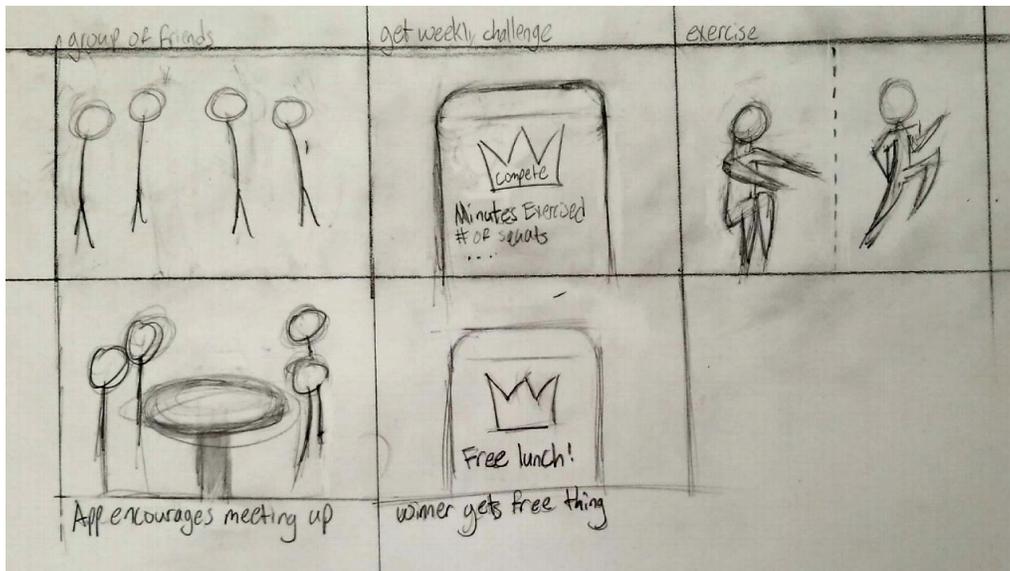


Figure 5.2.9 Sketch of weekly group exercise challenge design idea

### 5.2.10 Video conferencing tutorial extension

This would be a video conferencing overlay that shows on-screen tutorials that persist locally despite connection issues. It makes sure everyone is ready to exercise before proceeding with a set. It also provides positive feedback throughout the workout to be a form of positive reinforcement and motivation for users, to encourage consistency in application usage and user exercise.

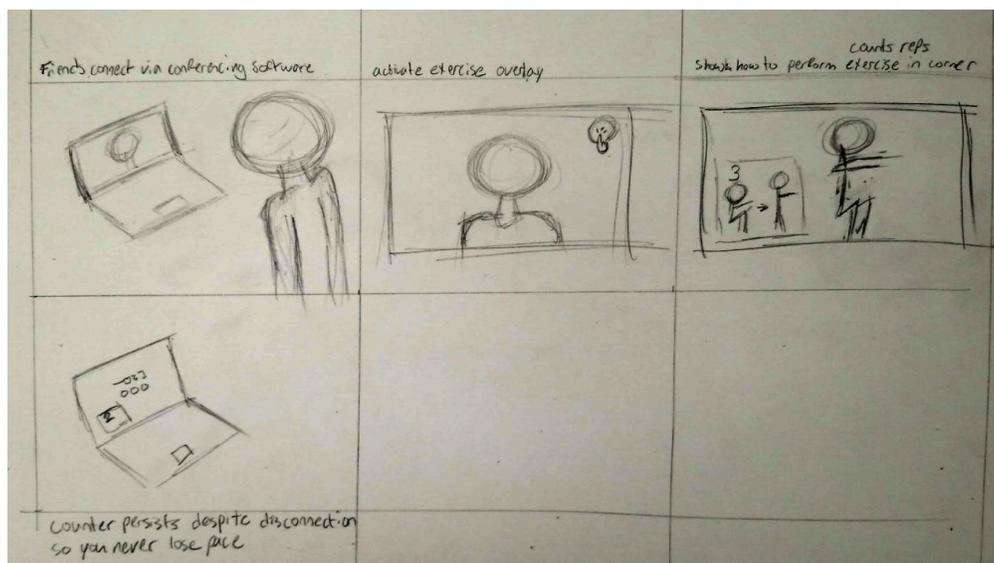


Figure 5.2.10 Sketch of video conferencing tutorial extension design idea

## 5.3 Top Two Ideas

We selected “nurture a virtual character” and “spontaneous fitness buddy” as our top two (2) ideas. In addition to satisfying our design requirements, the ideas were selected based on three metrics: novelty, feasibility and user affinity. Taking the rankings from user feedback sessions, we mapped ten ideas onto a decision matrix (**Appendix C**). While they are distinct design ideas, the two share some common themes and mechanisms. Firstly, they both provide social support for exercise. Our target users have found group accountability and companionship to be very helpful in promoting regular exercise behaviors. Secondly, they both make the exercise experience more enjoyable, either through shared entertainment (listening to the same podcast) or gamification (taking care of a virtual character). Thirdly, they all address the problem of busy schedules. The system either avoids scheduling or provides assistance. Finally, both systems can be easily used in the everyday context, since they only require access to a smartphone, an exercise space at home, and minimal to no exercise equipment.

## 5.3.1 Nurture a virtual character

### Storyboard

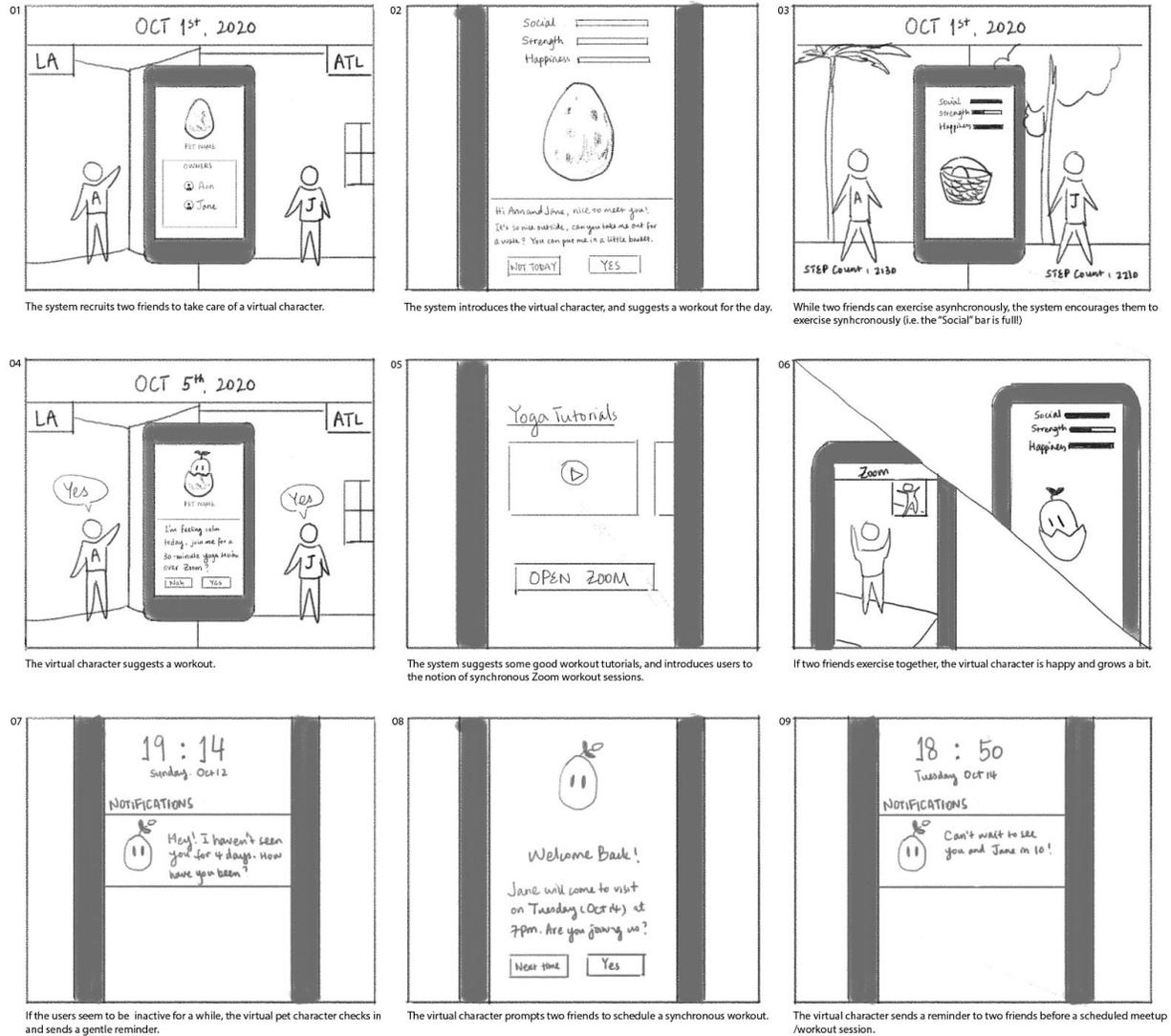


Figure 5.3.1 Storyboard of "Nurture a virtual character" idea

### Narrative Walkthrough

The system recruits two friends (they should be friends in real life) to take care of a virtual character. The character's growth mirrors the two friends' progress in fitness training. The character's well-being is represented by three (3) important metrics: social, strength, and happiness. The "social" metric corresponds to whether a synchronous group workout is completed. The character only gets a full social bar if a group workout is completed on a particular day. If the workout is asynchronous, the social bar is filled half-way, whereas no workout results in an empty social bar. The "strength" metric corresponds to the intensity of

workout on a particular day. The “happiness” metric corresponds to the consistency of exercise. If two people adhere to a workout schedule for a long period of time, the character is happier because they feel more cared for.

The character will suggest different workouts on different days. This is to help people slowly transition into a routine, starting with less intense workouts. The level of difficulty will increase as one starts to develop a consistent routine. Additionally, the character sends gentle, personalized reminders if one seems to fall out of a routine. The character also helps two friends to workout synchronously by suggesting meetup times, which hopefully will reduce unnecessary communications around schedule coordination.

Another important feature is that we introduce the notion of remote synchronous workout by embedding a Zoom link in the system. When two friends are ready to workout together, they can click on the “Open Zoom” button, which directly takes them to a Zoom video conference room.

### Justification of Design Decisions

A strength of this design is that it promotes a sense of accountability through both the role of a caregiver and group dynamics (as one is paired with a friend). This will lead to a combination of emotional investment and social connection through exercise. Another strength is that the system keeps track of one’s fitness progress in a rewarding way, more specifically, the character thrives as one takes care of their own physical wellbeing. Finally, the system helps one develop a more consistent exercise routine through gentle reminders and suggestions for group workouts.

A weakness of this system is that it may not be effective for individuals who prefer competition. In fact, some users reflected that a healthy competition between friends may provide motivation for exercise. Another weakness is that the system currently introduces users to remote synchronous exercise by taking them to a Zoom conference room. This may be inconvenient to users who have not downloaded Zoom or are unfamiliar with video conferencing software. Additionally, transferring users to a different app may cause confusion. Perhaps there is a way to incorporate a video conferencing feature in the app, or build this system on top of an existing video conferencing software.

## 5.3.2 Spontaneous fitness buddy

### Storyboard

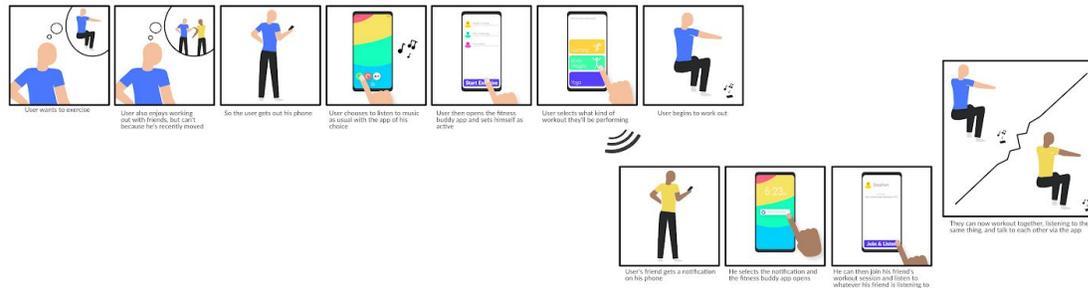


Figure 5.3.2 Storyboard of “Spontaneous Fitness Buddy” idea

### Narrative Walkthrough

The essence of this idea is group exercise on the fly, so when a user wants to exercise, they do what they usually do: put on music or a podcast, then go on to the workout. However, before they begin, users will open our app, select “start exercise,” then select which kind of exercise they’ll be doing. This will set them active within the app, and send out a notification to their friends that they’re starting to exercise. Friends can choose to join the exercise and listen to whatever is playing. Alternatively, a user can just open the app and browse their friends list to find friends who are currently exercising or ping friends who are currently resting to start an exercise.

### Justification of Design Decisions

The greatest benefit of this idea is its simplicity; it imposes few extra interactions to a user’s exercise routine and has no gimmicks that we would need to walk our users through. It should improve a user’s quality of life without a lot of work on the user’s end. It’s also flexible. Technically, the app is designed to support spontaneous workouts, but there’s nothing stopping users from planning work out sessions on their own, and use this app to facilitate them. In fact, during the last of our design feedback sessions, the participant said something that worried us. He had rated the calendar app highly, but upon further questioning, he realized that he probably wouldn’t actually use it over his current scheduling system. That lead us to question the viability of that design, but also suggests that it may simply be better to choose designs that integrate within a user’s existing workflow.

Some clear weaknesses in this design stem from its flexibility. Exercise regimens may vary, which prevent users from truly syncing up their activity. Users may also join in the middle of another person’s exercise, and that may be awkward to coordinate. The design, as it stands, also doesn’t emphasize video transmission, which we intended to accommodate for people who run outside, but loses out on the visual connection.

## 06 Panel Description

For 6755, one of our main questions centered around how to approach the team brainstorming process. The second years provided some industry-approved resources about how to brainstorm effectively, then gave us criteria we ought to focus on: feasibility, novelty, and user affinity. We used these metrics for selecting our top two ideas. Moreover, we asked whether we should engage our target users and relevant stakeholders in the ideation process. The second-years suggested that getting user feedback at this stage would be advisable if time permitted. We eventually decided to get user feedback on the 10 ideas, which gave us insights on the nuances of users' motivations and attitudes toward exercise. Other questions regarded clarifying ambiguities in the grading criteria.

## 07 Project Website

Link: <https://sites.gatech.edu/apexcs6755/>

## 08 References

- [1] Thomas G. Plante, Meghan Madden, Sonia Mann, Grace Lee, Allison Hardesty, Nick Gable, Allison Terry, and Greg Kaplow. 2010. Effects of Perceived Fitness Level of Exercise Partner on Intensity of Exertion. *J. Soc. Sci.* 6, 1 (March 2010), 50–54. DOI:<https://doi.org/10.3844/jssp.2010.50.54>
- [2] R. R. Wing and R. W. Jeffery. 1999. Benefits of recruiting participants with friends and increasing social support for weight loss and maintenance. *J. Consult. Clin. Psychol.* 67, 1 (February 1999), 132–138. DOI:<https://doi.org/10.1037//0022-006x.67.1.132>

# 09 Appendix

Appendix A. Consolidated user feedback session (full version [here](#))

**#7** Of Calendar feature

Role	
Triphong	
NI	
Xiang	
Adam	

**#8** Of Joining feature

Role	
Triphong	
NI	
Xiang	
Adam	

**#7** Of Social media feature (messaging, sharing)

Role	
Triphong	
NI	
Xiang	
Adam	

**#4** Of Spokenword Feature Body

Role	
Triphong	
NI	
Xiang	
Adam	

**#5** Of Feature body quality feature

Role	
Triphong	
NI	
Xiang	
Adam	

**#6** Of A virtual part

Role	
Triphong	
NI	
Xiang	
Adam	

**#1** Of Choose your own adventure

Role	
Triphong	
NI	
Xiang	
Adam	

**#4** Of A system that updates & shows together

Role	
Triphong	
NI	
Xiang	
Adam	

**#3** Of Weekly group exercise challenge

Role	
Triphong	
NI	
Xiang	
Adam	

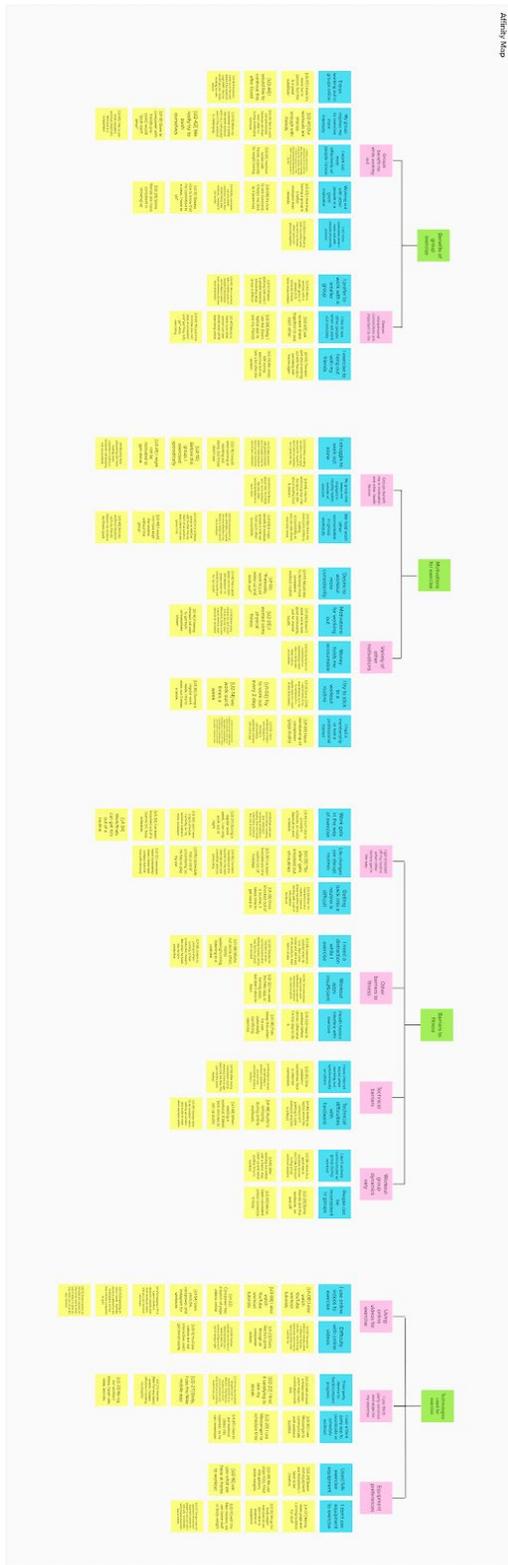
**#5** Of Video conferencing feature extension

Role	
Triphong	
NI	
Xiang	
Adam	

**Wishlist & General comments**

Role	
Triphong	
NI	
Xiang	
Adam	

Appendix B. Affinity map for synthesizing interview data (full version [here](#))



Appendix C. Decision matrix for selecting top two (2) ideas

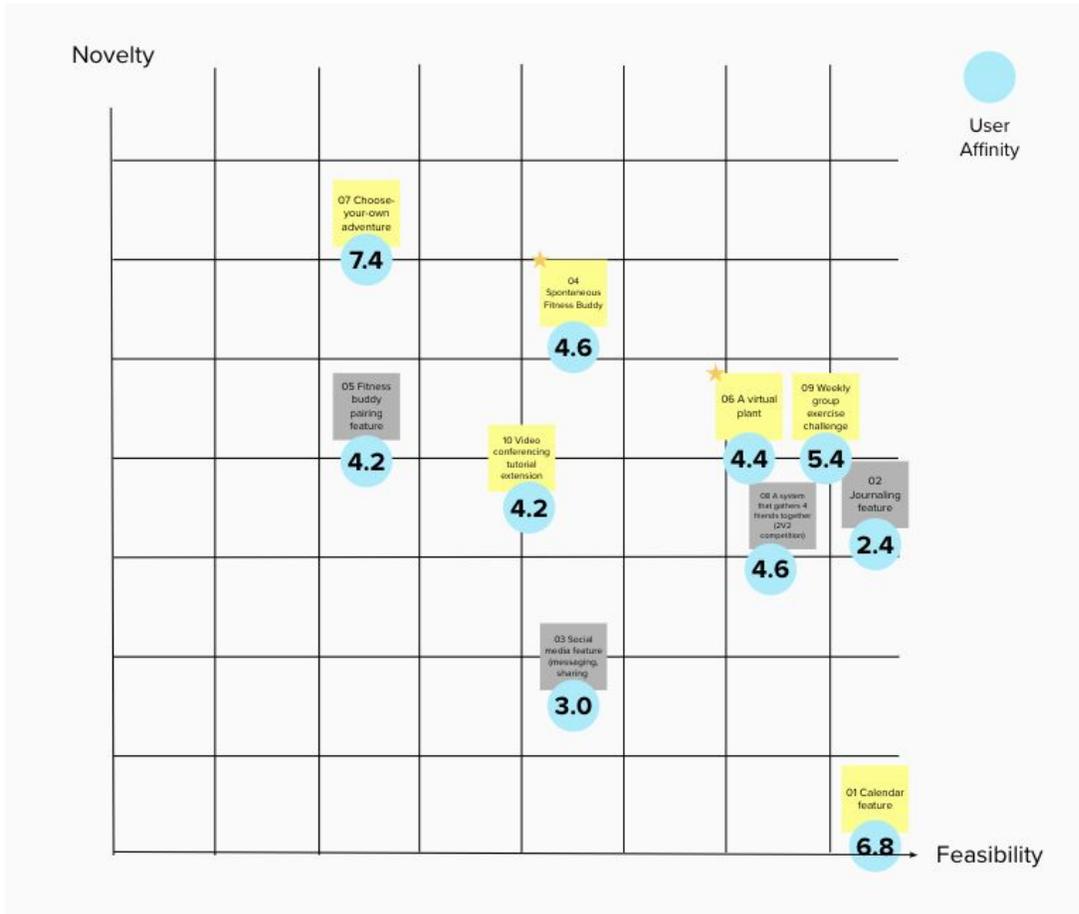


Figure Appendix B. Higher score means higher user affinity