Tufts University

Clocky
ENP 163 Extended Semester Project

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Topic

Problem Statement

Existing time management applications offer varying features and resources, resulting in the need for a single application that allows users to combine all of their personal and professional scheduling needs in one place with an emphasis on social connectivity and sharing group availability with other users.

Overview

Schedule planning tools have become a common fixture for many people, to help with managing personal and professional commitments. Common tools include Apple Calendar, Google Calendar, Microsoft Teams, Calendly and When2Meet. Apple Calendar and Google Calendar are automatically available to users with Apple products or Google accounts, and offer features such as creating calendar events, setting alerts and reminders, inviting other users to the event, etc. Calendly is a scheduling platform, commonly used by professors or working professionals, that allows users to display their availability for meetings to other users who can sign up for an available time slot. When2Meet is another scheduling platform, commonly used by college students, that allows a group of users to indicate their availability and produces a visual graph that indicates the best meeting time based on the availability of the entire group. While all of these tools offer valuable features and resources, each tool has a particular focus and offers different services than the others.

Research

Research Objective

Our research focused on improving user satisfaction with schedule planning tools. As of 2020, around 70% of adults use a digital calendar for time management (Admin, 2020). Our team observed that while many people use schedule planning tools, they often have to use several different tools with varying features in order to achieve all of their needs. College students, working professionals, and many other groups rely on schedule planning tools to manage personal and academic commitments, schedule meetings, and set alerts and reminders to stay on track. We decided to address this issue using our human factors background to develop a solution that combined our needs into a singular schedule planning tool. Upon choosing this topic, we chose our research objective: What challenges do people (18+) face when using schedule planning tools, and which features and capabilities do they wish were included in schedule planning tools?

Methods

We administered a Qualtrics questionnaire to gain insights into user preferences, needs, and pain points with existing schedule planning tools, conducted gap analysis based on the questionnaire responses, and conducted in-depth interviews with questions tailored to insights gained from the gap analysis. The Qualtrics questionnaire had 14 questions and was administered

to 27 participants. The in-depth interviews were conducted with 12 participants. 2 interviews took place in a focus group, and the other 10 interviews were conducted one-on-one via Zoom. The focus group lasted approximately 30 minutes, while the online interviews lasted 20 to 30 minutes.

Data Analysis
Questionnaire
  The questionnaire included multiple choice and short answer questions asking participants to select their most commonly used schedule planning tools, select their favorite tool, select their reasons for using these tools, rate their experience using these tools, identify challenges with using these tools, and to identify suggestions and desired features for schedule planning tools. Google Calendar and Apple Calendar were found to be the most commonly used schedule planning tools, with 56% of respondents choosing Google Calendar as their favorite. The most common reasons for using schedule planning tools were for work meetings (27%), personal time management (21%), friends, family and community activities (16%), social and networking events (14%), academic project meetings (11%) and selected hobbies (9%). On average, participants rated their experience using schedule planning tools 3.85 out of 5 stars. Participants noted positive attributes of schedule planning tools such as "syncs across my accounts" and "keeps me up to date on meetings and social commitments" while negative attributes such as "hard to find one that has good fleshed out features" and "confusing to navigate". When asked what changes should be made to improve schedule planning tools, participants identified more customization, additional features and plug-ins, more minimalistic interface design, social components to view others' calendar availability, and additional synchronization with other apps. An overview of the questionnaire is located in Appendix A and an overview of the questionnaire results is located in Appendix B.

Gap Analysis
  After reviewing the results of the Qualtrics questionnaire, we conducted gap analysis to identify the gaps that exist in current schedule planning tools and develop an action plan for addressing these gaps for our design solution in the future state. The gap analysis is located in Appendix C.

Interview
  We interviewed seven female identifying and five male identifying individuals. Participants' ages are 22, 22, 23, 23, 24, 25, 25, 26, 28, 33, 40, and 60. We mostly interviewed adults in the early stages of their career. Of the seven participants that disclosed their race, six identified as Asian, and one identified as white. Two participants joined their interviews from Taiwan, and the remaining ten participants participated within the United States.
  All twelve participants relied on a combination of messaging and emailing to coordinate events. We found that overall attitudes towards group communication and scheduling changed

drastically with the participant's age range. Participants ages 22-24 were heavily influenced by their institution's deadlines. Participants aged 25 and above were conversely focused on their job and personal free time. The two oldest participants saw significantly less difficulty with group scheduling overall. We can conclude that university students and early college grads may intuitively understand and identify a need for group collaboration tools. Interview participants that mentioned research and group projects were more likely to list multiple calendar apps like Apple Calendar and When2meet. Older participants mentioned Microsoft Teams. Microsoft Teams is a noteworthy competitor due to the fact that Teams is a professional-level software as a service, most commonly purchased through employers for company-wide communication.

Google Calendar was the most popular app among participants. Google Calendar was mentioned by five of the participants, and three of those five participants relied solely on Google Calendar for event tracking. Despite that, all twelve participants used an Apple iPhone as their mobile communication device. Eight of the participants mentioned Apple's data ecosystem and the ease of sharing between apple devices. In fact, three users mentioned using Apple Calendars, and one of those three users relies solely on Apple Calendars for time management. Notably, only three participants specified that they use iMessages for group messaging.

All twelve participants mentioned a desire for a healthy work and life balance. The focus group participants desired more time to cook and eat healthy foods with their busy schedules. The older participants desired self-care time and regimented exercising. At this point in time, Google Calendar, Apple Maps, and Microsoft Outlook do not promote goal creation or emphasis on work/life balance.

Our results underscore the complexity of event scheduling from an individual's perspective. For our participants, group communication occurs on multiple email and text message threads. College-attending participants were the most concerned with work-life balance, and simplistic group coordination/communication, while the oldest participants were highly interested in their physical health. Based on these findings, our product has considered the user's overall wellbeing with regard to their day-to-day activities. An overview of interview questions and responses can be found in Appendix D.

Research Insights
Based on the insights from the questionnaire results and the interview responses, we used Miro to create affinity diagrams, empathy maps, journey maps, and user personas located in Appendix E. Significant takeaways from our research include:
- Users do not have a streamlined solution for planning collaborative projects
- Users feel ill equipped to manage work/life balance
- Users wish to add healthy habits to their routine like exercise and meal planning
- Users do not have elegant solutions to rescheduling or managing last-minute plans
- Users want to be able to schedule events based on everyone's availability and automatically create an event in the same page

- Users want social connectivity integration to view friends/family availabilities and schedules
- Users want integrated features such as traffic and weather reports
- Users want more opportunities for customization
- Alerts and reminders are the most important aspect of schedule planning tools for users

**First Iteration Design Solution**

Design Process

      For our solution, we developed a time management app prototype that allows users to coordinate all their personal and professional schedules in a single app. We intended for our app design to focus on social networking and letting users share group availability with each other. We started with initial market research to generate ideas, in which we analyzed some of the most well-known related apps, like Calendly, When2Meet, and Google/Apple Calendar, to learn about their features and ui designs. We then had a brainstorming session to collect ideas and decide the direction for our app design. Each team member came up with various ideas and functionalities that would make the app better for users. After our team members decided as a group on the features we wanted to include, we started our wireframes. Our initial outline and wireframes showed the basic structure and function of our app. Then, we completed the detailed mockup and final prototype. We added colors and fonts to make our wireframe more concrete and real. Finally, we completed the final prototype, which allowed us to test functionality and usability, and complete later evaluation and modifications.

Figma Prototype

Onboarding Screen:

The login page of our app has a very concise and minimalistic design, making it easy for new users to understand and use. Users are prompted to login or create an account, then select their priorities for using Clocky and select their current location.
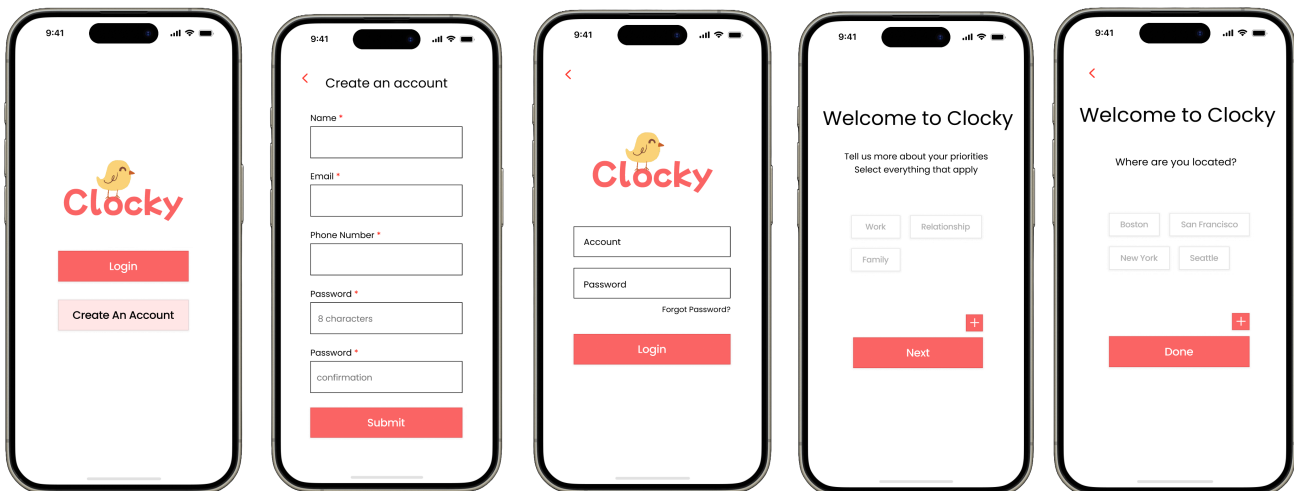
Setting Pages:

The setting page allows users to customize their account, notifications, accessibility preferences, and privacy preferences. For the Account tab, users can edit their profile, change their password, invite friends to join Clocky, and change their account. For the Notifications tab, users can turn on feature and app updates, turn on tips and suggestions, turn on updates of other user's modifications, and turn on activity recommendations. For the Accessibility tab, users can turn on audio descriptions, turn on the magnifier to improve legibility, turn on voice control, and turn on touch duration. The Preferences tab allows users to select font size, display brightness, and language. The Privacy tab allows users to view their friend's permissions, information and authorizations, personal information collected from Clocky, and information shared with third parties.
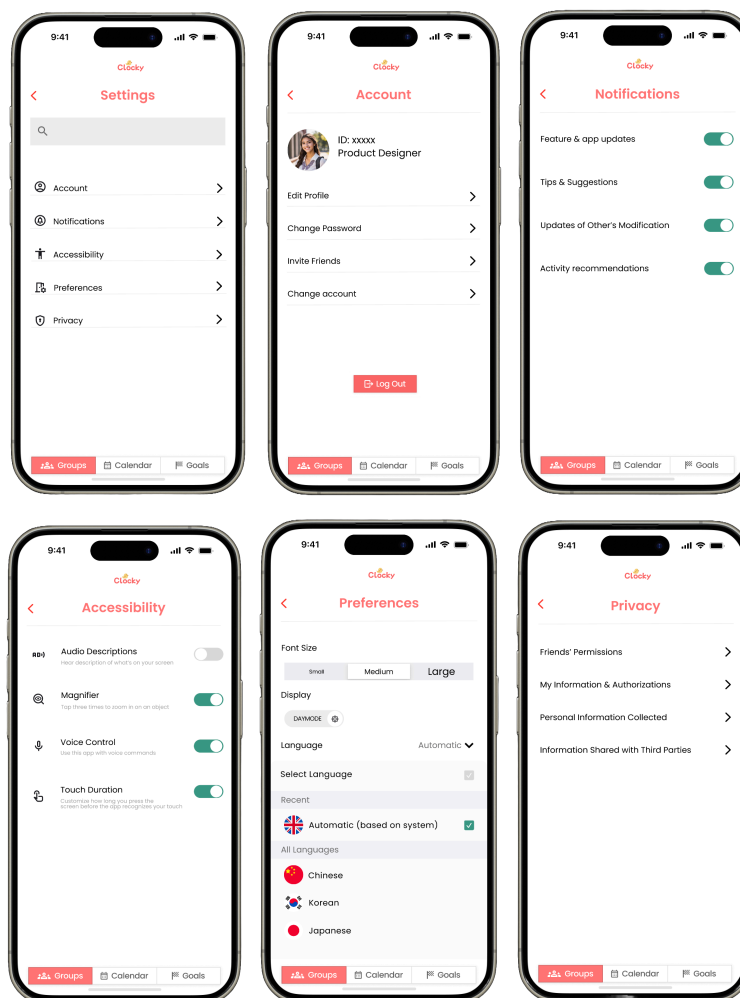
Groups:

These pages allow users to know what events are happening and allow them to join different groups or create their own group. Users can add members to create new groups, and share their availability and upcoming events with members within the group. The upcoming tab view shows

users their upcoming events, the groups tab displays all of the groups the user is a part of, and the availability tab allows users to set their availability (work and personal) for other group members to view.
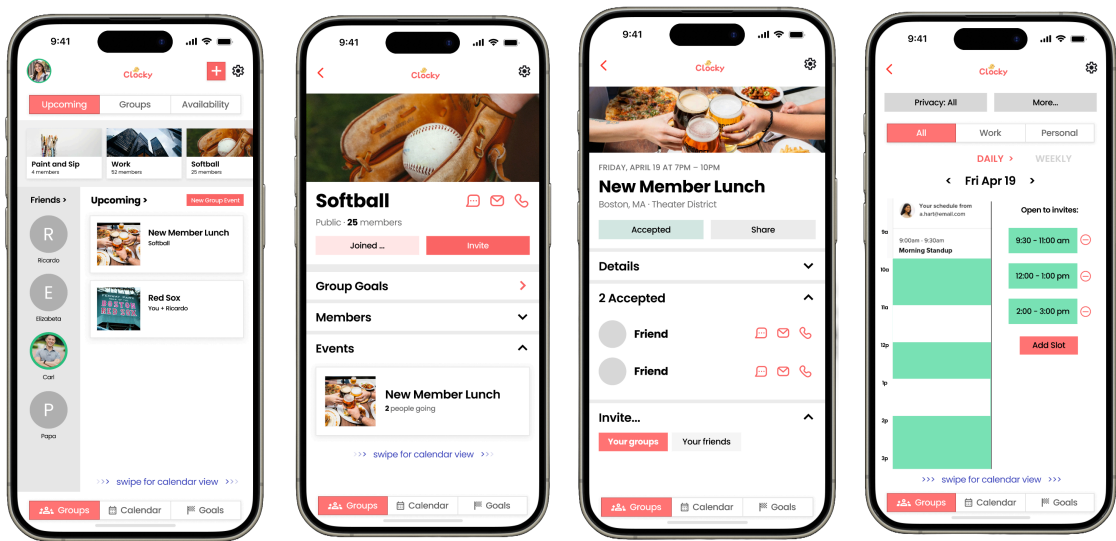
Goals:

The goals page allows users to create goals and track their progress. Users can create a new goal and customize their reminder alerts and progress bar color. After creating a new goal, users can fill out the goal log and also view suggestions to help them work towards their goal. On the goal dashboard page, users can view their progress for each of their goals and check off action items.
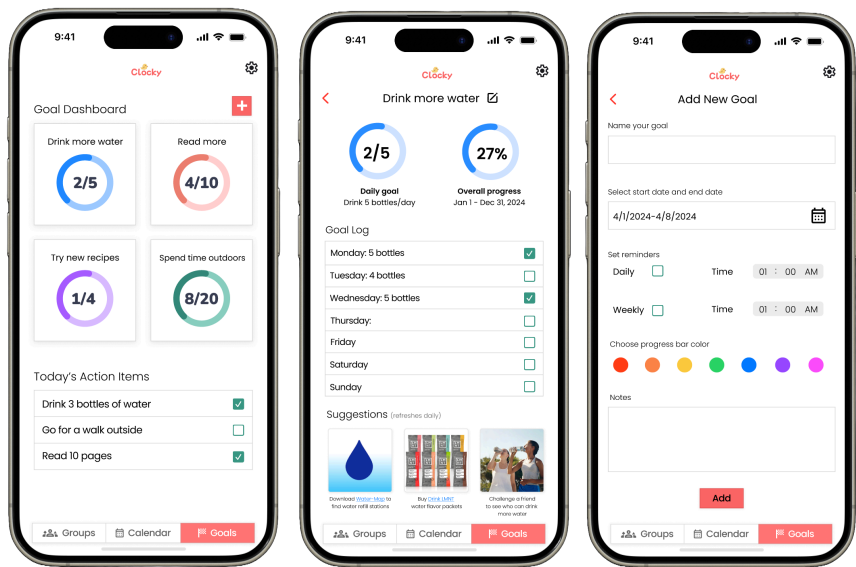
Calendar:

The Calendar page is the home of Clocky. There is a main calendar that users can navigate through to view their schedule and upcoming events. Users can view their upcoming events, and categorize them (Personal, Work, etc). Users can also view their groups, and edit their shared availability to share with the group in order to find common meeting times. When creating a new event within a group, users can set the time, best group availability, set reminder alerts, add the event location and ant attachments, and message members within the group.
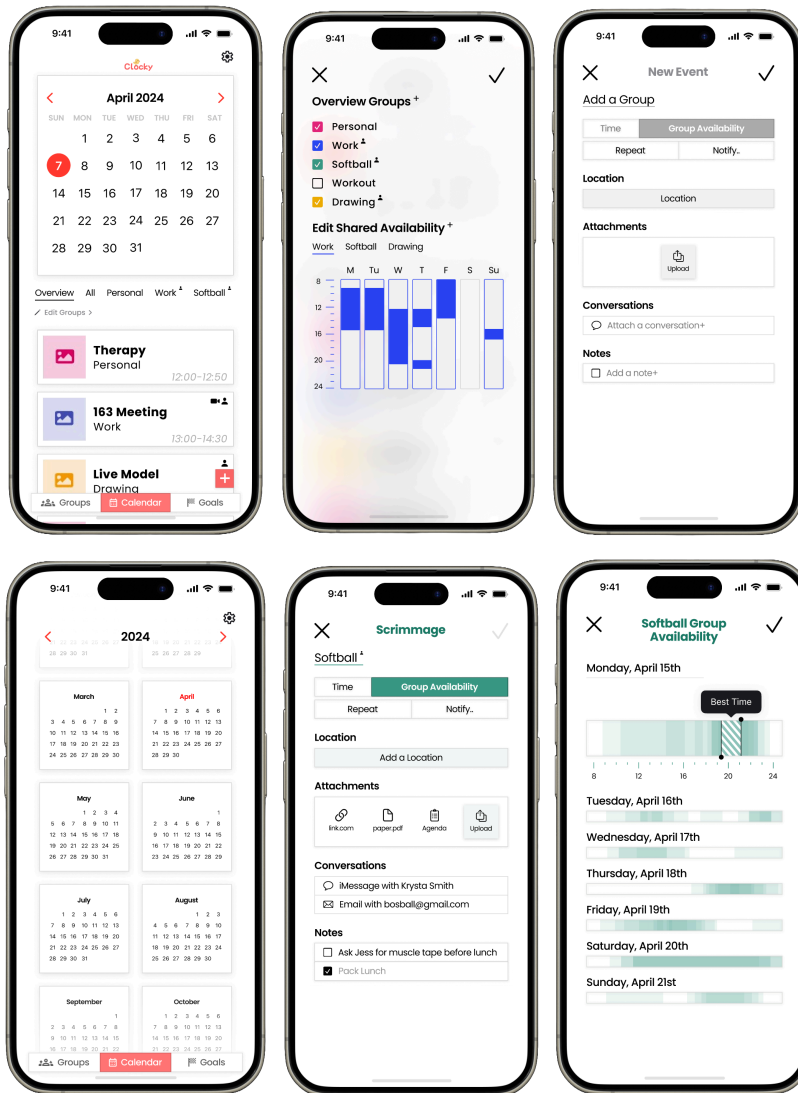
Human Factors Analysis

Task Analysis

Our team conducted a task analysis in order to better map out and understand the tasks that would be needed for a user to accomplish their goals with our app, as well as to document the steps in our workflow. Our task analysis included insights from our initial interviews and initial survey, in which users told us about the tasks they typically must complete using their

existing scheduling and time management apps as well as their goals in using them. We also considered the screens of our clickable prototype, which were designed based on those insights. Additionally, our work on creating user journeys and personas aided with our analysis of user goals and tasks.

This research led us to identify 20 different tasks users typically will have to do in our app in order to complete their goal of scheduling/joining an event with other people. We then categorized them into 6 use scenarios of Onboarding, Navigating, Managing Groups, Setting Goals, Managing Availability, and Scheduling. Finally, we listed the tasks in order of cognitive flow, beginning with the required steps of account creation and ending with successfully scheduling an event. We later compared this task analysis with our initial journey, which was based on the current state solutions on the market, and saw that our solution would be able to reduce a lot of unnecessary communication, redundant steps, and switching between apps.

Through this process, we were able to better understand our users' main goals of managing their work, school, personal, and social calendars, and scheduling activities with other people's availability in mind. We also understood that there were many steps that went into scheduling a simple event, from communications to logistics, and hoped we could integrate all tasks into a streamlined experience. Our full task analysis can be seen in Appendix G.

Risk Analysis

After completing our task analysis, our team then conducted a risk analysis on all of the tasks identified. This risk analysis was based on our findings from our initial interviews and survey, our usability testing interviews, and our online research. Our format and scale was a standard 5x5 matrix with severity and likelihood.

First, we aimed to find a suitable severity scale for our needs. In consulting the literature, we determined that the greatest risks that mobile app developers are often concerned with (and spend fortunes to mitigate) mostly pertain to app security and the security of users' data, including security against software exploits, attacks, and malicious use (Ikwuegbu 2020). This meant that the highest level of severity for our risk analysis, 5, would be defined as breaches of security and privacy for users and their data, which can open the door for indefinite safety risks. Second, we define our likelihood scale inspired by "rating scales for occurrence in FMEA design" (Butunoi 2016) and based on both qualitative and quantitative estimates & insights from our user research and testing, in which the highest score of 5 meant that the majority of our users were likely to run into the issue. These 2 scores would be multiplied in our matrix for a final risk score, with the highest score being 25. The scales we defined are shown below.

Likelihood

Rating	Criteria
1	1 in 80 users

Severity

Rating	Criteria
1	Minor inconvenience, or affecting only 1 user

2	1 in 20 users		2	Moderate or major inconvenience, or affecting multiple users
3	1 in 8 users		3	Mental, emotional, or social/structural harm
4	1 in 3 users		4	Breach of personal data
5	1 in 2 users		5	Breach of personal safety & security

In our risk analysis, we determined that the majority of tasks only had very minor risks associated, mostly causing only inconvenience or confusion. Most of the risks we found pertain only to user errors in using the interface and thus had low severity but high likelihood, with most risk scores landing around 1-4. However, we did find a few risks that had a higher risk score of 5 or more, with the highest being 8. Given that our app would have permission to access lots of user data such as location, schedules, relationships, and connected accounts, these larger risks included shared and unprotected login information (which can lead to hacking), ignoring privacy settings (which can lead to breaches of privacy), and being tricked by fraudulent users who may have malicious intent, all of which had higher severity but low likelihood.

Changes & Risk Mitigations

Finally, for each risk, we ideated mitigation strategies that can be applied and tested to reduce the likelihood and severity of the risks. Many of these mitigations involved decision confirmations, account verifications, navigation improvements, better instructions/onboarding, and more. Overall, this risk analysis helped us understand that there are many areas where our app could be more user-friendly to prevent errors, as well as a few areas where our security and privacy options should be strengthened. Our analysis and mitigation strategies are also helpful to guide our post-testing iterations and final design direction for our solution. The full spreadsheet for our risk analysis can be found in Appendix G.

Residual Risk Analysis

After identifying our possible mitigation strategies, we then planned to include some of them in our subsequent prototype iteration in Figma. We intended to first make the most immediate, simple edits to our interface to address minor risks and issues from our testing, and given more time and resources, we would then plan to design more advanced features for protecting account security and privacy. Most of the immediate edits we successfully made post-testing involved the navigation-related issues and risks, and included:
- A new onboarding feature that shows users exactly how to use the app
- Better integration between groups and calendar
- Clearer labels on the calendar screen
- Moving the 'edit availability' feature to a singular location under groups

- Less crowded screens for more clarity

We then revisited our risk analysis criteria to rate the post-mitigation risk levels. For most of the minor-severity issues (involving navigation, onboarding, and managing groups/availability/schedules), we determined the mitigations we implemented should reduce the likelihood of user errors to lower levels around 1 and 2. For the more severe risks related to security and privacy, we believe the mitigations we ideated in theory should reduce all likelihoods to 1 or lower, although we did not find a way to reduce the severity. Based on this analysis, we believe the primary residual risks of this app would continue to involve user data privacy.

Usability Testing
Testing Protocol

We produced a usability testing protocol for feedback on our medium-fidelity prototype. The protocol contained instructions for in-person interviews using the Figma app and the iPhone screen recording feature to capture the participants' interactions. The protocol includes pre-test questions, usability tasks, root cause analysis interview guidelines, and post-test questions.

We recruited five participants in the Boston area to perform in-person tests. Our criteria required the participants to be working professionals. In addition to screen recording, we recorded the tests with a camera facing the participant's face. Below are the tasks we assigned the users:

1. Create an account
2. Change the app settings
3. Open the Goal Dashboard, take a look at your current goals
4. Check off an Action Item under "Today's Action Items"
5. Create a new Goal
6. Open the Calendar, examine the overview of your day
7. Switch the calendar view to "work"
8. Successfully create a new event
9. Edit the time of your work, "163 Meeting" event
10. Edit your shared availability"
11. Under the "Groups" tab
    1. Open an event and invite a friend
    2. Create a new Group
    3. Edit your availability

After performing the test, we asked the participants a series of follow-up questions to understand their overall attitude towards the product. The full usability testing protocol can be found in Appendix H.

Testing Sessions

Participant Breakdown:
- Participant 1: 21 year old Male, Medical Assistant
- Participant 2: 28 year old Male, Retail Manager
- Participant 3: 23 year old Female, Graduate Student
- Participant 4: 29 year old Female, Occupational Therapist
- Participant 5: 54 year old Female, Marketing Manager

The tests provided feedback about the overall experience of our product. All five of our users saw promising features within Clocky. They unanimously agreed that the layout and overall flow of the app needed improvement. Many participants struggled with app navigation and inconsistent methods of interactions like swiping or tapping.

<u>Session One</u>

Participant one was well-versed in scheduling apps prior to using Clocky. Participant one values punctuality, and keeps a tight schedule for their work and personal schedules.

They did not have any issues with onboarding and user preferences. The participant had no errors when using the "goals" tab, the app fit the participant's mental model of goal creation.

Participant one had minor difficulty locating the "create event" feature, and one use error attempting to edit an event. The user did not foresee the ability to "swipe" to interact with the calendar feature. Moreover, the user required assistance to navigate to the "shared availability" page. Using the groups feature, participant one demonstrated frustration with the lack of clickable buttons. Due to the inconsistent button function, the participant produced three use errors, and felt generally confused about the functionality of the "groups" feature

During the follow-up interview, participant one said that the app was similar to other calendar apps, but difficult to navigate, especially when seeking out information. Despite that, participant one felt that the features were unique and useful.

<u>Session Two</u>

Participant two was unfamiliar with scheduling apps. They are often on time to daily commitments, but not extremely concerned with punctuality. At times, participant two forgets about social engagements.

Participant two had no difficulty with the onboarding process. However, they pressed the navigation arrows of the user preferences pages several times with no success. The navigation arrows used throughout the application were too small for participant two to use comfortably. Participant two intuitively discovered all of the features inside the "goals" tab without prompting. Likewise, the user intuitively navigated the "calendar" tab. Participant two experienced one close call with the swipe to edit feature. They said, "it's always worth a swipe" as they discovered the feature. Conversely, the user required assistance with the "edit

availability" function. The placement of this feature did not match the user's mental model. In the "groups" tab, the user remarked that they felt confused and excited by the app's group features. The user did not experience any use errors in the "groups" tab.

During the follow-up interview, participant two rated the overall experience highly. They rated the layout of the app a three out of five, stating that the app was in too early stages to call a judgment about layout. Participant two noted that they wouldn't likely use Clocky, because they do not currently use any comparable apps.

Session Three

Participant three was very familiar with scheduling apps and they never miss a scheduled event.
Participant three had no issues with onboarding, but one close call with user preferences when they were unable to locate the day/night button. In addition to this close call, they said that it felt awkward that they could navigate to the app's other tabs from the settings menu, without exiting settings.

Participant three intuitively used the goals feature, but felt confused about the goal hierarchy, and the overall relevance of main goals to the user's "progress". Additionally, they remarked that the date and time of the goal would be useful or expected information. On the "calendar" tab, the user had no errors navigating, but stated that the groups were small. When attempting to create a new event, they were distracted by the number of features on the page, and struggled to locate the "create" button. Additionally, they were unable to edit the work event or edit their shared availability, performing two use errors. Using the "groups" tab, the user was very confused and did not understand the purpose of the feature. They were unable to discern between clickable and unclickable buttons, and had an overall difficult time creating and inviting people to group events.

In the follow-up interview, the participant rated the app a three out of five overall, saying that the purpose was unclear, the navigation was confusing, and tasks were difficult to complete. On the other hand, the participant felt that the features could be useful in the future.

Session Four

Participant four was not familiar with many scheduling apps. They have used When2Meet and Google Calendar in the past. Despite that, they are punctual and do not miss scheduled events outside of emergencies.

Participant four had no issues with onboarding, but experienced with navigation of user preferences. They remarked that the flow and layout of system preferences should not be integrated with other features.

Participant four initially struggled to locate the "goals" tab, but experienced no errors with the feature. When examining the "calendar" tab, the participant experienced no errors with navigation and creation. However, participant four had to be informed that multiple modes of interaction were possible, in order to successfully edit a calendar item. After more exploration,

the participant was able to locate the "edit availability" feature. In the "groups" tab, participant four intuitively navigated, but struggled to invite a friend to an existing event.

In the follow-up interview, the participant felt that the app was easy to understand and enjoyed the features. They stated that the flow had room for improvement, but that they would use the app if it was developed further.

Session Five

Participant five was unfamiliar with common scheduling apps. Using Microsoft Teams through work, they are always on time and present to meetings.

The participant successfully created an account, but critiqued the incomplete and inconsistent text fields. They expected interactive fields and buttons. After establishing a mental model for our design, they were satisfied with the user preferences. The participant was fond of the goal setting feature, but a little overwhelmed by the amount of information, options, and colors. The participant was generally confused by the presentation of the "calendar" tab. Participant five was unable to discern the purpose of the feature. Despite this, they were able to change the event visibility with no errors. When creating an event, they expected the creation button to be located at the top of the screen, due to this, they were unable to create an event and required assistance. Moreover, they failed to edit the work event.

The participant experienced extreme frustration with the "edit availability" function. They did not understand the purpose, nor the logic of navigating to this feature. After accessing the feature, they felt frustrated by the fact that they could not see changes reflected on the main calendar. On the "groups" tab the participant made several suggestions about the displayed information. They intuitively navigated the flow of the feature, but they remarked that key details were missing from the interaction.

In the follow-up interview, the participant spoke highly of the app. They said that the flow was not very intuitive, but the features were useful and that they would use the app in the future. Detailed notes of the usability testing responses can be found in Appendix H.

Root Cause Analysis

Use Errors

To conduct root cause analysis, we created a spreadsheet to document the type of use error, description of use error, description of task, root cause analysis, and usability testing notes identified with the use error. While conducting root cause analysis, our team identified 11 instances of assistance, 8 use errors, and 4 close calls. The root cause analysis spreadsheet can be found in Appendix I. We used the following criteria to classify types of use errors:

- **Close Call:** Almost finished successfully.
- **User Error:** Task unfinished or not finished as intended.
- **Instance of Assistance:** User required prompting from the moderator to complete the task.
- **Success:** The user completes the task.

Root Causes

<u>Observation One</u>

Task #4b: Successfully create a new event

Need Help: The user cannot find the (+) button to create a new event and needs help finding it.

Root Cause Analysis:

The fact that users can't find the plus icon on the calendar page suggests that the button may not be obvious or noticeable enough. The button's size, color, position, or visual hierarchy may be the cause, indicating a usability issue related to the visibility or position of the plus icon in the interface.
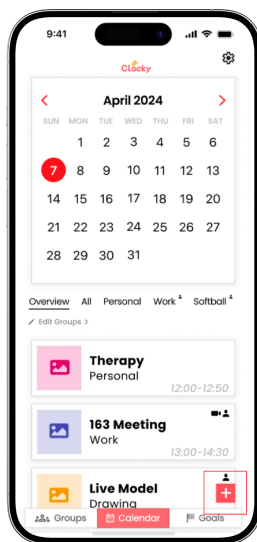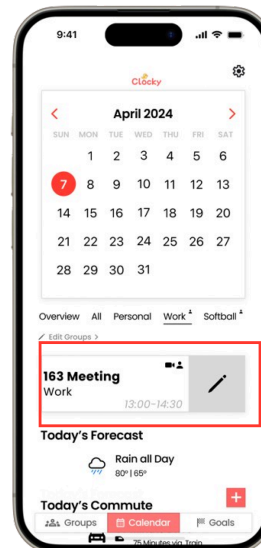
(Observation 1)   (Observation 2)

<u>Observation Two</u>

Task #4c: Edit the time of your work, "163 Meeting" event

Need Help: User needed help to figure out to SWIPE LEFT in order to reveal the Edit button.

Root Cause Analysis:

It's possible that users are unfamiliar with the swiping motion required to make the Edit button in the UI visible. When attempting to interact with the UI, users may become confused due to their unfamiliarity with swiping motions. Furthermore, users could find it difficult to access some functionalities if the software does not offer clear instructions on how to conduct swipe movements.

<u>Observation Three</u>

Task #4d: Edit your shared availability

Use Error: User couldn't find how to share availability and started clicking random buttons.

Root Cause Analysis:
Users may find it difficult to locate the "Share Availability" option if it is not put prominently or clearly marked in the user interface. Confusion may result from this lack of visibility, particularly when users want to modify their share availability. Users might find it difficult to understand the relationship between "edit group" and "share availability," which would make things even more difficult.
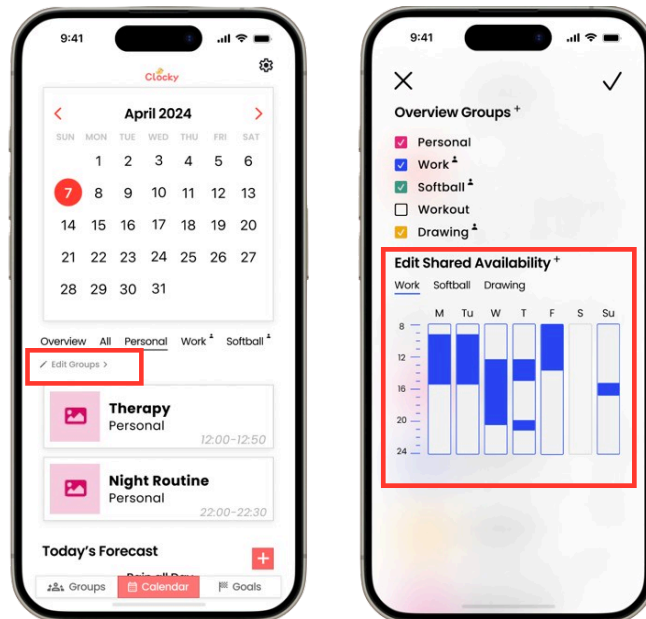
Observation Four
   Task #5a: Open an Event and Invite a Friend
   Need Help: User needed help navigating to the correct button to invite friends.

Root Cause Analysis:
Users may become confused about how to invite friends to an event as a result of unclear instructions, which may cause them to look into other invitation options in an attempt to find a solution. Additionally, users may get doubtful about whether a function will work as intended if buttons are overly similar or unclear. This ambiguity might make users more frustrated and make it more difficult for them to use the interface with assurance.
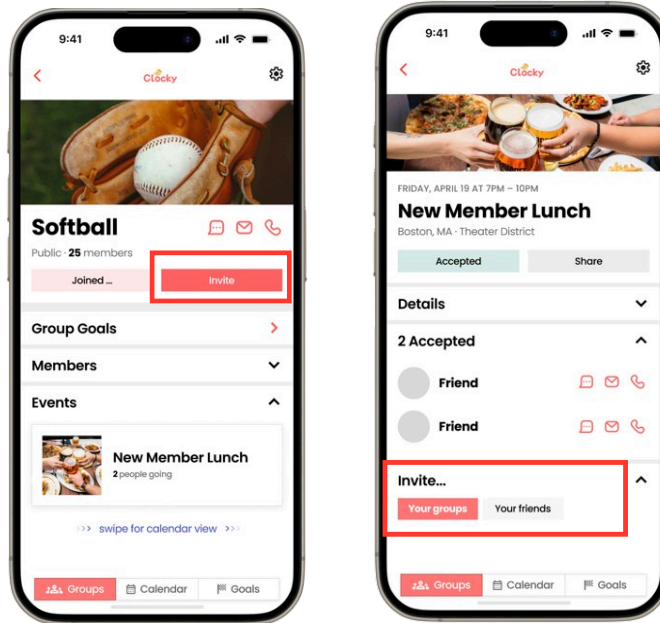
Observation Five

Task #5b: Create a New Group

Close Call: It took the user a while to figure out where to click to create a new group.

Root Cause Analysis:

Users may not immediately recognize the plus button as a way to create a new group. As such, it could take users a while to find and press the plus button. This delay in locating the button may cause annoyance and inefficiency when carrying out the intended task.

Subjective Feedback

Positive Feedback:
- The UI of Clocky is easy to use. Users thought it was comparable to other apps and enjoyed the colors. One user said that the tools for groups and goals in particular are lovely and well-designed. Another customer said it was easy to see and operate, and they liked the color design.
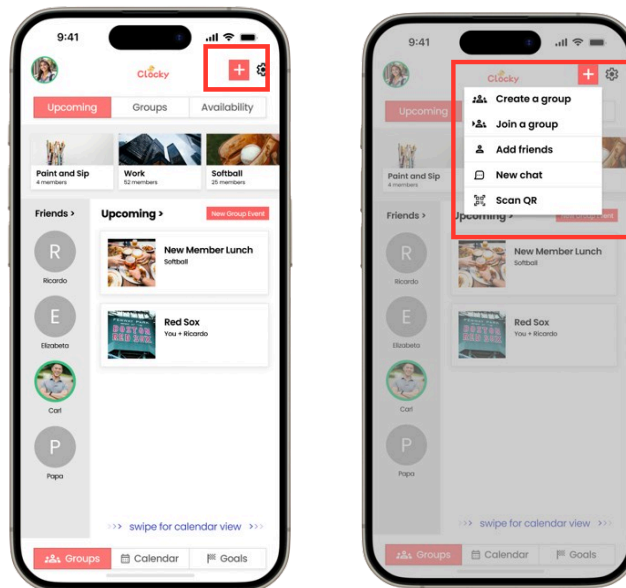- Clocky offers practical features. Features that allow users to invite friends to events, view availability, access the Goals page, and combine features from several applications were well-liked by users. One user thought it was handy to have multiple functionalities in one app.
- Users complimented the layout design's aesthetics, highlighting elements like the adorable logo and color scheme.
- Users said that if certain problems were resolved, they would be willing to utilize Clocky as a planning tool. If it were released, they liked the notion of utilizing it frequently.

Areas for Modification:
- Regarding navigation, user input was inconsistent. Some said it was confusing since there were so many colors, buttons, and icons, while others said they had trouble with specific pages or features. Comments were made about buttons that didn't operate and pages with an excessive number of sections.
- Views regarding the logic flow among users were divided. Some users reported that it was simple to get confused, particularly on the Calendar page, while others expressed bewilderment about the many views for groups and events. There were complaints that it was difficult to navigate due to the excessive number of tabs and buttons.
- Finding the information they needed proved to be difficult for users, particularly when working on more specialized jobs. Although early tasks such as onboarding were simple, users encountered difficulties with specific tasks and needed help to locate what they were seeking for. Some people found it difficult to do some activities, particularly as they got more complicated.
- Given Clocky's current situation, some users were hesitant to suggest it to others. They made reference to confusion and made negative comparisons with other calendar apps, such as Apple and Google Calendars.

Second Iteration Design Solution

We completed one round of design interactions based on testing feedback. Below is a list of changes and images of the new "calendar", "groups", and "edit availability" pages:

1. We added a comprehensive onboarding process that included a tutorial for using the calendar feature.

2. We removed the "edit overview" button originally seen on the "calendar" tab to make "availability editing" only accessible from the "groups" tab.
3. We gave "friends" and "shared availability" a dedicated page under the "groups" tab.
4. Besides Clockly's bright salmon branding color, we reduced the repetition, saturation, and brightness of the colors on the app.
5. We replaced the settings icon with a hamburger menu, and removed the appearance of the icon on event and goal editing pages.
6. We removed the navigation bar from the settings and event and goal editing pages.
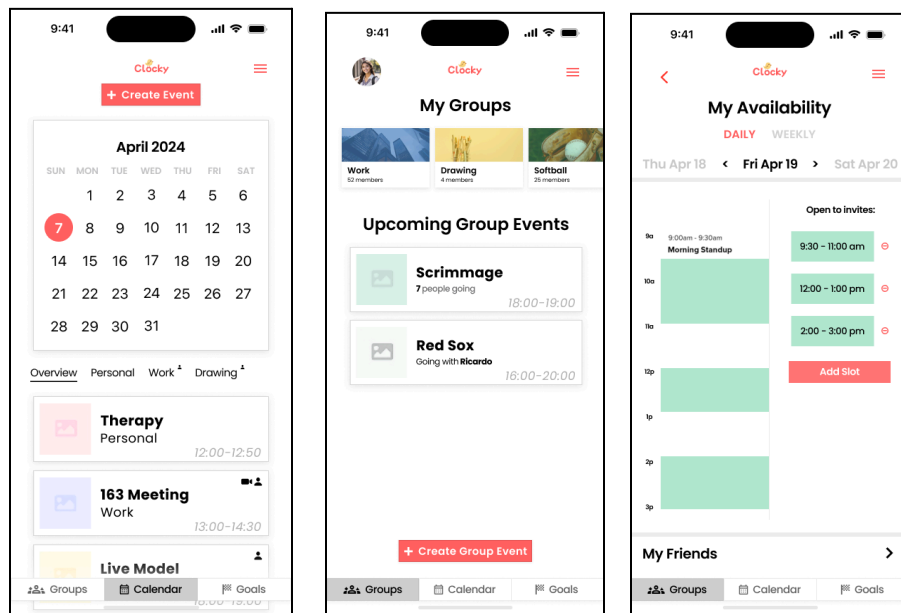
A video of the app redesign and link to the prototype is linked in Appendix J.

Conclusion

The Clocky app concept is a promising solution to the problem of not having a centralized app that meets all of the schedule planning needs of users. Our original idea was to redesign the When2Meet interface, which is very outdated and has limited functionality. As a result of our initial research, we expanded the scope of our project to create an original schedule planning tool that would combine elements from several different existing schedule planning tools, including When2Meet, Apple Calendar, Google Calendar, Microsoft Teams and Calendly.

After administering the Qualtrics questionnaire to participants, we identified a set of user needs and pain points with existing schedule planning tools which informed the types of questions we asked test participants during the interviews and focus group. Research insights from the interviews and focus groups illuminated which features should be included and prioritized in our application, and which issues associated with existing tools to avoid and improve upon. Conducting risk analysis and gap analysis based on the design features included in our first Figma wireframes allowed our team to identify potential risk factors early on in the

design process, and proceed to mitigate these risks with improvements to our next round of Figma mockups. During usability testing, it became increasingly apparent how participants found our application to be overly complicated and overcrowded with features and capabilities.

Recognizing our expert bias, that our familiarity with how to navigate the application due to designing it and spending so much time working on it, had hindered our ability to understand how complicated the application was to a new user was an important takeaway. Since our design solution was centered around the idea of combining the functionality and capabilities of several different tools into a singular platform, we incorporated many different design features that led to the app becoming overcrowded. Additionally, since we used a clickable prototype for usability testing and did not prototype every single button or feature within the application, some user errors committed during usability testing were likely due to the limited functionality of the prototype design. The residual risk implications of our current design largely arise from our expert bias and the inclusion of too many different features. In the future, our team would focus on narrowing the scope of our design and prioritizing certain features to simplify the application and improve the user experience.

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Appendix

APPENDIX A - <u>Qualtrics questionnaire</u>

Question 1	What is your age? (optional)
Question 2	What is your gender identity? (optional)
Question 3	What is your racial identity? (optional)
Question 4	Where are you from? (optional)
Question 5	Which of the following groups best describes you? * ☐ Current Student ☐ Teacher/Educator ☐ Working Professional ☐ Other: _____
Question 6	What do you usually use planning & schedule tools for? * (Check all that apply) ☐ Personal Time Management ☐ Work Meetings ☐ Academic Project Meetings ☐ Social & Networking Events ☐ Hobbies ☐ Friends, Family & Community Activities ☐ Other: _____
Question 7	What scheduling/planning tool(s) do you typically use? * (Check all that apply) ☐ When2Meet ☐ Outlook/Teams ☐ Google Calendar ☐ Apple Calendar ☐ Calendly

	☐ Other: _____

Question 8	If you had to choose, which tool or app would you use most often? *
	    ☐ When2Meet
	    ☐ Outlook/Teams
	    ☐ Google Calendar
	    ☐ Apple Calendar
	    ☐ Calendly
	    ☐ Other: _____

Question 9	Do you use the same tool for personal and work-related purposes? *
	    ☐ Yes
	    ☐ No
	    ☐ Sometimes

Question 10	Please rate how often you encounter each of the following: *

Question 10 table:

	Rarely	Sometimes	Often
Schedule a calendar event	☐	☐	☐
Struggle to check others' availability	☐	☐	☐
Forget a meeting	☐	☐	☐
Miss a calendar invite	☐	☐	☐

Question 11	Overall, how would you rate your experience using scheduling and planning tools? * Rate 1-5 stars ☆☆☆☆☆
Question 12	Please briefly state the reason for your rating. * _____
Question 13	What do you wish were different about scheduling & planning apps? * _____
Question 14	Please select all features and qualities that may be important to you in achieving your goals using scheduling & planning apps. *

	☐ Social Connectivity ☐ Cross-Platform Support ☐ Reminders ☐ Motivational Support ☐ Setting Goals ☐ Setting Timelines ☐ Managing Availability ☐ Real-Time Communication ☐ Other: _____

APPENDIX B - Qualtrics questionnaire results

QID1 - Which of the following groups best describes you?

#	Answer	%	Count
1	Current student	40.74%	11
2	Teacher/Educator	3.70%	1
3	Working professional	48.15%	13
4	Other	7.41%	2
	Total	100%	27

#	Answer	%	Count
1	Current student	40.74%	11
2	Teacher/Educator	3.70%	1
3	Working professional	48.15%	13
4	Other	7.41%	2
	Total	100%	27

Q4 - Do you use the same tool for personal and work-related purposes?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count

		1.00	3.00	1.7 6	0.71	0.50	25
1	Do you use the same tool for personal and work-related purposes?						

#	Answer	%	Count
1	Yes	40.00%	10
2	No	44.00%	11
3	Sometimes	16.00%	4
	Total	100%	25

Q5 - What do you usually use planning & scheduling tools for? (Check all that apply)

#	Answer	%	Count
1	Personal time management	20.99%	17
2	Work meetings	27.16%	22
3	Academic project meetings	11.11%	9
4	Social & networking events	13.58%	11
5	Hobbies	9.88%	8
6	Friends, family, community activities	16.05%	13
7	Other	1.23%	1
	Total	100%	81

#	Answer	%	Count
1	Personal time management	20.99%	17
2	Work meetings	27.16%	22
3	Academic project meetings	11.11%	9
4	Social & networking events	13.58%	11

5	Hobbies	9.88%	8
6	Friends, family, community activities	16.05%	13
7	Other	1.23%	1
	Total	100%	81

Q6 - Please rate how often you encounter each of the following:

#	Question	Rarely		Sometimes		Often		Total
1	Schedule a calendar event	12.00%	3	24.00%	6	64.00%	16	25
2	Struggle to check others' availability	24.00%	6	48.00%	12	28.00%	7	25
3	Forget a meeting	60.00%	15	32.00%	8	8.00%	2	25
4	Miss a calendar invite	52.00%	13	40.00%	10	8.00%	2	25

Q7 - Overall, how would you rate your experience using scheduling & planning tools?

#	Answer	%	Count
3	3	28.00%	7
4	4	56.00%	14
5	5	16.00%	4
	Total	100%	25

Q8 - Please briefly state the reason for your rating.

Please briefly state the reason for your rating.

I don't use it as often cuz I don't think it's that efficient

I like that it syncs accross my accounts and I can look at other peoples calendars

I put everything in my Google Calendar as soon as I make plans so I rarely miss events I plan for

Although we have tried our best to arrange it properly, there are still ambiguities and ambiguities in the schedule. If we cannot replace it with a more reasonable plan, it will lead to significant problems.

Difficult to manage

Make my life more manageable

如果某件事真的不那么重要，我记到日程里也会忘记😢感觉用处没到5星的程度

Pretty good

Tools can be super helpful, but it's hard to find one that has good fleshed out features AND lots of freedom to customize my experience.

Use Google Teams for work and personal events, keeps me up to date on meetings and social commitments. I use When2Meet for school (Tufts masters) to coordinate group meetings.

Rarely have any difficulties with Teams syncing between my phone and laptop, but when I do it is confusing to navigate.

Easy interface, simple to use

Feel like it works okay. Don't know what I am missing out on I guess.

Does the job

Google Calendar is easy to use

I like Apple Calendar, but I don't really like using When2Meet it's just the default that we use in college for club meetings and group projects

I use Apple Calendar to schedule every event. Even if someone invites me on Calendly or Google Calendar, I will input the event into my Apple Calendar. It's just easier to have all of my commitments in one place and I can set reminders.

Helpful for personal/work purposes

My work uses Outlook/Teams, I'm more used to using When2Meet in college and Google/Apple Calendar for personal events and I like the layout design better than Outlook

I have horrible time management and always forget plans, so putting things in GCal and Apple Calendar really helps me

Helpful for keeping track of events, I like the Set Reminder feature on GCal and Apple Calendar

I use Google CAL for personal stuff which is good. But When2Meet isn;t the best

Often miss Calendar invites, can't send Google calendar invites to everyobe

Outlook works well for business purposes

Not good not bad

What do you wish were different about scheduling & planning apps?

An easier to input interface

I wish it would be easier to import events from things like emails or text messages. Rather then entering all the details manually.

Seeing my friends google calendar events would be cool, I think that's an option but I haven't pursued it

No

easier to use and visually more inspiring

Clear and simple timeline

無

More regular reminders

I wish they had more intuitive To-Do lists and systems

I wish that When2Meet could be integrated into my calendar so I don't have to make a separate calendar entry after scheduling the meeting.

I wish I could voice dictate things into it

More interaction between different apps

I have always wanted a way to propose times to host meetings.

Better interface

No complaints

I wish that When2Meet had the option to create a Calendar invite with reminders that can also embed a Zoom link into the invite.

I wish there was more of a social feature connected into the Calendar app, to see who is RSVP to certain events that are for groups etc

I like using Calendly, especially when scheduling new client meetings. However, I wish that Calendly also gave mobile reminders rather than the email default

I wish that the layout design was more clean and minimalistic, rather than looking outdated and complicated

More customization features for creating an event in Apple/Google Calendar

I wish I could send text reminders to people for Calendar events and When2Meet meetings, and to embed a Zoom link for virtual meetings planned with When2Meet

I wish When2Meet had more features and was more interactive

Ability to insert Calendar invits into Text conversations

More features and customization

Ui isn't great because it's tedious and not intuitive

Q11 - What is your age? (optional)

What is your age? (optional)

23
23
23
25
23
23
24
23
23
24
24
45
19
21
42
23
21
22
19
22
32

Q12 - What is your gender identity? (optional)

What is your gender identity? (optional)

Female
Male
Male
straight
female
Nonbinary
Female
Woman
Male
Female
Female
Male
Male
Female
Male
Female
Female
Female
Male
Male

Q13 - What is your racial identity? (optional)

What is your racial identity? (optional)

Indian
Chniese
asian-chinese
white
Biracial (Asian + White)
White
White
White
Caucasian
African American
Asian
White
Indian
Asian
Asian
Asian
White
White
White

Q14 - Where are you from? (optional)

Where are you from? (optional)

Dubai
Boston
China
china
China

| Denver, Colorado |
| Boston, MA |
| Connecticut |
| Los Angeles CA |
| Moorpark, CA |
| NYC |
| Phillipines |
| New York |
| New Delhi |
| New York |
| Seattle |
| LA |
| Chicago |
| Los Angeles |
| New Hampshire |

Q10 - What scheduling/planning tool(s) do you typically use? (Check all that apply)

#	Answer	%	Count
1	When2Meet	20.83%	10
2	Outlook/Teams	16.67%	8
3	Google Calendar	29.17%	14
4	Apple Calendar	27.08%	13
5	Calendly	4.17%	2
6	Other	2.08%	1
	Total	100%	48

Q11 - If you had to choose, which tool or app would you use most often?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	If you had to choose, which tool or app would you use most often? - Selected Choice	4.00	8.00	6.16	0.88	0.77	25

#	Answer	%	Count
4	When2Meet	8.00%	2
5	Outlook/Teams	4.00%	1
6	Google Calendar	56.00%	14
7	Apple Calendar	28.00%	7
8	Calendly	4.00%	1
9	Other	0.00%	0
	Total	100%	25

Q12 - Please select all features and qualities that may be important to you in achieving your goals using scheduling & planning apps.

#	Answer	%	Count
1	Social connectivity	5.68%	5
2	Cross-platform support	14.77%	13
3	Reminders	26.14%	23
4	Motivational support	0.00%	0
8	Setting goals	9.09%	8
9	Setting timelines	18.18%	16
10	Managing availability	15.91%	14
12	Real-time communication	10.23%	9
13	Other	0.00%	0
	Total	100%	88

APPENDIX C - Gap Analysis

Current State	Future State	Gap	Reasoning	Action Plan
When2Meet, can only find best group availability	Find best group availability and create an event in the same page	When2Meet only accomplishes half of the necessary steps to create an event with a group	More efficient, doesn't require 2 different tools to achieve the objective	Implement a feature that combines finding group availability and creating an event based on that shared availability in the same page
Not enough customization	Allow users to customize color coding, naming events, adjusting Calendar views and categorization, how many alerts to receive, etc.	Different schedule planning tools offer users varying degrees of customization	Users want more user control and freedom, through more customization options	Allow greater options for customization within each page of the app
Limited social connectivity options (Can invite others to events, but not many features beyond this)	Allow users to create groups or invited users to share availability and view others schedules	Most schedule planning tools to not have options for viewing others' schedules or availability	Users want to be connected to other friends and family to share their schedules and availability with each other to make it easier to plan events and coordinate	Allow users to create circles of groups with family members, friends, or co-workers to allow them to view your schedule or availability
Limited plug-ins	Incorporate more plug-ins to provide users with more information in a single platform	Users have to go to different apps and websites to find all of the information they all looking for to plan their events	Users want to be more efficient, and get all the information they need in one place	Include plug-ins such as traffic patterns and weather reports into the app, so users do not have to check other apps and websites

APPENDIX D - Interview Protocol & Results

Demographic Questions:
- Age:
- Gender Identity:
- Race:
- Where are you from?:
- Current occupation/school:
- Former occupation/school:

Focus Group Questions:
1. Please walk us through how you scheduled your first team meeting
2. What would you have done differently?
3. What are your biggest challenges with communication?
   a. Android vs iPhone?
4. Does your personal schedule align well with your team?
5. Do you use the same calendar system for personal and work-related purposes?
a. What system do you use?
6. How frequently do you reschedule or miss appointments?
   a. (if applicable) What types of appointments are you most likely to reschedule or miss?
7. If given the opportunity, what activities or chores would you add to your current schedule?

Interview Questions:
1. How often do you currently use calendar or planner apps, and what features do you find most essential in such apps?
2. In what ways do you collaborate or interact with others regarding scheduling and planning activities?
3. What challenges do you face when trying to coordinate schedules with friends, family, or colleagues?
4. How do you currently stay motivated to achieve your goals or complete tasks, and do you involve others in this process?
5. What features would you like to see in a calendar/planner app that interacts with other people's calendars?
6. Can you share examples of how a personal calendar app could enhance your ability to pursue hobbies or organize hangouts with others?
7. How important is the social aspect in a calendar app, where you can motivate and be motivated by others to achieve common goals?
8. Would you prefer a more competitive or collaborative approach when using a calendar app to achieve shared objectives?

9. Are there specific privacy concerns or considerations you would have when sharing your calendar information with others?
10. In what ways do you envision this app positively impacting your daily life and social interactions?

Link to Interview Responses

APPENDIX E - Affinity Diagrams, Journey Maps & User Personas

Affinity Diagram from all interview

Scheduling Preferences and Challenges

- **Difficulty in Finding Common Meeting Times**
- different time zones
- weekly standing meetings
- requiring compromise to balance

Technology Use and Preferences

- Outlook
- google calendar
- Apple calendar
- when2meet
- Different platforms make high chance of double booking
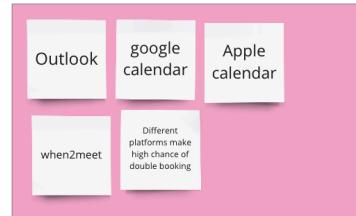
Communication Methods and Tools

- Different devices may use different tools
- whatsapp
- slack
- Email
- message
- platforms that support easy file sharing and group discussions.
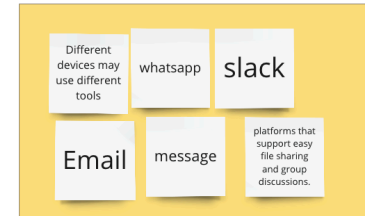
User Experience and Interface Issues

- need intuitiveness for new users
- outdated interface
- need better compatibility and synchronization features
- get update/notification when someone change the schedule
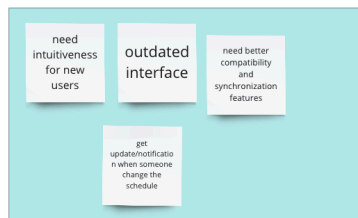
Social and Cultural Aspects of Scheduling

- Personal scheduling habits
- Informal/formal scheduling tool
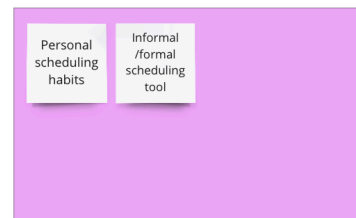
Improvement Opportunities for Scheduling Apps

- easier integration with other users' calendars
- automatic detection of common free times
- suggestions for resolving scheduling conflicts
- Privacy concerns when sharing personal schedules
- provide robust privacy settings and controls
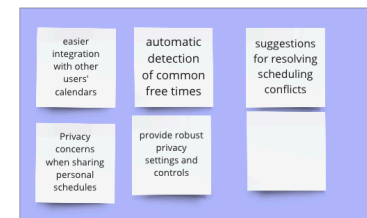
Using Scheduli...

Survey: 56% consider "Managing availability" important in a scheduling app

Survey: 92% consider "Reminders" important in a scheduling app

I don't use it as often cuz I don't think it's that efficient

I like that it syncs accross my accounts and I can look at other peoples calenders

我记得日程要也会忘记却查看我的安排(Even after I record an event into my schedule, I still forget about it)

I have horrible time management and always forget plans, so putting things in GCal and Apple Calendar really helps me

It's hard to find one that has good fleshed out features AND lots of freedom to customize my experience.

Helpful for keeping track of events, I like the Set Reminder feature on GCal and Apple Calendar

Often miss Calendar invites, can't send Google calendar invites to everyone

I use Google CAL for personal stuff which is good, But When2Meet isn't the best

Ability to insert Calendar invits into Text conversations

I wish I could send text reminders to people for Calendar events

I wish that When2Meet could be integrated into my calendar

I have always wanted a way to propose times to host meetings.

I wish there was more of a social feature connected into the Calendar app, to see who is RSVP to certain events that are for groups etc

Operatin...

I might opt for a user friendly Oracle, perhaps an iPhone, for its reliability and ease of use. The choice relies primarily on preference for straightforward technology that supports communication and stays convenient for the community.

iPhone user

prefer the flexibility and customization of an Android device

I might opt for an Android device for its customization and compatibility with a broader range of applications.

Rarely have any difficulties with Teams syncing between my phone and laptop

Desired activities to add to...

Organizing gaming nights or coding jams would be easier, ensuring everyone can make it.

stay informed about the latest developments in my field

leisurely pursuits like reading, gardening, or spending quality time with family and friends into my daily schedule

Planning volunteer activities or social justice meet-ups would be streamlined.

Survey participants: 44% Students, 52% Workers

workouts or relaxation

Volunteer work/social activities

spontaneous activities

hobby projects, diy electronics

Survey: 88% use scheduling apps for work meetings, 36% for academic project meetings

As a retiree with more flexibility in my schedule, I would aim to align community activities and my daily routine, ensuring that they complement my exercise regimen and other personal interests.

health, exercise, meal planning, checkups

exercise

cycling meetups

Survey: 44% use for social & networking events, 32% for hobbies, and 52% for friends, family, community activities

looking for more balance in life

add more dedicated time for self-care activities

reading

quality time with friends

Attitudes towa...

minimize rescheduling or missing appointments

emails is something I might need to work on

Juggling multiple commitments and ensuring I don't double-book.

make a conscious effort to avoid frequent rescheduling or missing appointments

I don't overlook any commitments

Privacy

Sharing my calendar means I need strong privacy controls to keep certain aspects personal.

Privacy is crucial; I'd want control over who sees what in my calendar.

I'd be wary of sharing my location or details about personal appointments.

Concerns about over-sharing; I'd like granular control over privacy settings.

Design

I wish that the layout design was more clean and minimalistic, rather than looking outdated and complicated

easier to use and visually more inspiring

Clear and simple timeline

An easier to input interface

Clear and simple timeline

I wish they had more intuitive To-Do lists and systems

More customization features for creating an event in Apple/Google Calendar

I wish When2Meet had more features and was more interactive

Ui isn't great because it's tedious and not intuitive

Scheduling Medium

Separate calendar systems might be necessary for personal and work-related purposes

I would likely use a digital calendar system, such as Google Calendar or a community-specific platform, to keep track of both personal and community-related commitments. This would help me manage my time efficiently and stay organized.

I use calendar apps daily, mainly for reminders and scheduling tasks

Through messaging apps and occasionally When2Meet for group study sessions.

Integration with others' calendars for viewing combined availabilities would be fantastic.

Google Calendar would be my preference

unified digital calendar system, such as Google Calendar or Microsoft Outlook

Tools like Asana or Trello could be beneficial

I rely heavily on calendar apps for managing my coursework and projects. The reminder and notification features are essential.

We use a mix of shared online calendars and apps like When2Meet for volunteer events.

I collaborate through shared Google Calendars and sometimes Doodle for determining availability.

Apple Calendar

Google Calendar

Survey: 40% When2meet, 32% Outlook/teams, 56% Google, 52% Apple, 8% Calendly

Overall average quality rating: 3.88 stars

I use Google Teams for work and personal events, I use When2Meet for school

I put everything in my Google Calendar as soon as I make plans so I rarely miss events I plan for

I use Apple Calendar to schedule every event. Even if someone invites me on Calendly or Google Calendar. It's just easier to have all of my commitments in one place and I can set reminders.

I don't really like using When2Meet it's just the default that we use in college for club meetings and group projects

My work uses Outlook/Teams. I'm more used to using When2Meet in college and Google/Apple Calendar for personal events

I wish that Calendly also gave mobile reminders rather than the email default

Group Work Mainten...

To-do lists and sharing progress with my volunteer group keep me going.

more proactive in setting up a group chat or online platform for communication before the meeting

Suggestions for meeting times based on mutual interests outside of obligations could encourage more personal interactions.

Automatic availability matching for quick event planning with friends or volunteers.

would prioritize clear and concise communication methods, leveraging tools like Slack or Microsoft Teams to keep everyone in the loop without overwhelming messages

I would prioritize transparent communication, regular updates, and the use of project management tools to keep the team informed and aligned with project

regular updates are provided to keep everyone informed

Automatic conflict resolution suggestions when scheduling with others would be a lifesaver.

Group Scheduli...

I would strive to establish a common understanding of each member's commitments and find mutually convenient meeting times

shouldn't be too difficult to find common meeting times

finding a balance between the intense focus required for research and maintaining effective communication with the team

Finding a time slot that suits everyone is a challenge, especially for international projects.

Aligning our schedules, especially with differing class times and extracurriculars.

I would propose a few time slots and seek input from the team members

Survey: 76% SOMETIMES or OFTEN struggle to check others' availability

Seeing my friends google calendar events would be cool, I think that's an option but I haven't pursued it

Proactive Action...

proactively established communication channels

set up a communication channel or group chat early on to discuss preferences and availability

Survey: 40% SOMETIMES or OFTEN forget a meeting

Survey: 48% SOMETIMES or OFTEN miss a calendar invite

I wish it would be easier to import events from things like emails or text messages. Rather than entering all the details manually

Survey: 36% consider "Real-time communication" important in a scheduling app

Community aid...

Setting personal milestones and sharing progress with friends keeps me motivated.

Collaborative, definitely. Shared achievements feel more rewarding.

encouragement from peers in a shared goal setting is very motivating.

I keep a strict schedule and share my goals with a study group for mutual motivation.

Collaborative, to build a sense of community and shared success.

A collaborative approach feels more inclusive and supportive for academic and personal growth.

Very important; it's easier to stay on track when friends working towards similar goals.

Social aspects are crucial for motivation, especially in long-term projects or goals.

My motivation comes from setting clear, achievable goals and deadlines. Group chats help us stay accountable.

Survey: 20% consider "Social connectivity" important in a scheduling app

Survey: 0% consider "Motivational support" important in a scheduling app

Survey: 32% consider "Setting goals" important in a scheduling app

Survey: 64% consider "Setting timelines" important in a scheduling app

Work/Life Bala...

Finding a balance between staying connected with friends and staying on top of group messages

A mix of both, competitive for personal achievements, collaborative for group objectives.

it could positively impact by reducing scheduling conflicts and increasing productive collaboration and personal interaction time.

Emphasizing a balance between work and personal life from the start is crucial

but I would prioritize work-related commitments, especially project deadlines and team meetings

Enhancing social planning and helping maintain a balance between work and leisure activities.

fostering a culture of mutual respect for work-life boundaries

The biggest challenge is aligning our lab schedules with coursework and personal time.

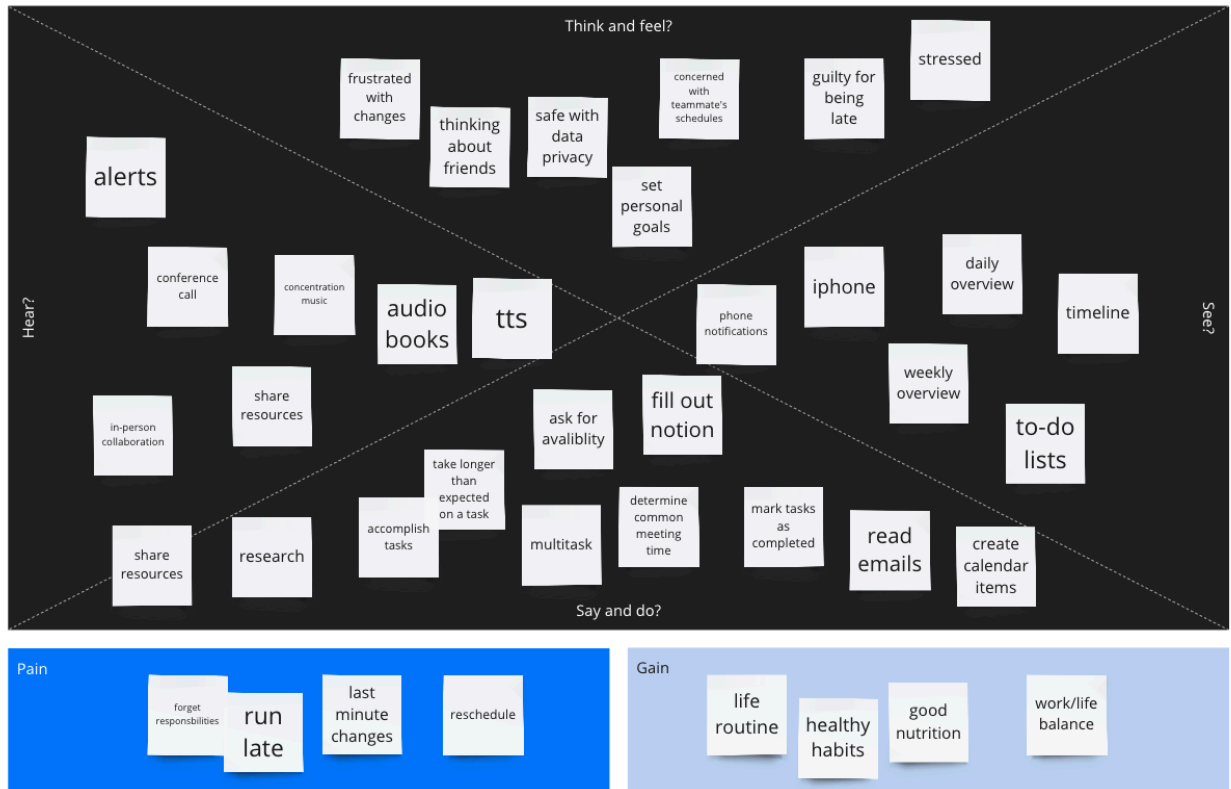Survey: 40% DO NOT use the same tool for personal and work purposes

Survey: 68% Use scheduling apps for personal time management

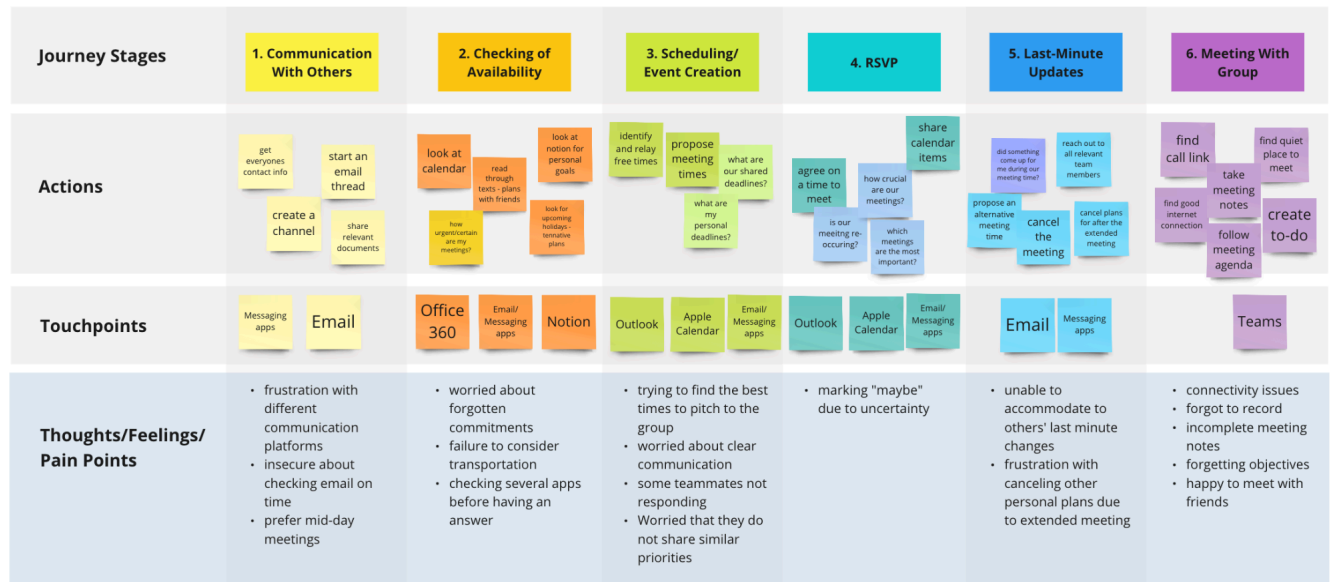Survey: 60% DO or SOMETIMES use the same tool for personal and work purposes

Yellow: Interview Quotes & Insights.

Green: Survey Quotes & Insights.

Empathy Map

Think and feel?
- frustrated with changes
- thinking about friends
- safe with data privacy
- concerned with teammate's schedules
- guilty for being late
- stressed
- set personal goals

Hear?
- alerts
- conference call
- concentration music
- audio books
- tts
- share resources
- in-person collaboration

See?
- iphone
- daily overview
- timeline
- weekly overview
- to-do lists
- phone notifications
- fill out notion
- ask for avaliblity
- read emails
- create calendar items

Say and do?
- share resources
- research
- accomplish tasks
- take longer than expected on a task
- multitask
- determine common meeting time
- mark tasks as completed

Pain
- forget responsbilities
- run late
- last minute changes
- reschedule

Gain
- life routine
- healthy habits
- good nutrition
- work/life balance

Journey - Younger Persona

Journey Stages	1. Communication With Others	2. Checking of Availability	3. Scheduling/ Event Creation	4. RSVP	5. Last-Minute Updates	6. Meeting With Group
Actions	get everyones contact info; start an email thread; create a channel; share relevant documents	look at calendar; read through texts - plans with friends; how urgent/certain are my meetings?; look at notion for personal goals; look for upcoming holidays - tentative plans	identify and relay free times; propose meeting times; what are our shared deadlines?; what are my personal deadlines?	agree on a time to meet; share calendar items; how crucial are our meetings?; is our meeting re-occuring?; which meetings are the most important?	did something come up for me during our meeting time?; reach out to all relevant team members; propose an alternative meeting time; cancel the meeting; cancel plans for after the extended meeting	find call link; find quiet place to meet; take meeting notes; find good internet connection; create to-do; follow meeting agenda
Touchpoints	Messaging apps; Email	Office 360; Email/ Messaging apps; Notion	Outlook; Apple Calendar; Email/ Messaging apps	Outlook; Apple Calendar; Email/ Messaging apps	Email; Messaging apps	Teams
Thoughts/Feelings/ Pain Points	• frustration with different communication platforms • insecure about checking email on time • prefer mid-day meetings	• worried about forgotten commitments • failure to consider transportation • checking several apps before having an answer	• trying to find the best times to pitch to the group • worried about clear communication • some teammates not responding • Worried that they do not share similar priorities	• marking "maybe" due to uncertainty	• unable to accommodate to others' last minute changes • frustration with canceling other personal plans due to extended meeting	• connectivity issues • forgot to record • incomplete meeting notes • forgetting objectives • happy to meet with friends

Journey Stages	1. Communication With Others	2. Checking of Availability	3. Scheduling/ Event Creation	4. RSVP	5. Last-Minute Updates	6. Meeting With Group
Actions	collect contact info; select recipients; send emails & messages; create group chat or chain	look at group members' calendars; decide length of time needed; read through comms for ppl's best times; check calendar for other events/ conflicts	message group members; send out invite; label invite & add location; add group members	respond to invite "accept" or "decline"; receive RSVPs; reply to messages	cancel or adjust meeting deets; reach out to all relevant team members; propose an alternative meeting time	find call link; find quiet place to meet; take meeting notes; find good internet connection; follow meeting agenda
Touchpoints	Messaging apps; Email	When2meet; Teams; Email/ Messaging apps	Outlook; Google Calendar; Email/ Messaging apps	Outlook; Google Calendar; Email/ Messaging apps	Email; Messaging apps	Zoom; Teams
Thoughts/Feelings/ Pain Points	• frustration with different communication platforms • insecure about checking email on time • slow responses from others • no feedback about received/not	• worried about forgotten commitments • hard to know everyone's availability and priorities • technological concerns	• once sent, difficult to edit in retrospect • worried about clear communication • some teammates not responding • nervous about invite labeling	• teammates slow to RSVP • declines & maybes	• unable to accommodate to others' last minute changes • frustration with canceling other personal plans due to extended meeting •	1. connectivity issues 2. no-shows, late people 3. can't find location 4. forgetting objectives 5. happy to meet with friends

User Persona

Elena Rivera

About

- Age: 19
- Boston, MA
- Single
- Female
- BU College of Communication

Bio

Elena is a freshmen at BU. She recently declared her communications major. She has a passion for community organizing and personal health. She struggles to find work/life balance with school. Right now, she uses Notion to track her personal goals, and outlook to schedule her academic meetings. She takes contemporary dance classes twice a week, and tries new hobbies if she has the time.

Motivations

- A happy, balanced life
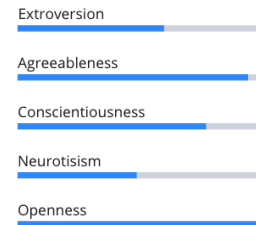- Developing her career
- Creating a 5 year plan

Goals

- Keep herself accountable to her promises
- Feel confident in collaborative settings
- Cope with stress in healthy ways

Frustrations

She has a tight-knit friend group. It has been hard to communicate her external constraints to her best friend. She doesn't know what to prioritize right now.

Personality - Big 5

Extroversion

Agreeableness

Conscientiousness

Neurotisism

Openness

Technological Skill

Office Tools

Social Media

Current Planner

User Persona

Carl Zhang

About

- Age: 45
- Braintree, MA
- Married + Kids
- Male
- Works at: US Department of Transportation

Bio

Carl is a **professional and dad** who manages a lot of people at work, while also leading and taking care of his own family of 5 (his extended family is even larger). His **work activities** include meetings, travel, workshops, lunches, happy hours, and team building activities. His **activities with family and friends** include outings, meals/barbecues, sporting events, family gatherings, vacation trips, and more.

Motivations

Because of this busy job, long hours, numerous family members, and numerous colleagues and friends, Carl's schedule is packed and he often forgets things, has conflicting priorities, messes up details, and feels stressed.
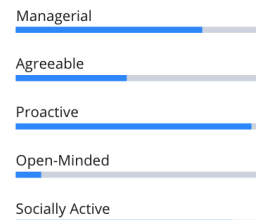
Goals

Carl wants to **find a better way to manage his schedule**, a way that is effective and efficient without adding even more planning time to his already busy day. Ideally, he will be able to easily manage all his activities and schedule with minimal stress, from rescheduling to ad-hoc events to setting reminders.
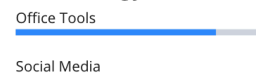
Frustrations

Existing apps don't provide what Carl needs, and are often too complex and disconnected. Many are either only for personal/social things, while others are only for work. Likewise, some are mainly for scheduling, and others are mainly for messaging, without doing all of it seamlessly.

Personality

Managerial

Agreeable

Proactive

Open-Minded

Socially Active

Technology

Office Tools

Social Media

Current Planner

APPENDIX F - [Figma Clickable Prototype Link](#)

APPENDIX G - Task & Risk Analysis

Use Scenario/ Goal	Task	Potential Use Error(s)	Hazard	Harm	Severity rating before mitigation (Scale: 1-5)	Likelihood rating before mitigation (Scale: 1-5)	Risk rating before mitigation (Scale: 1-25)	Mitigation	Severity rating after mitigation (Scale: 1-5)	Likelihood rating after mitigation (Scale: 1-5)	Risk rating after mitigation (Scale: 1-25)
Onboarding	Login/Sign up	Forgotten password, forgotten username	Lack of easy login method	Inconvenience to user	1	4	4	More login options like QR scan, SMS code, connect other accounts	1	1	1
		Not protecting personal info and login, leaving account prone to login attempts and hacking	Lack of account security	Breach of privacy, loss of personal data, and theft/fraud	4	2	8	Security options for users: Two-step verification, authetication methods, face ID	4	1	4
	Complete onboarding steps	Instructions not followed	Lack of clear instructions & onboarding	Misuse of app features, privacy risks	1	3	3	Clearer instructions, onboarding required	1	2	2
	Choose settings preferences	Ignoring important settings, e.g., privacy	Lack of emphasis on user settings	Privacy risks	4	2	8	Clearer instructions, onboarding required	4	1	4
Navigating	Navigate between tabs (groups, calendar, goals)	Getting lost in menus	Confusing user flow	Confusion of user	1	2	2	Reduction of menus, simpler navigation paths	1	1	1
	Navigate between upcoming, your groups, discover tabs				1	2	2		1	1	1
	Navigate between your groups and your friends under Invite				1	2	2		1	1	1
Managing Groups	Create a group on Groups screen	Accidental creation or deletion	Buttons easy to mis-click, no confirmation	Inconvenience to members	1	3	3	Additional confirmations, clear button labeling	1	1	1
	Invite another member to join a group	Being tricked by fraudulent activity by other users online	Other users who may have malicious intent	Breach of privacy & security, scams, theft, fraud, safety concerns incl. physical violence	5	1	5	Identity verifications when creating an account, adding friends, and using groups. Show identity verifications and contact methods tied to accounts, allow limiting of other users' permissions	5	<1	<5
	Select Softball group, make a scrimmage	Wrong group members invited	Easy to mis-click, too much info on screen	Inconvenience to members	1	2	2	Simpler UI	1	1	1
					1	2	2		1	1	1
	Check group availability in Calendar	Mistaken or misread availability	Formatting of times, calendars, timelines are unclear		1	3	3	More precisely defined and differentiated inputs and information on timelines & calendars	1	2	2
Setting Goals	Create a new goal	Goals feature goes unnoticed	Lack of emphasis on goals & how they work	Missed goals	1	4	4	Onboarding of goals feature	1	2	2
	Click on existing goal	Forgotten goals	Lack of reminders		1	4	4	Robust notification system	1	1	1
	Check today's action items	Action item goes unnoticed	Lack of reminders	Missed actions	1	2	2	Robust notification system	1	1	1
Managing Availability	Select/adjust availability	Wrong input of availability	Confusing controls & functions, calendar layout	Missed meetings, meeting conflicts	1	3	3	Crystal clear layout and times, as well as clearly labeled buttons/functions	1	1	1
	Change from Overview to Personal or Work	Confusing one calendar for another, hidden events on nonselected calendars	Not obvious enough which calendar is currently selected	Missed actions	1	3	3	Color coding and clear labeling of current calendar	1	1	1
	Edit Shared availability in Calendar	Wrong input of availability	Confusing controls & functions, calendar layout	Missed meetings, meeting conflicts	1	4	4	Crystal clear layout and times, as well as clearly labeled buttons/functions	1	2	2
Scheduling	Create a new Calendar event	Wrong input of details	Confusing controls, lack of verficiation by other people	Meeting doesn't go to plan	1	4	4	Clearer labeling, allow group members to verify details, e.g., with a check mark	1	1	1
	Save new Calendar event	Accidentally deleted or created event	Buttons easy to mis-click, no confirmation	Inconvenience to members, mixup of information	1	4	4	Additional confirmations, clear labeling	1	2	2
	Edit 163 meeting event	Accidentally edited event			1	4	4		1	2	2

[Link to file](#)

Participant Breakdown

       Participant 1: 21 year old Male, Medical Assistant
       Participant 2: 28 year old Male, Retail Manager
       Participant 3: 23 year old Female, Graduate Student
       Participant 4: 29 year old Female, Occupational Therapist
       Participant 5: 54 year old Female, Marketing Manager

Protocol
- Participants
  - Working professionals
- Activities
  - What activities will participants be instructed to conduct?
  - Participants should perform/talk through the tasks outlined in the risk analysis
    - Identify observable errors for root cause and risk analysis
- Usability Questions
- Data Collection
  - Track errors, instances when participants need help, close calls, and difficult tasks
  - Document why participants experience these errors

Introduction Script

We appreciate your willingness to participate in this usability test for our Tufts University ENP Analytical Methods project. I am recording this meeting for note-taking purposes. Do you consent to being recorded for this usability test? (if yes, continue, if no, stop.)

To provide some context, we are in the process of developing a mobile calendar app that people can use to easily manage group and personal events.

I will give you a brief overview of our usability testing session. First, I will ask you some pre-session questions. Then, I will have you interact with our prototype. Our application is called Clocky. I will give you some tasks to complete, and we will wrap up with some post-session questions. Please interact with the prototype as you would a real application.

Are you willing to participate in this usability test? (if yes, continue, if no, stop.)

Introduction Questions

On a scale of 1 to 5, where 1 represents no understanding, and 5 represents complete understanding:

When using scheduling apps like Apple Calendar or When2Meet, how would you rate your level of understanding?

Notes	
Participant 1	4 out of 5, understand them pretty well but there are some advanced/more complicates features that I've never really looked at or tried to use before
Participant 2	2 or 3 out of 5, does not use them in their day to day life and never relied on apps for scheduling
Participant 3	4 out of 5, most apps have a familiar interface so it's easy to navigate
Participant 4	2 out of 5, have only used When2meet 1 or 2 times, and use Google Calendar most of the time.
Participant 5	1 of 5, don't use either to manage time, uses Teams or outlook

On a scale of 1 to 5, where 1 represents complete difficulty with attendance, and 5 ease of attendance:

How do you rate your level of attendance to scheduled events in your day-to-day life?

Notes	
Participant 1	5 out of 5, never miss a scheduled event because I set a bunch of calendar reminders
Participant 2	4 out of 5, because of exact timing. Not always punctual.
Participant 3	5 out of 5, I'm mostly very punctual.
Participant 4	5 out of 5, wouldn't miss any meeting unless it's an emergency
Participant 5	5, always on time, my attendees are always 4

Tasks:

If possible, please describe your actions as you finish these assignments.

1. Create an account

Notes	
Participant 1	"Ok so I am making a new account, I guess I would put in my name and email and fill this out, and then I click next, and now I do the onboarding steps, fill this out, click next, okay now I've made an account and I am in the app" - Went through creating an account + onboarding steps very quickly and easily, (no errors)
Participant 2	Went through smoothly with no questions.
Participant 3	It was very easy.(no error)

Participant 4	The process is very smooth and nothing confusing (no error)
Participant 5	Name should be first and last name fields or username, not both. No instructions provided for emails. I don't know what you mean by the priorities, life or for the app? Why only showing 4 cities, should leave open to any city. **successful**

2. Change the app settings

Notes	
Participant 1	"Click on the settings button in the top corner, I'll change accessibility settings, and click back" - Easily located settings icon and navigated to settings page, clicked on Accessibility, adjusted slider, then clicked back arrow to navigate back to Home page of the app, (no errors)
Participant 2	" Now let's see. So accessibility, am I not clicking this like hard enough?" - Difficulty with every back arrow, pressed each at least 4 times. Some 7-10 times. "Day mode, night mode. I am actually a day mode kind of person, but. So let's keep it on night mode for now. It's nicer." - Make a sarcastic remark here because he was unable to change the mode back to day mode. Inconsistent ability to press buttons Overall, straightforward - On multiple occasions, pressed the settings button and couldn't navigate back to the screen he was on prio
Participant 3	"The day mode button should be bigger, cuz I can't see it."**(1 close call)** "I found something weird that you can go to the main app pages from below the settings screen instead of exiting from settings and then going to those pages."
Participant 4	"Oh, I can't close the features and app updates after I open it." - Functions must be turned on and off, making it more convenient and intuitive for users. "Your back arrow is too insensitive, and it's hard to succeed in the first try." - The back button is too small, should increase the range of the entire icon (no error)
Participant 5	Categories look good, settings under "account" look good. Curious about "Privacy" settings and they look good, allow you to change permission. **successful**

3. Open the Goal Dashboard, take a look at your current goals

Notes	
Participant 1	Initially confused, took a couple seconds to locate "Goals" on the menu bar, (no errors)
Participant 2	"Buy a book light reading clip. That does sound pretty nice" - Found everything very quickly, no hesitation. Explored all of the elements of the goals page without prompting. Ticked boxes, created a new goal, exhausted the capabilities.
Participant 3	"It is easy to identify and I can see what goals are. But I'm confused about the main goals and today's action items whether they should correlate."(no errors)

Participant 4	It took about ten seconds to find this function, but after entering the dashboard, the subject was no longer confused. (no error)
Participant 5	I like these, and would love to be able to add different goals that I have. **successful**

a. Check off an Action Item under "Today's Action Items"

Notes	
Participant 1	Scanned the goals dashboard page, scrolled down to Today's Action Items, pressed the checkbox to check off the action item (no errors)
Participant 2	Already completed in step 3
Participant 3	"It was very easy"(no errors)
Participant 4	Scroll down from the dashboard and click on the clickbox (no error)
Participant 5	I think it's fine, curating goals I have for today, but not obvious that they are related to the above goal categories. Timeframes for the goals are not obvious. Maybe color coding and a daily reminder for each goal. No errors

b. Create a new Goal

Notes	
Participant 1	Took about 10 seconds to find the + icon (no errors)
Participant 2	Already completed in step 3
Participant 3	"Although it was easy to make the goal, I'm confused why the date or the time doesn't show up on the main goal dashboard." (no errors)
Participant 4	It took about 15 seconds to find the added function. (no error)
Participant 5	I like daily + weekly options, but for weekly it's confusing, which day? Color coding "progress bar" is confusing, what would it do? Too much customization. No errors

4. Open the Calendar, examine the overview of your day

Notes	
Participant 1	Pressed Calendar on the menu bar, navigated to Calendar page, scrolled through overview and viewed Today's Forecast and Today's Commute (no errors)
Participant 2	No Errors. Noted that the time was in the military and said that it may be confusing for others.
Participant 3	"It's easy and looks like it includes a daily time table." (no errors)

Participant 4	Just looked for the goal, so I found the location on the calendar very smoothly this time. (no error)
Participant 5	Calendar pops up right after selecting the location. Not sure what this is showing me, is this the current meetings I have, is the calendar only meant to show what day it is? Instead of showing the whole calendar, it should just show today's date and the upcoming events today. Also can't understand how to navigate to other tabs like groups or what the point is. **(Instance of Assistance)**

a. Switch the calendar view to "work"

Notes	
Participant 1	Scrolled back up, tapped on "Work" to change to work view (no errors)
Participant 2	"Yeah. So I'm gonna look at the overview, the top of the overview part and see that there's an all personal work and softball group kind of thing that it looks like. So I can click work. And I see that my meeting is the only thing I have for work today." No errors, did not initially realize he could switch views, however
Participant 3	"Groups are kinda small, easy to navigate to when I identify." **(close call)**
Participant 4	Spent 5 seconds scrolling up and down to find work, but then found the location of work by himself. (no error)
Participant 5	I like the tabs for different categories, but maybe make the navigation stand out more or add color, kinda gets overshadowed by calendar. No errors

b. Successfully create a new event

Notes	
Participant 1	Tapped on + sign, tried to press the checkmark to create the new event but checkmark could not be pressed, so pressed on X sign to navigate back to calendar page **(1 close call)**
Participant 2	" So it looks like the best time is that time. Tuesday the 16th. At that time, it seemed pretty good. I guess not for me, but I'll make it work." - Intuitively tapped Tuesday's time to explore multiple options with group timing - Intuitively understood that the timing was a representation of teammates avail ably, remarking "not for me, but ill make it work"
Participant 3	"The plus button took a few seconds longer to find. One thing which I don't like is there are too many options on creating an event and the time availability is confusing." **(1 instance of assistance)**
Participant 4	After pressing the plus sign, I tried clicking on each area. Later found that he could choose to add a group, tried clicking on other areas again, selected the time, tried to change the time and checked the checkbox to save. (no error)
Participant 5	Can't figure out how to create an event on the calendar page, why no plus icon. Why settings instead of plus icon (she didn't see it in the bottom). **Use error + assistance**

c. Edit the time of your work, "163 Meeting" event

Notes	
Participant 1	Tried to click on "163 Meeting" while on Overview view, (Use error) needed HELP to navigate to "Work" view, kept clicking on "163 Meeting" but nothing happened (instance of assistance) needed HELP to swipe to the left to reveal "Edit" button **(1 use error, 1 instance of assistance)**
Participant 2	"Is it supposed to click? It's okay. If not, Let me. Let me think." - Tried repeatedly tapping. Had to intervene by stating "there are multiple forms of interaction" Swiping was the first alternative method the user tried. "Whoa. Okay. Well, that's cool. So slide and click the pencil. I was under the assumption it was a tap only app. But I was proven wrong. It's always worth a swipe. So now I've got group availability at that time. Pretty good. And I will remind Miela about the feedback. We'll set it."
Participant 3	"I clicked so many times but it didn't work. I tried to overview and work, but both are not working."
Participant 4	Kept clicking 163 Meeting in the overview but did not go to the next screen. Spent a minute trying to solve it, but in the end still needed help. (error) After being prompted for different ways to interact, I tried sliding and editing successfully. **(1 error, 1 instance of assistance)**
Participant 5	Link doesn't work, task failed.

d. Edit your shared availability

Notes	
Participant 1	Stared at screen confused, needed prompting to find "Edit Groups" button, was able to successfully edit shared availability **(1 instance of assistance)**
Participant 2	Complete confusion. The user opened the groups tabs and found the availability there (which was correct, in a way, so I let him continue and after he was finished, I introduced the concept of multiple group methods, and told him that there was a way to access availability from the calendar screen) From here, he was still unable to find it and had to be told to press the edit button. "Just a static screen." - suggests the feature is out of place
Participant 3	"Where is shared availability?" (clicked on random buttons till it showed up) "I can't figure out how to edit it. Also, too hard to find edit groups."**(1 error, 1 instance of assistance)**
Participant 4	Tried pressing different buttons but couldn't find it. After a minute, I was prompted to edit the group, and then realized that this function was placed here. **(1 error, 1 instance of assistance)**
Participant 5	No idea what these groups are, this is the first time I see them. "Overview groups'' makes no sense why not "my groups'' or "my priorities''. Shared availability is hard to understand, does this show what's on my agenda? No colors, no description, what does the plus sign mean, what do I even click on? Why not reflect the color on a single view with different color blocks, can't even see my overall calendar.

	(Instance of assistance)

Say: "Thank you, Clocky currently has two methods of group event creation, I will ask you to try another way"

5. Open your groups, and explore around this feature

Notes	
Participant 1	Tapped on "Groups" on menu bar, pressed friends and upcoming but nothing worked (no errors)
Participant 2	"This is fun" - Shocked reaction, noting that there is a lot of information - Excited about the copy of the events
Participant 3	"This is too difficult to understand. I like that i can see the plans i have with specific friends but i would like to know when it is " (no errors)
Participant 4	Find Groups from the menu bar, click in, and press New Group Event and the plus sign respectively. (no error)
Participant 5	Looks pretty, add friends could be in the friends box. The plus could be confusing but the options under it make sense, could be more of an action/hamburger menu. Groups upcoming stuff makes sense, should also show date/time. Swipe for calendar view can just be a clickable icon. Softball Group: ● Joined...: What does the "..." mean? Suggest removing to avoid confusion. ● Calendar (swipe to see): I believe you wanted to show all events in a calendar view (like Outlook). If so, I am good with the swipe functionality which I imagine will show a calendar with event names in time blocks. Then having a separate page makes sense. (I brought this up earlier on another page when I saw this swipe. Ignore that comment if this is what you intend it to be.) Another option is to show a calendar icon and on click it will take the user to the page. Or on click of the icon expand and show the calendar view (like the accordion functionality). ● Appointment box: Will be great to show date/time as well - handy info to have. ● Q: Do you want to allow users to add new events here as well? If yes, should show a + icon in the Events section. No errors

a. Open an event and invite a friend

Notes	
Participant 1	Clicked on Softball event, pressed "Invite" button but nothing worked (no errors) had to click back arrow 2x to get back to "Groups" main page
Participant 2	- Did not recognize that the invite friend button was a button, tried alternative methods several times. Generally confused by the lack of pressable buttons - Did not have much to say other than that the event itself looked fun.

Participant 3	Initially try to invite on the softball group invite.**(1 error)**
Participant 4	After pressing work, click softball. After entering, keep pressing invite (error). After being reminded, I entered the event and successfully completed the invitation to friends. **(1 error, 1 instance of assistance)**
Participant 5	• The page looks great. The only suggestion I have is to change the "Friend" under 2 Accepted sections to Friend 1 and Friend 2. • Also, the 2 Accepts may be hard to implement in real life. I think you can remove it for simplicity. • Q: Is "Your Groups" under Invite intended to invite the whole group? Just curious. No change needed. No errors

b. Create a new Group

Notes	
Participant 1	First clicked on "New Group Event" button (error), but nothing worked, so pressed on + sign in top right corner and pressed "Create New Group" tab but nothing worked **(1 use error, pressed wrong button)**
Participant 2	The user remarked that he wasn't sure what a plus button would be for, pressed it, and said "oh ok"
Participant 3	Plus button, drop down menu, create a group button doesn't click.
Participant 4	First, tried pressing the New group event and found that nothing happened. Then pressed the plus sign to create a new group. (no error)
Participant 5	Not that obvious that that's how you create a group at first (until after you click it), but otherwise, add button makes sense, but feels more like a hamburger menu. **Close call**

c. Edit your availability

Notes	
Participant 1	Clicked on "Availability" tab, tried to press on the red minus signs next to "Open to invites" availability times **(1 use error)**
Participant 2	As stated above, he reached this screen as a mistake earlier in the test. Tried to press more buttons on the availability screen.
Participant 3	Clicking the availability and screen looks understandable but couldn't work because the button can't click.
Participant 4	Click on Availability and try pressing the - sign (remove) (no error)
Participant 5	Wasn't super obvious how to get here, but this page looks good. The only Q I have is "Add Slot." Do you mean "Add appointment " instead? I don't know how you can add an availability slot. One more thing - I recall seeing some color coding for different types of appointments. You may want to incorporate this view so it's easier for users to identify the types of events/appointments they have. No error

Root Cause Guiding Questions:

1. We observed that you (insert difficulty they encountered). Could you elaborate on the steps that led to that?
2. Why do you think you found (task) challenging?
3. How did you feel as you completed (task)?

Notes (THREE MINIMUM)	

Participant 1	1. We observed that you were confused about how to edit your shared availability. Could you elaborate on the steps that led to that?
	    a. Yeah I just didn't know where the button was or where I was supposed to find it. The app is kinda overwhelming, there's a lot of different buttons and colors and stuff going on so I was confused.
	2. Why do you think you found (task) challenging?
	    a. I don't think it was challenging but it was more confusing because it seemed like that feature, or that button, was less obvious or more hidden for me to find.
	3. How did you feel as you completed (task)?
	    a. I was just trying to find the button on the page
	
	1. We observed that you had some difficulty when creating a new Group. Could you elaborate on the steps that led to that?
	    a. Yeah I saw a button that said "New Group Event" that stood out so I clicked on that. But nothing happened. So then I saw the (+) plus button at the top of the screen so I clicked on that. And then there were more options that came up to create a new group.
	2. Why do you think you found (task) challenging?
	    a. Again, I don't think it was hard. It just was not super obvious. Why is there a (+) plus sign for something and then a button with words for something else. It's not really consistent throughout, so I think that makes the app more confusing to go through.
	3. How did you feel as you completed (task)?
	    a. When I clicked the first button and nothing happened, I was thinking maybe I clicked on the right button but it just doesn't work since I know this is kind of a basic prototype. So I didn't really think I did anything wrong. I first assumed that it was just the prototype thing being weird and glitchy. But I just pressed the wrong button I guess.
	
	1. We observed that you had some trouble being able to edit the 163 meeting on the Calendar page. Could you elaborate on the steps that led to that?
	    a. Yeah it just was not immediately clear to me what to click or what I should be doing to get there. Because when I clicked on the 163 meeting nothing happened.
	2. Why do you think you found (task) challenging?
	    a. This one I found challenging because it just didn't make any sense. I am supposed to edit the 163 meeting. So I click on the 163 meeting, and nothing happens. I just started clicking all the different views. So when I clicked on "Work", then I saw the 163 meeting. And I clicked on it and nothing happened. Once you prompted me to try interacting with the event in a different way I tried pressing and holding, dragging, and sliding finally worked to reveal the edit button.
	3. How did you feel as you completed (task)?
	    a. Honestly I felt kind of frustrated. Because it's a prototype, half the buttons you click don't even work so it kind of feels like a maze. Like I was more just pressing everything until something worked, rather than the next step being more obvious.

Participant 2	1. I observed that you had some issues with the navigation arrows. Can you elaborate on that? a. Oh, like clicking them? Yeah. It seems to be a rather small point of contact that I am a very fast clicker who wants what I want clicked right away, so if it doesn't click, I'll keep mashing it. And ultimately, it seemed like that might not have been helping me. It was easier to click the button when I took my time with it and really made sure to press in the right spot. 1. Okay, thank you. I noticed that you have some difficulty swiping to edit the work calendar item. Can you talk more about the steps that led to that?

     a.   I think I just didn't really know that that was going to be an option at first. I think it seemed more like the idea of the swiping kind of like, wasn't. I didn't feel it totally intuitive to myself to be like, I should swipe this. It felt more like just the way in the shape of the square was, like, inviting for a tap. So I believe that a tap would do it. And admittedly, I didn't try swiping at first, but perhaps, like, something to kind of identify that there's, like, an option behind that part of the box or something might make it a little more apparent to someone who might not think of it like I did and kind of.

2.   Can you describe how you felt when you were figuring this out?
     a.   That part, I mean, it's kind of just like, oh, man, I could have just swiped the whole time, but I didn't think about it like, well, that was a little silly. I mean, it's the same thing that I would feel for, like, other apps in which you can swipe that I find out after the fact. And ultimately, the swiping leads to something easier. You know, it's definitely not the first time it's happened to me. How did I feel about it? I mean, I think it's, like, totally understandable. Though, because it happens to me pretty often. So I'm kind of used to it. But I do think that something to kind of indicate that there's an option or like a tip on the screen or something to let you know that that's there would be nice.

1.   Okay. Can I notice that you experienced some difficulty when trying to edit your availability? Can you elaborate on how that went?
     a.   Yeah. So I was initially, I don't know what I saw edit groups, but I didn't think about it. For some reason. I felt like edit groups would kind of have. I thought that edit groups would have a different kind of option when I saw it. I thought that it was going to mean something different than like, what the, what it turns into, which allows you to edit your availability and show the overview of what groups you want to look at. My first impression was that it would be something more individualistic to whichever group you would kind of click edit groups, go into a group and edit it somehow that way. That was my first impression of the button, hence why I didn't click it at first. And also, I exploratorily saw that availability was open in or another option in the groups tab. So I went over there for it. But once you click edit groups, it makes sense that it shows, it allows you to choose the options that you will see in your, your own availability. But putting availability in something that kind of seems to me like it might do another thing, might not be the most intuitive thing.

2.   Okay. And can you talk about how you felt emotionally when doing this process?
     a.   I mean, I thought it was kind of fun. I enjoy, like, exploring an app. I think it's cool. It wasn't, it definitely wasn't, like, upsetting at all. I mean, there were those two main parts that were a little confusing. Just the way that I am and the way that I work through those kinds of, like, processes.
     b.   I'm not being nice. I mean, like, I don't think I'm specifically being extra nice. I'm being honest. I mean, like, like, I don't. It doesn't bother me. You know what I mean? Like, I'm not a person to get bothered by something like that. I'm not gonna be pissed off. Like, you learn, you know? And if it's a good functioning app, you learn how it works. It doesn't always have to be the same every time, you know, it's nice to have a variance. But on that note, yeah, it was freaking, freaking really annoying. No, I'm kidding. No, I just think that, like, specifically, the first thing, the swiping, like, makes sense. The edit groups thing was definitely more confusing because I just didn't. There's nothing that indicates availability will be behind a group's option. So to me, it was kind of just like, what?

Participant 3	1. We observed that you couldn't find shared availability. Could you elaborate on the steps that led to that?
	a. I was looking for an app that said shared availability, but I could not find that. I kept clicking every button on the screen until I found shared availability.
	2. Why do you think you found (task) challenging?
	a. It was challenging because it was under edit groups. I did not think shared availability would be under that tab.
	3. How did you feel as you completed (task)?
	a. This is confusing. Why is this here?
	1. We observed that you had trouble inviting friends for an event. Could you elaborate on the steps that led to that?
	a. I clicked the invite button under the softball group, instead of inviting a friend to an even by the group. I just saw the invite and thought it was the right button.
	2. Why do you think you found (task) challenging?
	a. I thought I was clicking an event and the invite looked like I was inviting a friend for the event. I did not pay attention to the events tab under the group.

	3. How did you feel as you completed (task)?
	    a. I think the invitation should be at the top of the event. And also what does the share button mean? Is it also to invite people for the event?
	
	1. We observed that you had difficulty in creating a new event. Could you elaborate on the steps that led to that?
	    a. The plus icon was too small to notice and it's also just in the calendar view which was confusing.
	2. Why do you think you found (task) challenging?
	    a. I did not notice it initially and it kind of looked like I was adding a new group.
	3. How did you feel as you completed (task)?
	    a. The time availability in creating an event is quite confusing. I don't understand how it works. Also it seemed that each page had multiple pages within it which can be tiresome.

Participant 4	1. We observed that you were experiencing some difficulty editing the 163 meetings on the Calendar page. Could you elaborate on the steps that led to that?
	    a. I tried clicking 163 meetings in different areas, but no matter how I clicked, I couldn't get to the editing place.
	2. Why do you think you found (task) challenging?
	    a. Because I tried every possibility but could not find a place to edit.
	3. How did you feel as you completed (task)?
	    a. I wanted to find the edit button quickly, but I didn't expect it to be a swipe.
	
	1. We observed that you were experiencing some difficulty editing your share availability. Could you elaborate on the steps that led to that?
	    a. I also searched everywhere, but it took me a while to find a place where I could edit my share availability.
	2. Why do you think you found (task) challenging?
	    a. Because I don't think I can modify my shared availability in the edit group
	3. How did you feel as you completed (task)?
	    a. I was thinking about where it might be possible to find it, but had no idea at the time.
	
	1. We observed that you were experiencing some difficulty inviting a friend in an event. Could you elaborate on the steps that led to that?
	    a. I heard that there was an invite in the task, so when I entered the softball interface, I found that there was an invite button. After several attempts, I found that this was not what the task required, so after the reminder, I entered the event and invited friends. .
	2. Why do you think you found (task) challenging?
	    a. I don't think this is a challenging thing, because I didn't understand the question clearly and clicked the wrong question.
	3. How did you feel as you completed (task)?
	    a. I wanted to say why there was no response when I kept pressing the invite button, but I didn't hear the request clearly.

Participant 5	1. We observed that you had trouble creating an event on the calendar (the add button was actually in the bottom right). Could you elaborate on the steps that led to that?
	    a. First when I got to the calendar, didn't know what to do since it's just a blank calendar and some events below. I then scrolled down to look for the add button but couldn't find it. I did check under edit groups to see what was there, but didn't know what else to do.
	2. Why do you think you found (task) challenging?
	    a. I feel like I would've noticed the add button better if it was closer to one of those and not in the bottom, especially cause it was hidden by the safari thing.
	3. How did you feel as you completed (task)?
	    a. Confusion, it felt like there was a lot on screen, but I liked everything underneath the calendar and the ability to filter the events.
	
	1. We observed that you had trouble understanding the shared availability, both via the calendar and in the groups tab. Could you elaborate on the steps that led to that?
	    a. For the calendar page, I didn't know where the availability would be located, but when I clicked on Edit Groups to look around I saw it there. But it wasn't clear how to add or edit it, and the layout is a bit vague and confusing. The availability page under groups was a bit easier to understand but it was unclear what the "add slot" function does.
	2. Why do you think you found (task) challenging?

a. There should be an easier way to add and edit time slots. One of them had a tiny plus sign that I thought was meant to be clickable. The other one needs clearer wording on what "add slot" means (see comment from earlier)

3. How did you feel as you completed (task)?
   a. I was trying to understand how the availability works in this app, and kind of understood it, but I think some instructions or labeling/other color coding would have helped.

1. We observed that you had issues knowing what to do after you finished creating an account. Could you elaborate on the steps that led to that?
   a. Yes, after the account creation, I wasn't sure what the point was until you told me to go to the settings page. I don't think I would have done that otherwise, I probably would have tried to understand the calendar and groups first.

2. Why do you think you found (task) challenging?
   a. There was no onboarding or tutorial element to explain what this app can do, so I wish it wouldn't just throw you in to all the features once you add your information.

3. How did you feel as you completed (task)?
   a. Kind of overwhelmed because of all the possible things to click and not sure what to do first.

Follow Up Questions

I am going to ask the following questions on a scale of 1 to 5.

1 representing strongly disagree, 2 representing disagree, 3 representing neutral, 4 representing agree, and 5 representing strongly agree.

1. Clocky has a user-friendly interface.

Notes	
Participant 1	4 out of 5, I like the colors and it's kind of similar to other apps with the menu bar and everything
Participant 2	4
Participant 3	3, certain pages are confusing.
Participant 4	4, Overall, easy to understand
Participant 5	User 1: Beautiful & well designed, especially groups and goals User 2: 3

2. Clocky is easy to navigate.

Notes	
Participant 1	2 out of 5, I don't know if it's because it's still a prototype and a lot of the buttons don't click but I found it pretty confusing. There are too many colors, buttons, icons, etc. that the app feels kind of complicated and overwhelming.
Participant 2	4

Participant 3	3, some pages have too many subdivisions in them.
Participant 4	3, Some functions are hard to imagine interacting with in a non-click way
Participant 5	User 1: Not really User 2: 4

3. Clocky has a logical flow throughout the app.

Notes	
Participant 1	3 out of 5, I don't think the flow makes sense at all. There are too many tabs and buttons everywhere, I think it's very easy to get lost. Especially on the Calendar page I had no idea where to go to access certain functions.
Participant 2	3, Hard to say
Participant 3	3, the two different groups/events view don't make sense.
Participant 4	3, There are a lot of features, so overall it's a little hard to think about where it currently stands.
Participant 5	User 1: Somewhat User 2: 3

4. Clocky has useful features.

Notes	
Participant 1	4 out of 5, Yeah I think if all the buttons work and it's less complicated than Clocky is useful. I think the Goals page is pretty cool, I haven't seen that in other calendar apps before. I also really like seeing the weather forecast and commute time. It sort of combines aspects of other apps into just one app, so that part seems very convenient.
Participant 2	5
Participant 3	4, I like inviting friends to events and I also like to see their availability.
Participant 4	5, Integrate functions from many different apps!
Participant 5	User 1: Yes User 2: 4

5. I like the aesthetic of the layout design.

Notes	
Participant 1	4 out of 5, Yeah I like the color palette and the logo is cute. But the layout design kind of seems different on each page, it doesn't seem very consistent across the entire app.
Participant 2	4, but I am not too particular about that kind of thing. There are a ton of buttons that don't work. There are so many features it feels like multiple apps.

Participant 3	4, I like the color scheme.
Participant 4	5, Color is easy to see and use
Participant 5	User 1: Yes User 2: 3

6. I found it easy to locate the information I was looking for.

Notes	
Participant 1	3 out of 5, In the beginning tasks it was very easy like doing the onboarding and finding the Settings page and things like that. But the more specific tasks at the end I did not think it was easy to find what i was looking for at all. Like the buttons weren't working and I needed [the moderator] to step in and nudge me towards what I was supposed to be looking for.
Participant 2	Yeah like a 3 for now
Participant 3	2, it's really hard to do some tasks.
Participant 4	3, As mentioned before, when the task becomes more complex, it becomes difficult to know where what I am looking for is.
Participant 5	User 1: No User 2: 3

7. I would use Clocky as a planning tool.

Notes	
Participant 1	4 out of 5, Yeah I think if all the issues get fixed and the app actually works then I would be willing to try it again and use it. I like how it combines features of a bunch of different apps into just 1 app. But I also really like using Google Calendar so I'm not sure if I would switch over completely.
Participant 2	3, Um, for me, it's hard to say. I really don't use it like planning tools. So I would say, like, three for myself. I feel like that's a biased statement, though. I think for someone who does, it would be good. But personally, three.
Participant 3	3, i would mostly just use apple calendar as it's convenient
Participant 4	5, If it is really released, it will be an app I use often
Participant 5	User 1: Yes User 2: 3

8. I would recommend Clocky to others.

Notes	
Participant 1	3 out of 5, Yeah I think if I were able to test out another updated version of Clocky and it was improved then I would maybe recommend it to others. But the way the app is right now, nah I

	wouldn't recommend it to people. It's just kinda confusing, especially compared to things like Google and Apple Calendars.
Participant 2	4, sure
Participant 3	2
Participant 4	4
Participant 5	User 1: Not sure User 2: 3

APPENDIX I - [Root Cause Analysis Spreadsheet](#)

APPENDIX J - Revised Prototype

[Figma Link](#)

[Video Link](#)