

Low-fi Prototyping and Usability Testing

O by Trability

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Introduction

Don't be a tourist; be a traveler.

While traveling can be a wonderful experience, some people have a strict to-do list or lack knowledge of the new area, limiting their experience to only the main tourist attractions. Their trip may be pleasant, but they end up having a generic tourist experience and do not get the most out of their journey.

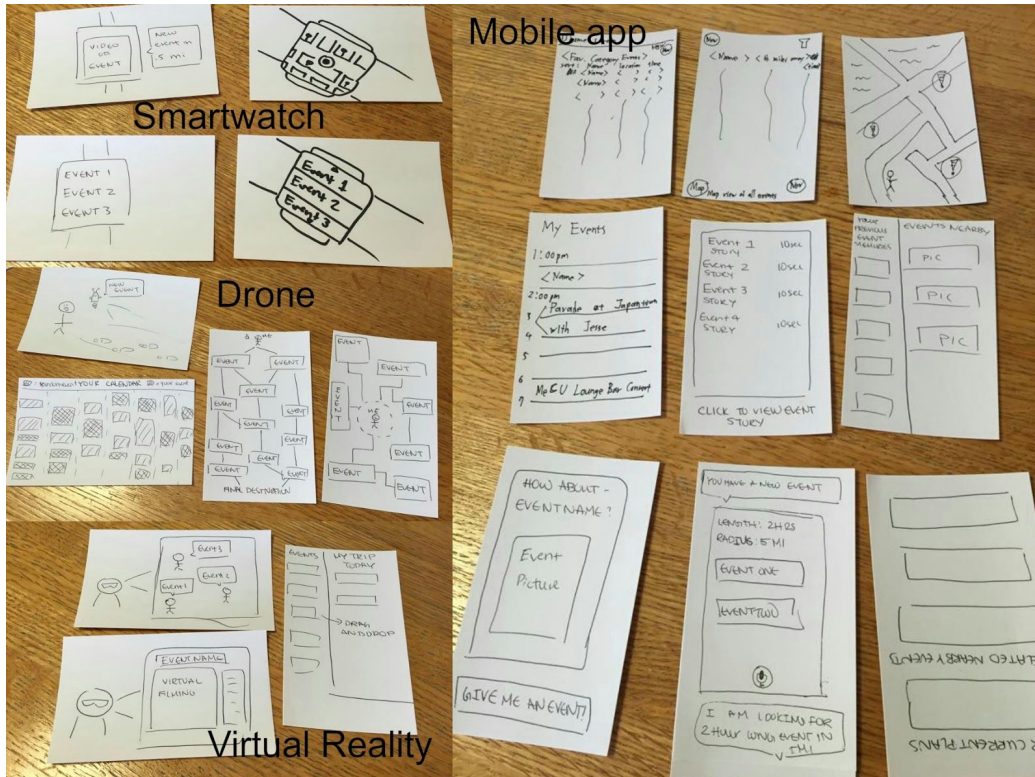
In order to enliven a journey, we decided to make travelers aware of events in the area that they probably would not have planned to attend. By attending these diverse, spontaneous events, a traveler can focus more on the rich and unique experiences in the present. Our main goal is to allow tourists to be travelers by updating them on local events and creating authentic experiences that make them say, "Oh!"

Design Ideas

We sketched several implementations of a few different interface ideas:

1. Smartwatch
2. Mobile app
3. Virtual Reality website
4. Companion drone

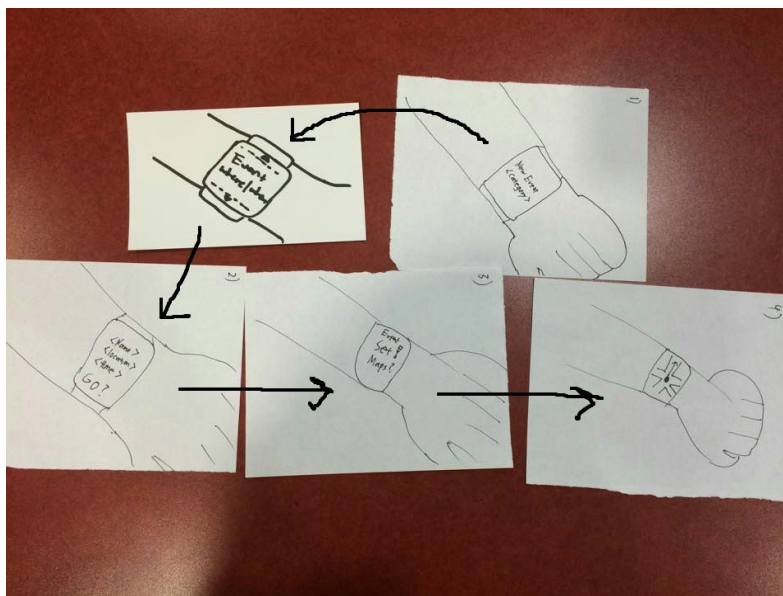
Below are the sketches showcasing each of the unique interfaces.



We chose the smartwatch and mobile app as our top two interfaces.

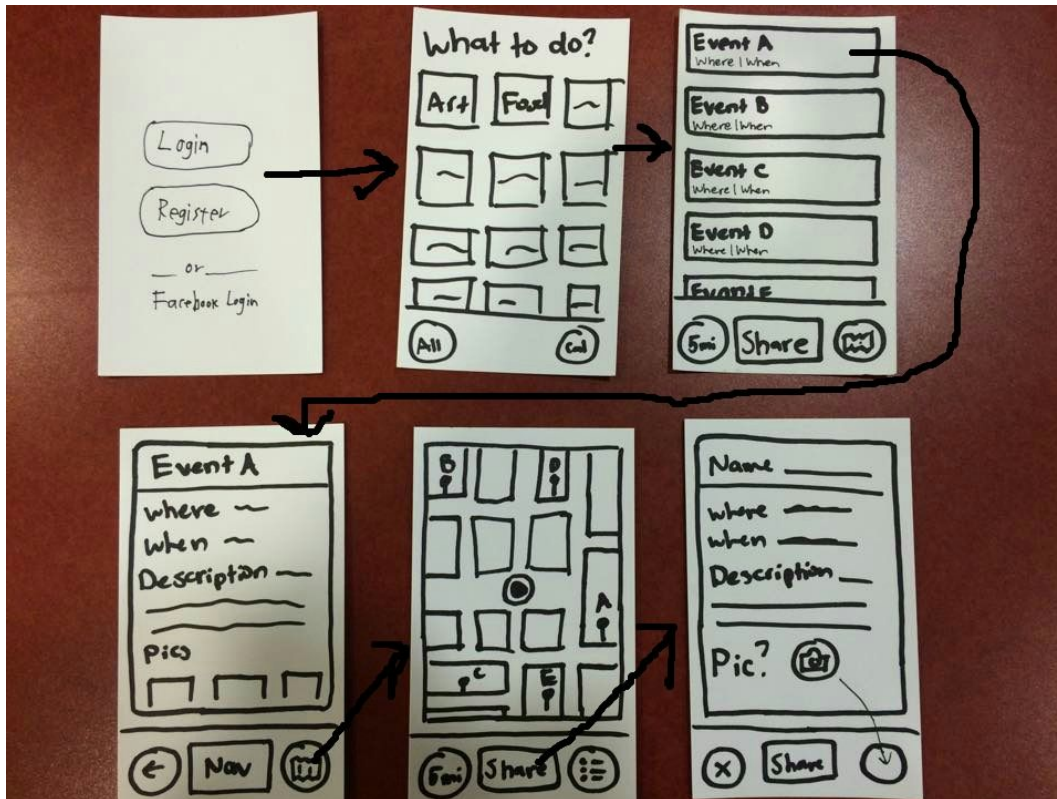
Smartwatch

In our early interviews, users stressed that traveling should feel natural. We felt a smartwatch, which is simple and portable, would be able to notify travelers without being bulky or intrusive.



Mobile App

Mobile apps are extremely common and well-understood by users, and the majority of our original interviewees used and depended on smartphones while traveling. A smartphone app provides the convenience of portability along with a sense of familiarity.



Selected Interface Design

Mobile App > Smartwatch

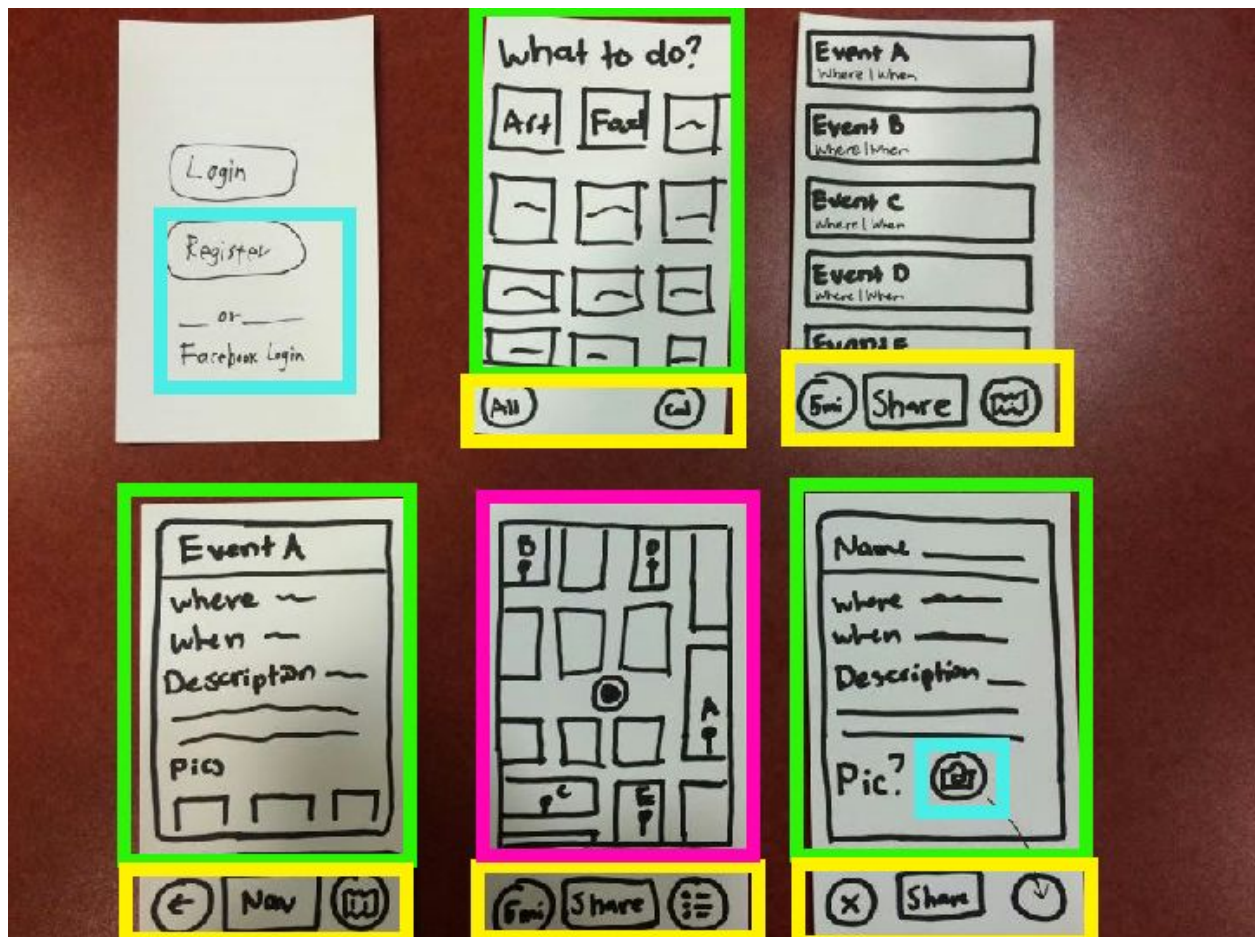
- I. During our preliminary interviews, a recurring theme was how people constantly used their phones to look up information, navigate, and stay connected when traveling. A mobile app would be a natural extension of what travelers are already accustomed to using.
- II. A phone has storage capacity to function outside of wifi. Travelers told us it's frustrating when they cannot use their apps because of lack of wifi while abroad. On a phone, we would have the capacity to implement features that would work through phone storage rather than wifi.
- III. Most people have smartphones. Smartwatches are not as common.

IV. Looking at our sketches, the mobile app would give much more flexibility and ability for interface complexity that we felt would enrich our app and travelers' experiences.

Functionality

Feature of mobile	Functionality
Larger screen	Provides larger area for interactive features and allows users to receive more information on one screen
Native phone functions	Provides ability to integrate phone features such as camera and 4g/LTE access (not available on all smart watches)
User familiarity	Allows users to draw parallels between our app and other apps such as Google maps

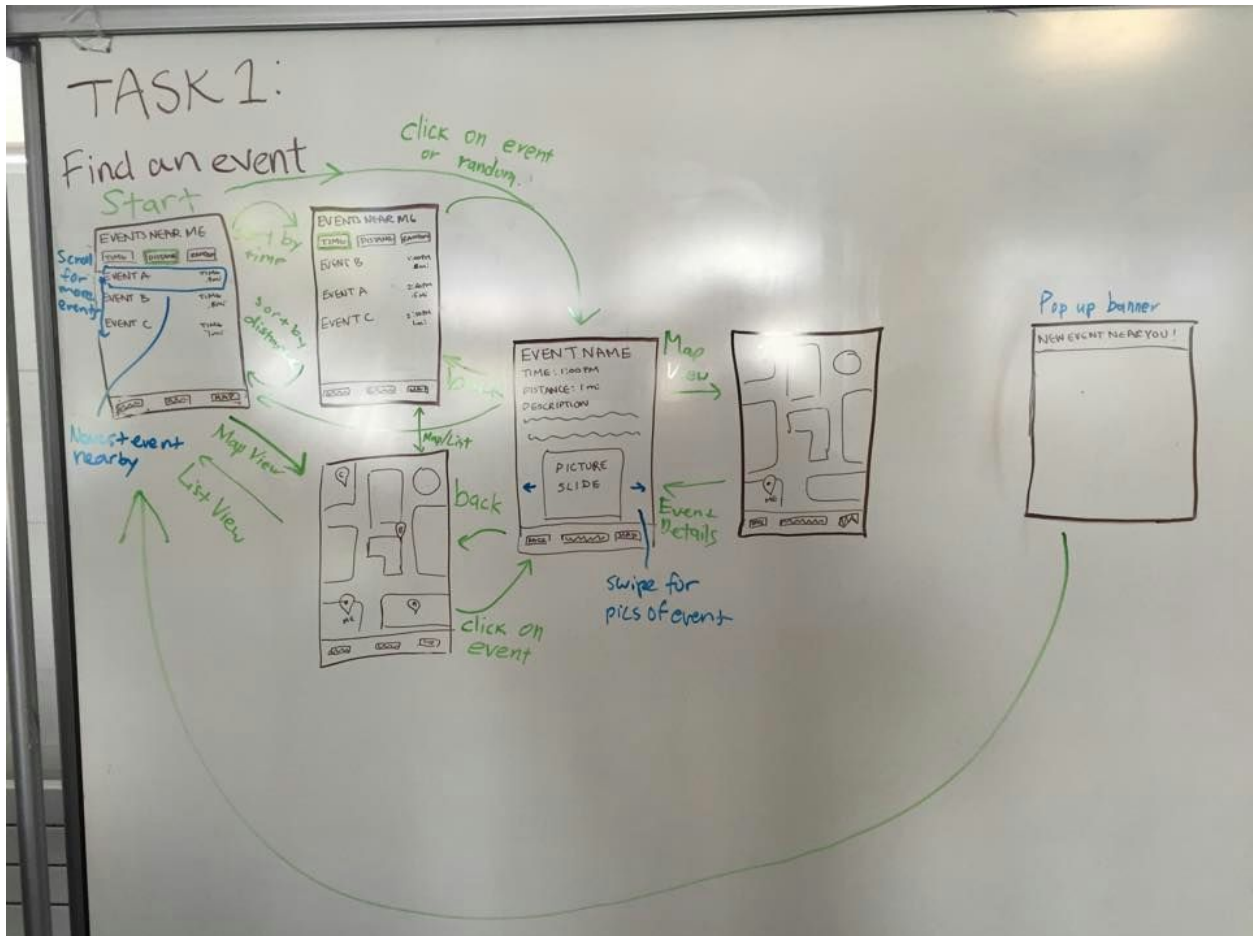
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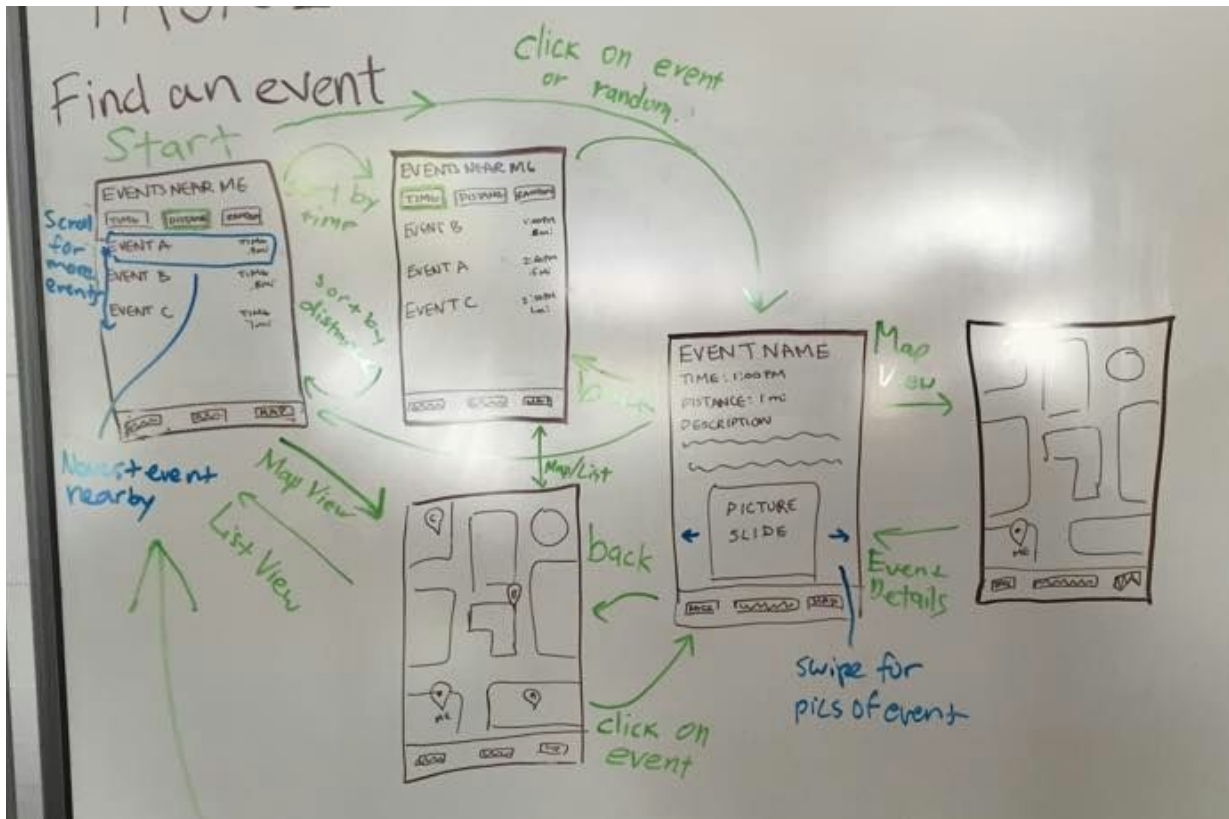
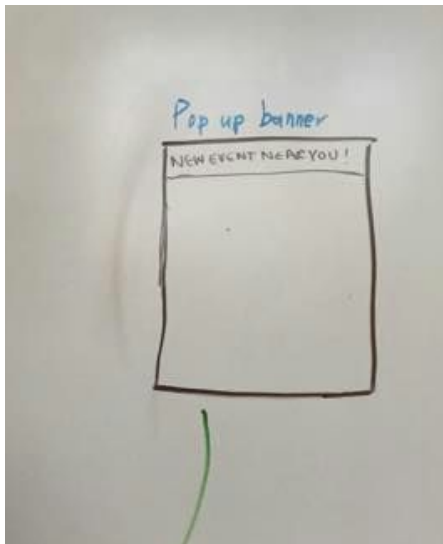


Mobile App Task Storyboards

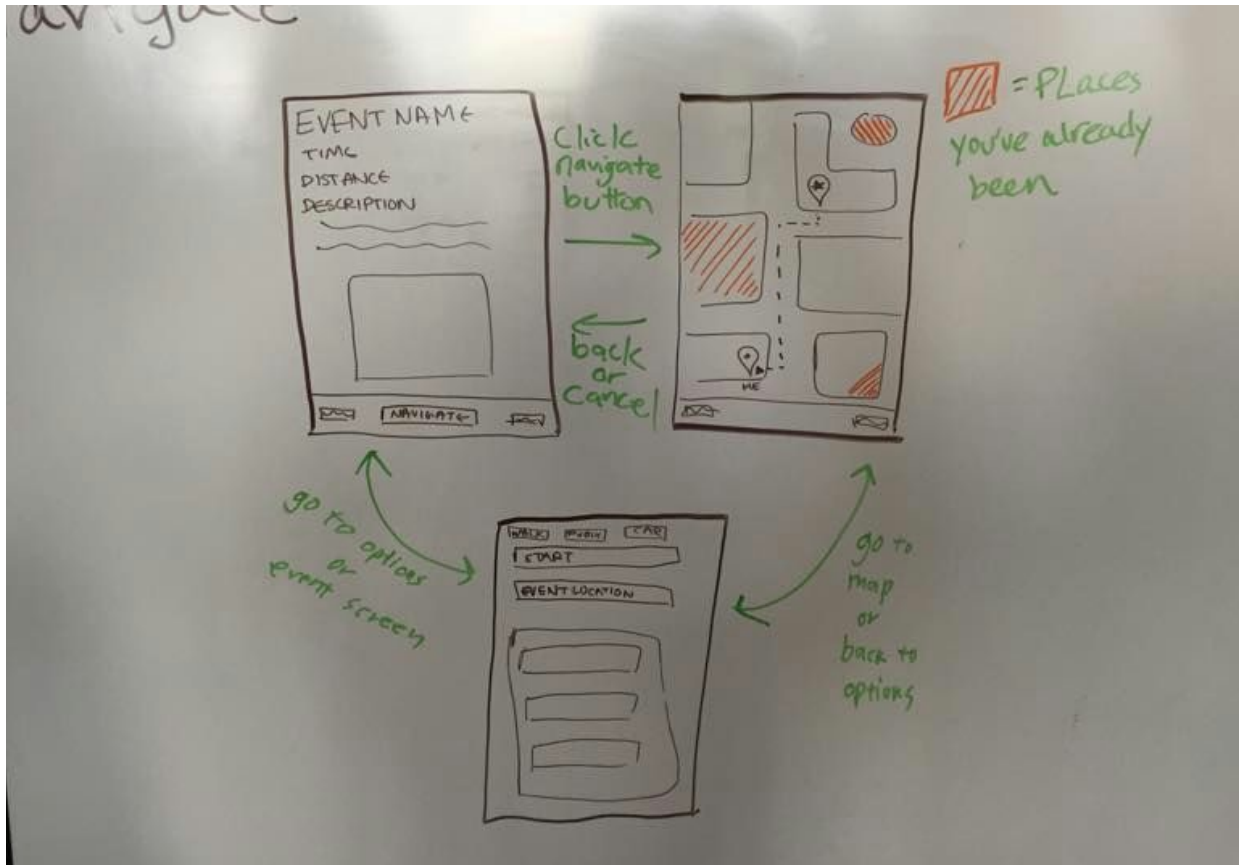
Note: Green arrow/text shows correlation and direction of flow, while blue text/arrow shows functionality details.

Task 1: Find an event

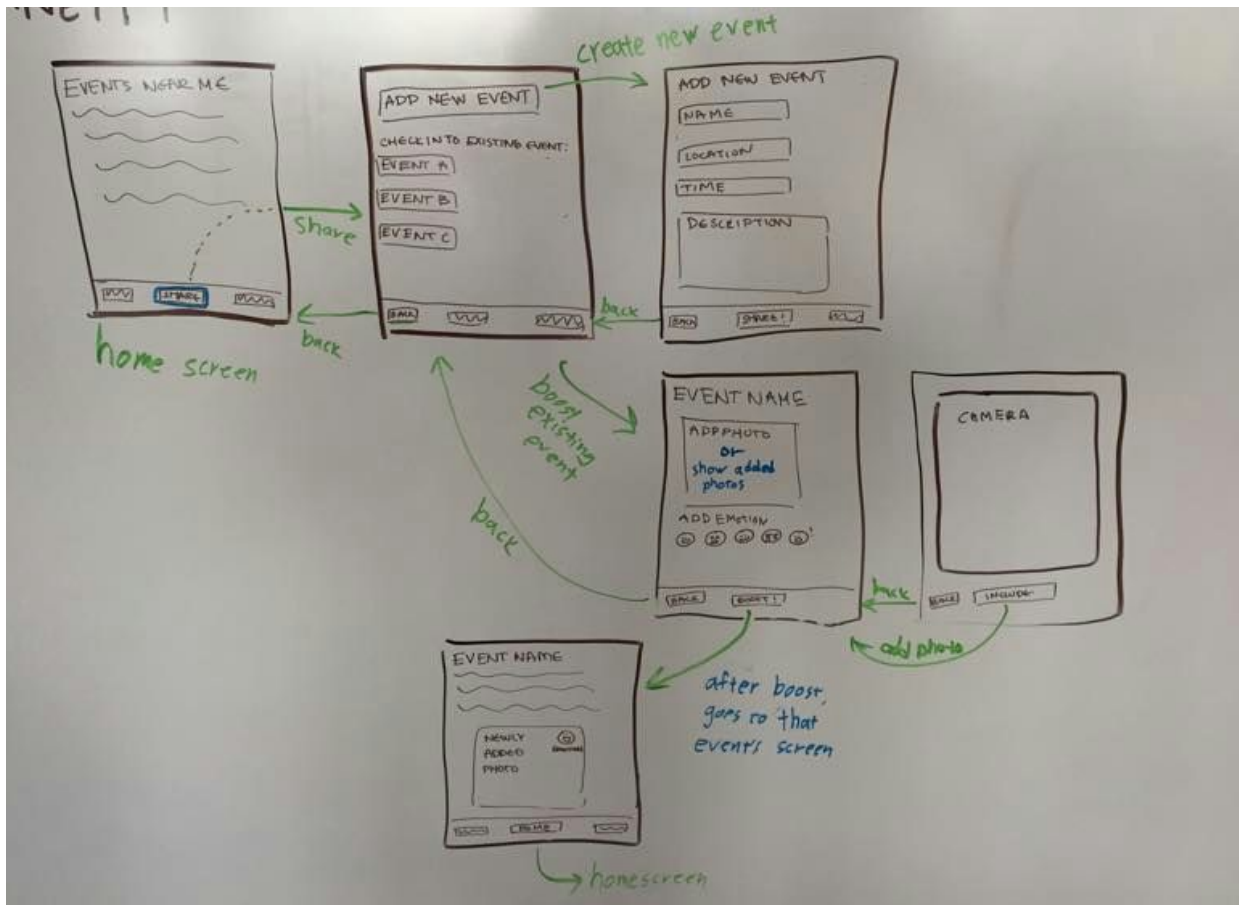




Task 2: Navigate to an event through an unfamiliar area



Task 3: Share experience of event with others

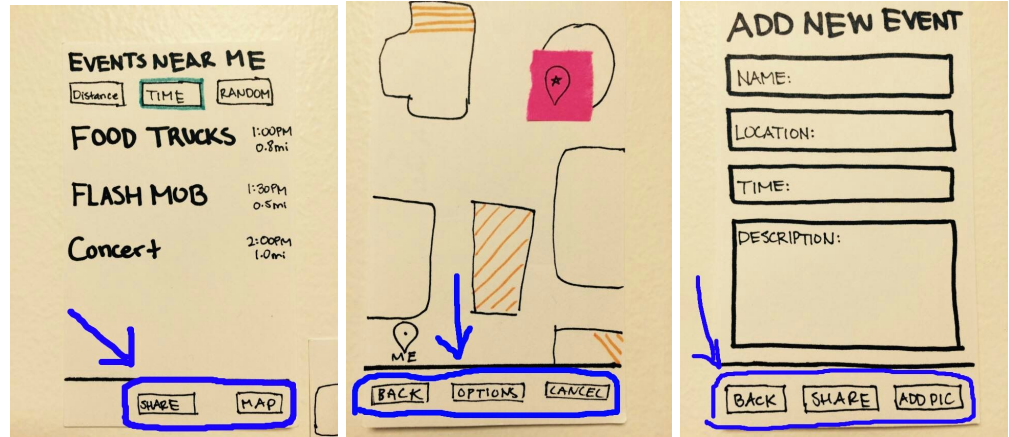


Prototype

Overview: The vast majority of interactions are based on touch input to move through visual screens.

Main Functionality

Functionality	Low-fi Implementation
Touch buttons to move between screens	Hand user a new paper screen whenever they tap a "button"



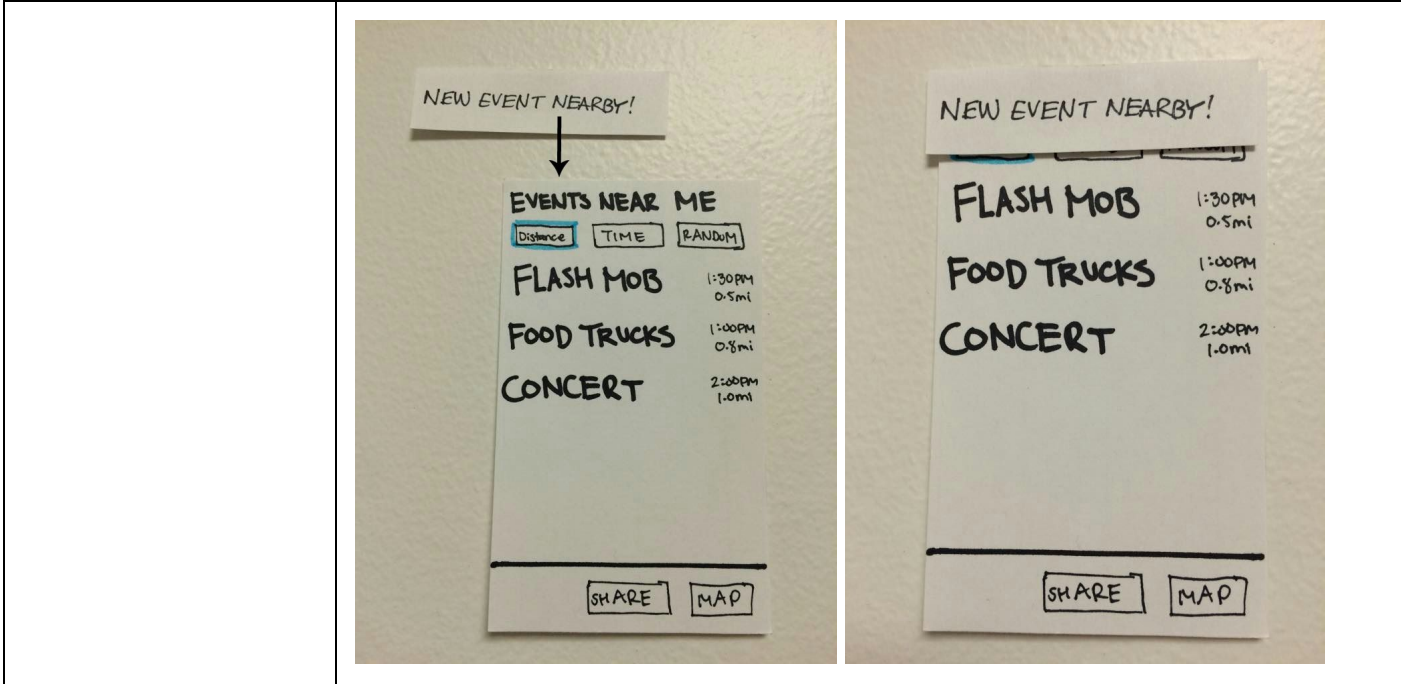
Toggle options to sort events by "time" or "distance"

Have different paper screens representing each sort option



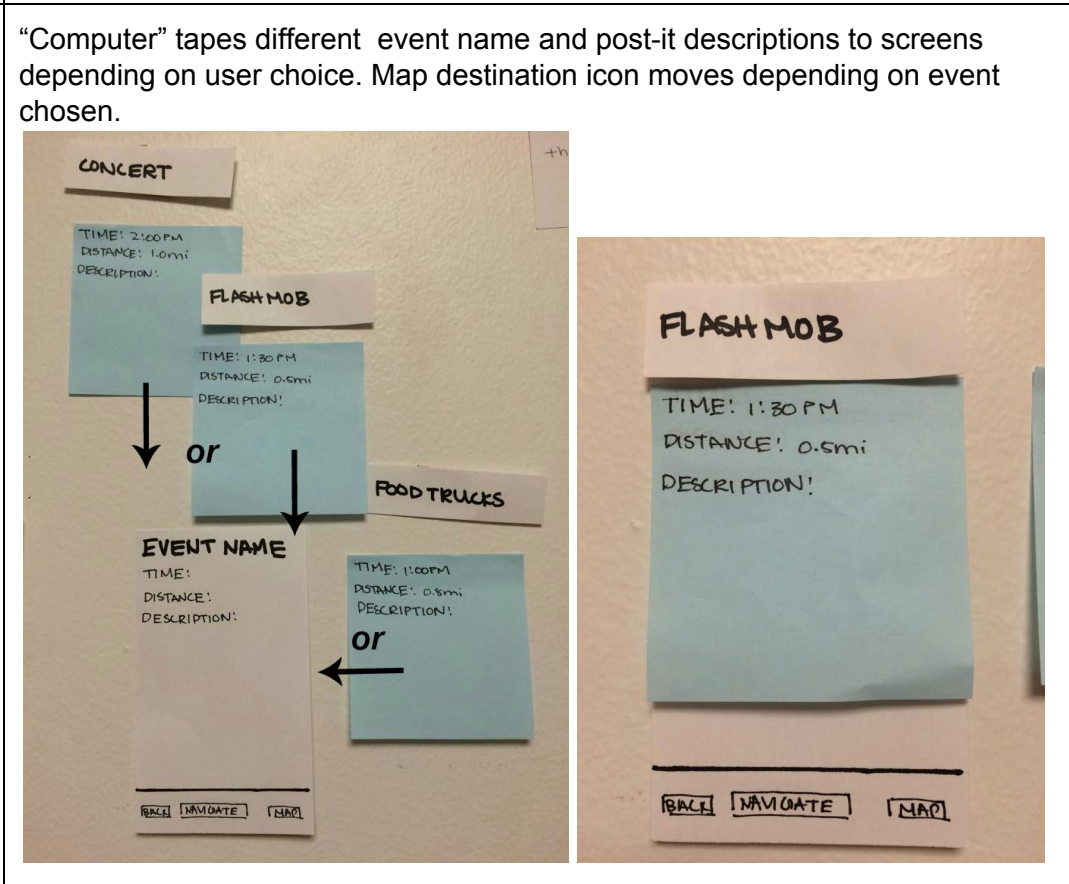
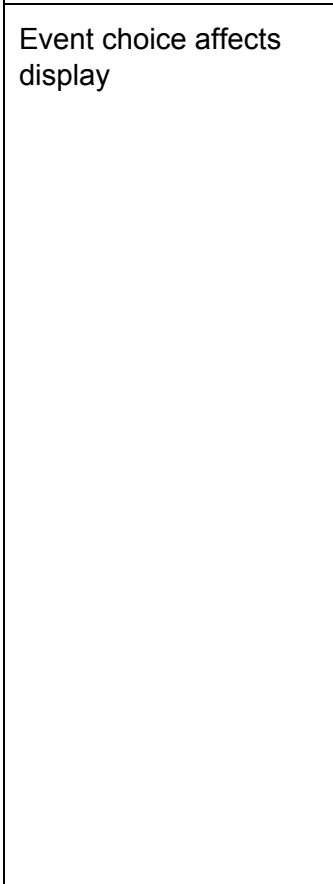
Pop up notification

"Computer" tapes paper notification to top of paper screen



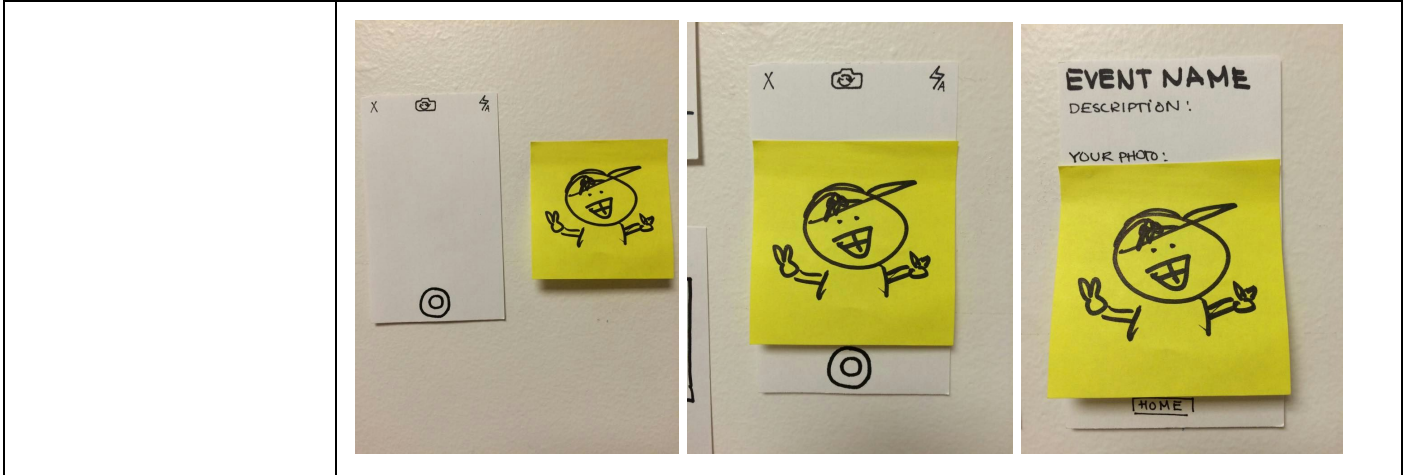
Event choice affects display

“Computer” tapes different event name and post-it descriptions to screens depending on user choice. Map destination icon moves depending on event chosen.



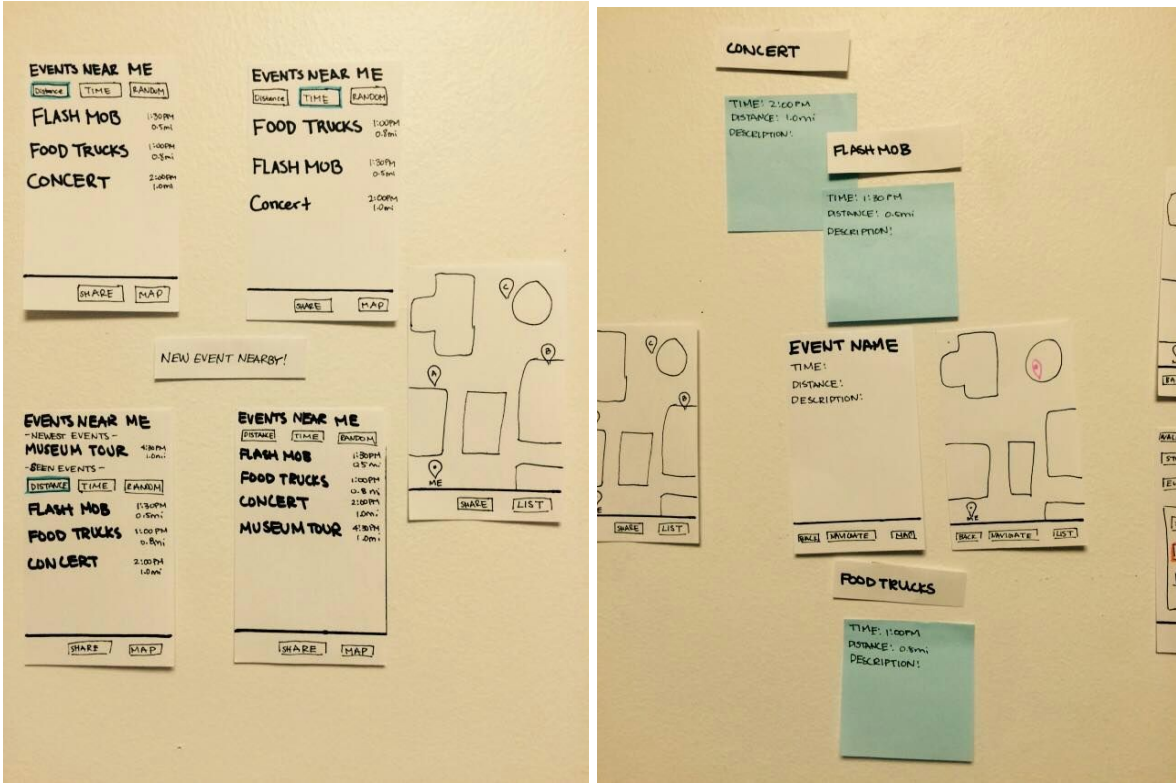
Take photo

Stick a post-it with a drawing to represent a “picture” being taken and move post-it to paper screens where the “picture” is displayed

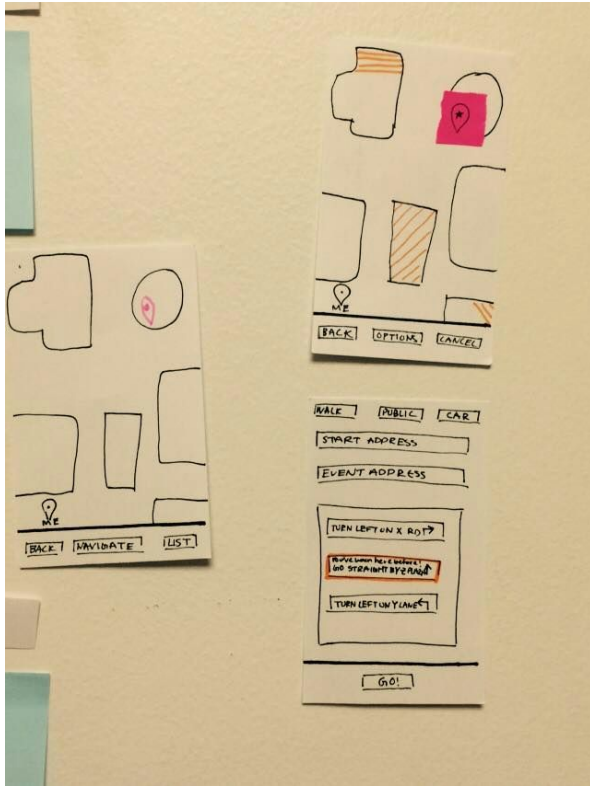


Tasks/Overview (with zoomed in shots for detail/readability)

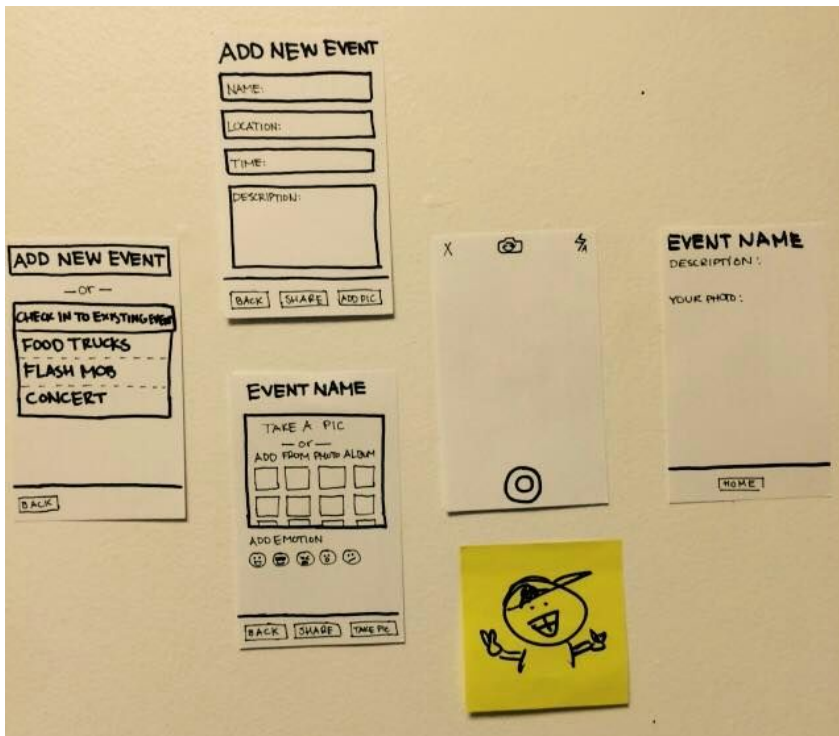
Task 1: Find events



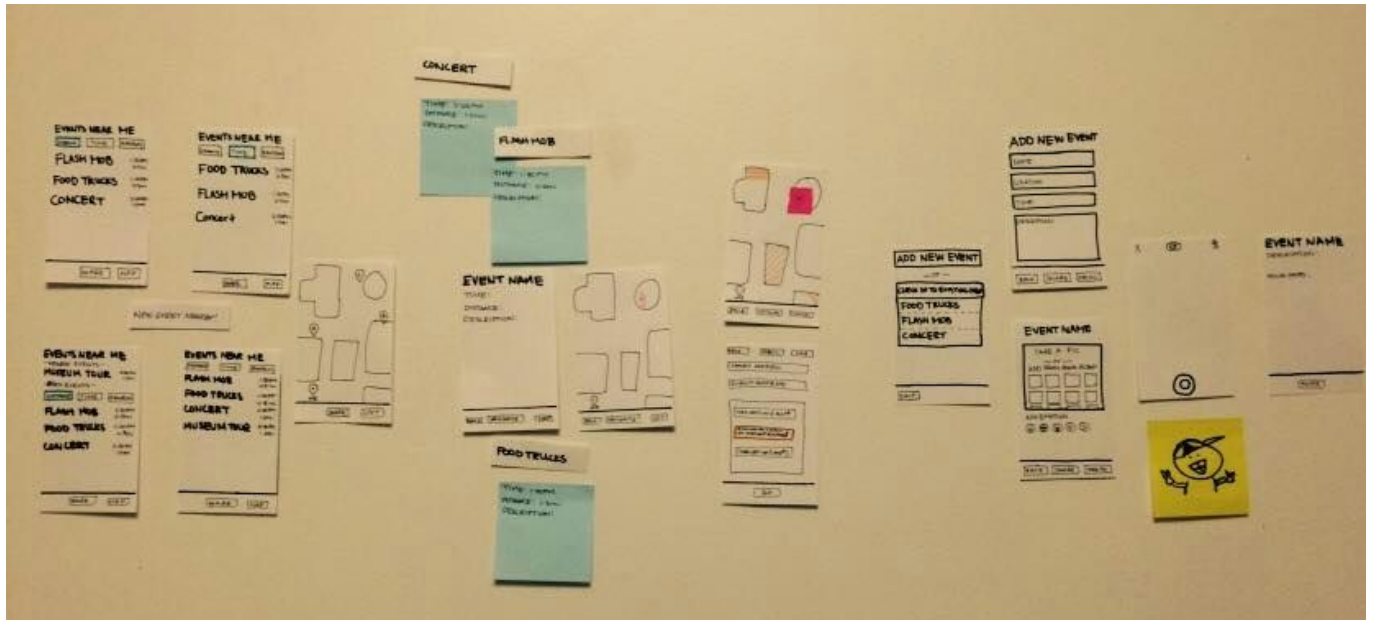
Task 2: Navigate to events through unfamiliar area



Task 3: Share emotion of event with others



Overview



Methods of Testing

Characteristics of testers

- Chose by travel experience - needed to travel outside of home country at least once
- Found two testers at off-campus “hacker house” after asking for volunteers with travel experience
- Found one tester by asking friends for experienced travelers

Participants

Participant 1

- 5th-year senior studying human biology
- From California
- Traveled outside of country most recently to Granada
- Volunteer from hacker house
- Tested prototype outside of Old Union



Participant 2

- Physics graduate exchange student from Netherlands
- Traveled through Europe and United States
- Volunteer from hacker house
- Tested prototype in dining area of Tressider

Participant 3

- Sophomore studying chemistry and bioengineering
- Dual citizen of France and United States
- Traveled through Asia and Europe
- Speaks English, Mandarin, French
- Recruited on volunteer basis through mutual friend
- Tested prototype at Old Union lounge



Tasks

Task 1: Find an event

- Select an event from list home
 - Sort the events by location or time
 - Click event to receive more information
 - Click “RANDOM” for a random event description
- Banner notification of new event
 - Press for more info
 - Ignore and let event be added to list
- User clicks “NAVIGATE” to end task

Task 2: Navigate to an event through an unfamiliar area

- View route on built-in map
 - Click “OPTIONS” to edit route settings
 - choose walk, public transportation, or driving
 - view list of directions
 - Areas user has visited previously are marked orange
 - Meant to aid users by reminding them of familiar places
 - Task ends after navigating to event

Task 3: Share experience of event with others

- Press “SHARE” on home screen to share new event or existing event
- Take picture of event or choose photo to upload
- Represent emotion of event with emoticon

- Click "SHARE" to be taken to confirmation screen with event and picture and end task

Procedure

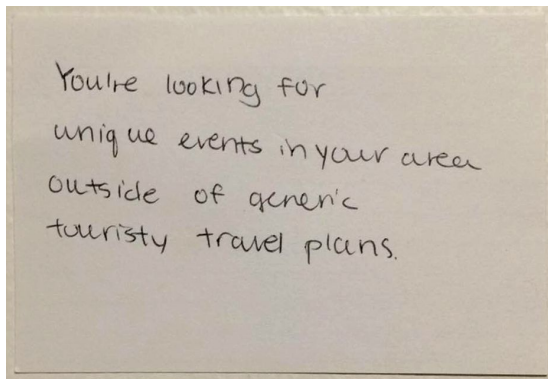
We told user three points before testing:

1. Imagine they are in an unfamiliar place using the app, which we demo
2. Voice all thoughts as they accomplish the tasks
3. We cannot give them additional information

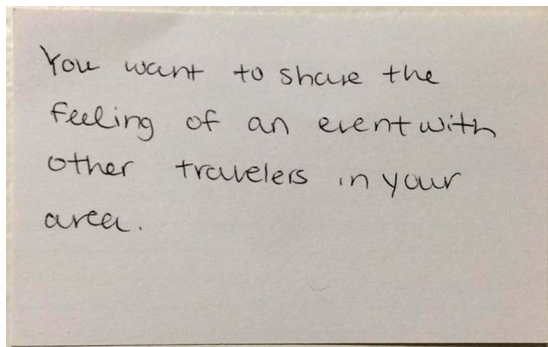
To control the procedure, a user read a written script before starting each task.

Hali was our primary facilitator, Michael handled note taking, and Max focused on noting the users' reactions and emotions.

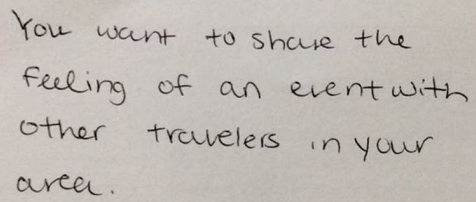
Script for Task 1 (Find):



Script for Task 2 (Navigate):



Script for Task 3 (Share):



You want to share the feeling of an event with other travelers in your area.

Test Measures

- Note reactions and emotions regarding UI ease and intuitiveness, scaled from 1-10 as annoyed to satisfied
- Note features or buttons user finds missing or redundant
- Limit scripted testing to 15-20 minutes but give user control over when to move to each task
- Follow with open discussion for improvement and ideas

Test Results

Satisfaction Summary

10 being super excited and 1 being annoyed, 5 being indifferent.

	Participant #1	Participant #2	Participant #3
Task 1 Find Event	8	10	8
Task 2 Navigate	10	7	7
Task 3 Share	7	4	6

Critical Events

Event Description	Severity: No problem (0 - 4) usability catastrophe
Can't share directly from navigation page	4 - All three users cannot intuitively complete the third task. Participant #2 told us that he would have "given up" at that point
Map does not give enough information to navigate	4 - All three users struggled most with the navigation task and found it insufficient. Wanted information about travel time, alternative routes, travel tips related to the area, compass guide, download option.
Can't have navigation run in background while viewing other app screens	3 - User wants to view other events while navigating to a selected event. The current implementation would require leaving the navigation screen altogether
Purpose of orange shading that marks visited areas on navigation map is unclear	2 - Users either ignore the orange markings completely, or they are confused by what they represent. The app needs to give more information about their purpose.
Pop-up notification is annoying	2 - Participant #2 felt it disrupted his completion of the first task. Participant #3 was confused when the pop up appeared and had to take some time to decide what to do.
Emojis are not necessarily the best rating system	1 - Participant #1 thought there would be better ways to provide a quick overview of an event. Participant #2 finds emojis to be annoying in general.
No one clicked on our "map" option on the event description page	1 - This option shows the user a map of only the event chosen in relation to the user. No one clicked this so there was likely some misunderstanding about the button purpose.

"Options" at Navigation screen is unclear	1 - Participant #2 thought that the "Options" means "Settings" for the entire app, so some more clarification is needed
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Discussion

Overall, our testers' reactions were positive. All three testers said they would actually use the app to better experience the local culture. However, the spontaneity component of our app did not stand out as much. Users prefer to be able to plan out their own schedules and use the app as a supplement to their own travel itinerary. Participant #2 wanted to see events beyond the current day in order to plan out the entire trip. Participant #2 even found the pop up notifications of new events to be annoying, and participant #3 didn't know what to do with the pop up. It would seem that forced spontaneity has a negative effect on the user, and it needs to be done in a very subtle way. Or, it may be better to show events on a future date. Since the users prefer to have more choices in making their travel decisions, we should add more ways to filter or categorize our events. We may need to tweak our features to suit the needs that the testers described.

Navigation appears to be a very important part of one's travel, so the user wants to use a map that's familiar to them - in this case, Google Maps. The user wants to know about travel time, alternative routes, and how different means of transportation would change their maps. Also, perhaps because navigating is a frustrating part of travel, the users wanted our map to show travel tips, compass, and to be downloadable so they can access the map without using the Internet. Users found our idea of shading familiar places to be cool and helpful, but they did not realize the significance of the shading during testing. What these observations show is that we need to make our map more intuitive and easy to use.

While our testers loved the idea of finding local events, they were more indifferent about sharing events, having far less excitement but also not many complaints. The testers understood the importance of posting an event but weren't as excited about sharing an existing event. But, it's a personal preference, and the only major complaint is that emotion rating isn't as useful. Participant #2 skipped it completely, thinking it was "annoying" and wishing for a more quantifiable rating system instead. This shows that using emotion rating may cause ambiguity among some of our users, and we might need to consider using it purely as decoration. But we shouldn't use a traditional points system, as our testers point out, since those ratings are sometimes skewed and don't

accurately reflect the values of an event. Instead, we should consider using population to show the popularity of an event.

Based on these results, we need to make our UI more concise and intuitive, especially on features that deviate from the traditional features (e.g. shaded map, emotion rating). But, at the same time, we need to increase our functional features to user more options in finding an event (e.g. filter, categorize) and in navigating (e.g. show time, alternative routes).

The experiment could not reveal how our app experience would change under the constraints of an actual foreign location. For example, our navigation can show a route that users find intuitive in an imaginary scenario, but may in fact be missing key, location-specific information such as how to buy bus tickets.

Word count: 2083

Appendices

Consent Forms

Consent Form

The O application by Trability 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 O. 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 (Max Wang, Hali Mo, Michael Doshi) 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 Trability 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 Matthew Glenn Billman

Participant Number 1

Date 10/21/2015

Signature 

Witness name Max Wang

Witness signature 

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
Name Nicolas Quach

Participant Number 3

Date 10/21/2015

Signature 

Witness name Max Wang

Witness signature 

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
Name Ewout Lubberman

Participant Number 2

Date 10/21/2015

Signature 

Witness name Max Wang

Witness signature 

Script

Background:

You are traveling in a new and unfamiliar location. Can you tell me what location you are in and describe the setting?

You have an app that helps you add spontaneity to your trip. You are going to use it to complete three tasks.

Treat this as you would a real interface, and voice your thought process as you use it. We cannot give you additional information.

Task 1: (*handed to user on notecard*)

You're looking for unique events in your area outside of generic touristy travel plans.

Task 2: (*handed to user on notecard*)

You've found an event and are wondering how to navigate there, especially since you're in an unfamiliar area.

Task 3: (*handed to user on notecard*)

You want to share the feeling of an event with other travelers in your area.

Test Data

User 1

Matthew Billman

Task 1 - looking for event

can tell these are events

sorted by distance

picked food trucks

logging event for other people to use

don't know how to give distance

- probably from hotel room

Task 2

then click navigate

walk to the star

i would walk to the star

confused what orange things are

- would touch them
- if not, options

you've been here before?

assuming its google maps

orient myself start walking

probably want a pointer for a compass

look like its the building to my left

would wing it if no other choice

would click on star if no other choice

Task 3

i would take pics and record video if possible
up vote if thats an option or reshare
on fb

- no instagram or twitter

hit back, back
huh, i'll click share

i would check in at food trucks
take my photo

- do a little selfie at the food truck
- write a little description

looking for a share button don't see one

messed up redo

i'm there

take pic, add happy face, and i share it
click home

might go check out the concert

first task, feedback

feasibility of app

wonder if travelers would be in the same place to start sharing things
sharing w/ everyone on the app

like the sort by distance, by time, random is cool

- wouldn't use it necessarily too much

sort by type

- list of 50 or something predesignated categories
- user generate other categories

low key and user generated, wouldn't want to go to museum

second task,

having a pointer or pointer would be nice, like a compass

i use google maps

little confused by orange

- think

really cool idea'

might be good to have at tutorial

- see orange stuff, you can click on it
- kind of like

third task, share

straight forward, like it

nice

tap star to automatically check in event

- have to scroll through other events

navigating here, want to check in??

maybe while on map, click and check in and share option

share doesn't go to add new event

- maybe a plus button
- kind of make sense
- two separate functions
- biased towards minimalism

do like the orange

GENERAL

comments on interface

learned everything from talking to airbnb guy

cool to have locals in neighborhood to hype it up

- not just corporations
- very intent to get

waze: can

- comment
- hey this is still here

rating thing

- yik yak
- might be cool not to have it, so people can just kind of go

emoji is a cool idea

- i think that's really good
- attention draining for up vote system

not want to see how many checked in

- want to see if they're
- give me a sense of touristy concentration

maybe a quantifier to see how touristy something is

- off beaten path
- or main touristy thing

live feed is nice, sorting by rate of posting

- injecting itself into event
- cool to have video option (short duration)

really love the map

- little confused by orange on building
- maybe different color to put on street
- you've walked this way before
- you've been this way, why are you still lost???

interactivity with star would be nice

should only be able to check in from map

creating new events from home screen is good

adding emotion

- add text for emotion
- didn't know it would impact rating of event

check mark after you've gone to event

notify you if event happens again if you liked it

User 2

Ewout Lubberman

traveled in jordán, israel, nicaragua, costa rica,
trying to explore neighborhood now

Task 1 - looking for event

small village in jordan right next to entrance of pet...??

says events near me

- can sort by distance time
- random

looks pretty clear

all today, all upcoming

I would like a couple hours from now rather than 1:30

check out flash mob

description of event or how to get there?

- probably description

would find notification annoying

- NYC, lot of events
- new event nearby
- one random guy upload event, check it out anyway

clicked notification

just getting out of bed, would check them all out

- read descriptions
- already checked out flash mob
- i would check out museum tour

wanted to see where it was at

- didn't click map view

Task 2 - navigating to event

start off w/ zooming out

- check global whereabouts

i'd like more info, esp in some parts of world

- if you're about to walk 2mi by foot at 9pm, can't do in Nicaragua
- need info on how to get there if area is dangerous or not
- looking for transportation
- always public, way more fun
- google suggest buses to take or taxis to call

i would try options

- expect things i don't want to do; not public transportation
- check it out anyway

expect under options

- taxi

definitely not options

- think interface settings, profile settings, alert settings

i'm a bit confused here

- did i select walk or is it already selected?
- already gave clear directions
- highlight which setting it is on
- i'd check public out

route is highlighted, but wouldn't give me info i need

- want to know where stops are
- esp in foreign language
- usually read lonely planet for transportation
- have a how-to screen-
- before getting out, want to know how

THIS IS FUN

Task 3 - sharing an event

not much of a sharing person

wouldn't put it on fb

i do like foursquare

- checking in

want to click destination

- address will be there
- like interface

don't know what to do, so click options

- not gonna help, so go back

in real life, i would've given up

- checking in is nice thing but not priority

would try clicking on me

phone could prompt you (100ft radius)

- pop-up; want to share?
- distance based buffer

couldn't get to share screen

assume i'm at location

- not check in at other event, cheating
- like to add new event; could be fun
- wouldn't add new event in "share"; put in interface

check in and write review

that's cool, like to take pic

i click share (didn't click emojis)

would like if confirmation is right-most button instead of middle

- top-right would be best
- usually case in iPhone, confirm in top-right

so i already shared?

confirmation screen, i click home

GENERAL

INTERFACE

i really like the idea, should expand on it

confirmation in top-right

interface is pretty intuitive

- mimic iOS, google interfaces

orange made me confused

- square, like walk through area
- imagine would just use google maps

oh yea, probably won't have internet!!!

- got trip advisor, download map
- should definitely have pre-download feature
- add feature without internet, based on gps data

CONCEPT

gain traction

need a lot of money, or partnering up

nice if you can kickstart by importing database w/ lot of events

- lonely planet, trip advisor

dangers of traveling is interacting with traveling community

- get more of an authentic experience
- won't get if only w/ other travelers

would be cool if local participation

- take database, that would be awesome

would want to plan entire trip over these events, definitely

- major things; holidays, parades
- most fun experiences in general

events.stanford offers subject base but i like all subjects

- having more advanced filtering system
- arts, cultural, public would really help
- interesting what scale event is; large parade or small event

don't really like emoticons in general

- personally wouldn't take time to type description or add emoticons

User 3

Task 1

Concert -> navigate

Task 2

Don't know difference between navigate and map buttons

Do I get a "path" on the map?

more visual person

will hit back after options

pink star is place, i'm me

do i get a path though?

- click on options

this is giving me turn by turn directions

- don't jive with
- i like visual interface
- i'm going to go back, wait i'm going to click go

do i still have highlighted path?

proceed by highlighted route

hopefully in real time

one concern, getting there in time

- gps interface, will have time to destination

how to i get back to options?

i'll just hope i can make it in time

didn't even notice that, i can click walk

- i like the public transportation option
- i chose to walk

Task 3

Hits "map" after push notification

Oh wait, might push on notification instead

Doesn't know how to react to banner notification

Navigation was most difficult; don't know how long it takes to get there, wants a path

Didn't know what the orange meant on the map

go back to back, go back to main screen

can i go back again?

ah, share

went to concert, will check in to existing event

is this photo album my photo album, on my phone?

will be cool to have pics from other people at this event and share those

take a selfie

add an emotion, want a smiley face and share

guess i go home

GENERAL

NEW EVENT

i'll go with map, actually i'll click on the event notification

museum tour

navigation causes most confusion

- don't know how long it would take to get there
- no clearly highlighted route
- didn't know how to react to push notifications
- turn off notifications except for texts
- not familiar with turn by turn directions

didn't think much of orange, didn't know what it meant

really cool idea

thought it was part of turn by turn

maybe have an intro, how to use app

maybe have a pop-up; you've been here before

would like to have an expanded photo album

- contribute to collective imagining of event
- thought pic sharing would go to the ether