

D3

System Prototype and Evaluation Plan

CS-PSYC 6755 / HCI Foundations

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01 Background

As lives continue to be disrupted by COVID-19, the void that synchronous, organic social interactions used to fill becomes increasingly noticeable. Many have spent quarantine trying to get in shape, but have struggled to maintain consistency and motivation. Given the positive mental and physical effects that exercising with a partner or group can have [2,6,8–10], our team has spent the past three months identifying how to help physically separated individuals exercise together. By enabling people to work out together virtually, we intend to support users in their goal to become more physically active. Additionally, we intend to provide a social outlet for users to interact with their friends, no matter how far away they might be.

02 Design Requirements

Our research throughout the various stages in the project has informed our system requirements. Due to the iterative method we adopted, we have refined our system’s functional and nonfunctional requirements from its initial stages (D1) to maturity (D2, D3). Our user feedback has been fundamental in uncovering key user needs, flows, and wants; additionally, we learn about their current adaptations, mental expectations, and future aspirations (for a system) based off in-depth user interviews in D0, D1, and D2 phases. The table below denotes the updated requirements alongside our justifications.

2.1 Functional Requirements

Initial Requirements	Updated Requirements & Justification
<ul style="list-style-type: none">• 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 others)• The system facilitates exercise itself with	<ul style="list-style-type: none">• The system supports asynchronous workout, but highly encourage synchronous workout <u>Justification:</u> During the second phase of research in our design concept feedback sessions, users expressed concerns about scenarios where they might not have enough / any friends to workout with if the product only supports group workouts. This presented a significant barrier to usage if the system only supported group workouts, thus we updated this requirement to include this user group while maintaining our main problem statement (i.e. facilitate remote group workouts).• The system promotes consistency of exercise through group socialization regarding exercise <u>Justification:</u> This requirement refers to our exploratory interviews in D1 whereby users revealed that accountability and socialization amongst friends are the

<p>interactive scaffolding</p>	<p>main factors in keeping their workouts consistent. Additionally, in D1 research, we found that our users mostly had friends and/or close social support around the country or globe. From D2, analysis of our research findings revealed that the social aspect of group workouts (i.e. virtual presence of others, accountability) was a key factor to their consistency. Thus, we tweaked the initial requirement to encompass the broader social aspects.</p> <ul style="list-style-type: none"> <p>D1-The system facilitates exercise itself with interactive scaffolding D2-The system should introduce users to the notion of remote synchronous exercise D3-The system should facilitate remote synchronous workout</p> <p><u>Justification:</u> We changed this requirement from D1 and D2, due to the lack of urgency/priority of the related concepts/features to the initial requirements. We found, within internal team discussions, that focusing on just introducing the users to the system was insubstantial to ensuring that the system facilitates their workouts and overall remote experience.</p> <p>The system keeps track of user workout progress</p> <p><u>Justification:</u> Both in D1 and D2 user interviews and design feedback sessions, users repeated that tracking their activity and progress was helpful and meaningful to them. Some users mentioned they used current systems e.g. FitBit to compare their progress and/or track personally. They stated that having visible UI or features to track their activity and / or performance would let them understand their progress and be more consistent to keep the streak going.</p>
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2.2 Non-Functional Requirements

Initial Requirements	Updated Requirements & Justification
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> <p>Involves bodyweight workouts exclusively</p> <p><u>Justification:</u> We kept this requirement from D2 as insights from D1 and D2 user interviews have uncovered user pain points in terms of finding equipment at home to supplement their workouts. These users resorted to workouts that leveraged on their body weight as resistance during the exercises. Due to the variability of equipment our users have, we justified that it would be most inclusive to focus on bodyweight exercises.</p> The system should work on laptop / tablet devices

<p>to learn and use by fatigued users</p> <ul style="list-style-type: none"> • 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 	<p><u>Justification:</u> We changed this from D2. In D2, our research findings informed us that users are currently often using multiple devices due to their need for multiple applications for group workouts virtually. Though we initially ideated a mobile system, upon further discussions for D3, we found that the physical nature of a mobile phone would be more challenging for hands-free video calling, whereas the tablet and laptop devices would be more conducive for hands-free video. Thus, we decided that our design solution would fit tablet and desktop/laptop devices.</p> <ul style="list-style-type: none"> • The interface should be eminently observable/visible to focus the motivation towards specific action <u>Justification:</u> We kept this from D2, as our desk research and class materials informed us 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. • Promote accessibility by accommodating different exercise needs <u>Justification:</u> We kept this D2 requirement. 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 flexible system that caters to their unique needs and goals as exercising is rather personal and varies from one individual / group to another. Thus, we intend to design our system in a way that delivers diverse content according to our user preferences and workout needs. • The vibe of the system should be friendly and inviting; exercise should feel rewarding and promote camaraderie <u>Justification:</u> We kept this D2 requirement. Our exploratory research as well as user interviews (D1 and D2) 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; they felt that working out with others, even friends, could be intimidating. Hence, we intend to design a system experience that made users
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	feel welcomed, rewarded, and confident in conducting their workouts.
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03 Prototype

3.1 Prototype Description

3.1.1 How the prototype works

We created the mock-ups on the Figma platform. Similarly, the mock-up screens were converted into an interactive prototype with limited functionalities. The interactive prototype was designed to allow users to click around the various interactive pages and explore what they can or cannot potentially do with the system. Users also get a sense of the design and types of information they can access on the system. This prototype was not designed for in-depth and specific end-to-end user tasks, but rather encompasses a broader, but shallower interaction between the different features.

The prototype steps are as follow:

1. On clicking the prototype link, the user should be directed to a new browser tab. At the landing page, the user should not need to create any account or sign in, but immediately view the Onboarding page, with the **'Workout Information'** title. Users can experiment by clicking various preferences at each question. Users should scroll all the way down, simulating an actual sign up where all fields are selected, to click the action button (**'Get Started'**) for the next screen.
2. (At this page, the user is free to click around and explore the Home / Tutorials / Progress / Schedule / View Calendar features.) Yet, to follow the sequence curated by the designers, the user can look at the **'Pending Invitations'** and **'accept'** the invite from Jennifer for November 3, 2020, 6:00-6:30pm. Upon clicking the **green check button**, the card provides feedback: "Invitation Accepted", with "Undo", and View" buttons. If the user clicks on the **'Undo'** button, the card switches back to its original form.
3. Next, the user can click on the **Tutorials** button at the top navigation bar. (Here, the user is free to explore the page too.) The user can click the **'Saved Videos'**, below the search bar, to toggle from Video Library to Saved Videos.
4. Next, the user should now focus on the **Friends** list at the left section. The user should **click on Join** next to **Joe's** name (Cardio 5 mins). A pop-up modal should appear with a 'Join Workout' title, 'In Progress' videos (which users can scroll to view more videos in the list). Then, the user can click **'Join'** where they are taken to the video call preview - here, they can **toggle** the camera and microphone on or off; they can also **click 'Go Back'** to return to the previous step and not join the workout. To move on, the user should **click 'Join Now'**.

5. The user is brought to the group video call. They can see users on the call at the right section. The majority of the screen shows the workout tutorial; in this section, the video countdown is displayed at the top right. On the left, there are (uninteractive here) mute/unmute, camera on/off, and hang-up buttons action buttons. At the bottom, the timeline displays the video timeline. To move to the next step in this flow, the user should **click the 'X' button at the top right corner**.
6. The user should be back at the Home page. Here, the user should **click the 'Tutorials'** button at the top navigation bar. The user is able to look around and get a sense of the layout. Next, the user should scroll down to **Recent (videos)** and **hover** over the first video card; a **'Save'** button should appear. The user should **click the 'Save'** button to save the video.
7. Next, the user should **scroll back up** - where they can view Video Library and Saved Videos tabs. The user should **click the Saved Videos tab** to view their 'saved' videos. There, they will see the tutorial videos they have saved.
8. Next, at the top navigation bar, the user should **click the 'Progress'** button. Here, the user can get a sense of the information they can track. This page was designed to display the progress tracking UI and test information relevance and hierarchy, so it is not highly interactive.
9. Again, at the top navigation bar, the user should now **click the 'Schedule'** button. They will see a planner / calendar feature. Here, the user should **click 'Schedule Workout'** at the right section below the calendar. They can then click on the date button (which triggers an autocomplete for this demo); next, **click 'Schedule'** at the bottom of the card - this simulates creating an event on the calendar which would be displayed.
10. Next, still on the **'Schedule'** page, under the **Friends** section, **click 'Ping'** next to Jennifer's name. Here, users can **toggle** the 'Private' setting and **select** Jennifer's name. Next, **click the 'X'** at the top right to close the modal without starting a workout.

These steps will take a user through the functions and components in this prototype. Some features may have more than one entry point e.g. Join workout, View calendar, but these steps ensure the user is able to interact with all the main user flows.

3.1.2 Prototype Innovation

The prototype we've created intends to combine the synchronous co-presence of video calling with structured exercise of online video streaming platforms. However, to recreate the organic, spontaneous interactions that remote friendships often lack, we enabled users to join others' active exercise session (as long as the session is marked as public). Users can also "ping" others to indicate that they are going to exercise, as sort of an open-ended invitation.

Currently, users have to juggle multiple devices and services throughout their fitness journey: different calendar or messaging applications to schedule workout sessions, real-time communications conducted through video conferencing software (like Zoom, Discord, Google Hangouts, etc.), often supplemented with exercise tutorials provided through a video streaming service like YouTube. Many users will stream the video on one device while running the videoconferencing software on another device (usually a phone), propped against a wall, door,

or table leg. After the workout finishes, users can *also* optionally record their progress in a fitness tracking app. Few of these steps overlap with another, which can make the entire virtual exercise experience unpleasant.

3.1.3 Addressing Design Requirements

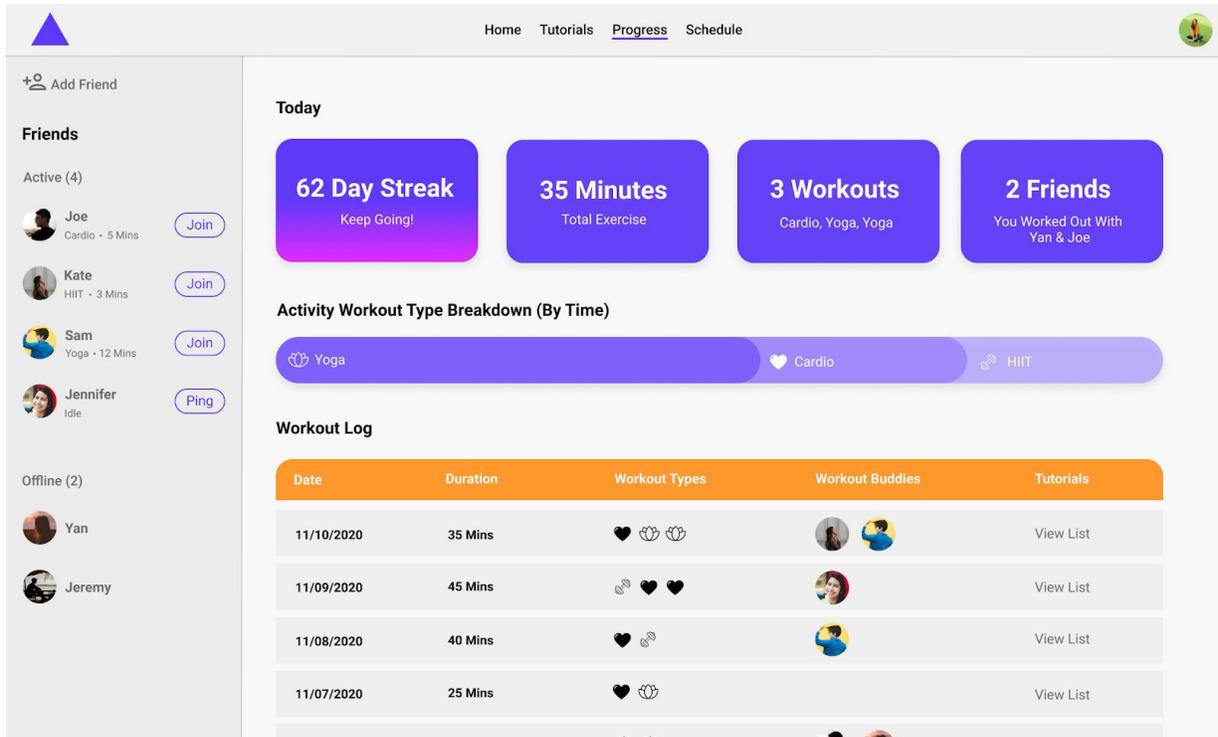
Functional

While our system supports asynchronous exercise, it heavily encourages synchronous exercise with other users, evidenced by how easy it is to get into a call with friends. From the first screen the user sees, it takes as little as 3 mouse clicks to get into a call with a friend. The home page provides three independent ways of getting into a call: one for joining another users' call, and two for starting one's own. We also ensured that joining a call with another user is easy from any part of the system by pinning the friends list permanently to the side of the page. Our system doesn't just support synchronous workout, though, it also facilitates the process.

We provide a number of different methods that facilitate synchronous exercise. Firstly, we include scheduling functionality for users to block off the time they need to exercise together. Next, by incorporating "ping"ing functionality into the system, we can streamline the process of joining in an exercise, while also suggesting to other users that their presence is desired in a session. Lastly, video calling serves as the medium by which our users can have face-to-face interaction.

Our emphasis on synchronous workouts lets us leverage the fact that social groups keep people consistently exercising [1,3–7,9]. For remote users, the most familiar and accessible approach to having a social group exercise experience is through video calling. Most modern laptops and tablets include both a video camera and microphone, and unlike mobile phones, often don't require a makeshift stand to sit upright so that the user can see their friends and the exercise material simultaneously.

Lastly, our prototype tracks users' exercise progress, both within and between sessions. Within a session, users can easily view the length that the call has been active, the current, and ending timestamps for the video currently being played, and the number of videos remaining in the queue. We also present progress between sessions. By asking users to fill out a simple questionnaire before starting their exercise journey, video recommendations can be tailored to the user's skill level. Users can also track their progress from the "Progress" page. On that page, we present users with the types of workouts that they engage in, the amount of time they've engaged in each type, the number of times they've done each workout, the most recent dates of exercise, and the people they exercise with. All of these different aspects can provide the user with indicators as to their progress as they continue to engage with their friends and the application.



Our Progress page, which describes the number, type, and dates of exercise sessions

Non-Functional

Our prototype also addresses our non-functional requirements effectively. Some are simply addressed, such as limiting video tags and content exclusively to bodyweight and at-home workout videos. By limiting our content to a specific type of fitness routine, we also accommodate people of varying skill and fitness levels, allowing them to progress with people they trust in the comfort of their own home.

However, other non-functional requirements are intrinsically baked into the application's design, like the intent for it to be run on laptops and tablets. By designing our system for large screens, we can encourage the use of larger devices (and discourage the use of smaller ones). This mitigates users' concerns regarding rapid battery drain, and encourages participants to run the system on WiFi networks, instead of their mobile data plans, which can be rapidly consumed by video streaming and video conferencing. Also, as mentioned before, by targeting laptops and tablets, we remove the need to create a makeshift stand as most of these devices can stand on their own (or have cases that enable them to stand).

Another non-functional requirement we laid out was ensuring that the user interface was always visible, so that users could remain motivated. By keeping the video tutorial the primary focus of video calls (instead of the other users), we focus the user's attention on the task at hand: exercising. That being said, we want to promote a social environment as well, so persistently

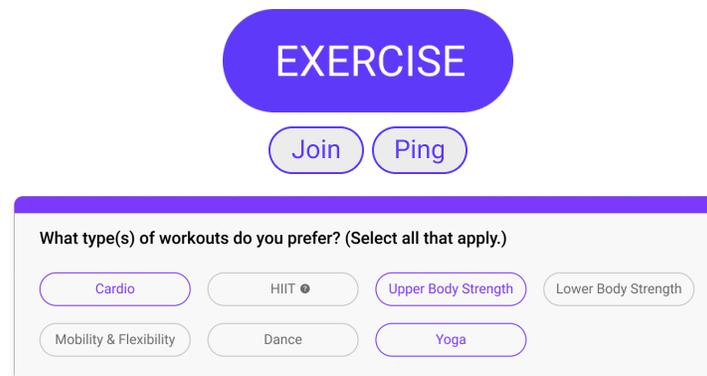
displaying other participants on the side of the screen keeps them visible, accountable, and co-present.

Lastly, we invested significant time and effort into the color scheme and characterization of our application. High-saturation, unaggressive colors were chosen to motivate action while being friendly and inviting, rather than stimulating and competitive. We also picked rounded corners for our cards and buttons to give the interface an organic, peaceful, and serene feeling.

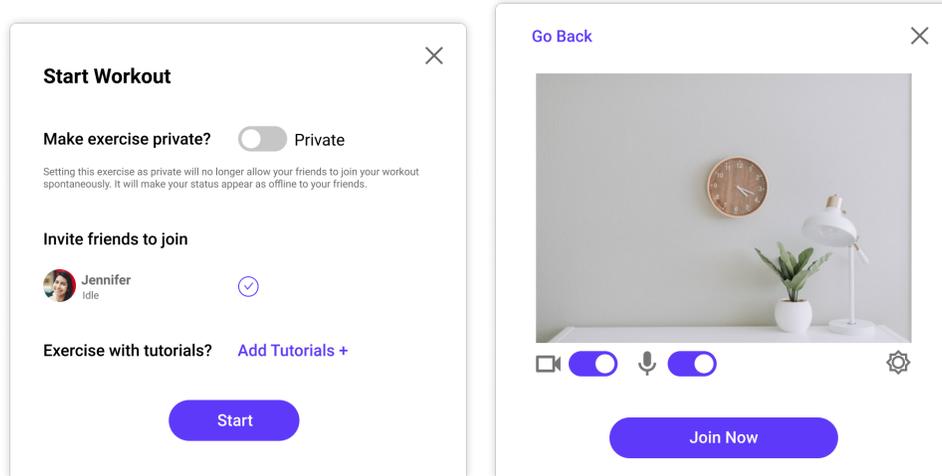
3.1.4 Reflecting Principles of Design

Consistency

Our prototype utilizes consistency to indicate and outline paths between different functionalities. Our buttons are consistently shaped to indicate actionability. In addition, to indicate to the user that they are transitioning between functionalities, we focus their attention on center-positioned dialogs with similar layouts: all dialogs can be exited by clicking the “X” on the top right corner, and clicking the primary button at the bottom-center of the dialog either brings up another dialog or ends the transition between functionalities. For example: users on the homepage choose to exercise with a friend, which immediately brings up a dialog that they use to configure the upcoming state, whether by inviting friends, selecting videos to play, or configuring their audio/video settings. When they’re finished with each stage, they click the large, purple button at the bottom of the dialog, which either presents another dialog or finalizes the transition.



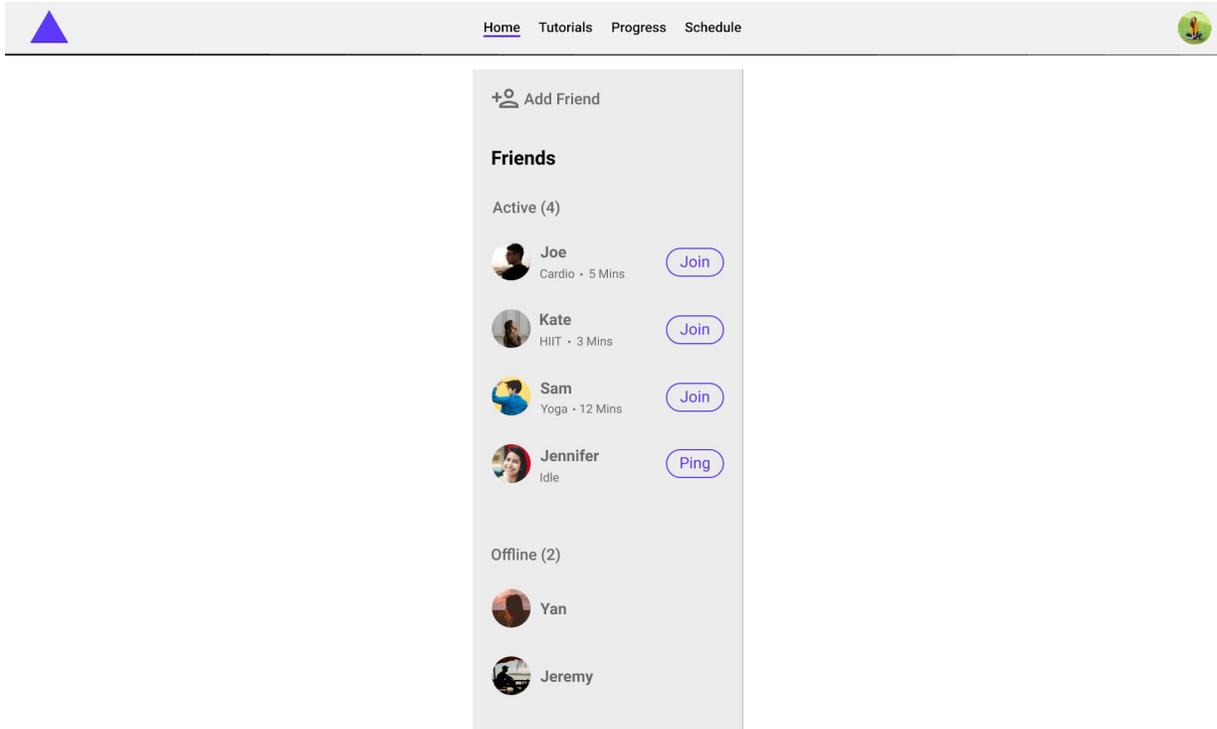
Some example buttons present in our prototype. Each button is shaped the same way to indicate its clickability.



Examples of dialogs used in our system that transition users between intermediate steps

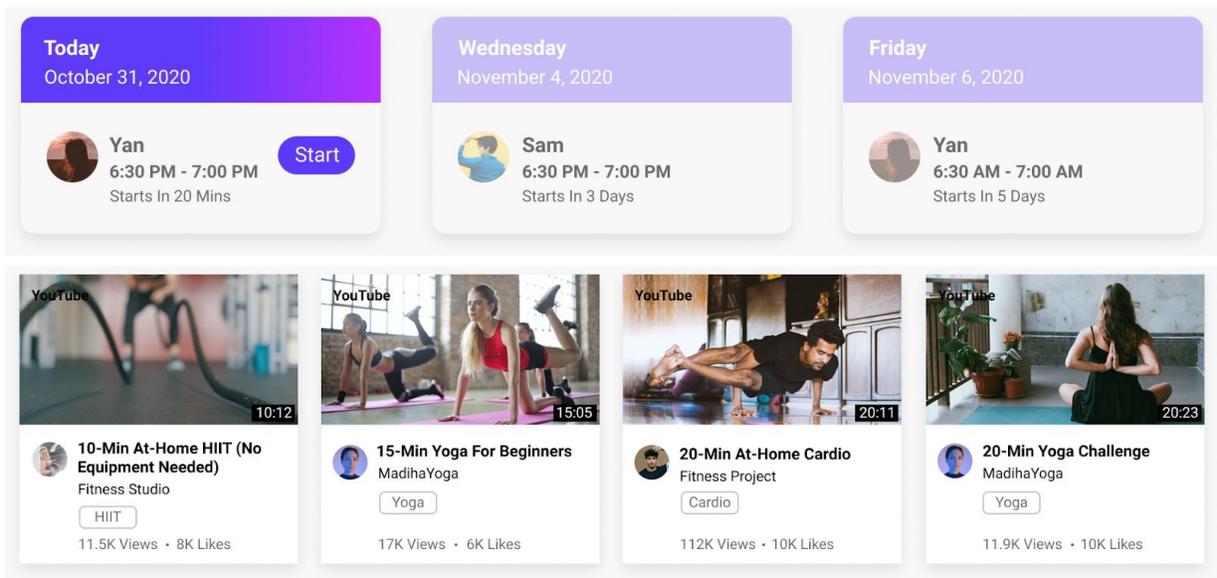
Familiarity

Instead of presenting users with experimental layouts or content organization schemes, we rely on familiar concepts that users have encountered previously to communicate information. Some examples of this include the use of a persistent side drawer for presenting users with friends and actions that they can take from any screen. These kinds of sidebars are present on Facebook, Discord, Slack, and Microsoft Teams. We also employ the use of a tab bar, allowing users to navigate between related but distinct pieces of information. These are commonly utilized in Material Design-based applications, and can contextualize the information on the screen while offering transitions to related information and actions.



The tab bar and sidebar we use to list friends and provide actions for across the application.

In addition to overall layout familiarity, we rely on cards to encapsulate and present complex pieces of data like appointments, meetings, videos, and queues to users. These paradigms are widely-used across different systems and contexts, so users can understand that the cards represent something more complex.



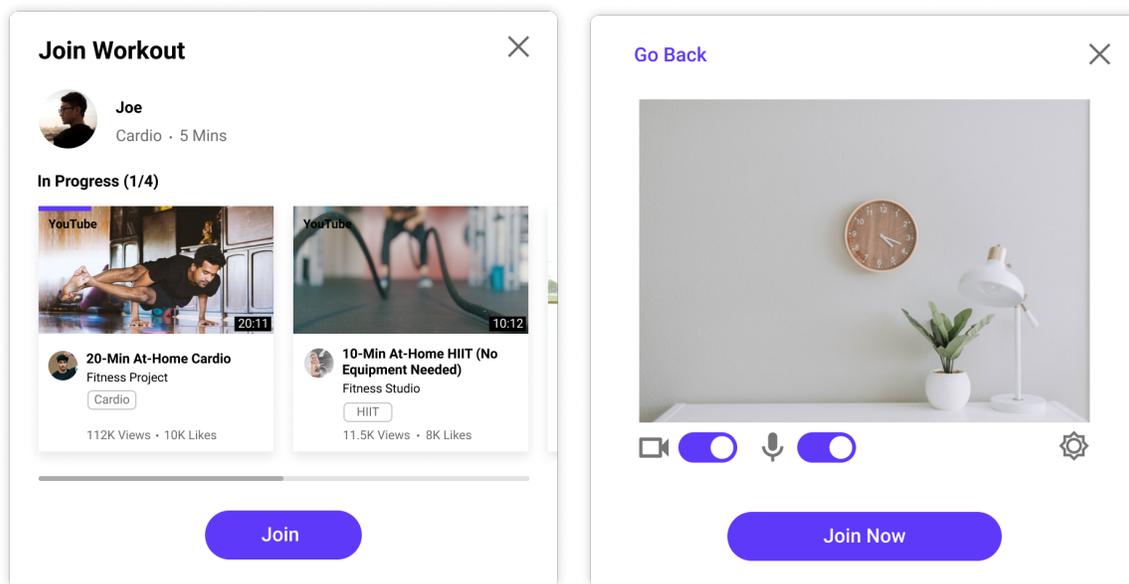
Examples of how we use cards in our application: the top row represents upcoming workout sessions, while the bottom represents potential videos to add to the queue.

Flexibility

To ensure that our application offers flexibility to our users, we enable them to access the primary functionality (video-calling with friends) from multiple different locations. Users can join a friend's current session from the sidebar drawer by pressing the JOIN button, as well as by pressing the JOIN button on a card on the homescreen. We also enable users to create calls for themselves from the same places.

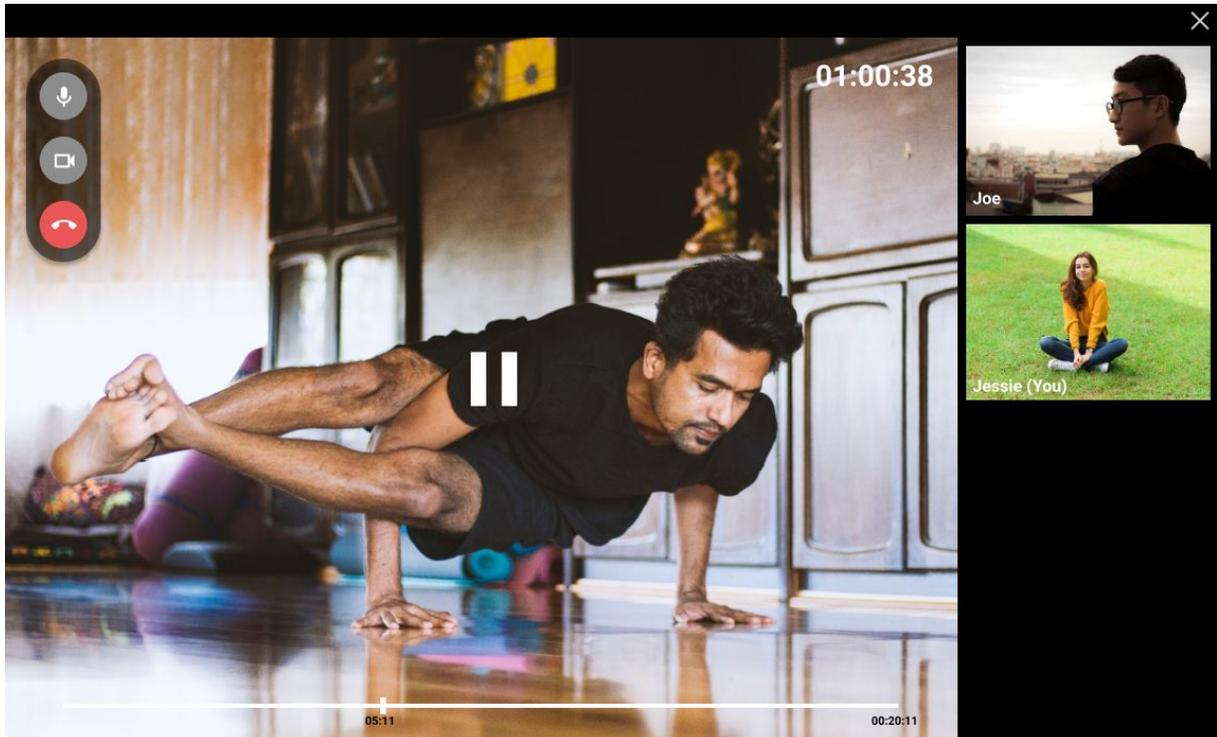
Robustness

One of the more important aspects of our system is making it forgiving. Accidentally walking in on someone exercising is an awkward and uncomfortable experience, as is joining a video call with someone by accident, or unintentionally leaving your microphone or camera on. Before a user enters another person's call, we have them both verify the user they intend to join, as well as how they want their microphone and camera to be configured. This gives them the opportunity to undo their mistake, as well as reaffirm that what they're doing is what they *want* to be doing.



The confirmation dialog sequence that users see when they click the “Join” button, allowing them to avoid mistakenly joining a call.

To ensure that users are constantly aware of our system's status, we also incorporate common traits of video calling software, such as indicating whether the user's camera and microphone are enabled or disabled and listing who's in the call. Specific to our application, we incorporate information about the currently-playing video such as current timestamp and remaining time.



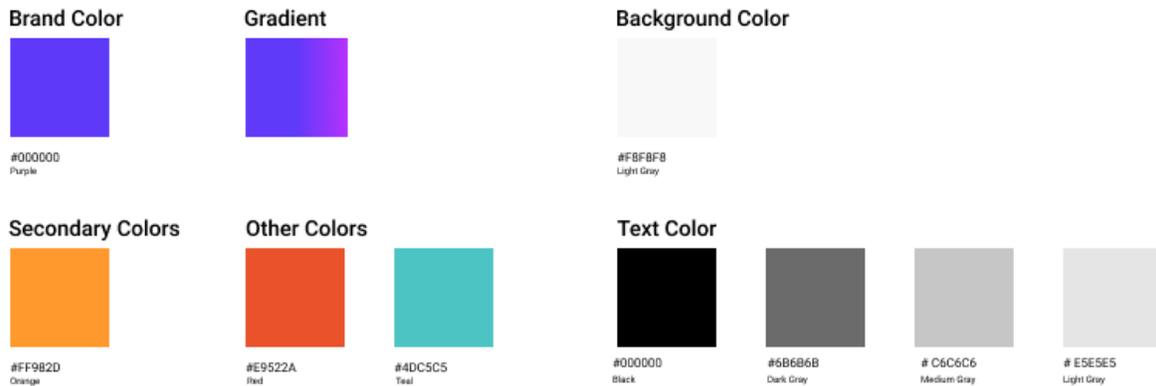
Our video calling interface. To the left is the video tutorial, to the right are the other participants.

Additionally, by using dialogs that demand the user's attention before continuing, we can give them confirmation feedback when they cancel the task they're currently completing midway through by removing the dialog and handing control back to them.

3.1.5 Visual Design

Color

Colors



Primary (brand) color, gradient, secondary colors, background and text colors

When we were coming up with the color palette for our design, our main goal was to emphasize the concept of “social fitness” and “wellbeing”, while keeping in mind our non-functional requirement of making the interface “friendly and inviting.” We chose purple as the primary (brand) color because it synthesizes the invigorating vibe of red and the stability of blue, evoking a sense of calmness and motivation. To add a cheerful and energetic touch, we decided to use a warm yellow-orange as the secondary color. Since orange and purple are complementary colors, this pair is not only pleasing to the eye, but also they contribute to the friendly, vibrant, and modern look of the interface. We also used a gradient (purple-pink) to create more visual interest and variation. Additionally, it bridges purple and orange a bit more as it represents a section between the two colors.

The primary, secondary colors and the gradient are all very saturated for two important reasons. Firstly, since the primary color (purple) is used for key action buttons, a vibrant tone and more intensity help capture users’ attention and prompt them to take immediate actions (in this case, to start exercising immediately.) Secondly, higher saturation increases the contrast between the main content and background. In fact, we used light gray, a muted color, for the background in order to avoid having too many vibrant colors compete for attention.

Since we use color blocks to highlight certain contents, we used white, black and different shades of gray for the texts and icons throughout the prototype to avoid visual noise. Considering the other colorful visual elements such as avatars, videos, and images, we balanced the visual stimulation by using saturated colors for 15-20% of the page layout.

Typography

Typography

Roboto

Title 1

28 pt

Large

13 pt

Title 2

20 pt

Regular

11 pt

Title 3

16 pt

Small

10 pt

Micro

8 pt

Space (2x Grids)

2, 4, 8, 16, 32, 64



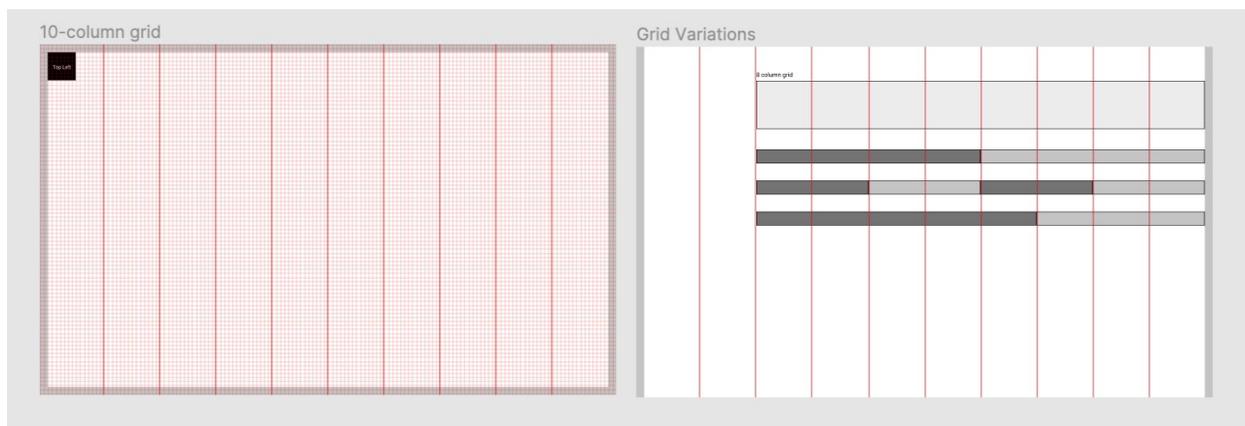
Reference

<https://learnui.design/blog/ios-font-size-guidelines.html>

Typography and Space/Grid Element guide

We chose Roboto as our primary (and only) typeface because of its legibility and versatility. Since we are presenting a lot of information, it is crucial to use a clean and easy-to-read sans serif typeface. Fortunately, Roboto not only has a geometric form, but it also features organic curves. Since our goal is to make a friendly and inviting interface, the humanist nature of Roboto conveys a sense of openness and flexibility. Moreover, Roboto is very versatile in that it has different weights (from Light to Bold), which makes it easier to create visual hierarchy and to present an abundance of information more effectively. Finally, Roboto works well on a high resolution screen such as the computer, which fits our system and its context perfectly.

Visual Structure: Grids and Space



10-column grid on the left, 8-column grid layout variations on the right

In order to ensure a consistent layout and logic throughout the prototype design, we decided to establish a grid system. We used a 10-column grid because it allowed enough flexibility while avoiding presenting too much information at once. Since our design has a “Friends” section on every page, we’re left with 8 columns for curating the content. This layout helped us maximize

the usage of empty space on the screen, and supported the notion of centered alignment throughout the interface.

The wide spacing between sections, along with clearly defined section titles, serve as section dividers in our prototype. Since we had a lot of screen space to work with, it seemed like varying the spacing between sections and elements (and implementing these “dividers” consistently) is a very effective way of grouping relevant information and conveying information hierarchy. Additionally, since we wanted to create a visually clean interface that helps users clearly visualize system functionalities and achieve their goals, it was important to clearly separate the sections and leave sufficient spaces in-between.

Texture

Radius

4, 8, 16, 32



Border



Color
C6C6C6
Medium Gray

Weight
1px

Overlay



#000000
Black
Transparency: 25%

Shadow



Modal & Menu
Elements



Content Elements (e.g.
Cards, Videos)

Texture and shape guide for visual consistency

We used shadows for the card elements, videos, and pop-ups in order to bring more contrast to the key contents and background. Card with drop shadow is an effective way of grouping relevant information together. Especially since we have a lot of textual and visual information on the interface, using bounding boxes for grouping and categorizing information can feel visually heavy and cluttered. Drop shadow, on the other hand, is more subtle and adds visual depth to the overall design.

Shape

We utilized rounded corners for most components, including cards, modal pop-up menus, buttons, search icons, tags, etc. Since we’re designing a friendly and inviting interface, elements with rounded corners appear more organic and less harsh to the eye. It helps communicate a sense of friendliness and openness, which fits the vibe of the system. Additionally, rounded corners have been adapted by many popular interfaces and is becoming a design trend.

Icons

We only used a small number of icons because a lot of visual information (colors, avatars, images, videos) are already presented on each page. Therefore, we did not want to utilize many icons as they may increase the cognitive load in processing visual information. However, when an icon is used, it is either universally comprehensible or that it comes with a text label.

3.1.6 Functional Design

Starting an Exercise

The single most important thing that users should do with this app is to just start exercising, so we wanted this functionality as simple and obvious as possible. This is why we put a big purple exercise button on the bottom of the screen. Once clicked, a modal will pop up where a user can invite their friends by selecting them from the friend list, browse and add tutorial videos to watch along to, or simply jump straight to the exercise.

Naturally, because the app is designed to promote group exercise, the start exercise flow is more complicated than merely hitting start, but we endeavored to condense and simplify the process as much as possible. Within 3 clicks a user can start their workout alone, and with a few more clicks, they can exercise along with a video.

Friends Bar

The essence of our design is friendship: getting friends to work out together. Hence why the friends bar is the centerpiece of the design. It's persistent throughout nearly every screen. We did this to encourage exercise as much as possible. No matter where a user is on the app, they'll be reminded whenever their friends are working out and that they can join them with a press of a button. This kind of friend bar should be familiar to anyone used to social media and messaging apps, and that knowledge of navigating friend statuses should be able to translate into understanding our unique spontaneous exercise flow.

User Status & Privacy

User statuses are instrumental to the function of the friends bar. Where most social media services merely inform the user that their friends are online, our user statuses display whether a friend is exercising, roughly what they're doing, and how long they've been doing it or otherwise display them as idle. This is similar to apps like Discord, where the user statuses display what games a user's friends are playing, which reminds idle users that they can play as well. We include a time indicator along with a friend's status to clue users into how far along into an exercise their friends are. We expect this to minimize awkwardness of friends joining exercises that are about to end.

Additionally, the delineation between idle and offline allows for a degree of privacy. If users wish to exercise without having anyone hop on spontaneously, they can set their session to private when they start an exercise, which will display them as offline. We wanted to avoid an explicit

“Do not disturb” mode, because we didn’t want any user to feel like their friends were deliberately trying to ignore them.

Pinging & Joining

While our status system allows users to easily observe what their friends are doing, the ping and join system allows them to easily act upon that information. Whenever a user’s friend is publicly exercising, that user will be able to click the join button by their name, view what videos they’re watching (if any), and join the video call.

Pinging works the other way around: if a user is in the mood to exercise with a friend, they can ping any idle friend of theirs from the friends bar, which will open a start exercise modal with that friend preloaded into the invite list. The process from there is the same as starting an exercise normally, so the ping flow should feel internally consistent and intuitive.

Together these systems serve the overarching goal of encouraging friends to exercise together by allowing them to join and invite each other easily at any time.

Scheduling

If users are less inclined to join or invite exercise on the fly, our system has an integrated calendar system, which allows users to set up group exercises with their friends from within the app. This grants our design some degree of flexibility with our users; if they’re not the kind to jump into exercise with their friends, they can still comfortably use this app to work out with their friends. Indeed, comfort is the operative word with this feature, because it was designed to feel exactly like every other popular scheduling app. Users can view their calendar in week view for upcoming exercises and schedule

The schedule interface functions almost exactly like the start exercise interface, in that users can invite friends and select tutorials to watch, except instead of starting the exercise immediately, the system creates an event on the calendar, and sends invitations to all invited to add this event on their calendar as well. Once made, scheduled workouts are displayed both on the calendar itself, and prominently on the home page to remind users of their obligation.

Ideally this system could be granted permissions to read and modify a user’s internal calendar, so they could see their whole schedule on the app’s calendar to work around it; however, this functionality is not currently prototyped.

Notifications

To facilitate both impromptu and scheduled workouts our system employs notifications. Whenever a user gets a ping for exercise or an invitation to a future workout, it pops up in the right hand corner of the app for a brief period of time, where the user can accept or decline it. If a user misses the notification popup, it will also appear in their notification feed on their home page, where it will stay until the exercise organizer has completed the workout.

Video Conferencing

The video conferencing interface we designed should look familiar to anyone who's ever used a comparable solution like Zoom or Teams. Because we weren't reinventing the wheel for this feature, we decided to make it feel as familiar as possible: the same mute video/audio and leave buttons and the video feeds of friends arranged in a grid on the page.

We endeavored to make the interactive elements on this page fairly large without compromising on screen space, so that users can still effectively interact with the screen while they are fatigued. Similarly, we pared down the interface to the bare essentials, so that users wouldn't want or need to fiddle with any features in a way that would distract from just starting their exercise.

Videos & Tutorials

Our video system exists to facilitate exercise. Users told us that they watched tutorial videos while they exercised in groups, so we decided to fully integrate this feature. Before starting a workout, users can search and select videos and then watch them on the video call screen once they start exercising. Prior to starting a workout, users can browse videos on the tutorial screen and save them for easy access once they start exercising. These videos would be scraped from public sources like Youtube and would be streamed through an embed in the video call screen.

We also maintain a list of recommended and recent videos and display them in the tutorial search box in case users want to try something new, or easily keep up with the same routine.

If multiple users are watching the same exercise video, the video navigation options (pausing, next video) would be synced across each client. While this can be abused by an annoying friend pausing the video for everyone else, we feel that prioritizing synchronicity is more important.

Tags

Tags may seem like an obvious feature to simplify and organize our search functionality, but we chose to add them for an even grander purpose. Tags were needed to buttress our status, progress tracking, and recommendation functionalities. Because videos have tags on them, whenever a user selects one to work out to, we can set their status to what the tag describes, and their friends can now get a rough approximation of what that user is doing. Further, we can leverage these tags to make our progress tracking more personalized without requiring excessive user input or extra sensors. Finally, we can take that more personalized exercise data and use it to serve better video recommendations to our users.

Onboarding

To better leverage our user analytics and tracking, we designed a simple on-boarding process. This has a dual purpose: improve our recommendation system and prime users to commit to an exercise regimen. The former should be fairly straightforward, in that the data provided in the onboarding can help the system tailor video recommendations for the user. However, the latter

is also important; because we prompt the user to commit to a style and length of workout, they may feel more compelled to follow through with their stated goals.

Modals

Our design features an abundance of modals. We felt like this design pattern was best suited for our system because modals effectively constrain and focus user actions without navigating them away from where they were. Our app displays a lot of information, and it would be overwhelming to have every action take place among all that density, so for actions like starting an exercise or scheduling a workout, we employ modal flows that contain a limited number of functions. Modals have the added benefit of keeping navigation eminently recoverable. If a user decides that they no longer want to pursue the goal they had, they can simply exit out of the modal and return to where they were in a single click. No time wasted navigating back through several menus or lost scroll positions.

Desktop Interface

We knew we needed to design a desktop interface because our users noted how much they enjoyed being able to see their friends while they exercised, and a phone screen just wouldn't be large enough to comfortably house multiple video streams. The size also allows users to clearly see any videos they're watching, which is helpful if a user is unfamiliar with an exercise. They may need to study the video in detail in order to replicate the motions.

This does, unfortunately, sacrifice the portability of the design quite a bit compared to a mobile app, and thus the spontaneity of it. However, we believe that conforming to user expectations with video conferencing and squeezing the most out of their video-watching experience is worth the sacrifice.

3.2 Prototype

Link to Figma prototype:

<https://www.figma.com/proto/ADmy93KpC8zKC12Cm1vgVe/Visual-Language?node-id=186%3A802&scaling=min-zoom>

04 Evaluation Plan

The table below outlines our evaluation plan. The first column refers to the updated functional and non-functional system requirements. The next column refers to our **evaluation goals** which are defined as '**Metrics**', including '**Reason**' to justify our operationalization. The '**Methodology**' column outlines the research method and brief overview of execution.

The **location** of our study depends on the metric and method being used. For passive evaluations, we plan to conduct them indoors / virtually within a naturalistic environment as

users interact with the prototype. These passive methods are user interviews, surveys, and longitudinal diary studies. For active evaluations, i.e. related task performance with prototype, we plan to conduct these virtually and / or in person. These evaluations include user task analysis whereby we need to measure things such as misclicks, time taken to achieve set user goals, and task success rates. Additionally, we intend to have recordings of the sessions (in-person and / or virtual) with sufficient detail to analyze the recordings further for those measurements if needed; however, the measurements would be recorded during the sessions by the scribe. For passive tests such as surveys, these may be conducted during, after, and/or independent to the user testing sessions. Some surveys are shorter and related to the particular user testing session, while others, such as affinity to video workout tutorials may be deployed independent to the user testing sessions.

In terms of participants, we plan to adhere to our target population that was defined in our problem statement. Thus, they are:

Participant inclusion criteria:

- Between 22-34 years old
- Intermediate workout experience (1-2 years)
- Has stable internet access
- Has working laptop, desktop computer, and/or tablet device
- Has motivation / need to maintain consistent exercise routine

Participant exclusion criteria:

- No internet access at all
- Underlying, critical health issues (medically unfit to conduct unsupervised exercise)

Passive task - Ask for user to reflect
Active task - Ask for user to perform a task & measure their performance

Requirement	Metrics	Methodology	Justification
Functional			
The system supports asynchronous workout, but highly encourages	User affinity towards the idea of remote sync workouts <i>Reason: Key to know user attitudes and expectations before they interact with the system; can inform onboarding experience or</i>	User interview: Ask user before evaluation whether they currently do remote sync workouts & ask after evaluation whether they (1) would be more likely to do so with this app and (2) if they	Evaluate attitudinal factors in relation to natural use of product and requirement

synchronous workout.	<i>overall system feel</i>	already remote sync workout if this app would make that easier	
	Usability of video call flow compared to competitors (should be as easy or easier) <i>Reason: Key to ensure that user expectations and existing mental frameworks align to encourage synced workouts</i>	User task analysis: First, allow users to explore and be familiar with system flow. Then, compare video call flow to baseline (Zoom/Teams) against prototype. Test for time taken and misclicks (errors).	Test scripted use of system in relation to task and system requirement
		User interview: Ask user if they felt the flow was faster/easier than competitors	Evaluate attitudinal factors in relation to existing mental frameworks
	Affinity towards scheduling remote sync workouts <i>Reason: Key to measure user behavior & frequency to understand impact/helpfulness of this feature in relation to supporting online meeting times</i>	User interview: Ask user before evaluation how / if they schedule workouts with others & ask after if they would be more likely to do so with this	Evaluate attitudinal factors in relation to natural use of product and user goals
	Usability of scheduling function compared to competitors (should be as easy or easier) <i>Reason: Key to measure user ease in scheduling meeting time as it affects affinity/ability for synced vs unsynced workouts</i>	User task analysis / A/B Testing: Compare video call flow to baseline (Zoom/Teams). Time users setting up a video call in prototype vs. Teams & count errors	Evaluate usability of system compared to existing systems; understand user expectations and mental framework
		User interview: Ask if user prefers this to their current scheduling workflow; if not, then ask if they would at least use this integrated feature or would prefer to use external system	Evaluate attitudinal factors and predict degree of system facilitation
	Usability of ping system <i>Reason: Key to evaluate if notification system is</i>	User task analysis: Test user receiving notifications	Test scripted use of system in relation to task

	<i>user-friendly as it affects user awareness and engagement with other users which affects synced workouts</i>	1. Clarity of notification 2. Ease of user reaction	and system requirement
		User task analysis: Test user sending notification	Test scripted use of system in relation to task and system requirement
		Ask user if they would be comfortable with this system 1. Pinging their friends 2. Being pinged Do they think this would compel them to workout more?	Evaluate attitudinal factors in relation to natural use of product
The system should facilitate remote synchronous workout	User affinity towards video tutorials <i>Reason: To understand the impact / urgency of this feature in relation to user needs & expectations when working out remotely</i>	Survey: Ask how user feels about video tutorials during exercise Do they watch them now? Would they watch them? Do they find them helpful? In what way do they find them helpful?	Evaluate attitudinal factors in relation to natural use of product and current behaviors
		Usability of workout tutorial discovery system <i>Reason: Key to ensure that one of the main system features i.e.. workout tutorials, support and enhance user experience in an impactful way</i>	User task analysis: Test usability of tutorial page adding to favorites
	User interview: Ask user preferences / attitudes towards video tutorials Ask how user currently finds tutorials		Evaluate attitudinal factors in relation to natural use of product
	Usability of tutorial watching system <i>Reason: Key to ensure that the remote/virtual experience is supported by having a seamless and intuitive (workout) tutorial watching system</i>	User task analysis: Test usability of tutorial selection and watching; measure rate of task success versus misclicks & failure rates	Test scripted use of system in relation to task and system requirement. E.g. happy path for users to search videos, filter

			results, save to list, etc.
		User interview: Ask if this better facilitates exercise Ask what were the challenges to navigate and use the system	Evaluate attitudinal factors in relation to natural use of product
The system promotes consistency of exercise through group socialization regarding exercise	User affinity towards group exercise <i>Reason: Key to understand significance and impact of group workout with user workout consistency</i>	User interview: Ask user if they currently or would enjoy working out with friends	Evaluate attitudinal factors in relation to natural use of product
	User belief that they would be more consistent with friends <i>Reason: Key to measure to ensure that user belief aligns with actual behavior</i>	Longitudinal study: Firstly, diary studies to track participant activity and consistency. Advantage: dig deeper into user experience, the 'whys' of their actions. Cons: time consuming, reliant on self-report data. Have question about tutorial videos (would they help with consistency) Thus, combine with: Data analytics to track user usage of the system. Advantage: could be faster and cheaper to get data; not reliant on self-report and no need to compensate participants; non-invasive. Con: leave out the 'whys' of user behavioral pattern in the data	Evaluate attitudinal factors in relation to natural use of product in the long run to gauge consistency
	Usability of friend adding & inviting friends to workout together, compared to competitors <i>Reason: Key to understand</i>	User task analysis: Have user add a friend 1. On the app 2. Not on the app Then have user invite	Test scripted use of system in relation to task and system requirement

	<i>usability of the system experience in relation to friends (i.e. other users) to ensure coherence and support for consistent and seamless group sociability</i>	multiple people to workout together	
		User interview: Ask how this feels and also how it compares with common friend / social apps like Groupme, Facebook messenger, etc.	Evaluate attitudinal factors in relation to existing systems and current user expectations
	Usability of join system <i>Reason: Key to measure and ensure effortless joining of workout sessions so users are able to connect with other users i.e. friends; this is key for the social aspect (& social engagement) of our system</i>	User task analysis: Test user joining a workout they have committed to	Test scripted use of system in relation to task and system requirement
		User task analysis: Test user joining a workout they haven't committed to	Test scripted use of system in relation to task and system requirement
		User interview: Ask user if this system would compel them to stick to their schedule more	Evaluate attitudinal factors & predicted user behaviors
		User interview: Ask user if they would feel comfortable joining a workout mid-flow	Evaluate attitudinal factors in relation to natural use of product
The system keeps track of user workout progress	Information relevance <i>Reason: Key to ensure that information shown is relevant and meaningful for user tracking</i>	User think aloud: What other information do you expect to see here? What information is helpful for you to see?	Evaluate information relevance and user expectations
	Usability to understand and use components <i>Reason: Key to ensure that the UI allows users can synthesize the information and achieve their intended tracking goals</i>	User think aloud: What do you think you can do on this page? E.g. What can you view and track? What else do you expect to see here?	Evaluate user mental framework and expectations
Non-functional			
Involves bodyweight	User ability to find space with laptop/tablet	User interview: Ask user to look around	Evaluate practical / physical factors

workouts exclusively	<i>Reason: Key to ensure user experience, albeit seemingly indirect to requirement, yet vital for UX/ 'feel' in regards to physical space; need to ensure that user context fits this requirement</i>	their home (or recall it) and ask if they can find space to exercise	in relation to natural use of product
		Contextual inquiry : Ask user to set up their laptop/tablet safely in a way they can see and be seen Observe use of space with device set up and workout space	Test scripted use of system in relation to environmental context
The vibe of the system should be friendly and inviting; exercise should feel rewarding and promote camaraderie	User affinity to design <i>Reason: Key to measure the impact of the UI & UX design to ensure users feel what was intended in requirement</i>	Survey: Ask users to rate what feelings they had when using the app and which were strongest Ask if these feelings persisted and if/where they stopped	Evaluate emotional, attitudinal factors in relation to natural use of product
The interface should be clearly visible so users can act towards their intended goals	Usability of tutorials taggings and recommended video section <i>Reason: Key to know that users are able to leverage system behavior to suit their intended goals and personal preferences</i> <i>*Note: this requirement overlaps with other metrics (e.g. joining workout, scheduling, inviting friends)</i>	User task analysis: Ask user to view tutorials based on given category Ask user to access recommended video section and 'start' a workout session	Test scripted use of system in relation to task and system requirement
	Usability of video call flow <i>(Also included in previous requirements)</i>	As mentioned in previous requirement segment	
	Usability of scheduling function <i>(Also included in previous requirements)</i>		
	Usability of ping system		

	<i>(Also included in previous requirements)</i>		
	Usability of workout tutorial discovery & watching <i>(Also included in previous requirements)</i>		
	Usability of friend adding & inviting friends to workout together <i>(Also included in previous requirements)</i>		
	Usability of join system <i>(Also included in previous requirements)</i>		
The system should work on laptop / desktop / tablet devices	User preference for different platform <i>Reason: Key to evaluate if this requirement suits user current needs, experiences, and expectations</i>	User interview: Ask user which devices they use to conduct their workouts (either remote sync or not) If they don't conduct remote sync workouts, ask them if the prospect of using a laptop/tablet would be too much of a change If they do, ask if they feel fine doing so	Evaluate current use and mental framework
	User affinity for laptop/tablet over the course of testing <i>Reason: Key to evaluate user affinity to ensure their preferences, openness, and expectations are measured for this requirement</i>	User interview: Ask user if they were satisfied with the interface on their laptop/tablet (both in regards to using each feature, but how those features held up during setting up/executing an exercise)	Evaluate robustness of system in relation to user goals and needs
Promotes accessibility by accommodating different exercise needs	Search filters, diverse categories <i>Reason: This metric helps us measure which parameters are most meaningful and relevant to our users</i>	Closed card sorting: Allow users to create their most often used search videos and group them into categories	Evaluate user mental framework, current behaviors, and expectations in relation to the system design

	<p>Onboarding system, select preferences, levels <i>Reason: This metric helps us measure user first impressions and emotions (e.g. comfort level) during the onboarding process; it is key as it affects user openness to continue signing up and actually use the system. This metric also tests for personalization & accommodation for varying user needs and experience level which is the requirement</i></p>	<p>User task analysis: Allow users to undergo onboarding flow, select their preferences, experience, and goals. Combine with an interview.</p>	<p>Test scripted use of system in relation to task and system requirement</p>
		<p>Interview: Ask them about their onboarding experience</p>	<p>Evaluate attitudinal factors in relation to natural use of product</p>

05 Team Member Contributions

For this assignment and phase in the project, each member (ordered alphabetically by last name) contributed as self-reported in the bullet points below.

Britain, Gabriel

- Attended meetings on time and contributed to ideation, critique, and problem-solving during the sessions
- Wrote the introduction of the report
- Wrote the Prototype Innovation, Addressing Design Requirement, and Principles of Design (sections 3.1.2 - 3.1.4) of the report
- Reviewed and gave feedback on high-fidelity mockups and interaction flow

Britti, John

- Attended meetings on time and contributed to ideation, critique, and problem-solving during the sessions
- Designed low-fidelity wireframes for Home screen, friends bar, friend/group pages, and start exercise screens
- Designed high-fidelity mockups for Schedule screen
- Contributed to smaller aspects of other screens in high-fidelity mockups
- Drafted Evaluation plan
- Wrote the functional design section
- Compiled high-fidelity mockups and created the interaction flow for the prototype
- Finalized document for submission

Tan, Phoebe

- Scheduled and sent meeting invites
- Attended meetings on time and contributed to ideation, critique, and problem-solving during the sessions
- Designed low-to-mid fidelity wireframes for Calendar and scheduling user flow
- Designed high-fidelity 'Track Progress' screen
- Explained Prototype behavior & description
- Elaborated evolution of System requirements (Functional & Non-functional), as well as justifications for the changes
- Wrote, refined and elaborated Evaluation plan
- Worked on some prototype UX writing e.g. On-boarding questionnaire

Zhang, Wenrui

- Attended meetings on time and contributed to ideation, critique, and problem-solving during the sessions
- Created & finalized visual design language

- Designed low-fidelity wireframes for “Track Progress” and “Tutorials” pages
- Designed mid- and high-fidelity mockups for Onboarding questionnaire
- Designed mid- and high-fidelity mockups for “Home” and “Tutorials” screens
- Designed mid- and high-fidelity mockups for “Start (a scheduled exercise)”, “Exercise”, and “Ping (friends to join exercise)” flows (and the corresponding visual components)
- Wrote the visual design justification section in the report
- Helped with project management and assigned design, evaluation plan, and report-writing tasks

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