



Low-fi Prototyping & Pilot Usability Testing Report



Scott A:
User Testing



Christian M:
Development



Adrian H:
Design



Ashwin K:
Team Manager

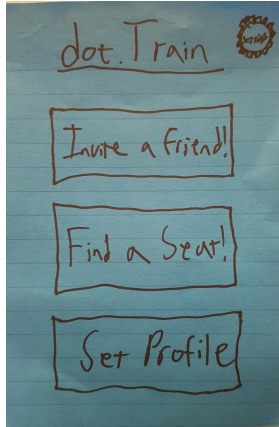
Introduction

In their daily commutes, people consistently choose to drive cars rather than use public transportation, despite the negative impacts on the environment, the opportunity costs of commute time, and the tedium of traffic. According to a U.S. Census Bureau report, over 105 million US drivers commute to work in private cars, with each driver responsible for emitting approximately 7000 pounds of CO₂/year, and spending an average of 260 hours per year sitting in traffic.

DotTrain is a smartphone application that strives to impact the issue of sustainability at precisely this crucial point: the commute. DotTrain is a social platform that connects commuters with each other, allowing strangers to develop friendships over common interests. At DotTrain, our core value proposition is traveling together. We believe that if we can facilitate social interaction, we can make public transportation a richer and more substantive experience, which will encourage more people to choose it over less sustainable commuting options.

Sketches

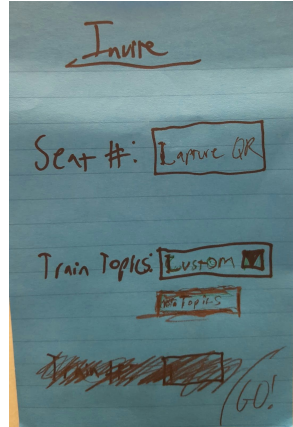
Idea 1:



Home Screen

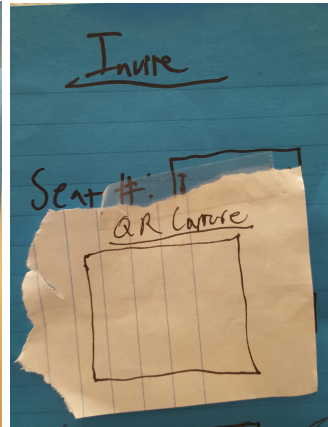
Topic

Fig 1.1



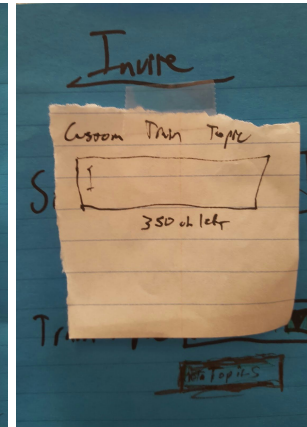
Invite Screen

Fig 1.2



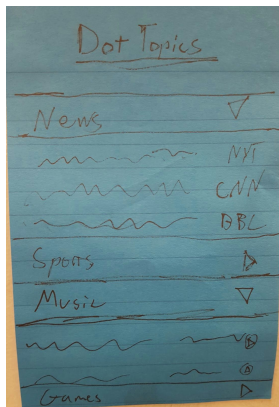
QR Capture Screen

Fig 1.3



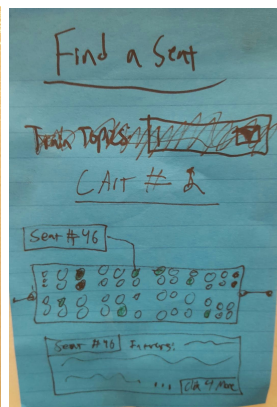
Custom Train

Fig 1.4



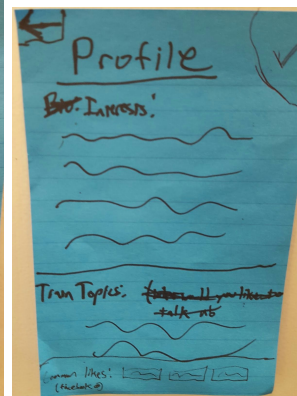
Suggested Dot Topics Screen

Fig 1.5



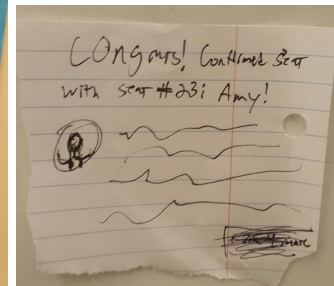
Find a Seat Map

Fig 1.6



Profile

Fig 1.7

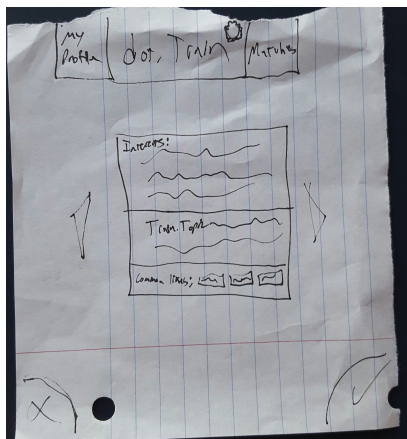


Seat Confirmation

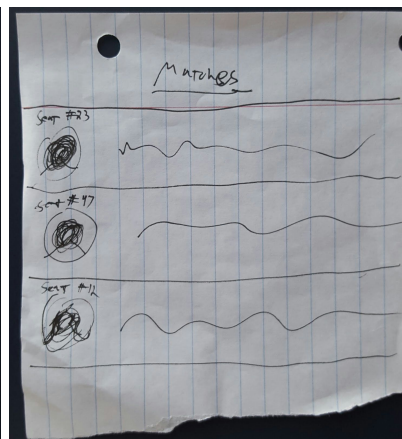
Fig 1.8

The most significant feature of this idea is that power over partner selection is only given to the person searching for a seat. The rider who already has a seat, or who is unwilling to move seats, specifies their location by scanning a QR code on the back of the seat in front of them (Fig 1.3), and then sets a "Train Topic" for the day (Fig 1.4 and 1.5). Whoever clicks "Find a Seat!" can view a map of the train and see profiles of available partners (Fig 1.6).

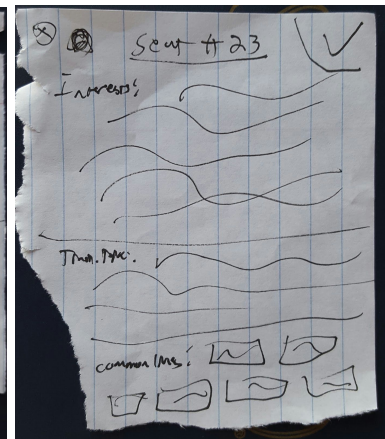
Idea 2:



Home/Swiping Screen
Fig 2.1



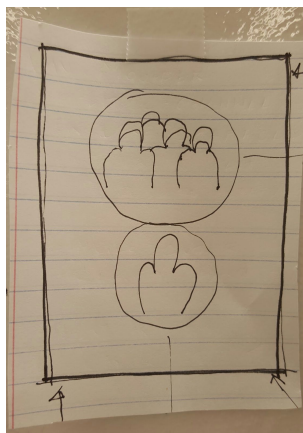
List of Matches
Fig 2.2



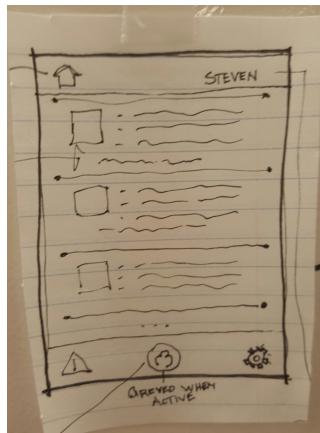
Profile
Fig 2.3

This idea is modeled on Tinder. Users first select if they are sitting or looking for a seat, then they swipe left (no) or right (yes) on profiles (Fig 2.1). Any matches are displayed in a different tab. A user can then invite any user they matched with to sit with them, and if the other user accepts, the connection is complete.

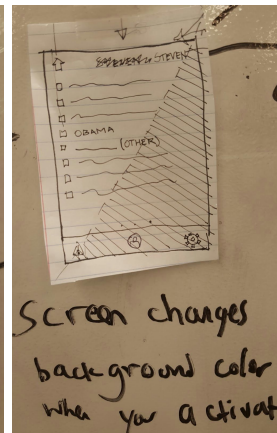
Idea 3:



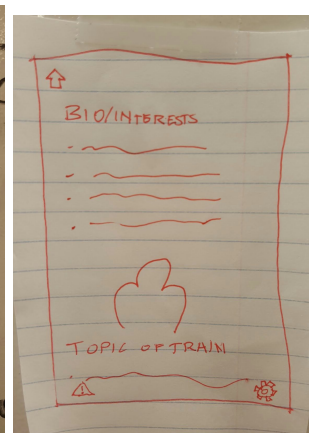
Home Screen
Fig 3.1



Scroll Profiles
Fig 3.2



Current Topics List
Fig 3.3



Expanded Profile
Fig 3.4

The home screen has two options: activate yourself or browse active users (Fig 3.1). The browse option allows users to scroll through active users without being active themselves (Fig 3.2). The activate button goes to a checklist style page filled with different current topics (Fig 3.3). The user checks off the topics they are interested in and then can scroll through profiles of other active users. Then, any user can send an invitation to any other user to connect.

Idea 4:

This concept is very simple and can be navigated completely through a watch. A user can swipe through available profiles and then send or receive requests. The app would tell by location whether one is sitting or waiting.

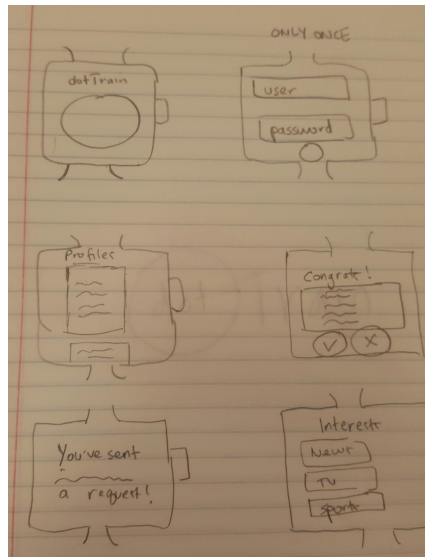


Fig 4.1

Supplemental Idea:

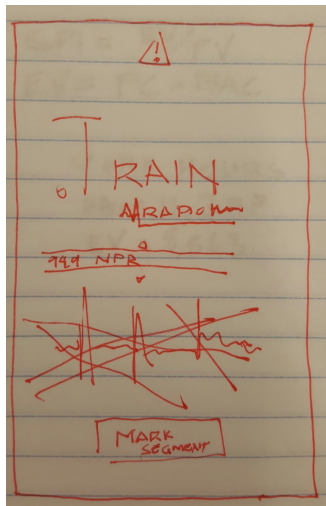
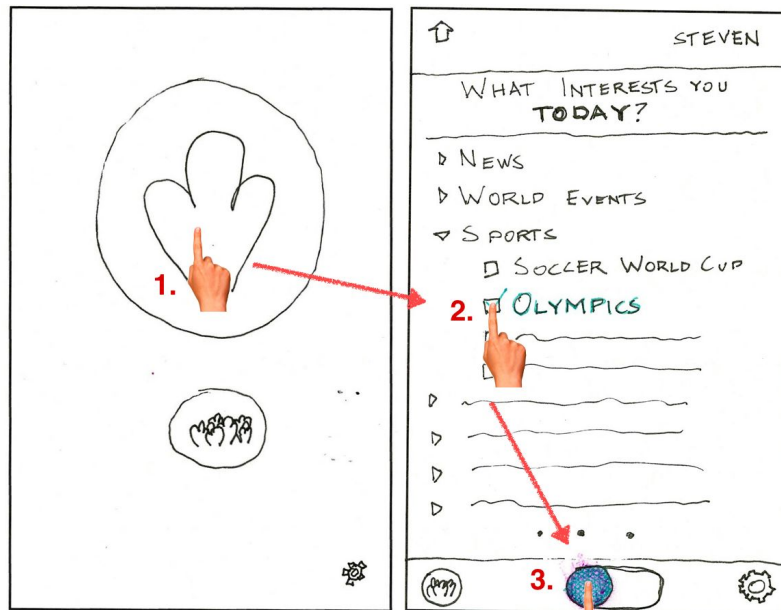


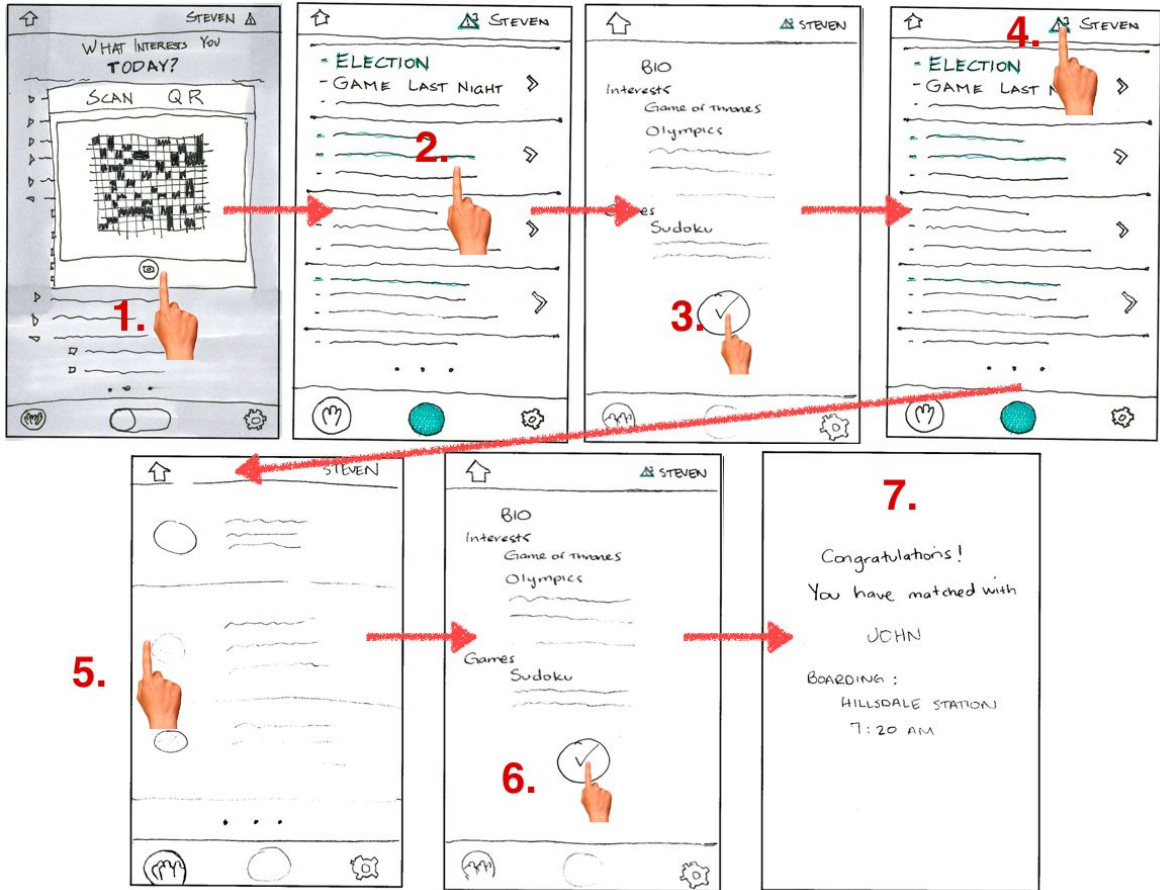
Figure 5.1

This is a supplemental task that can be incorporated into any design idea. Users can listen to the radio and then if there is a particular segment they find interesting they can mark it on the phone and then when viewing other profiles if you both liked the same segment it would display that.

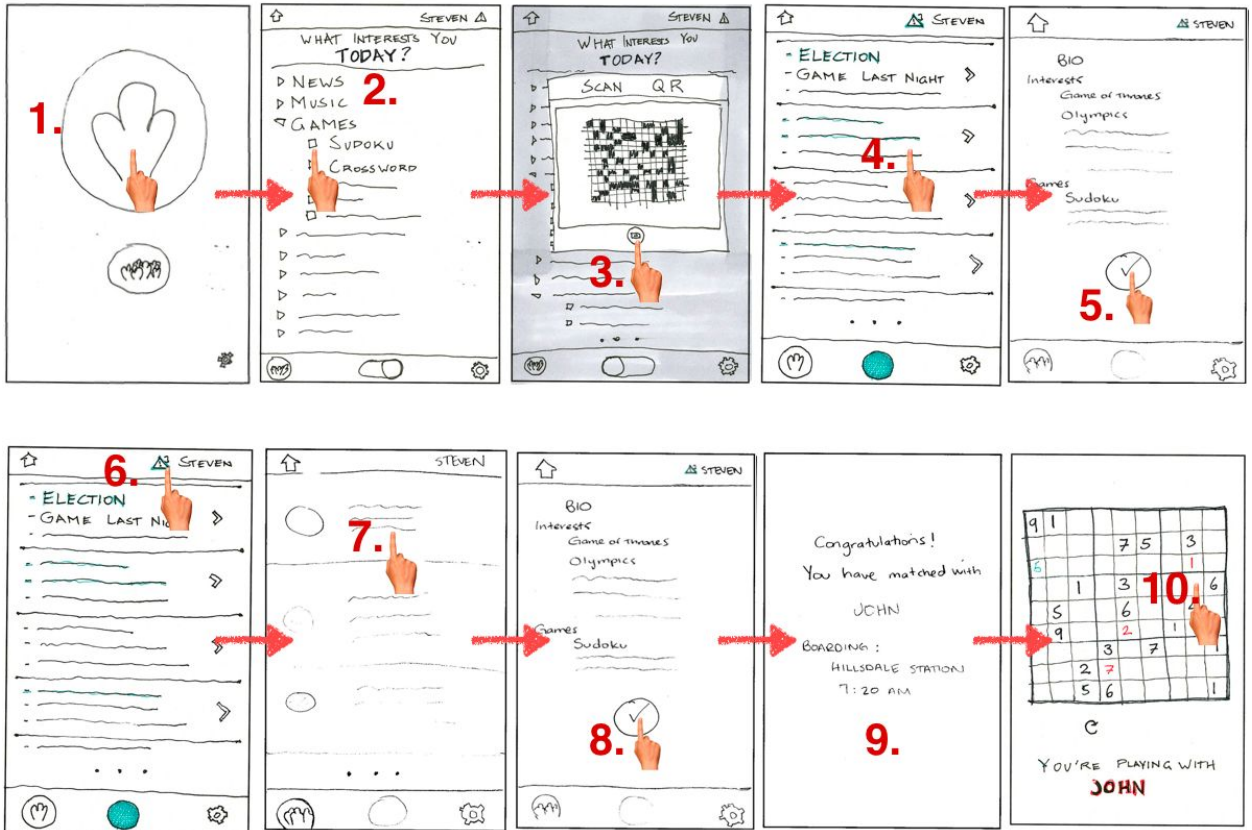
Selected Interface Design



Task 1: Mark yourself as available and interesting



Task 2: Find an interesting and available person



Task 3: Play a game with someone

We chose the framework explored in our third idea, because this idea gave an appropriate level of control to each person in the matchmaking process, while maintaining simplicity in navigating this relatively complex task. We decided also that an iPhone was an appropriate platform for the app, and not an Apple Watch, because of its ubiquity and because the app is structured to require reading about people's interests, which is hard to do on a wearable.

5. Prototype description, with images of each screen used by your tasks and a picture of the entire system (½ page)

Our prototype has five key screens - a home screen, daily interests screen, list of potential profiles, permanent profile, and other people's profile. These screens mostly cross reference each other with icons. Your status as discoverable to other people is indicated by a red or green circle at the bottom of all these screens. There are auxiliary screens in the app as well - notification screens, pop-up windows, and game screens, but these screens appear automatically when appropriate.

Method

Participants

Our target demographic is commuters between the ages of 20-39. Based on observations and interviews on the Caltrain, people in this age group tend to be sociable and regular commuters. We split our participants between people who drive cars and people who use Caltrain. We tested it on car drivers to test if the app would be a strong enough stimulus to convince someone to switch from private car to public transportation. We tested it on Caltrain users to determine if the interface and functionality were both easily usable and comprehensive. We recruited volunteers by asking if they would be willing to help be part of a study for a class, and did not offer any compensation.

Environment

Users of DotTrain are either standing at the train platform or sitting on the Caltrain. We used storytelling techniques to set the scene and put the user into one of these mindsets.

Tasks

- (Easy) The first task is the user labeling themselves as interesting and available. This task involves clicking a large, central button, several boxes indicating topics you are interested in, and then flipping a switch to indicate that you are available to socialize. We watched to see if users were confused by the availability declaration switch. The switch is modeled after the switch commonly found on the iPhone, but we incorporate a slightly different (and potentially confusing) color scheme.
- (Medium) The second task is the user finding an interesting and available person on the train. Users begin the task presented with the app's home screen. They complete it by navigating to the list of potential matches and selecting someone they find interesting. We also used this task to determine how intuitive our UI is. In particular, we were looking to see if users were able to recognize that they could browse potential matches while either discoverable or anonymous.
- (Hard) The third task is the user asking to play a game with someone. This task requires the skills used in the first two tasks and adds a layer of complexity - they must indicate the game they want to play and navigate the post-match screens to get to the game. Integrated with this task was a test of our notification system.

Procedure

We carried out all of our experiments using carefully drawn UI screens on small rectangles, meant to mimic the look, feel, and screen of an actual smartphone. Before the participant began each task, our team member representative described on a high level what problem the app was trying to solve, and provided a short description of the task the user was meant to complete. We proceeded in order from simplest to most complex task.

Because we all operated on different schedules, we were unable to have all team members present at each experiment. Scott was able to conduct the first two experiments, and Ashwin and Adrian were able to do the third and fourth experiments together. However, before beginning any experiments, we discussed the procedure as a team, and noted down exactly what information we would give to the participants. We went over a rough introduction script, as well as how much to prompt each user if they got stuck. Our users did not agree to being videotaped, but did allow us to take detailed notes of everything we saw.

Test Measures

When conducting our tests, we primarily evaluated how easy it was to use the application. Seeing as our application can be categorized as a social networking app, it should be simple and intuitive to complete our tasks. In the pursuit of determining if our UI was good, we assessed the following criteria:

- The number of mistakes made. One key data point in evaluating how intuitive a UI is, is to see how many misclicks a user takes to perform an action. This allows us to identify screens that are poorly designed, so we can focus on improving our weakest points in the next iteration.
- The amount of time it took them to navigate through the screens with each successive task. One of the key differences between a good UI and a bad UI is the amount of time it takes a user to learn how to navigate it. For instance, a bad UI might be learnable eventually, but this might take hundreds of iterations of using the app to memorize what each button does, and the workflow the app provides. On the other hand, a good UI might be confusing at first (understandable so, because all of the buttons will be foreign), but by the third or fourth time around, the user should smoothly be able to navigate the UI.
- The final measure is a qualitative analysis of how easy the app was to use overall. Specifically, I noted down all of the comments made by the person under their breath, or as a knee-jerk reactions to certain tasks. These natural reactions are extremely important, because they reflect the unabridged thoughts of the user.

Results

Participant 1 - 20s, male

Participant 1 was able to easily finish task 1, making no clicking mistakes. He commented that he liked our availability switch button, and comment that our icons could be confusing. He was also able to easily finish task 2, discovering both methods of scrolling through available people. He had the most trouble finishing task 3. When we displayed notifications to him, he was confused and didn't know what to click. He suggested that we change the notification, and make the notification alert disappear automatically when in the app. He also suggested that we make a better button to reject match requests.

Participant 2 - 20s, female, infrequent CalTrain, bus user

Participant 2 completed task 1 quickly, but noticed the notification icon, and commented that it looked like a warning, not something positive. She also commented on the profile screen button, saying that it was confusing and did not look like a person. She completed task 2 and 3 with relative ease, and got very excited about when she got a match. Participant 2 was very observant, and noticed that we had a few inconsistencies with our representations in the prototype, including discolored icons, and mismatched text.

Participant 3 - 20's, female, frequent CalTrain

Participant 3 thought our idea was interesting and said she would be a casual/regular user. On task 1, she clicked the wrong button on the home screen, commenting that our icons were unclear. She correctly identified the purpose of the following screen, and easily edited her interests of the day, but misclicked when trying to make herself available - she clicked the profile icon in the bottom left corner, instead of sliding the red slider. She completed tasks 2 and 3 easily, correctly navigating all of the menus, smoothly expressing interest in a potential match, and then matching with someone to play a game with them. She was also able to easily edit her own profile. However, she noted two issues. First, she said that our icon, which indicates when someone is interested in her, was "alarming and looking like a warning sign". Second, she expected the QR code scanner to scan and disappear automatically. Overall, her biggest issue was with the icons on the home screen.

Participant 4 - 20's, male, infrequent CalTrain

Participant 4 easily navigated through the home screen and edited his profile. He ran into problems when he tried to identify himself as available. Initially, he thought that he had to keep on declaring interest in topics until it turned green. For task 2, he was able to easily navigate to the screen to scroll through potential matches, and select someone he thought was interesting. The main issues he had were when he tried to back out of someone's profile, after he read it and found them to be uninteresting. His gut reaction was to try and swipe the page away - a feature we had not thought of. He was able to easily interpret the notification that someone was interested in him. For the third task, he was able to easily edit both his temporary and permanent profiles. He had difficulty with the QR scanner and understanding what exactly it did, and he wanted us to include some directions on its purpose. He also felt that the transition from matching interests with someone over playing a game to actually playing that game felt natural.

Discussion

The main result from our experiments was that the most important thing to have an intuitive UI. All of our complaints happened when someone was unable to distinguish exactly what a button does, or wanted a specific button to have different functionality. Our participants identified three major areas of improvement.

Home Screen. One of our participants complained that the icons on the home screen were unclear. Even though the correct button (displaying a solitary figure meant to indicate the user's profile) was much larger, she felt compelled to press the more social looking button. She recommended that we change the icons on the buttons, and look into resizing and repositioning them.

Notification Icon. Users described our icon as “alarming”, in large part because it is a symbol that is commonly used as a warning symbol. With regards to the push notification that told a user when someone else had reciprocated interest in them, we had mixed reviews. Some people enjoyed that it was front and center, and required them to take an action to make it go away. Others thought that it was a waste of a screen, and that we should “burn it”.

QR Code System. Users complained that they were prompted to scan the QR code at a seemingly random time, and didn't quite understand its purpose. To remedy this issue, we will provide a caption for what the QR code does. In addition, we are redesigning when the QR scanner appears. Also, we will change our QR scanner to scan and disappear automatically. Overall, we gathered great feedback from our design. We were pleased to see that people were able to learn our UI within minutes. Key things we learned were that we should redesign our home screen, redo our notification system, and refine our QR code scanner. In addition, we could look into consolidating the two types of personal profiles, because there was some confusion about the usage of a temporary vs permanent profile description.

Our prototype unfortunately could not help us determine how smoothly our app would actually work. We are interested to see how users would interact with the app if it were an actual application, rather than a paper prototype, because then users could move between screens more quickly. This would give us a better sense of if our app requires too much clicking.

Wordcount: 2497

Appendices

Test Script:

Introduction

1. Ask name, profession, willingness to take time for us.
2. We're Stanford students, making an app called Dot Train for a CS class. If you have a couple minutes, we'd like to test it on you. The basic concept is that it helps you to be social on the caltrain - the idea is that the app matches you with others based off of mutual interests, and then assists you in sitting with them. We'll structure this session by showing you a screen and then asking you about your comprehension of the interface and how you might use it. We'll then ask you to perform a specific task on that screen and see how you accomplish it.
3. This interview is completely anonymous, and none of your identifying information will be available to anyone beyond our team, and instructors. We have a simple consent form for you to sign.

Ok, let's get started

1. task 1 introduction: You're at the caltrain station, and you're getting ready for a long commute north. You want to find someone that you might have a conversation with, but first you have to indicate to the app and other people riding the caltrain that you're ready to socialize. You load up the app, and this is your home screen. What do you do from here?
2. task 2 introduction: Now you're sitting in the seat, because no one has invited you to sit with them yet, the app dings and tells you that your profile has been deactivated automatically because you've switched from sitting to standing , how do you go about re-indicating your readiness to socialize, updating your interests, and inviting someone to sit with you?
3. task 3 introduction: It's another day, and you feel like playing a game. You pull up dotTrain, how would you go about inviting someone to play a game with you?

General Prompting/Assistance script

Each time a person reached an unfamiliar screen, we would ask them to describe what they're seeing and what they thought the screen did. We would also ask if anything was surprising, or confusing. Then we would ask them to perform the next step to complete the task being tried. If they could not find the button, we would simply explain what that button does, and then ask them to try again. When they incorrectly completed a task, we would prompt them to describe why they were drawn to that option.

Consent Form

The Dot Train 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 Dot Train. 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 (Scott Arkin, Adrian Harrison, Christian Medina, Ashwin Kumar) 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 studentresearchers 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~~ dot Train 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 Mark Tepanjan

Participant Number 2

Date 10.22

Signature [Signature]

Witness name Scott Arkin

Witness signature [Signature]

Name	Misclicks	Time taken to Navigate(first time -> last time)	Easiness ranking (1-10)
Participant 1	3	20sec -> 5sec	7
Participant 2	1	12sec->4sec	8
Participant 3	5	24sec->4sec	7
Participant 4	6	6sec->3sec	8