Assignment 5 Report
Low-Fi Prototype and Test

The Team: 9:30am Voice Interaction Studio

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Introduction

Mission Statement
"You're not you when you're late."

Value Proposition
Learn to be respectful of other people's time by breaking patterns of habitual lateness.

Problem
Habitual lateness is a quality that plagues today’s society. With so many different tasks dividing our attention, punctuality is not prioritized. Those who make a habit of being late decrease their own productivity as well as the productivity of those who depend on them.

Solution Overview
Our solution provides a platform to help users be punctual. It allows the user to keep track of events and remind them to take appropriate actions to ensure a timely arrival. The user can set goals, monitor progress, and better understand his/her habits via personalized analytics.
Sketches

Original Design Ideas

We began by each creating sketches of what we wanted the interface of our app to look like. We experimented with a number of modes including mobile phones, wearables, voice, chatbots, and touch. The various constraints allowed us to explore different ways to represent the information applicable to our product. The following images represent original brainstorm ideas.

**Figure 1: Mobile Application as Calendar Plugin**

**Figure 2: Mobile Application Showing Notifications (Analytics Focused)**
Figure 1 depicts a mobile application that can be used as a calendar plugin. It syncs with the calendar on your phone and lets you customize your reminders based on personal data. This design down plays the presence of analytics and social accountability associated with being late.

Figure 2 displays the reminders that the user can get on his or her phone and how he/she can interact with it. This depiction also has a focus on analytics and displaying the user’s progress and goals.
**Figure 3** focuses on voice interaction. The goal of this design is to demonstrate how the application can be used solely by issuing verbal commands. This functionality extends from curating your data, to understanding your analytics and creating goals.

**Figure 4** demonstrates what the interface would look like on a wearable. The design is simplistic in nature and reveals the difficulty in portraying all the pertinent information on the small screen. Thus this design illustrates how voice can be used to navigate the app's functionality.

*Top 2 Design Ideas with Detailed Storyboarding*

After we brainstormed several sketches, we decided on two top designs. Our top designs differ in the appearance of their interfaces, as well as their conceptual focus. One is centered around the user and his/her personal progress, while the second design is oriented towards challenging friends to be prompt and keeping up with the progress of friends. One sketch focuses on the individual while the other is more socially focused. The two designs are shown below.

![Figure 5: Personal Focus Design](image-url)
Figure 5: Personal Focus Design

Figure 6: Social Focus Design
Selected Design Interface

Analysis of Top 2 Ideas

<table>
<thead>
<tr>
<th>Design 1: Social</th>
<th>Design 2: Personal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pro</strong></td>
<td><strong>Pro</strong></td>
</tr>
<tr>
<td>• Puts social accountability at the forefront</td>
<td>• Puts your progress at the center</td>
</tr>
<tr>
<td>• Measure how you compare to others</td>
<td>• UI focused on your lateness over time</td>
</tr>
<tr>
<td>• Challenges are emphasized</td>
<td>• Your profile is an intuitive homepage</td>
</tr>
<tr>
<td><strong>Con</strong></td>
<td><strong>Con</strong></td>
</tr>
<tr>
<td>• Do people need another social network?</td>
<td>• Hard to differentiate from calendar app</td>
</tr>
<tr>
<td>• Not interested in a play by play of my friend’s day</td>
<td>• Tells users they are late but doesn’t offer remedies</td>
</tr>
</tbody>
</table>

Rationale for Selected Final Interface Design

After evaluating the pros and cons of each of our top two designs, we decided that we wanted to move forward with the design that had a more **personal focus**. We thought back to our value proposition and the fact that we are trying to combat habitual lateness. Thus, we wanted to focus on the individual user, provide him/her with feedback and updates on his/her own progress.

We still decided that we still wanted to have some social aspects such as a section for creating challenges and interacting with peers. However, this aspect would just not be the prominent focus.

As we expanded this idea in the next phase of task flow storyboarding, we drew inspiration for how to incorporate voice interfaces from our earlier sketching and needfinding. We decided that voice interfaces provide the most utility on-the-go, and that we would prioritize voice interaction in push notifications and alerts. We also found that setting reminders by voice shows promise and is not currently supported by other voice technologies.
Detailed Storyboarding of Selected Design Interface

Simple Task: Set a Reminder
Moderate Task: Send an ETA to your Friends

Moderate Task:
Let partners know I'm running late.

3:03pm

What would you like to send Caroline + Bryce?

I'm running late, be there in 8 mins!

Done.

Happening w/ Voice

With app open...
Complex Task: Start a Challenge with your Friends

1. User selects challenges
2. User selects new challenge
3. User enters info for new challenge
4. User submits new challenge
The following chart summarizes key components of our prototype. These include important pages, buttons and features.

<table>
<thead>
<tr>
<th><strong>Interface Element</strong></th>
<th><strong>Functionality</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Home Page</td>
<td>Contains the user’s upcoming events, statistics, profile picture and a brief summary of key analytics (e.g. average arrival time and on-time streak)</td>
</tr>
<tr>
<td>Hamburger menu button</td>
<td>Clicking the hamburger tab button shows the user a drop down menu that allows quick navigation to key pages (e.g. profile, events etc)</td>
</tr>
<tr>
<td>Upcoming events page</td>
<td>This page contains information about the user event’s (time, place, people involved etc). It can be accessed by either clicking the “upcoming events” title on the home page or by using the hamburger button</td>
</tr>
<tr>
<td>“Reminders” pop up</td>
<td>The “set a reminder” button at the bottom of each event description leads to a pop up which enables the user to select how long before an event they would like to be reminded (15 mins, 20 mins, 1 hours etc)</td>
</tr>
<tr>
<td>Analytics page</td>
<td>This page contains graphs, progress charts and other visual aids to help the user monitor their progress. It can either be accessed by clicking “my stats” on the homepage or using the hamburger button and selecting “analytics.”</td>
</tr>
<tr>
<td>“Set goals based on statistics” pop up</td>
<td>Allows the user to set goals based on their analytics</td>
</tr>
<tr>
<td>Challenges page</td>
<td>Allows the user to monitor their challenges, people involved etc.</td>
</tr>
<tr>
<td>“Create new challenge” pop up</td>
<td>Allows the user to create a new challenge, invite friends to participate etc</td>
</tr>
</tbody>
</table>
Finalized Lo-Fi Prototype

Description

We designed our prototype out of paper and note cards. We decided to use a single outline, created with paper, of an iphone screen and swap the notecards in and out depending on the task. To simulate pop-ups we used smaller cutouts and placed them on top of the current screen the user was on.

Figure 10: Entire Lo-Fi Prototype System
Figure 11: Lo-Fi Prototype Screens for Setting a Reminder
Screens for Task #2: Set a Goal Based on your Statistics
Figure 12: Lo-Fi Prototype Screens for Setting a Goal Based on Statistics

Screens for Task #3: Send an ETA to your friends
Figure 13: Lo-Fi Prototype Screens for Sending an ETA
Screens for Task #4: Start a New Challenge with Friends
Figure 14: Entire Lo-Fi Prototype Screens for Starting a New Challenge

Figure 14: Example Voice Command for Setting Reminder
Interaction Principles:

- Navigate back to "homepage" from anywhere using hamburger menu
- All objects on the main pages can be tapped to get more expanded information
- You should be able to act on notifications without unlocking phone

Prototype Testing

Environment

We selected the participants based on diversity and availability (aiming for non-Stanford students). We met each participant at a location convenient for them and conducted the testing in a quiet, private space.

Tasks

1. Set a Reminder (Simple)
2. Set a goal based on your stats (moderate)
3. Send your friends an ETA (moderate)
4. Start a challenge with your friends (complex)

Test Measures

In order to evaluate our prototype design we kept track of a couple of metrics. We recorded the number of errors that each participant made. We defined an error as pressing a button that was not a part of the workflow for executing a particular task. For example a common error was pressing the challenges button when trying to set a goal based on analytics. We did not intend for this button to be part of the flow for this task, thus it is defined as an error. We also kept track of how long it took the participant to complete each task and then ordered the tasks based on time after the participant was finished. Finally, at the end of the session, we asked the participant to rank the difficulty of these tasks. We hypothesized that the time would correlate with how difficult the participant thought the task was. Further we hypothesized that this data would align with how we originally classified the tasks regarding difficulty.

Team Member Roles

Greeter: The greeter was responsible for meeting the participant and getting them setup in front of the prototype. He also helped to take notes, and catch important actions done by the participants. (Bryce)

Note Taker: The note taker was responsible for recording all the actions done by the user. She also noted important quotes the participant said, the questions the participant asked and the tasks he/she struggled on. (Caroline)
Facilitator: The facilitator was responsible for walking the participant through the desired task. She encouraged them to talk out loud about what they were doing and things that they were confused about. (Sasha)

Computer: The computer was responsible for stimulating the participants interactions with the apps. She switched out the various screens based on the buttons the participants pressed. (Yasmeen)

***Note: Sometimes these roles changed a little bit or overlapped.

Participant #1:

Participant #1 was recruited via email. He is a 23 year-old male who works at the Stanford bookstore. His participation was voluntary and he did not receive compensation. Before beginning the test, we asked the participant to articulate his thoughts out loud, and demonstrated how to interact with the paper prototype. Despite not having seen the interface before, the participant had no trouble navigating between the different pages of the UI. When asked to complete the simple task of setting a reminder, he clicked on a calendar item on the home screen without hesitation. The participant expressed concern that after setting the reminder, there was no visual change to indicate the reminder had been set. When asked to set a goal based on your stats, the user first navigated to the challenges page of the application. After realizing that this was not the page on which they could find "goals," the participant used the dropdown menu to try the analytics page instead.

When asked to act on the push notification prompting the user to send their ETA, the participant chose the option "customize" because he wanted to know exactly what content would be sent to the recipient.

Participant #2:

Participant #2 was recruited via a mutual friend. He is a 24 year-old male who works in the Tech Industry in the surrounding area. He currently holds a position as a Product Manager. Like the rest of our participants, his participation was voluntary and he did not receive compensation. He had no trouble creating a challenge with friends or setting a reminder, but struggled with sending an ETA and setting a goal based on statistics. These are the two areas in which he made the most mistakes. He tried to find the goals under challenges, and only after a little bit of direction did he find it under the analytics section. Another issue this particular participant encountered was navigating back to his home screen (which we asked each participant to do after they completed a task). The naming of “profile” vs. “home screen” was confusing. Although we assumed they were synonymous, this was not intuitive for him. Finally he expressed a variety of questions regarding sending an ETA. When he tested the voice interaction he wanted the message to be dictated back to him, and he struggled to find the send button on the screen. He also initially clicked clear on his reminder that he was already late, which was unexpected
**Participant #3:**

Participant #3 was a 20 year old female Stanford undergraduate majoring in mathematics. She was interviewed in the dining room of Slavianskii Dom. The participant made no errors when executing the simple task of setting a reminder. She expressed concern that after setting the reminder, there was no visual indication that the task was completed. When executing the moderate task of setting a goal, the participant hesitated over which dropdown menu item to select. She was unsure of how to dismiss the pop-up window representing the new goal. The participant made no errors executing the complex task of setting a challenge with friends, and remarked "I would use that" about the feature.

**Results**

Some of the common difficulties we saw across all users was the discrepancy in the naming of the home screen and the analytics screens. When asked to return to the home screen after executing the tasks, all participants were hesitant to click on the profile tab in the toolbar. Additionally, each participant ranked the task of setting a goal based on statistics as the hardest. We anticipated this to be the second most difficult task. From our testing we concluded that it was not intuitive to find the goals under analytics. Most participants naturally gravitated to the challenges tab in the toolbar. Also, most participants expressed a desire to be able to see their goals on the home screen. We hypothesize that the reason why our participants made so few errors on setting a reminder might be because these events were displayed directly on their home screen. Finally, our participants had some questions about how they were supposed to interact with the voice assistant. They were unclear if they were supposed to tap the microphone or if the app would just begin speaking to them. Two out of the three participants remarked that voice interaction would be useful to them if they were in a hurry.

**Discussion**

From the three user tests that we administered in this assignment, our main takeaways were the following:

- Consistency in naming is critical for users navigating an application.
- Having a drop down menu as a common method of navigating between the pages of an application seemed to make users feel confident in their ability to recover from mistakes.
- Users wanted a visual cue that the reminder was set successfully. From this observation we infer that in general, it is important to users to have visual cues that a task was completed.
- It seemed that grouping goals under the "your statistics" did not make sense to our users. In future iterations of the design, we should separate goals into a distinct page in our application.
For the most part, our interviewees seemed to feel positively about the concept of voice interaction in some narrow use cases, like sending your ETA when in a hurry. However, our user testing did not test whether a voice interface would be superior to a visual user interface for tasks other than those we specified beforehand.

**Appendices**

*Raw Data*

**Number of errors Executing Task Flow**

<table>
<thead>
<tr>
<th>Participant</th>
<th>Setting a Reminder</th>
<th>Set a Goal Based on Stats</th>
<th>Sending an ETA</th>
<th>Creating a New Challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>#2</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>#3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Time to Execute Task Flow vs. Difficulty**

Chart Explained: Our predicted rank for task difficulty is shown at the top of each column. For each participant the order of time of execution (shortest to longest) for each task is the row with time in parentheses. Their own ranking of the difficult of tasks is the row with rank in parentheses.
## Critical Quotes from Each Participant

| Participant #1 | “The screens are fairly straight forward and easy to follow”  
|                | “I can’t find the goals tab, does it have it’s own page”  
|                | “Are analytics and statistics the same thing”  
|                | “Do I have to input information for the graphs generated in the stats page”  
|                | “I really like the challenges feature, can I invite anyone or do they have to have the app” |
| Participant #2 | “I am looking for a send button” (with regards to sending an ETA)  
|                | “Are profile and home screen synonymous?”  
|                | “What would settings be in the context of this app? It feels like most of that information should go under profile.”  
|                | “The statistics in the top corner are not intuitive. I don’t understand what those mean? Can I customize them?”  
|                | “Why aren’t my goals on the home screen?” |
| Participant #3 | “All the tasks were pretty easy to accomplish”  
|                | “Creating challenges sounds really cool, does the winner get a reward?”  
|                | “Voice would be a nice addition but it definitely won’t be my favorite feature” |
Consent Form

The [TEAM NAME HERE] application is being produced as part of the coursework for Computer Science course CS 147 at Stanford University. Participants in experimental evaluation of the application provide data that is used to evaluate and modify the interface of [TEAM NAME HERE]. Data will be collected by interview, observation and questionnaire.

Participation in this experiment is voluntary. Participants may withdraw themselves and their data at any time without fear of consequences. Concerns about the experiment may be discussed with the researchers ([TEAM MEMBERS NAMES HERE]) or with Professor James Landay, the instructor of CS 147:

James A. Landay
CS Department
Stanford University
650-498-8215
landay at cs.stanford.edu

Participant anonymity will be provided by the separate storage of names from data. Data will only be identified by participant number. No identifying information about the participants will be available to anyone except the student researchers and their supervisors/teaching staff.

I hereby acknowledge that I have been given an opportunity to ask questions about the nature of the experiment and my participation in it. I give my consent to have data collected on my behavior and opinions in relation to the [TEAM NAME HERE] experiment. I also give permission for images/video of me using the application to be used in presentations or publications as long as I am not personally identifiable in the images/video. I understand I may withdraw my permission at any time.

Name __________________________
Participant Number __________________________
Date 10/24/18
Signature __________________________
Witness name __________________________
Witness signature __________________________
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Name: Ryan Merritt

Participant Number: 2

Date: 10/24/18

Signature: Ryan Merritt

Witness name: Bryce Johnson

Witness signature: [Signature]
Consent Form

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Name Dexter Hampton
Participant Number 1
Date 10/23/2018
Signature Dexter Hampton
Witness name Yasmine Tissi
Witness signature ........................