

DiscoverTexas

By Project Group 7:

Esha Kothari
Sharayu Shenoy
Wan Wang

Fa18 - INF385T : Human Computer Interaction
Jacek Gwizdka

Dec 5, 2018

Contents

1. Topic Selection and Concept Statement	3
1.1. Concept statement	3
1.2. Descriptive summary	3
2. Contextual Inquiry and Analysis	4
2.1. Tailoring the Scope	4
2.2. Preparation for Interviews	4
2.3. Client Representatives and Decisions	5
2.4. Interview Questions	5
2.5. Initial Contact	6
2.6. Collection of raw contextual data :	7
2.7. Work Artifacts	8
2.8. Field Sketch	9
2.9. Samples of task data	9
2.10. Samples of Raw Data Notes and Corresponding Work Activity Notes	10
2.11. Building the WAAD	10
2.12. Team at Work	14
2.13. Photo of WAAD	14
2.14. Work Roles, Sub-Roles and Machine Roles	14
2.15. Initial Flow Model Diagram	15
3. Requirements and Modeling	17
3.1. Tailoring the Scope	17
3.2. Interaction Design Requirement	17
3.3. Requirement Extraction Process	20
3.4. Model List	20
3.5. Justification of Models	20
3.6. Structure of Models	21
3.6.1. User Model	21
3.6.2. Usage Flow Model	23
3.6.3. Hierarchical Task Inventory	23
3.6.4. Usage Scenarios	24
3.6.5. Step-by-step Task Interaction Model	24
4. Design	27
4.1. Tailoring the Scope	27
4.2. Persona Design Process	27

4.3. Ideation and Sketching Process	29
4.4. Workspace and Materials Used	29
4.5. Photos--Our Team at Work	29
4.6. Sketches	31
4.7. Physical Mockups	35
4.8. Mental Models and Conceptual Design	36
4.8.1. Designer's mental model	36
4.8.2. User's Mental Model	36
4.8.3. Conceptual Design	36
4.9. Storyboards and Usage Scenarios	37
5. Prototype	38
5.1. Tailoring the Scope and Process	38
5.2. Prototype Design Process	39
5.3. Prototype	41
5.3.1. Wireframe (screenshots)	41
5.3.2. Links to Interactive Prototype	43
5.3.3. Narration / Walkthrough	43
5.4. Pilot Test	44
5.4.1. Test Cases	44
5.4.2. Summary	46
5.5. High Fidelity Prototype	47
5.5.1. Link to Interactive High Fidelity prototype	47
5.5.2. Screenshots	47
6. Findings from Evaluations and Recommendation	49
7. Appendix	51
7.1. Cognitive Evaluation Summary	52
7.2. Cognitive Walkthrough Forms	53
7.3. Heuristic Evaluation Summary	59
7.4. Heuristic Evaluation Forms	61

1. Topic Selection and Concept Statement

1.1. Concept statement

DiscoverTexas is designed to provide a better outdoor experience. Our aim is to create one stop shop for all the information about state and national parks in Texas -- right from tourist attractions to “what to watch out for”. DiscoverTexas integrates the features users need to plan their visit in these parks to have a fun and relaxed nature experience. The app is targeted towards Texans who enjoy outdoor activities like running, hiking, biking, camping, adventure sports and of course BBQ.

DiscoverTexas provides a very comprehensive and user friendly platform catering users with myriad interests ranging from fitness enthusiasts to relaxed vacationers. It will house features like GPS Tracking, trails, nature guide and facilities reservation system for pools, pavilions, campsites and BBQ grills. Outside the four walls of our house is a world full of surprises and DiscoverTexas aims at making every step of the way fun.

1.2. Descriptive summary

Based on the concept of our App “DiscoverTexas”, below are some of the “Must have” and “Good to have” feature list.

Must Haves:

1. To provide basic information of parks in Texas like operating hours, trail length, facilities and all other information.
2. To incorporate an interactive map system with GPS, so users can locate themselves in trail and will prevent them from getting lost.
3. To provide link to facility reservation system for users to make reservations for campsite, pool, adventure activity etc. and provide a feature that marks the facility on the map with its picture.
4. To enable a “Comment section” where people can ask questions, review the park, reply to other visitors’ questions and share their personal experience. This will also give visibility to the parks less visited by providing their details.

Good To Haves:

1. A good to have feature that the app will shoot for is a “mark” or “pin” function. When a user checks-in at the park, they can mark “animal”, “plant”, ”scene(pictures of that

point)" and "tips" within the park along with its location. These marks will be visible on the interactive map, so other users will be able to benefit from other's information.

2. Contextual Inquiry and Analysis

2.1. Tailoring the Scope

Aiming at designing an application that can help users to have better experience in Texas' county, state and national parks. Our first goal is to understand our potential users. We can only design a good product with the users' need in mind. So there are five general questions we need to answer in this context inquiry assignment:

1. Target, namely understand who are our users?
2. Procedure, namely how they search for state parks?
3. Motivations, why they want to go to a state park?
4. Information needs, answering the question that what do they want and what we should provide?
5. Role, describes what role the potential App plays in users' interactions with state park.

The main point of this assignment is to understand users -- how users plan, conduct and record their trip to these parks. Learning this process will help us have a better grasp of users' information needs and searching behavior. Leading by these five major questions, we focus our interview on different types of users and also observe their information searching and reservation making behavior. After data collection, we assort and summarized our finding according to the trip planning procedure. Overall, we are able to draw a behavioral map of users' interaction with the state park application.

2.2. Preparation for Interviews

In our preparation meeting, we started with general brainstorming and wrote down the questions that came to our mind on the whiteboard. We then categorized our questions into several broad themes, which are "habits", "preference", "information seeking behavior", "company seeking" and "application specific questions". We transfer the themes into a google sheet, so each team member can contribute to the question pool. After finished the question pool, we went back into the google sheet to combine similar questions and make the questionnaire as simple and concise as possible. To encourage freely talking and facilitate deeper conversation, we decide to use interview as our research method. And we edited the questions to make sure each question is open-ended.

During the interview, apart from the prepared questionnaire, we also decide to make the subjects to perform some searching and booking tasks. By observing their behavior, we wanted to learn their steps on gathering information of state park and also wanted to find out if there is any hidden barrier that the user might not be aware of but encounter frequently.

2.3. Client Representatives and Decisions

Our potential users can be broadly defined as adults who want to engage in some outdoor activities. They can be young and older adults, healthy or with certain types of disability, female and male, single or with family. Given the diversity in user demographics, we needed to further classify the targeted audience. We decided to classify our users based on their potential interaction with parks. In our preparation meeting, we brainstormed probable motivating factors that causes users to visit a county, state or national park. The client representation was broken down into six types as shown below:

1. Users travel with family
2. Users travel with pets
3. Professional hikers
4. Adventure seekers
5. Leisure experience seekers
6. Home-stucker

User	User Type	Age	Gender	Occupation
User1	Home-stucker	28	Male	Master Student
User2	Leisure experience seekers	40	Male	PhD Student
User3	Leisure experience seekers	27	Female	PhD Student
User4	Leisure experience seeker	26	Male	Working professional
User5	Professional hikers	25	Female	Working professional
User6	Travels with kids	33	Female	Working professional
User7	Users travel with pet	26	Male	Phd Student
User8	Users travel with family	35	Female	Working professional

2.4. Interview Questions

Questionnaire:

1. Tell us a bit about yourself :
 - a. Gender
 - b. Occupation
 - c. Age
2. Preferences
 - a. Do you like camping or exploring state parks around?
 - i. If yes, what is your reason to visit these parks?

- b. What kind of activities do you prefer or engage in?
- c. What factors matter most to you while deciding the place?
 - i. How much a pet friendly park matters to you?
- 3. Habits
 - a. When was the last time you visited any state/national park?
 - b. How frequently do you visit?
 - c. Do you make prior reservations? If yes, how do you make bookings?
 - i. Which device you use to browse/book?
 - d. Do you use technology when you are camping/hiking etc? If yes, what kind of devices do you use and what is the purpose for using them?
- 4. Information seeking behavior
 - a. How do you gather Information?
 - b. What does a typical process of trip planning look like?
 - i. What considerations do you make while planning your trip?
 - ii. What is the most important information to you while searching for a state park?
 - iii. Can you explain your experience and elaborate on that?
 - c. Do events in parks matter to you?
 - i. If yes, how do you stay informed about them?
 - d. Do you follow particular parks on social media?
 - e. What did you like about your exploration in finding the details?
- 5. Company
 - a. Do you usually travel with?
 - b. Has there been any time when you wanted to go but didn't find anyone to accompany?
 - i. If yes, how did you handle the situation?
 - c. Do you look for professional hiking/camping/outdoorsy buddies to plan trip with?
- 6. Emotions
 - a. Is there anything that frustrates you while planning the trip?
 - i. If yes, what according to you would make your outdoor experience easier?
 - b. Have you traveled with kids?
 - i. If yes, what are some challenges that you face while planning the trip?

Task:

1. Look for places in Texas where you can swim and camp for the night.
2. Look for Big Bend National Park.
3. Emulate booking a campsite/facility at the Big Bend National Park.
4. Look for route options you will take
5. Look for park maps and find your campsite

2.5. Initial Contact

Our initial contacts with subjects went smoothly as we are able to get most of our ideal interviewees from our friends and acquaintances. It was easy to have a relaxed and open discussion with the interviewees as our questionnaire did not pose any potential risk to our

interviewees, and we did not meet with any barriers when we ask them to perform the decided tasks. All our interviewees agreed to be audio recorded during the interview process.

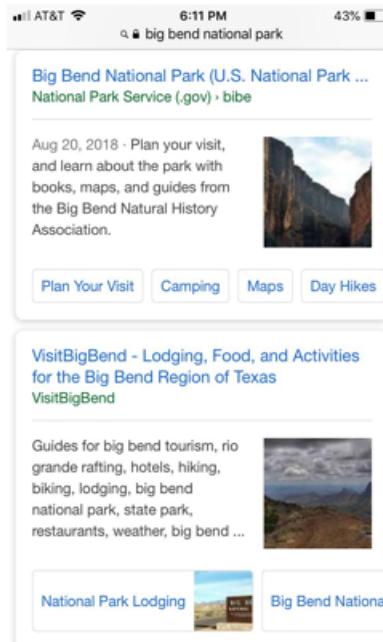
2.6. Collection of raw contextual data :

As a group we used various methods for collecting raw data. Some took notes and some made audio and video recordings of the interviews. The method they chose to take notes during interviews wasn't affected as everyone made summarized notes of their interviews. When we collectively discussed, those notes proved to be extremely helpful in making our decisions. Our participants had varied backgrounds. Their reasons and requirements for park visits were also different, so we got varied perspectives from diverse users. After conducting interviews, we created Excel sheet for all responses. This helped us greatly in constructing our WAAD diagram. We collected mainly qualitative data and that is why our questions were open-ended.

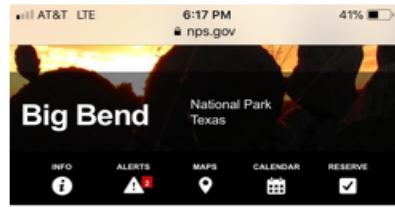
	A Reservation	B Recommendations	C Challenges	D Device usage	E Current App/web	F Company	G App	H Planning process
1	Makes reservation 25%	User checks reviews online on websites like Tripadvisor before making final decision	There is not enough information available for state/national parks	User uses their phone to find additional information while in park	The websites users use are recreation.gov, reserveamerica.com, tripadvisor, nps.gov or any other state parks website	User goes to such parks with friends and family	User wish to have a feature where they can search by activities	User plans to get preview of the state park
2	(FF review x internet review) - reviews by friends/family & internet	They search for reviews online from others and adjust their trip according to it sometimes	User finds it difficult to find history of the park he/she visits	User uses their phone to check their schedule they planned for the trip	User also searches on YouTube for recommendation	User goes with professional or interest group	User wish to have a feature which gives recommendations of must go places	User decides where to go based on their findings and recommendations
3	Users always makes reservations	They also look for availability of restrooms nearby	The websites which user currently uses for booking are not updated and very rudimentary	User uses phone or GPS for finding directions	User also uses meetup app	User goes by himself/herself	User wish to have feature which suggests things to do	User checks photos of the park they plan to visit
4	Users always make reservation during peak season	User wants that mobile network should be available	User feels websites are not user friendly	User uses phone to communicate with others while they are in park		User goes with some of their colleague	User wishes to have not just rating but also reviews of what people liked and disliked about those places	User looks at his/her schedule and finds the time when he/she can visit the park
5		The proximity of campuses to activities like swimming/hiking matters a lot to user	User feels there aren't sufficient pictures and facilities available to check online	User uses phone to click pictures			User wish to have a feature where they can search by attraction points	User checks online for the availability

Figure 2.1 : Screenshot from google sheet with answers

2.7. Work Artifacts



User exploring information related to the park they want to visit



Chisos Basin Campground

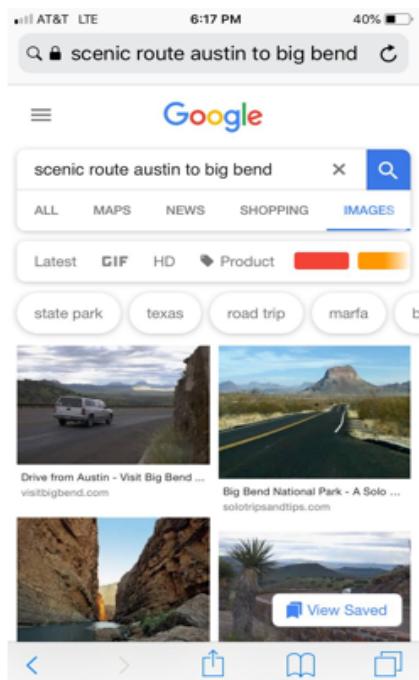


The Chisos Basin campground is located at 5,400 feet.

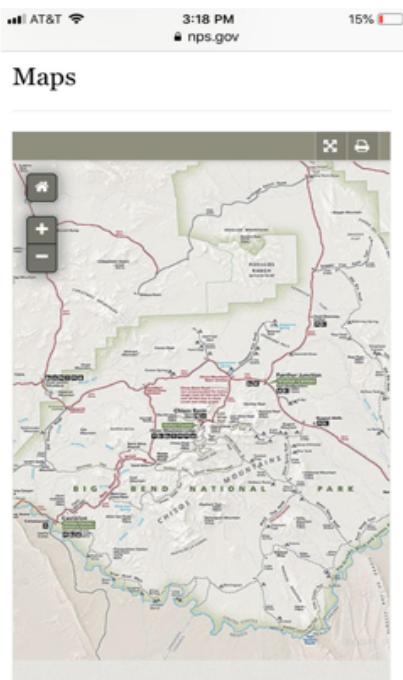
NPS Photo/Cookie Ballou

The Chisos Basin Campground is surrounded by tall, rocky cliffs and conveniently located near some of the park's most spectacular and popular trails. Download [Chisos Basin Campground Map \[JPG file\]](#)

Making reservations from available options



Planning which route to take



Exploring the park map and finding park related information

Figure 2.2 : Artifacts while user exploring various options

2.8. Field Sketch

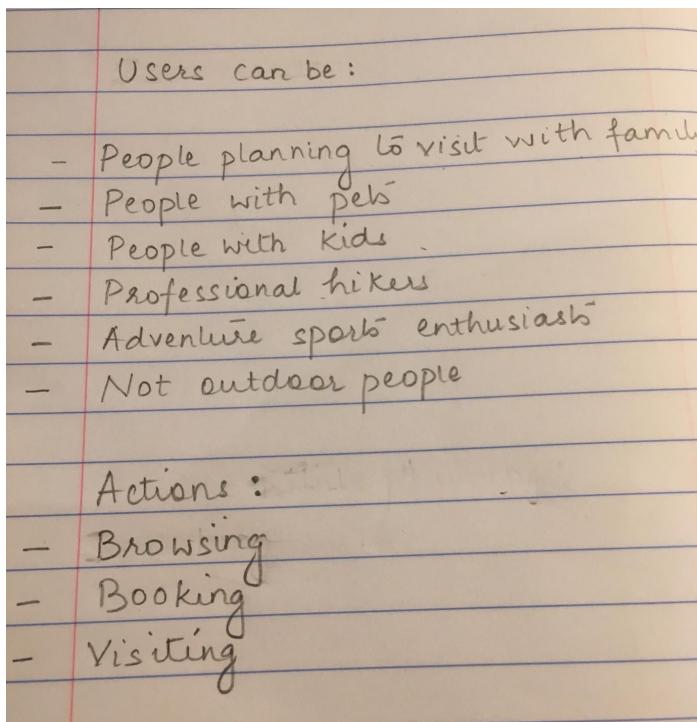


Figure 2.3 : Image of field sketch we created

2.9. Samples of task data

To obtain task data, we used set of observation questions and also asked users to show how they explore information and make reservations on the website. We asked the participants to show how they usually gather information about the park he/she wants to visit, how do they make their bookings and show us how they search for a particular information related to planning a trip to a park. From this we realized that families with kids firstly searched whether the place is kids friendly or not and if cabins are available on the site to ensure that their small kid is having a good time too. Similar was with people with pets that whether they can leave their pets off leash or are pets allowed there or not and based on the information they get, they decide if they want to visit that particular park or not.

Users quoted some of their requirements as follows :

U1 : “I find most parks to be pet friendly but that’s a consideration for sure”.

U2 : “With kids some challenges are to find cabins, kid friendly, distance of restrooms from campsites are some important considerations”.

2.10. Samples of Raw Data Notes and Corresponding Work Activity Notes

Raw Data 1 : I feel like the city has too much pollution and chaos. I go camping to escape the city and be close to nature.

Work Activity Note 1 : I feel close to nature

Raw Data 2 : I generally travel with friends and we almost never take packed food. We stop for food at the last available restaurant. It is extremely difficult to find these places when there is no phone connectivity. We always struggle when trying to find food options.

Work Activity Note 2 : I would like an easier way of finding food options nearby.

2.11. Building the WAAD

To construct our WAAD, we used every piece of information from our interviews. The process began by making notes of all the interview answers we got. We wrote these information on Post-its. We arranged and rearranged our post-its so that answers can be grouped. We then arranged further so that groups can be categorised and sub-categorised. But the challenge was that one meeting wasn't sufficient. The categories we identified were also related to system we are planning to build. We couldn't come to final conclusion on Day 1, so we chose to work remotely and re-organised based on everyone's consent and finally constructed our WAAD.

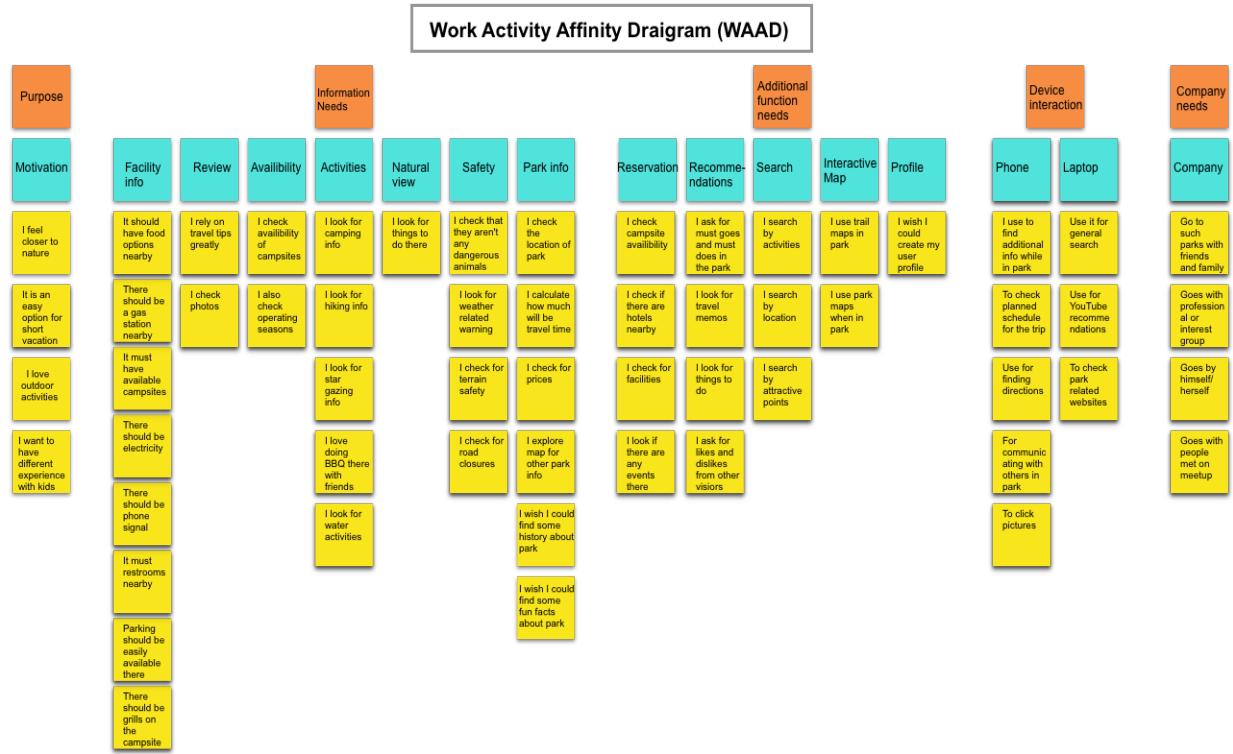


Figure 2.4 : Digitized version of WAAD





2.12. Team at Work



2.13. Photo of WAAD

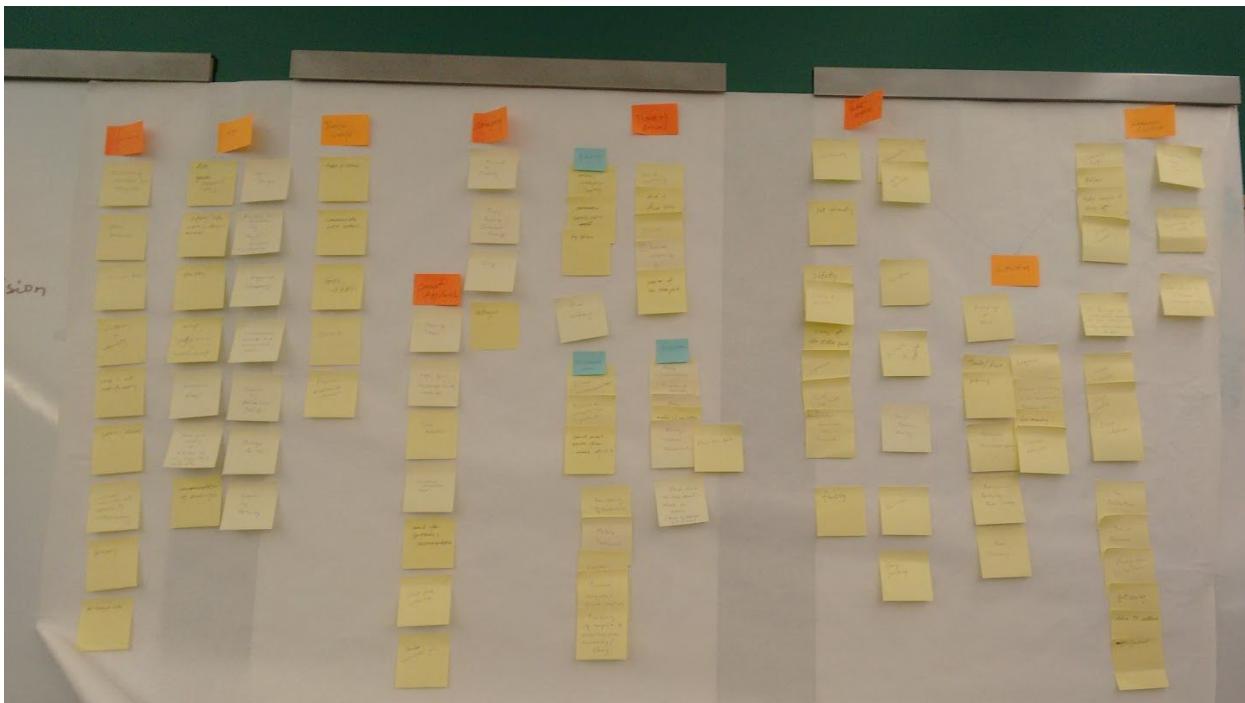


Figure 2.5 : Initial construction of WAAD

2.14. Work Roles, Sub-Roles and Machine Roles

Work Roles :

- Camper

- Professional camper : Who is a seasoned outdoor person.
- Nature Enthusiast : Who likes being in nature and engaging in activities that bring them closer to nature.
- Leisurely Traveller : Who is out on a vacation and wants to relax.
- Solo Traveller : Who is a perpetual wanderer and likes discovering new places.
- Co-campers : Co-campers can be friends, family or colleagues
- Park Administrator
 - Park Ranger : Who is responsible for the security and protection of the park
 - Park Office Receptionist : Who has all the information about the park, availability and events.
 - Park Facilities Manager : Who manages the facilities and equipment within the park.

Machine Roles:

- User's Phone :
 - GPS : Provide current location, route to destination, find facilities/ restaurants/ gas stations in the vicinity.
 - Camera : User QR Code reader, document the trip
 - Social Media
- Reservation System :
 - Enable users to register and make reservations
 - Keep track of past visits
- Planner
 - Information on Parks
 - Suggested Itinerary
 - To-Do List
 - Ongoing and upcoming events

2.15. Initial Flow Model Diagram

While analyzing our interviews, we realized that there are different phases from planning to reaching the park. The first phase is when user has to decide which park and when to visit. He/she browses online and also keeps discussing with friends/family. The second phase is to make reservation and check whether the campsite/cabin is available on the desired date and ends up with payment to reserve the spot. The third phase where user leaves for park and explores the route to take. It can be either scenic which can take longer or it can be non-scenic but faster. The last phase is when user reaches the location and explores park map to find cabin/campsite/trail/lake etc.

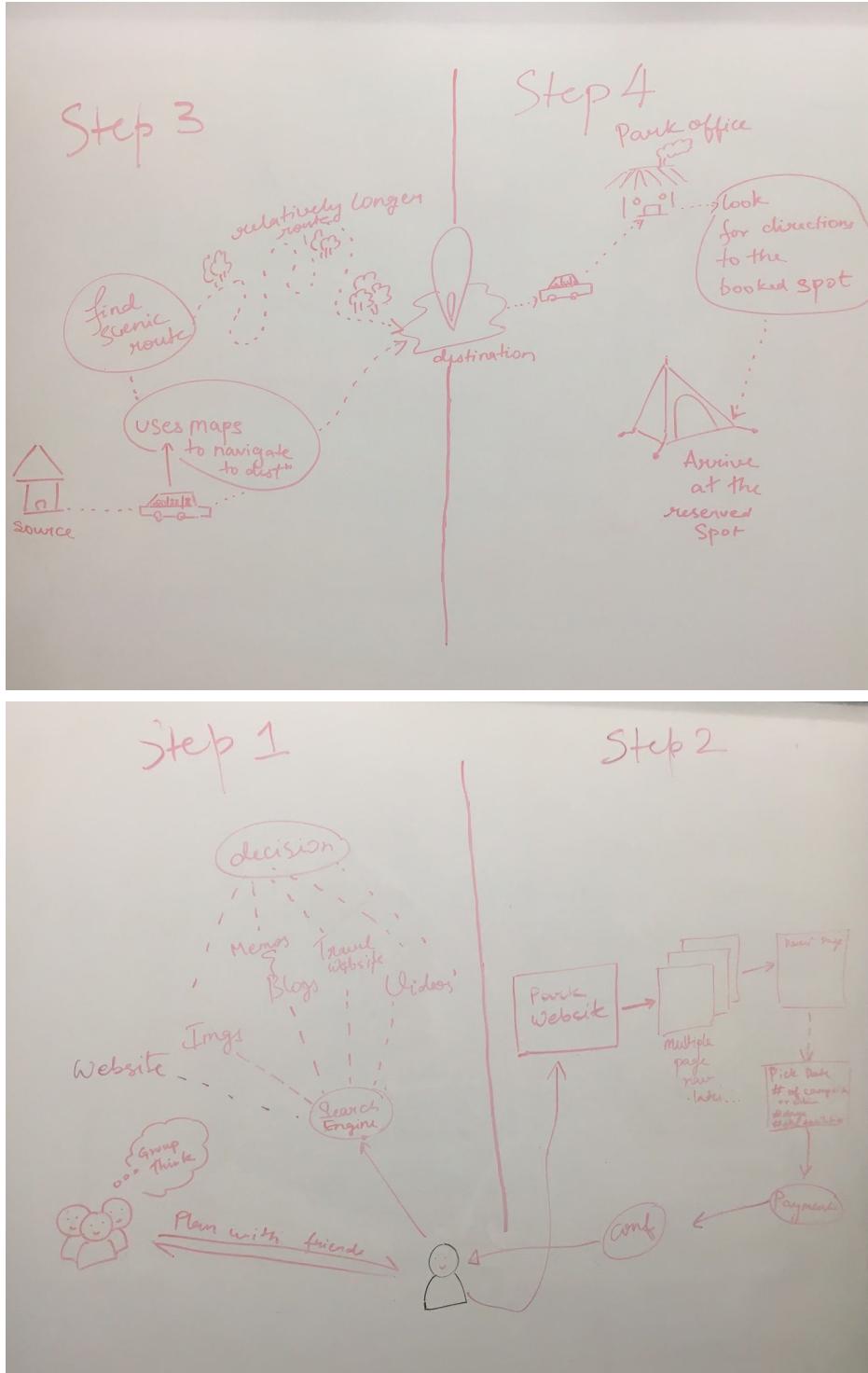


Figure 2.6 : Sketch of initial flow diagram

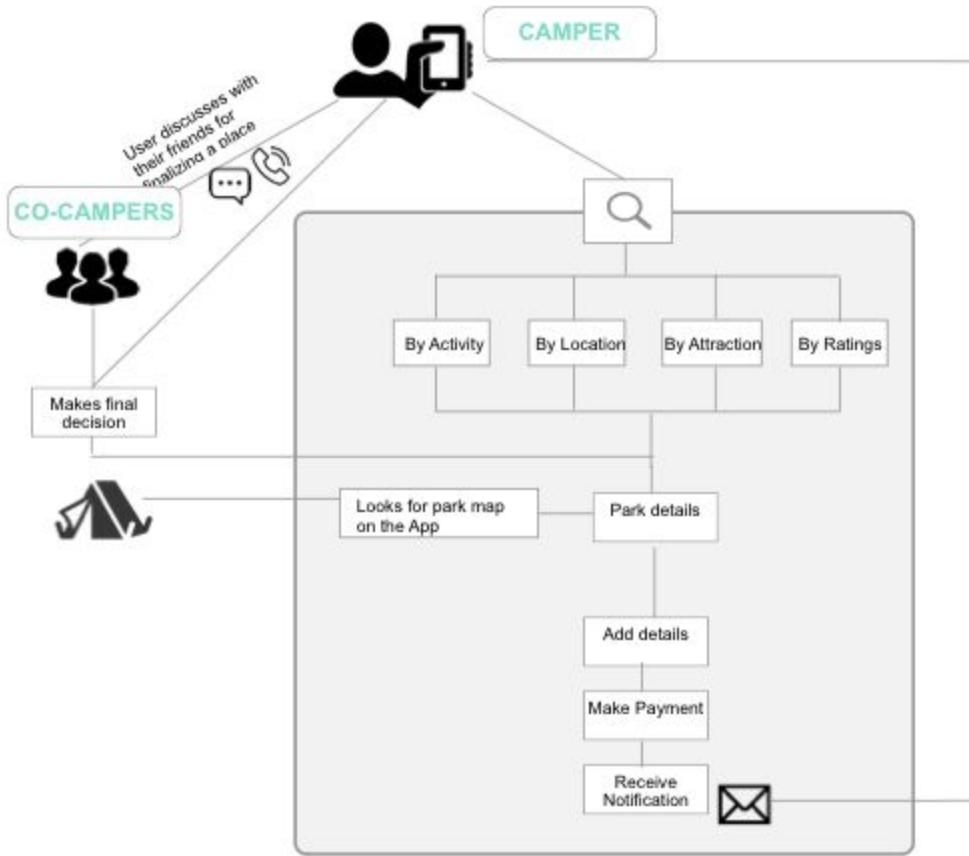


Figure 2.7 : Digitized initial flow diagram

3. Requirements and Modeling

3.1. Tailoring the Scope

We collected a large amount of data from the interviews we conducted. Since our idea is to promote and provide information related to outdoor activities, so we felt it can be achieved easily through mobile interface and thus our interaction design requirements are focused for mobile app. We analyzed various categories in our WAAD and extracted our interaction design requirements from there. We had twelve design requirements in the end which summarizes the needs and concerns of users. We developed five models to represent our findings : User Model, Usage Flow Model, Hierarchical Task Inventory, Usage Scenarios and Step-by-step Task Interaction Model.

3.2. Interaction Design Requirement

Search function

By Location or radius

Users will be able to search for state part by the park's location or distance from current location.[K2],[H1]

Rational: Location of the state park is an important factor that users consider when plan a trip.

By activity

User will be able to search for the state park by the outdoor activity available in that park.[K1],[E1],[E2],[E5]

Rational: Outdoor activities are one of the major motivations for users to go to state park. So searching by activities can help users make sure they will be able to enjoy that activity in the park they choose.

By park

Enable user to search by the park's name.[H1],[H4],[H5],[H6]

Rational: If users have a specific destination in mind, they can access to the park's information directly.

By event

Users can search for state park by the event they are interested in.

Rational: If users are interested in certainty type of event, they can find the park which has that event available.[E3],[I4]

Search customization

Customize search by parameters

User can narrow down their search even more.[H2],[H3]

Rational: Users care about price, facility, distance and special commendations. Enabling users to search makes the research easier for user.

Navigation

Navigation from home to destination

User can find navigation information from where they are to the state park parking lot.[N3]

Rational: Some state parks located at areas hard to access. Provide navigation information can help user to find the path to state park.

Navigation within park

User will be able to find locations in the park.[L1],[L2]

Rational: Help user find the spots they want to visit and prevent getting lost.

Reservation

Make reservation

User will be able to make reservation for trip.[D1],[I1]

Rational: User prefer to reserve the facility for their trip to make sure availability.

Payment

Pay for Reservation

User will be able to pay the associate fees for their reservation.[B3],[D1],[I1]

Rational: Help users to complete reservation process in one site.

Social aspect

Leave review

User can leave reviews of the state park they visited.[C1]

Rational: Users can share their experience with others and provide feedback for the state park.

Reply to review

Users can reply to others' review[J1],[J2]

Rational: Users can interact with previous visitors to ask questions and comments on others' review.

Share with friends

Users can send the state park's information to their friend.[J3],[J4]

Rational: Users always travel with company. Be able to share the state park information with friends will help.

User history

View Travel or Reservation History

Users can record their own searches or visit histories.[M1]

Rational: Users like to keep a record of their state park experience and also store the information they collected for trip.

General Info

Basic Information

Users can find the state park's information.[H1],[H4],[H5],[H6]

Rational: State park's information is user's primary need in trip planning.

Recommendation

Users can get recommendations to help them plan their trip better.[J1],[J2],[J3],[J4]

Rational: Users want to get previous visitors' experience, and also want to know the features of a state park when planning.

Photo gallery

Users can find pictures of the state park.[C3]

Rational: Users want to know how the park and the spots looks like before going.

3.3. Requirement Extraction Process

We analyzed each post its from our WAAD to find a common trend which signifies a common requirement or common pain of users. We also analyzed which ones were important over other. While we all were discussing the interaction design requirements, one of us was taking notes to ensure we don't forget anything important. We organized our design requirements to 7 initial work model bins : search function, search customization, navigation, payment, social aspect, user history, general info and photo gallery and we finally ended up with 13 design requirements.

3.4. Model List

For the scope of our project, we have decided to include the below models

- i. User Model
- ii. Usage Flow Model
- iii. Hierarchical Task Inventory
- iv. Usage Scenarios
- v. Step-by-step Task Interaction Model

3.5. Justification of Models

The User Model is developed based on 3 work roles - Camper, Co-Camper and Park Administrator. Our initial interviews and research highlighted extremely different behaviour from the users when they were responsible for planning the trip (Camper) versus when they were a passive participant(co-camper) in the process. We also noticed that behavior changes based on the travel intent i.e. whether the user intents to engage in outdoor activity or spend leisure time relaxing.

The Updated Usage Flow Model demonstrates the interaction of the three work roles within the DiscoverTexas' ecosystem. Currently disintegrated systems for different information makes it extremely difficult for users to maintain context. The hassle of constant context switching inspired us to integrate all these systems and provide the user a seamless experience. DiscoverTexas also tries to solve a potential communication barrier between a group of people who travel together.

The Hierarchical Task Inventory is a User-centric model. It representation of the goals that a user can achieve within the app. The goals are divided broadly into 3 categories : Profile, Searching and Reservation.

The Task Interaction model were a product of the best use cases for the application and real life situations that our interviewees expressed difficulty in performing. We determined three Usage scenario that would best represent the cases for which DiscoverTexas will be useful. The The Step-by-step Task Interaction model goes over 4 major tasks that a user may want to perform along with our vision of how the user and system interact with each other.

3.6. Structure of Models

3.6.1. User Model

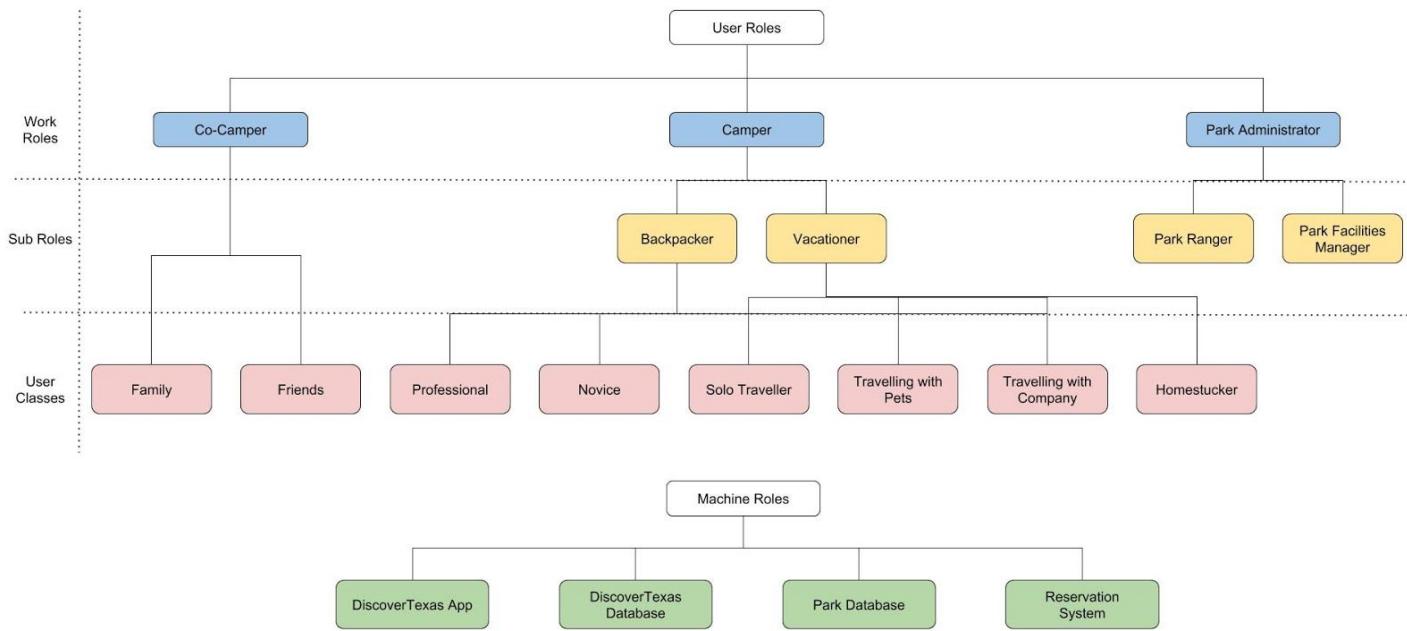


Figure 3.1 : User model

Work Roles :

- Camper
 - Backpacker
 - Professional: Who is a seasoned outdoor person.
 - Novice/Nature Enthusiast : Who likes being in nature and engaging in activities that bring them closer to nature but is an amateur.
 - Solo Traveller : Who is a perpetual wanderer and likes discovering new places.
 - Travelling with pets
 - Travelling with company
 - Vacationer : Who is out on a vacation and wants to relax.
 - Homestucker : Who is homebound and looking for an escape

- Solo Traveller : Who is a perpetual wanderer and likes discovering new places.
- Travelling with pets
- Travelling with company
- Co-campers
 - Friends
 - Family
- Park Administrator
 - Park Ranger : Who is responsible for the security and protection of the park
 - Park Facilities Manager : Who manages the facilities and equipment within the park.

Machine Roles:

- User's Phone & App :
 - GPS : Provide current location, route to destination, find facilities/ restaurants/ gas stations in the vicinity.
 - Camera : User QR Code reader, document the trip.
 - Social Media.
- DiscoverTexas Database :
 - Stores User Information.
 - Stores Park Metadata
 - Keeps track of past visits.
 - Miscellaneous Information.
- Multiple Park Database :
 - Park Details.
- Reservation System :
 - Connect with the Application and Park database to get reservations details.
 - Make payments

3.6.2. Usage Flow Model

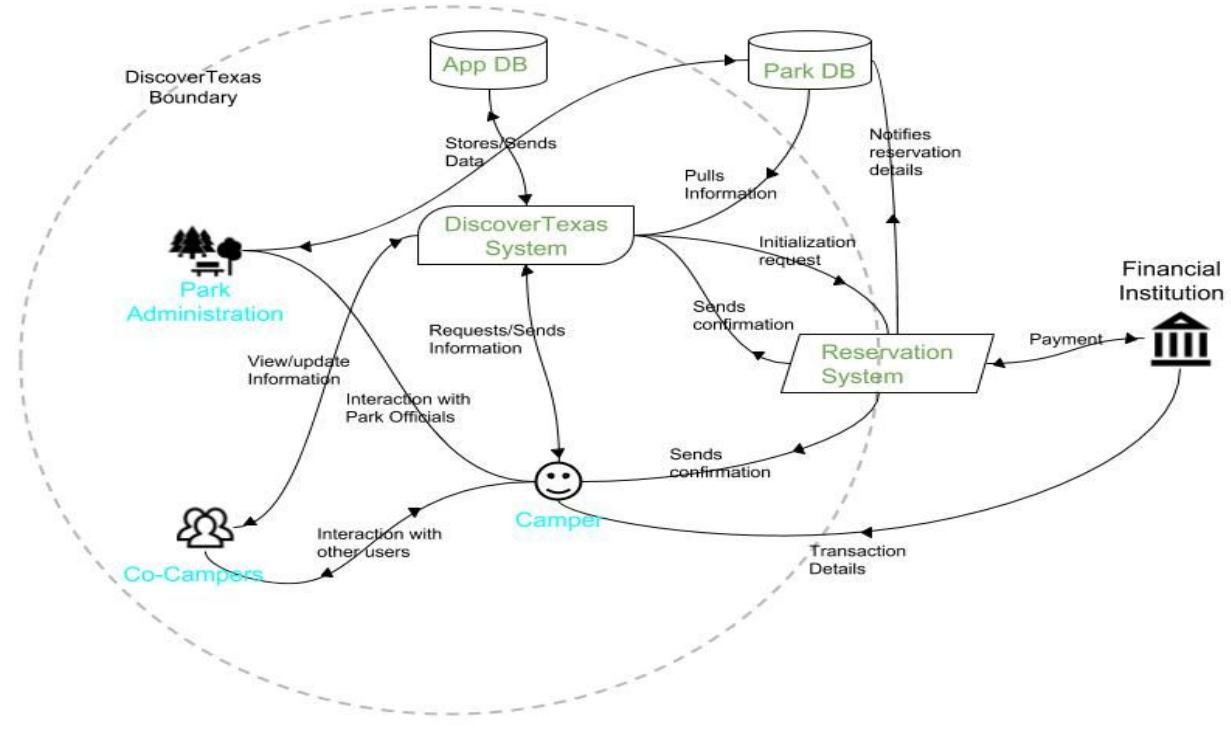


Figure 3.2 : Usage flow model

3.6.3. Hierarchical Task Inventory

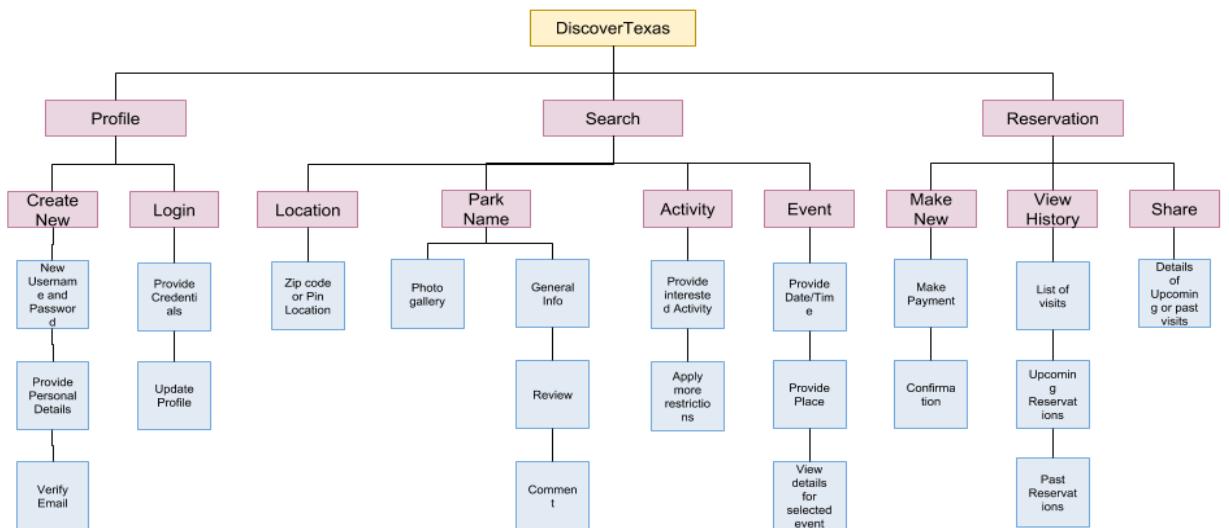


Figure 3.3 : Hierarchical Task Inventory

3.6.4. Usage Scenarios

i. User who seeks information regarding a certain activity

Andy wants to go for a 2-day trip next weekend and likes to experience a natural swimming pool. He asked his friends for recommendation, some friends can tell him which park have water views but don't know whether those pool or lake are available for swimming. Andy opens the app and search by swimming. A list of state parks which has natural swimming pools pop out. Andy picks few options and read each pools' introduction and pictures, and checks if the pool will open and be available on next weekend. Comparing the different options and the pool's availability, Andy decides he will go to the Lots Water park and swim in the Deep Water pool. For environment protection purpose, the Deep Water pool only allows 20 swimmers in the pool at the same time. So Andy uses the app and find out there are two spots available between 2-4pm next Saturday. So he makes a reservation with the app and plan to leave home in the morning so he can arrive at the state park by reservation time. Andy now can know that he will be able to swim in a natural pool for sure once he goes to the state park.

ii. User who wants to book a facility

Tom wants to camp with his friends in Good Fire park during weekend. They want to camp with their own tenants. Tom opens the app and search for the Good Fire park. He looks for the campsite information and check the facility availability such as electricity, bathroom, shower, and BBQ grills . He reads the campsite introduction and map, and check the available time and spots. Tom prefers NE campsite but there is no available spots next weekend. However there are two spots available at SW campsite. And reviews of SW campsite say it is a good place for stargazing. So instead of waiting for another week, Tom decides to camp at SW campsite. He makes a reservation and finish the payment for his stay on the app. He then shares the campsite information and maps to his friends.

iii. Users who has a special request

Joe want to visit a state park with her dog. Before going, she went online, and search for state parks that she is interested in. Within her interested park list, she further checks each park's information, and looks for pet-friendly parks. She finally decided to take her dog to the Big Tree Park. Joe then looks at the specific information of the trail, to see if there is any rules for pets. And she found that dogs have to be on-leash within the park, so she took the dog leash with her. Then she drives to the park following the app's navigation. Before she let her dog off the car, Joe puts the leash on her dog. Then she opens the app and finds the trail map out, enjoying her hiking with dog.

3.6.5. Step-by-step Task Interaction Model

i. Task name: Search Parks in vicinity

Task goal: Help user to find out how many parks are present in their vicinity.

Task trigger: User is interested in going camping but does not have any information about the parks and availability.

Barrier: Do not know how to find the search option.

Step goal: Find all parks close by.

User	System
1. User opens the app.	
2. User starts search and mentions a radius within which they want to see park options.	3. System gives back a list based on the distance.
4. User filters the list based on their requirement.	5. System removes options that do not satisfy the filter criteria and returns another list.

ii. Task name: Search facility information

Task goal: Help user to find out specific facility information of the given park.

Task trigger: User wants to make sure the facility they want to use in the state park is available before going.

Barrier: Do not know where to find facility information.

Step goal: Find the facility information.

User	System
1. User opens the app.	
2. User searches for the state park.	3. System gives back the general information of the target state park.
4. User search for the facility information.	5. System displays the facility list.
6. User looks for one specific facility.	7. System provides the detailed information of that facility.

iii. Task name: Make a reservation

Task goal: Reserve a campsite

Task trigger: Users make reservation of the campsite to ensure they can have a spot to camp when arrive.

Barrier: Hard to communicate with state park management system.

Step goal: Find an available campsite spot

User	System

1. User opens the app	
2. User searches for the state park	3. Display the state park information.
4. User searches for the campsite information.	5. Display the campsite information.
6. User checks the availability of campsite.	7. Display the available time and spot.

Step goal: Complete the reservation

User	System
1. Choose the available option.	2. Display the price and policy.
	3. Ask if user want to make a reservation.
4. Decide to make a reservation.	5. Ask user to enter personal information.
6. Enter personal information.	7. Ask user to enter payment information.
8. Enter payment information	9. Display confirmation
	10. Send confirmation to user.

iv. Task name: Navigation

Task goal: navigate user from one point to another point in the state park.

Task trigger: Users need to find places and avoid getting lost in state park.

Barrier: Do not know where they are.

Step goal: Find how to get to point B.

User	System
1. Search state park map	2. Display map
3. Search for destination	4. Display available paths
5. Choose path	6. Start navigating

4. Design

4.1. Tailoring the Scope

For this activity, we started with designing the persona, which can help us narrow down the many options and ideas we have generated and collected from the context inquiry process and focus on a particular niche market. A clear defined persona, in our context, can lead us through the designing process by having a target market in mind. Referring back to the information we were able to summarize from the context inquiry, building upon the persona, we summarized our designer's mental model and user's mental model as well as conceptual design, which led our ideation and sketching process. We then designed our applications to fulfill the identified user needs, and sketched out our main functions. In the end, we provided scenarios in which users can utilize our application to solve their problems.

4.2. Persona Design Process

To better focus on our target user group, we start the design process by identifying the persona. We went back to look at the data we collected during interviews and observations. From the data, we selected following persona candidates into consideration: "home-stucker", who are generally not interested in outdoor activities; "leisure experience seekers", who are not outdoor activity fans, but enjoy spending leisure time in a state park; "parents", who travel with kids and emphasize a family-friendly travel experience; and "pet person", who usually travel with pets. After analyzing each candidate's characteristics as well as their similarities, we finally decided to pick "leisure experience seeker" as our primary persona, as it covers the most commonly emerged themes in our analysis: "want to get closer to nature", "care about facility information", "value the reviews" and "prefer to plan the trip ahead such as knowing availability and making reservation".

Our primary persona is a young professional who lives in Austin with her husband. They don't have babies yet, but having a dog. She is busy on weekdays and loves to get away from urban life during a long weekend. She is no way a professional adventurous, but she likes to go camping, hiking, BBQ and some other outdoor activities with her friends and her dog. She relies on the internet to look for state park information and always plan her trip in advance. To provide richer information about our persona, we described her Goals on using the App, Frustrations she had in past experience, Travel motivations, Information Needs as well as an Information Source.

Anna Hart



"I want to get closer to nature and escape from my daily life during breaks, so have some fun time at a state park would be a good option for me."

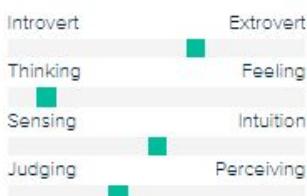
Age: 33

Work: Full time EE engineer

Family: Married, no kids.

Location: Austin, TX

Personality



Goals

- Find out where to go for a short break.
- Find general introductions and reviews of the destination and prepare a to-do-list.
- Check what facilities are available
- Find out whether pets are allowed.
- Make reservations of campsite and other facilities she will need during the trip and pay the bill.
- Get directions.

Frustrations

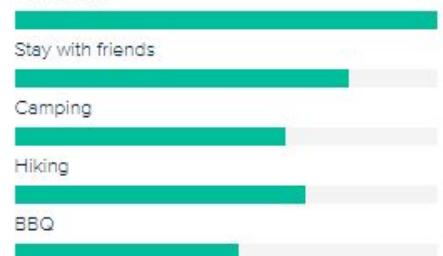
- It is hard for Anna to find an App that she can get access to all the information she needs for trip planning.
- Anna finds the reservation system provided by most of the state park office website are not user friendly.
- She finds some state park did not provide accurate pet policies.
- It is hard to find information.

Bio

Anna Hart is a senior engineer who works at AMD. She comes from Lansing, Michigan. After graduation, she found a job at AMD and moved to Austin five years ago. She has recently gotten married and has a Shiba dog. She is an outgoing person and made many friends in Austin. She is a foodie and loves traveling. Sports and adventures are not her thing, but she likes to get closer to nature. She is an organizer of a small hiking group, and Anna always organizes hiking activities during weekends in the Austin area. She heavily relies on her mobile phone when searching for information. Anna is a well-organized person and she always plan her trip before going. In information collection stage, Anna likes to use the excel and note-taking Apps to write down her trip plan. She always travels with her husband and friends, so she likes to make sure there are enough campsites or hotel rooms available for everybody. And as she loves food, dinning option is very important for her.

Travel Motivation

For leisure



Information need

- Hospitality information
- Available facility
- Pet policy
- Food option
- Map

Information Source

State park official website

Travel planning website

Social media

Friends and colleagues

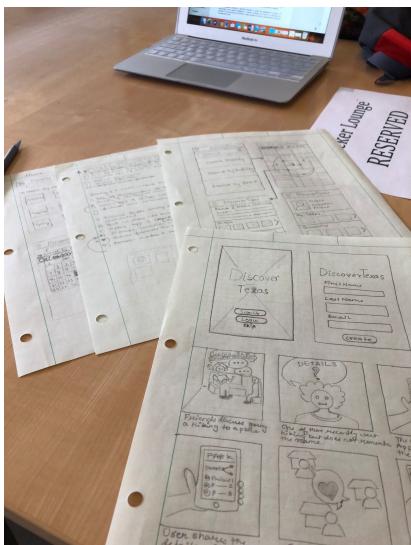
4.3. Ideation and Sketching Process

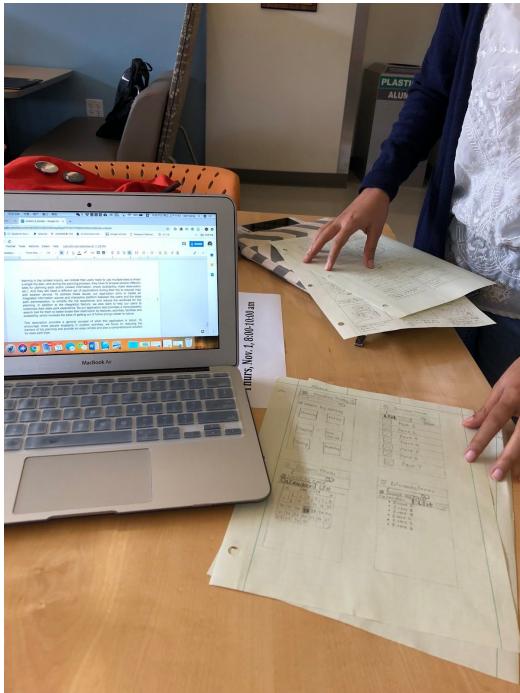
For the Ideation and Sketching process, we got together as a team and brainstormed on the possible user scenarios. We used our workflow model as a reference to come up with user scenarios and cases that would encompass all the actions and user roles that we were trying to include in the system. We did not complete the entire user scenarios at this stage. We just mapped out a potential user might take. The workflow model along with the high level user scenarios helped us refine our interaction design requirements and sketch wireframes of the solution. Since all of us have different styles of designing, we decided that completing the sketches as a team was crucial. Once the sketches were unanimously approved, we altered the previous user scenarios to create a storyline that blends in with our solution's flow. With this group exercise we were able to finally start seeing results of the efforts from the previous weeks' work.

4.4. Workspace and Materials Used

We worked together and finalized the key features which we wanted for our persona which led us to our final design. We realized that we will have to spend a great amount of time for ideation and sketching, so we all met at one of our group member's home and sketched the main functions of the app. We followed the old school method for sketching and used paper, pencil and eraser so that it's easy to make changes in our sketches. We also used Google doc to collaborate remotely.

4.5. Photos--Our Team at Work





4.6. Sketches

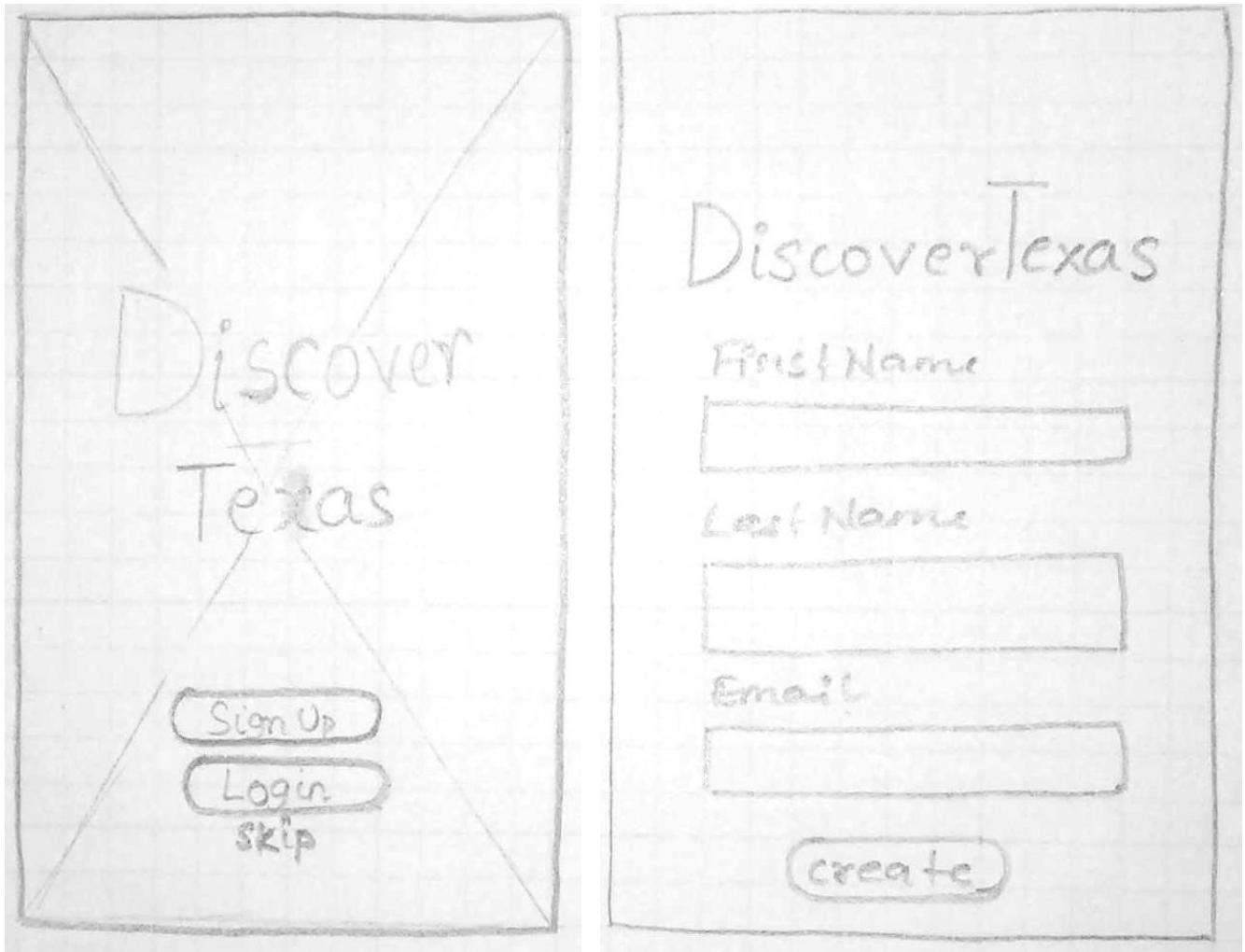


Figure 4.1: Main screen. When user downloads the App for the first time.

Figure 4.2: Sign-up or Login Screen. Requires basic information from user.

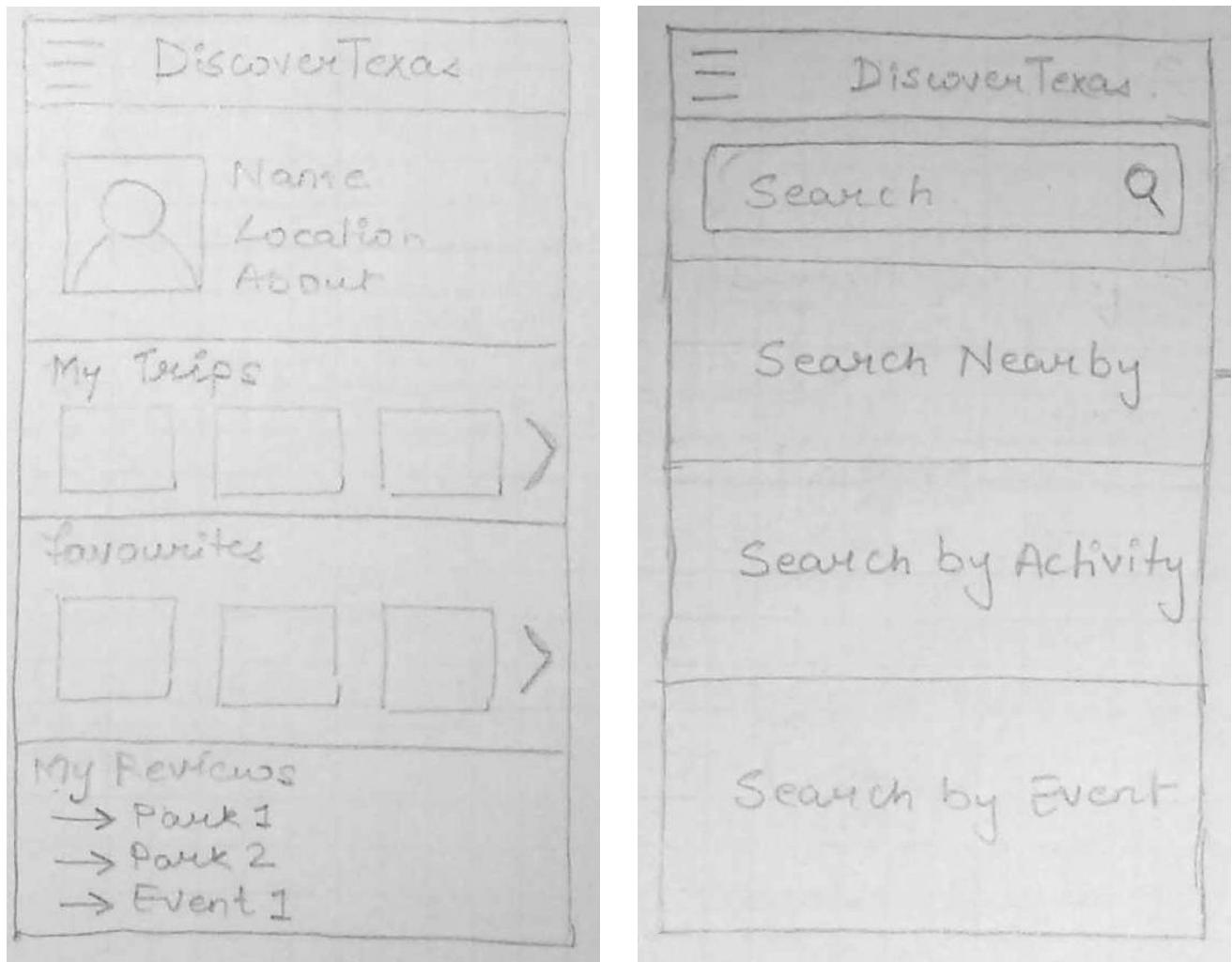


Figure 4.3: User account page. User can see details of their trips(past and upcoming), Their favorite locations and the reviews that they gave different parks.

Figure 4.4: Home Screen. When user logs in, they can see the different options using which they can search for the desired location/activity/event.

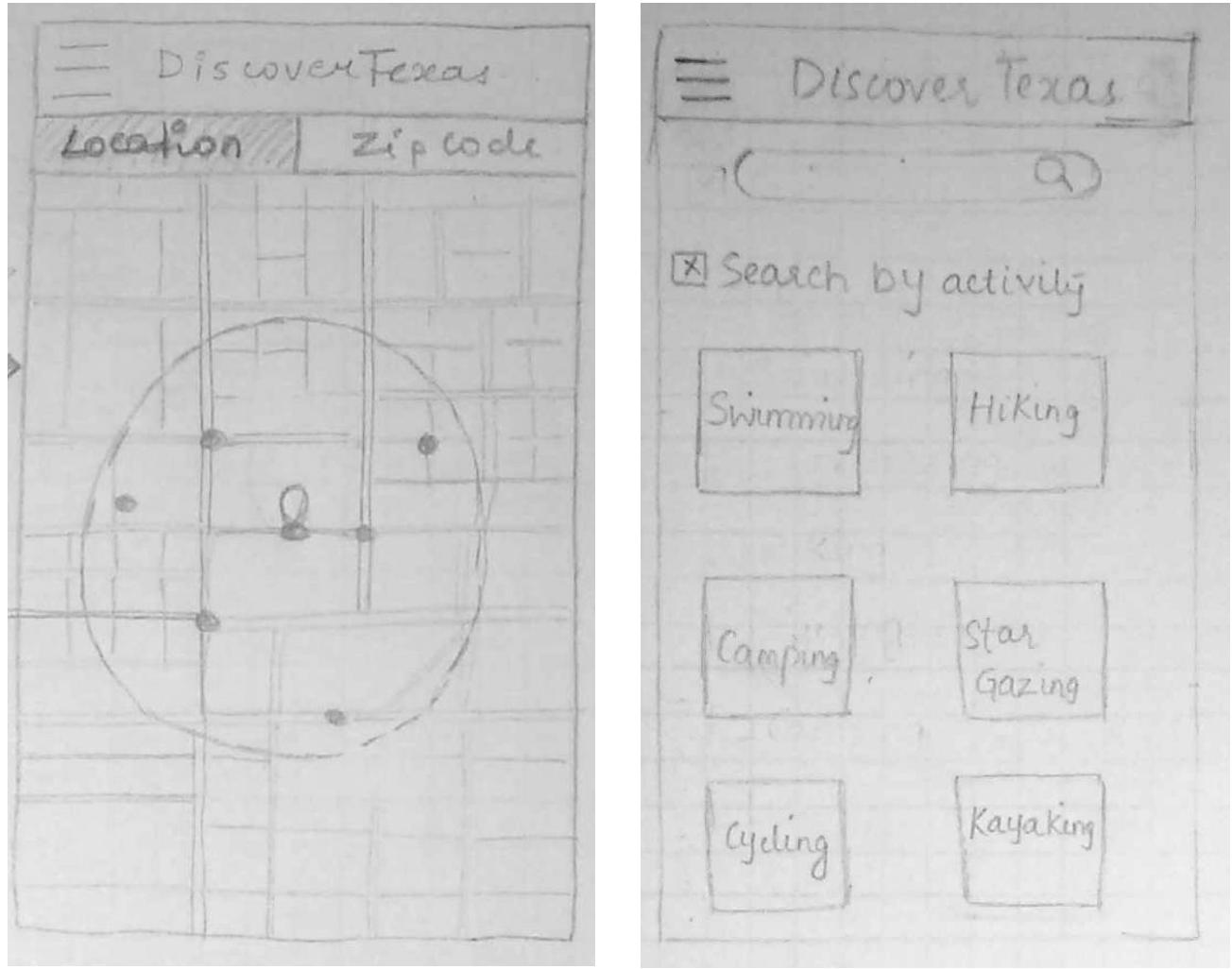


Figure 4.5: Screen for “Search Nearby”. When user selects “Search Nearby” option on the home screen(Fig 4), they will be shown this screen.

Figure 4.6: Screen for “Search by Activities”. When user selects “Search by Activities” option on the home screen (Fig 4), they will be shown this screen

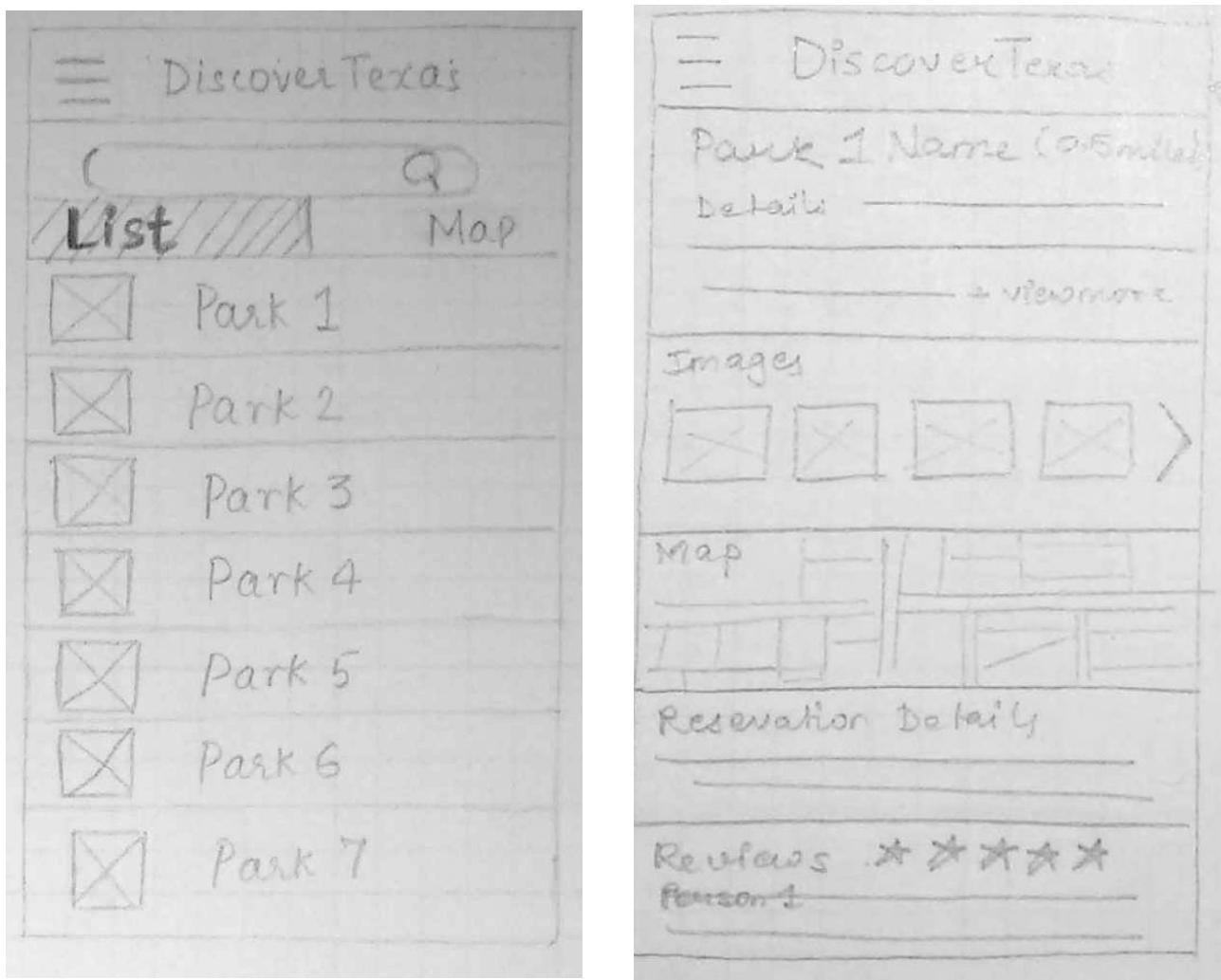


Figure 4.7: Park List Screen. Once user selects the activity (Fig 6) then all the possible parks show up in a list format. List of parks can be viewed on a map by switching the view.

Figure 4.8: Park Metadata Screen. Once user selects a park(Fig 5, Fig 7) or searches for a park directly from home screen (Fig 4), this metadata view is shown.

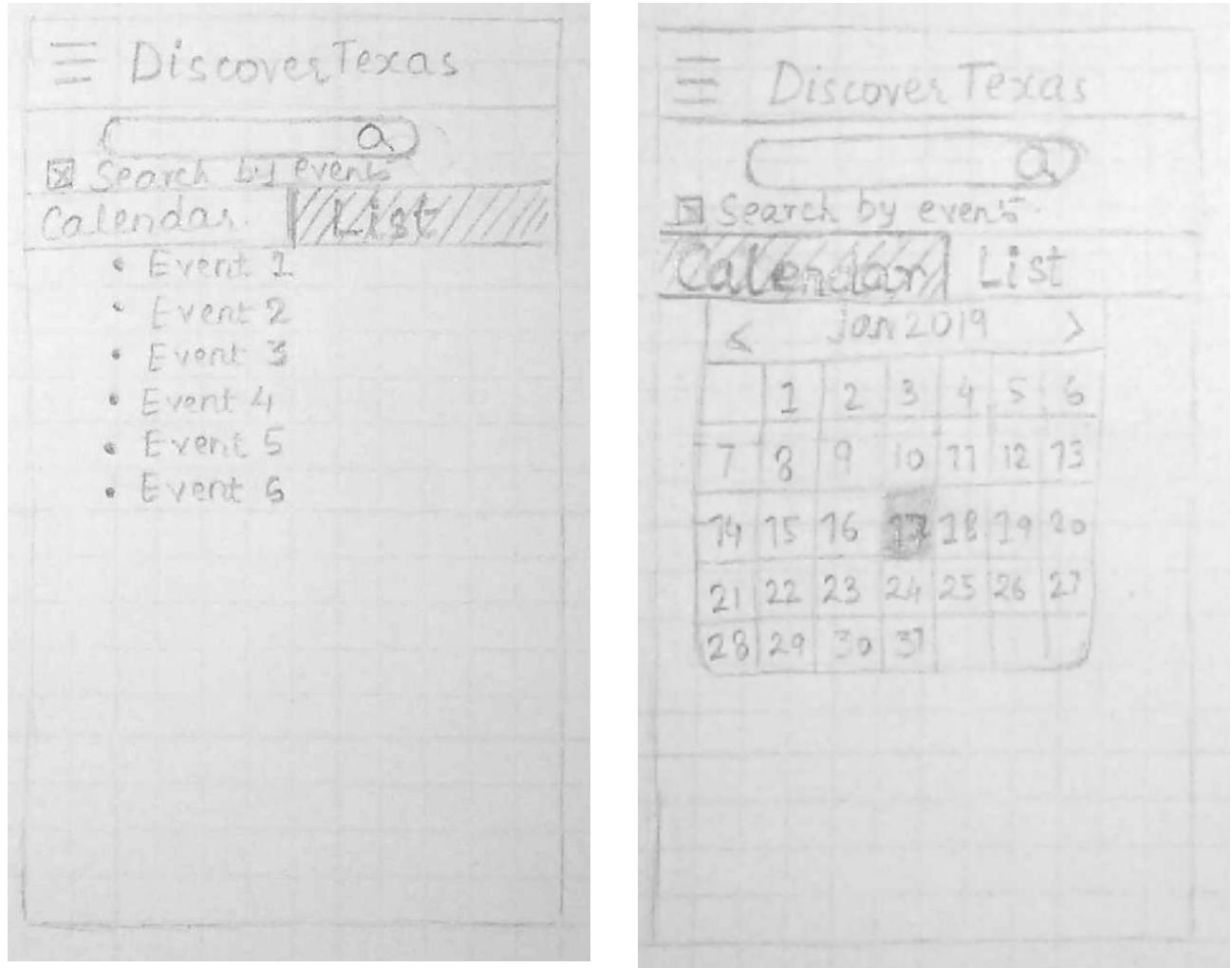


Figure 4.9: Events Page. When user selects “Search by Events” at the home screen (Fig 4), then the user is shown a list view all the events.

Figure 4.10: Calendar View of Events. The user can toggle between “Calendar view” and “List View” (Fig 9) of Events.

4.7. Physical Mockups

We don't find it is applicable for our current project to build a physical mockup, as this application provides online service and all the interactions are online.

4.8. Mental Models and Conceptual Design

4.8.1. Designer's mental model

Ecological perspective :

Our envision for the app is to provide a platform which a user can use while planning the trip, during the trip and after the trip. We wanted to ensure that user is able to use it anytime during the trip. We also wanted to provide an easy search facility to users where they are able to search the place based on location, activity and events, can find their details and explore all the options available to him/her.

Interaction perspective :

The most important feature was to make the app user friendly, where user is able to quickly find information they are looking for and make reservations to the place they want to visit with a simple click rather than going through multiple websites. We also realized how important reviews are, and user has the option to read reviews posted previously and/or write new ones. User can also create profiles to save their trips and bookmark places of their interest.

Emotional perspective :

Usually planning a trip is never easy and quick and as a result, people drop the plan because of the time and effort it requires. Our solution is quick, hassle free and secure to make a user comfortable with using DiscoverTexas app. Sometimes unawareness also results in frustration where users aren't aware about the available options around them. Our aim is to provide visibility to such hidden places which users aren't aware in general.

4.8.2. User's Mental Model

From our user research, we knew that our users generally use Google search and Google maps to find information. We recognized that our targeted user is typically familiar with the different navigation apps and reservation apps. With the current system being so disintegrated, the users have had to operate in an environment with constant context switching. We wanted to provide the user with the best features from all the other systems without having to have a considerable learning curve. Apart from those apps, we also performed a competitive evaluation different apps like Waze and Meetup to understand how applications in a similar space to serve the users. This got us to declutter our homepage and not bombard our user with too much information. This would mean that the user may need a few extra clicks to get their required information, however, it is a trade-off that we would have to make to have a cleaner and more intuitive user mental model.

4.8.3. Conceptual Design

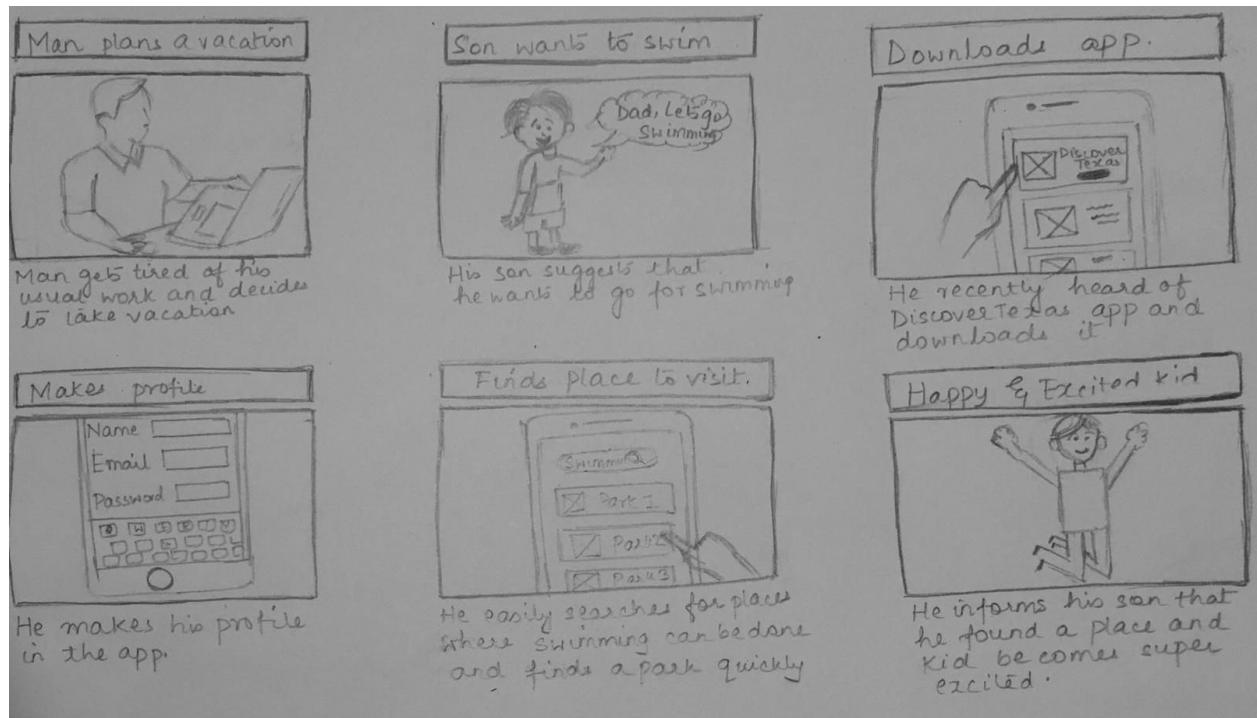
Taking our designer's mental model and user' mental model into consideration, we found that our primary goal of the DiscoverTexas app is to provide a one-stop service platform on which users can easily retrieve all the information they needed before and during the trip to a state park,

as well as make the necessary reservations. From our learning in the context inquiry, we noticed that users need to use multiple sites to finish a single trip plan, and during the planning process, they have to browse several different sites for planning each action (collect information, check availability, make reservation etc.). And they still need a different set of applications during their trip to request map and location service. To address these issues, our application aims to create an integrated information source and interactive platform between the users and the state park administration, to simplify the trip experience and reduce the workload for trip planning. In addition to the integration feature, we also want to help our users to customize their state park experience. So our application also provides a more powerful search tool for them to better locate their destination by features, activities, facilities and availability, which increase the ease of getting out of home and go closer to nature.

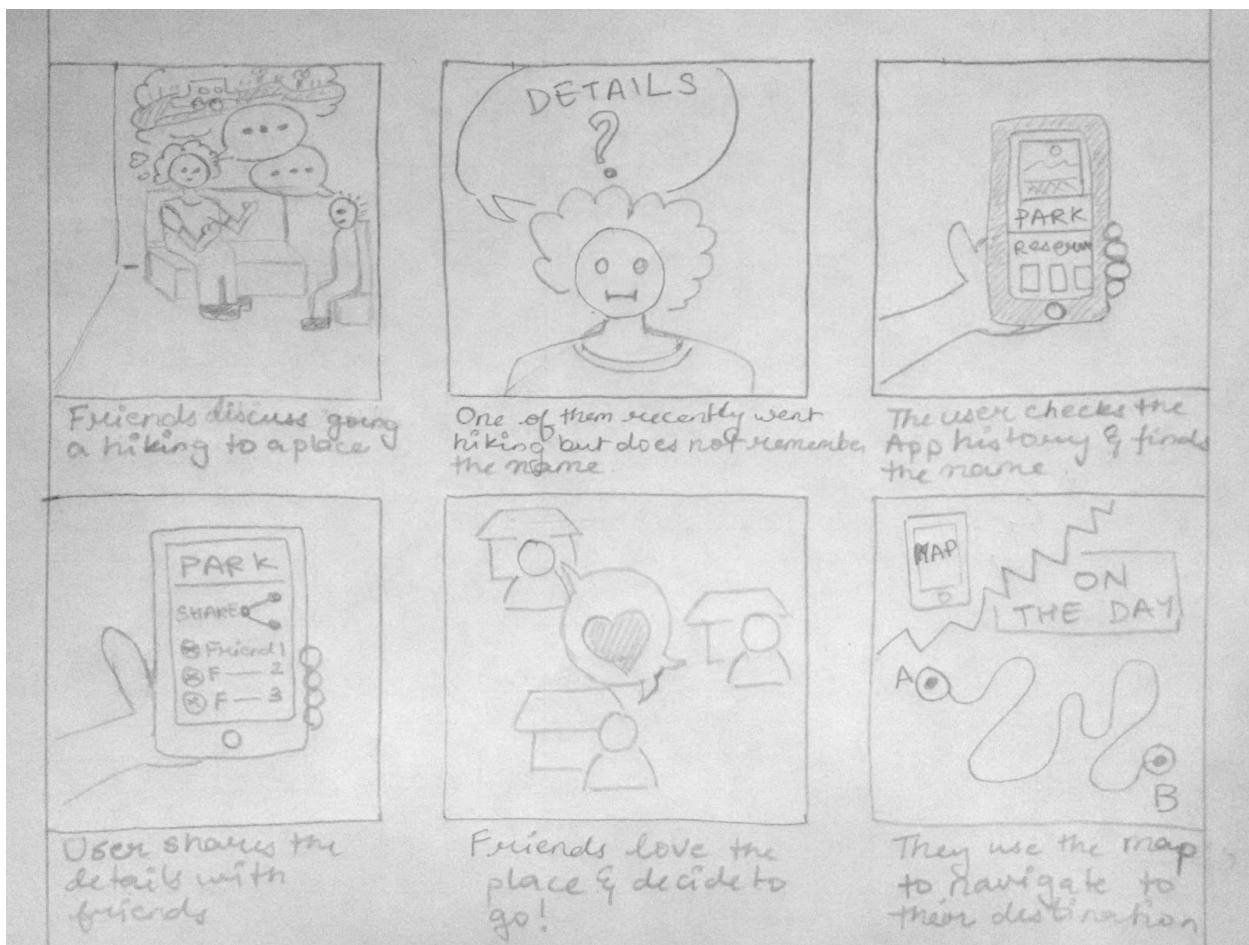
This description provides a general concept of what this application is about. To encourage more people engaging in outdoor activities, we focus on reducing the barriers of trip planning and provide an easy, simple and also a comprehensive solution for state park trips.

4.9. Storyboards and Usage Scenarios

Scenario 1



Scenario 2



5. Prototype

5.1. Tailoring the Scope and Process

The prototype covers the whole process of how a user will interact with the App. To be able to present an as complete as possible process, we first need to decide the key functions we are aiming to provide in this application. So our team starts with a meeting to list the major functions, and then write down the minor steps within each function to provide a stepwise process list.

During this meeting, we referred back to our Hierarchical Task Inventory table in P3, and focus on the 3 major function modules, which are 1) user profile function module, 2) search function module and 3) reservation module. Although each module contains many minor tasks, to be able to present the tasks which are most relevant to the key functions, we decided to trim our task list

according to a single reservation trip, and focus on the most important steps, namely from login, to search for destinations and accommodations, and then end up with completing a reservation.

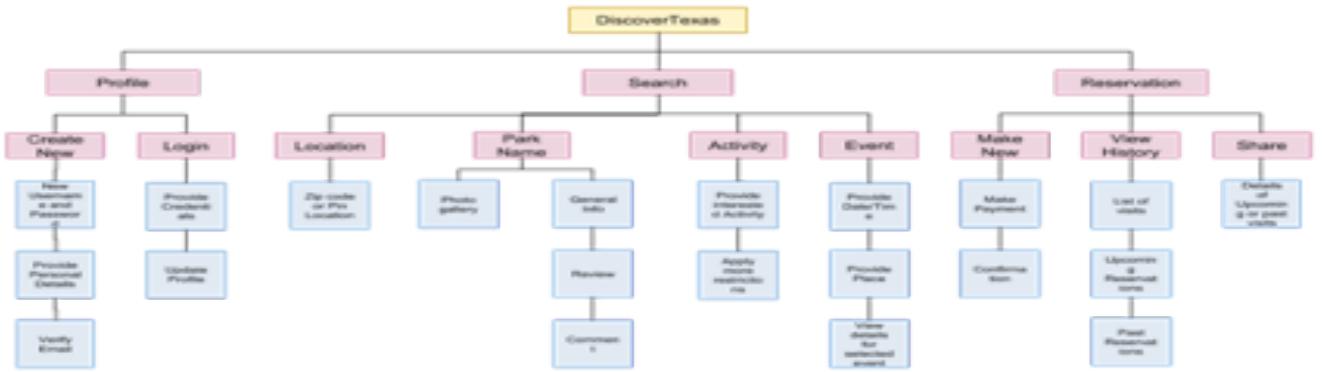


Figure 5.1 : Hierarchical Task Inventory

5.2. Prototype Design Process

With trimmed function list, we then brainstorm together and divided the functions into separate pages, and wrote down a page summary list. At this phrase, we found the sketches we developed in P4 are very helpful. Also, we draw out sketches for each individual page to align the design.

Next, we created an InVision account (a design collaborate platform) to share the elements such as icons, inspirations and color palettes, and decided a unified format for design.

Then our team divided the job up and each team member took responsibility of one function to design the wireframe, so that we can keep the inner consistency within each major function. After linked up the wireframe, we run the pretest to collect feedback from users. Based on their comments, we revised our design and then came up with the final version of wireframe as well as the high fidelity prototype.

Page list:

- 1) Hero + Login
- 2) Profile
- 3) Side Navigation
- 4) Filters
- 5) Landing Page
- 6) Map view
- 7) Search by Activity
- 8) Park Results
- 9) Park details
- 10) Park Images
- 11) Park Reviews + leave a review
- 12) Event List
- 13) Event Calendar
- 14) Reservation page -- All accommodations
- 15) Campsite Info
- 16) Bookings Page -- Select date, type #people/sites
- 17) Bookings Page -- Payment Info
- 18) Feedback page--pre-confirmation
- 19) Confirmation

The hand-drawn wireframe shows a 'Discover' section with three flags. Below are sections for 'Guest info' (Guest 1: Name, ID, ID type), 'Payment info' (Card type, CCV, Name on card), 'Order info' (Guest 1 checked, Guest 2 checked, Contact info: tel, email, payment processed), 'Campsite info' (Location: TX - Houston, Jul 14 - Jul 16), and 'Comments' (A confirmation message will be sent to the customer shortly). A large checkmark indicates 'Confirmed!'.

DISCOVERTEXAS
Add a description here...
+

Inspirations from other domain
Add a description here...

ICON
Add a description here...

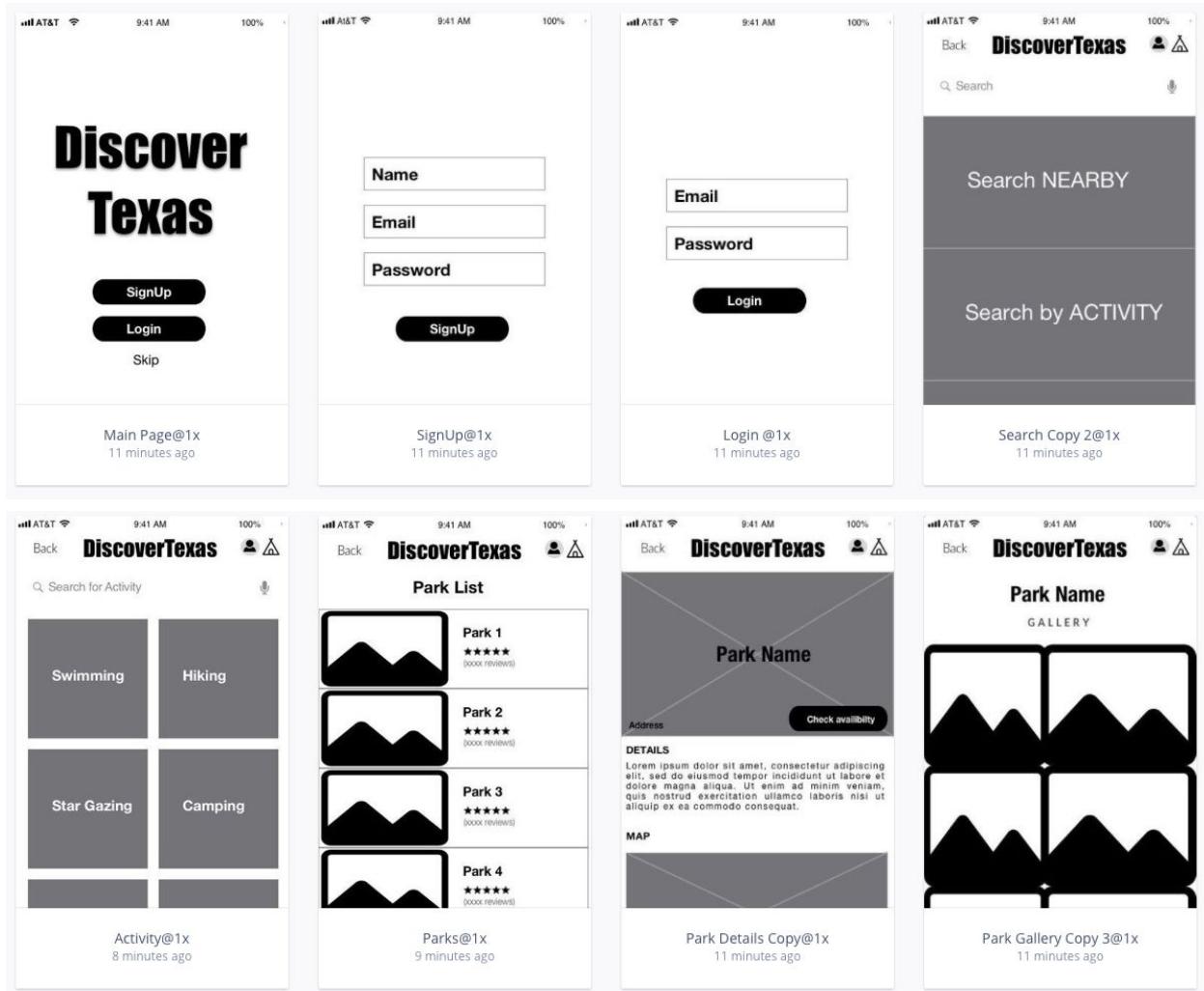
Reservation
Add a description here...

Color palette
Add a description here...

Figure 5.2 : InVision Platform

5.3. Prototype

5.3.1. Wireframe (screenshots)



Park Name

REVIEWS

Lore ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

Lore ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

Lore ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

Rate this place :

Leave your review

Reviews Copy 2@1x
11 minutes ago

Events@1x
8 minutes ago

Events Detail@1x
8 minutes ago

Campsite List

Campsite 1

Address:

★★★★★ (xxxx reviews)

Campsites @1x
11 minutes ago

Park Name

CAMP SITE ONE

No. of sites: xx sites
People per site: x people
Parking: x lots / site
Restroom: Public Bathroom
Pets: Allowed (on leash)
Wifi: Available
Others: Wheelchair Accessible
Picnic table
Water hookup
Fire ring &/or upright grill
30/50-amp electric hookups

Accommodation Details@1x
8 minutes ago

Select Dates

NOVEMBER 2018

SUN	MON	TUE	WED	THU	FRI	SAT
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3

NumberOfSites@1x
11 minutes ago

X DAYS X SITES

Personal Details:

Guest name:

Phone number:

Email address:
 Guest 2 (Optional)

Payment Details:

Name on card:

Guest And Payment Details Co...
11 minutes ago

REVIEW ORDER

Location: Park Name
Site Name: Campsite 1
Guest Name: Abcd Xyz
Phone Number: +1(512) 123 4567
Dates: 07/17 to 07/19 (3 days)
Site: X, Y(2 sites)
Total Amount: \$\$\$

Pay

Payment@1x
11 minutes ago

Congratulations!

Order ID: XXXXXXXX

Your order has been confirmed.
Confirmation email has been sent to your email address
XXX.XXXX@XXXX.COM.

Confirmation@1x
11 minutes ago

Map View

Hancock Recreation Center
Patterson Neighborhood Park
Mueller Lake Park
Ellie Woods Outdoor park basketball court
E. Martin Luther King Jr. Blvd.
Cherrywood
Chestnut

Map View Copy@1x
3 minutes ago

ABC XYZ

My Trips
Park 1, Park 2, Park 3

My Favorites
Park 1, Park 2, Park 3

Profile@1x
a minute ago

Side Nav@1x
a minute ago

5.3.2. Links to Interactive Prototype

[**https://invis.io/ZUPA5XLNJHA**](https://invis.io/ZUPA5XLNJHA)

5.3.3. Narration / Walkthrough

- Users is prompted to create an account with a valid email.
 - User is allowed to access the app after completion of sign-in process.
 - User is also allowed to skip the process and directly view the details.
- On the main page, the users are given the ability to search with the below criteria:
 - Nearby
 - User can search for parks nearby.
 - The results have 2 views -- List View and Map View.
 - User can filter the results by adjusting to the desired distance radius.
 - Activities
 - User can search for parks based on activities that they would like to participate in.
 - The user is shown with a few popular activities and is allowed to search for any other activity using the search bar.
 - Events
 - All ongoing and upcoming event details will be available to the user in a list format sorted by date.
 - User is given the ability to view the events in the form of a calendar.
 - Name
 - The user can directly enter the name of the desired park and view the result on the map without using the other easy access options.
 - The search results are shown on an interactive map.
- Clicking on a search result for Park or Event will display a detailed view of the Park or Event
- Park detailed view provides the user following information:
 - Name, Entrance Fee and Distance from current location
 - Map
 - The user can look at a view of the park with all the amenities and campsite location.
 - Reviews
 - User can view reviews and ratings by other users
 - User can rate and review a place.
 - Gallery
 - Pictures from the internet for the park will be available to the user.
 - Reservation Details
 - Upon selection of “Check Availability” users will be shown all the parks available in the next 1 month.
 - The user can filter the result by supplying intended travel date, required facilities and other special needs.

- After selection of park and accomodation type, user can proceed to reserve the place. The steps involved in reservation are:
 - Select reservation date(s)
 - Select number of sites(cabins, campsites etc)
 - Supply Guest and Payment Information
 - Confirm and Checkout.
- Using the right side navigation, user can navigate to their profile. The user profile contains:
 - Previous and upcoming trips
 - Once a user goes through the reservation process, the trip details are available under “My Trips” category.
 - The start date of the trip is visible to the user even before opening the trip details.
 - Favourites
 - User can mark any park or event as “Favourite” by clicking on the “Heart icon” on the details page.
 - Reviews
 - The user can see all their reviews and ratings in a single place under the “My Reviews” tab

5.4. Pilot Test

5.4.1. Test Cases

Test 1:

Instruction: Access to the user portfolio page

Feedback:

User gave a positive comment on the design, and said that the looking is simple, clear and relevant to the theme of current App. However, user suggested to provide an icon on the screen to show the user’s name or portfolio photo as a confirmation to show that she has already logged in.

And user also showed her preference on having a reservation history access to the portfolio page, which is a critical function in our App as well.

Test 2:

Instruction: Search for a state park

- 2.1 Search by location,
- 2.2 Search by activity,
- 2.3 Search by event.

Feedback:

The user appreciated the “search by event” function and the calendar design. She also likes the map view in “search by location”. However, due to the time limit, we are not able to draw out all the transaction pages. So some details on the function cannot be fully presented to the user. It was expected that we would get feedback on adding more small functions such as an option to change the “in circle distance” or “link to google map”. And the user is confused by the “available” tag on the park list. Another comment is the design of the review session, which does not provide the function to rate the park.

Test 3:

Instruction: Search and Select a campsite

Feedback:

The user thinks that it is a good way to present a list of all the available campsites as well as their prices in the search result, so she can get the most important information at the first glance. She commented on the color of the “book” button, and suggested we change to a more pop-out color to highlight this button. The calendar design for the availability check is very clear, and it is easy to see which date has been selected. However, she also suggests that to show the availability on the calendar as well to give users a clear feedback. The user also mentioned that she really appreciate that our App provided a list of available facilities, which she thinks is very helpful information.

Test 4:

Instruction: Complete a campsite reservation.

Feedback:

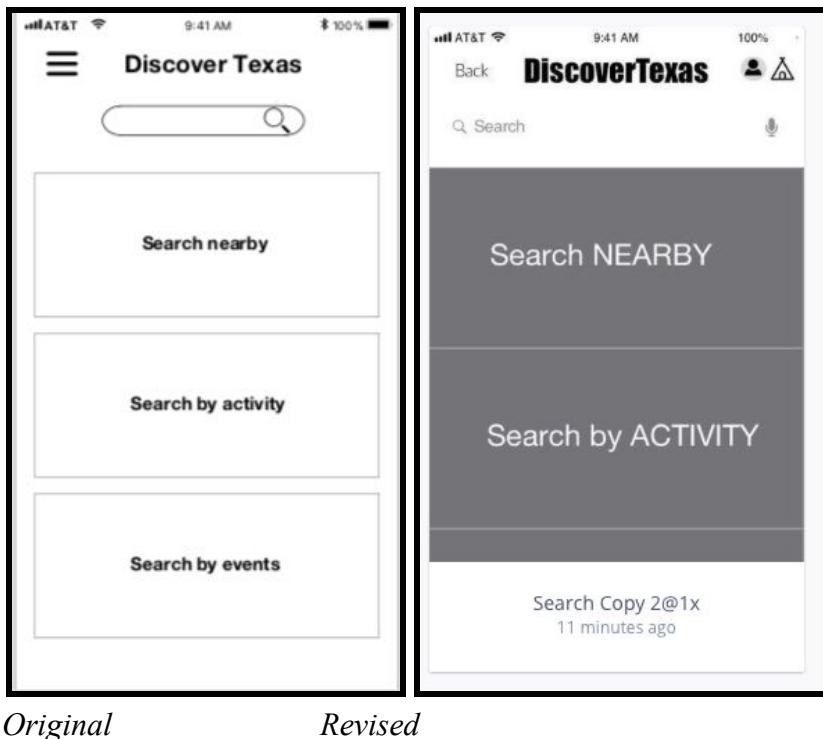
Generally, the user showed her concern on the feedback from the pages during each step. She suggest to change to another format when selects the campsite amount, as it is easy to make mistakes when using a slide bar. And before entering the payment information, she mentioned it could be better if there was a total amount shown on the screen so she can know how much to pay. And in the order review page, she spent a long time on finding the going back button, which is located at the upper left corner. From her feedback, we learned that we should think about including more feedback pages and error alters for each operation to provide stepwise confirmation to help user to prevent mistakes. This is especially important when they need to make a purchase, as no enough feedback could cause hesitations and decrease the trustworthiness of the application.

5.4.2. Summary

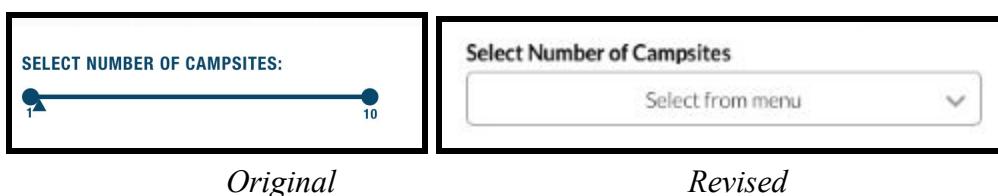
From the pretest, we learned the importance of providing stepwise feedback to users. And the test user's feedback helps us to review our design, add additional links to provide more flexible interactions with the Apps. Based on the test user's comments, we made edits on our original design, such as changed the room amount selection function to "enter a number" than using a slide bar; adding additional user portfolio access button on each page, and add more path to enable users to jump back and forth smoothly when interact with the App. And the pretest also informed our design for high fidelity prototype, for example, we added additional sign to show the availability of reservation dates (see section 6).

Example for revision according to pretest:

Example 1: added home button and user account button on the upper right corner



Example 2: Change amount selection button from slide bar to drop down menu

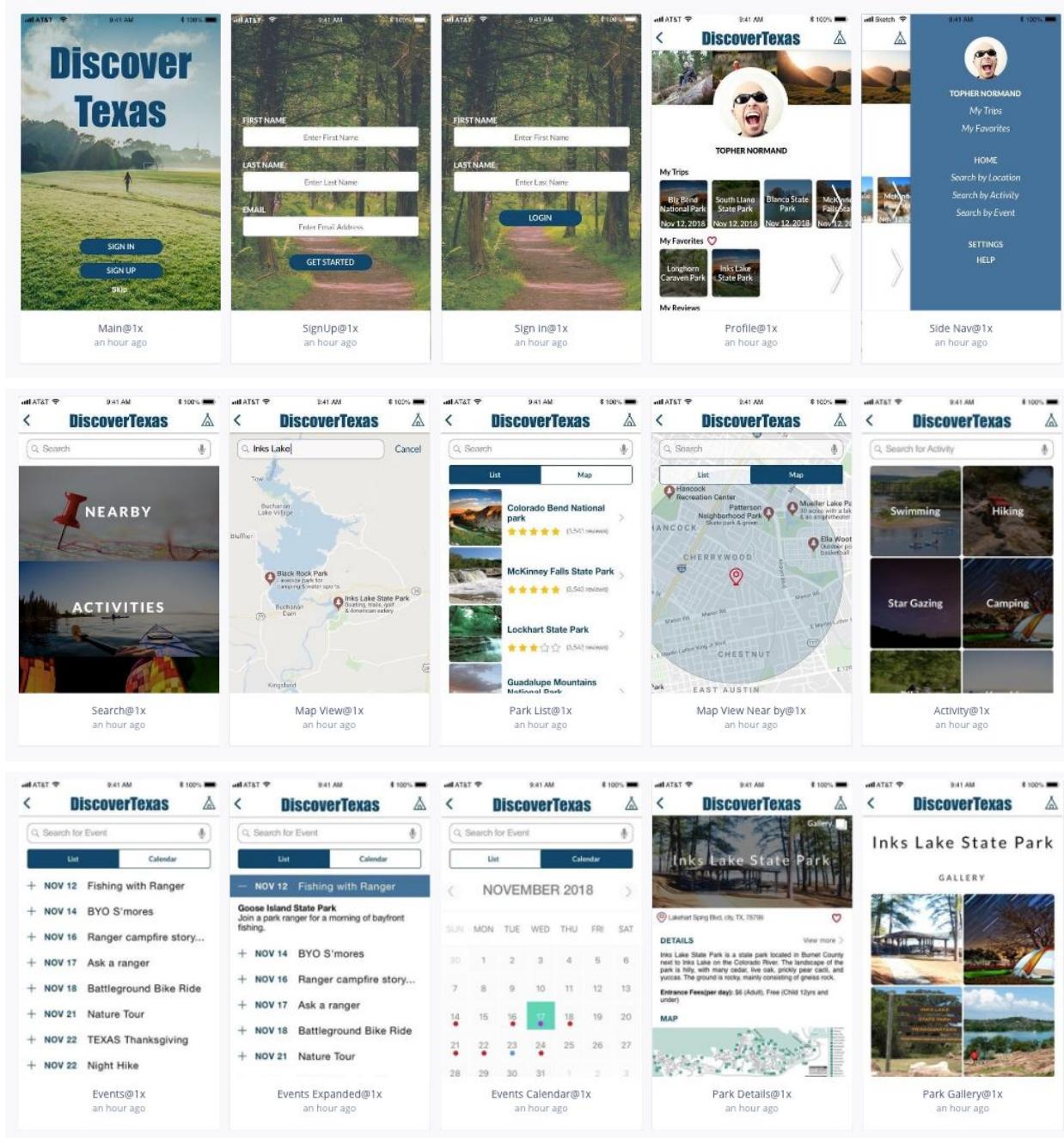


5.5. High Fidelity Prototype

5.5.1. Link to Interactive High Fidelity prototype

<https://invis.io/GKPA2X82B8Q>

5.5.2. Screenshots



Park Gallery Copy@1x
an hour ago

Reviews@1x
an hour ago

Reviews Copy@1x
an hour ago

Campsites@1x
an hour ago

Accommodation Details@1x
an hour ago

SELECT DATES

NOVEMBER 2018

SUN	MON	TUE	WED	THU	FRI	SAT
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3

Select Number of Campsites

Reservation 1@1x
an hour ago

SELECT DATES

NOVEMBER 2018

SUN	MON	TUE	WED	THU	FRI	SAT
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3

Select Number of Campsites

Reservation 2@1x
an hour ago

PROVIDE GUEST INFORMATION

Guest 1

Enter First Last Name

Email

Enter Email Address

Phone Number

+1 (111) 111-1111

Guest 2 (Optional)

PAYMENT of \$138

Card Holder's Name

Enter Card Holder's Name

Card Number

Reservation 3@1x
an hour ago

REVIEW ORDER

3 days, 2 sites

Location: Inks Lake State Park

Site Name: Campsite with Electricity

Guest Name: Topher Normand

Phone Number: +1 (512) 123-4567

Dates: 11/28/2018 to 11/30/2018 (3 days)

Site: 37, 40 (2 sites)

Total Amount: \$138

Reservation 4@1x
an hour ago

Congratulations!

Order ID: 94352838895

Your order has been confirmed. Confirmation email has been sent to your email address xxx.loper@miail.com.

Confirmation@1x
an hour ago

6. Findings from Evaluations and Recommendation

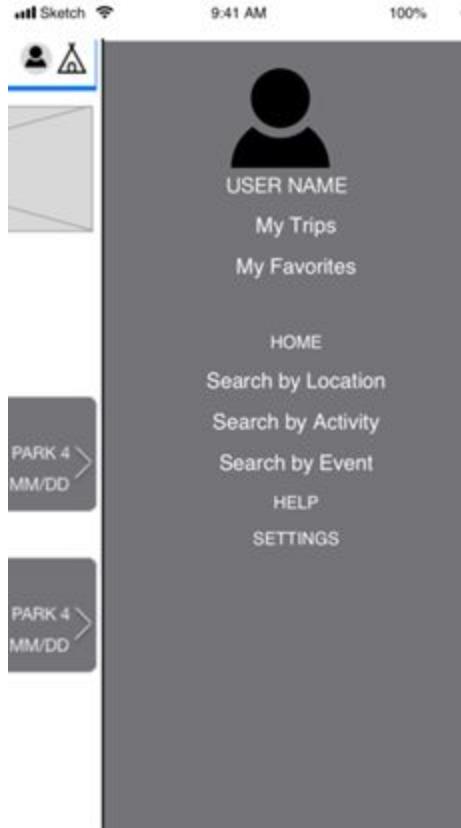
From the feedback we collected from our peers, we noticed that feedbacks are very important for user to get confirmation of their current statue in the application.

1. Visibility of system status



- Findings:
We did not include a statue notice in this page to show that this is the search result, so it will make user feel confusing whether the result came from their search behavior.
- Recommendation:
Add an icon to show the last action, such as showing the filter as “by activities”.
Add breadcrumbs to show the path traversed to get to the current view.

2. User control and Freedom issue



- Finding :
We did not provide a “logout” option in the user portfolio page, which limited user’s option to stay logged in or logged out, or even switch user.
- Recommendation:
Add the “logout” function.

3. Size of the button

- Finding:
In the user portfolio page, the clickable area too small for the user to tap on by finger. We failed to be considerable enough to take care the user’s using behavior.
- Recommendation:
Create blocks and portrait a clear boundary for each button to make it more visible and easier for user to tap on.

4. Unclear Icon Design

- Finding:
The little Teepee icon on the right upper corner does not directly convey a clear instruction on its function. Intuitively, user thinks that is the button for user to go back to main page, but it is in fact the off canvas side navigation and the word “DiscoverTexas” is the home navigation.

- Recommendation:
Change the icon to a generic hamburger icon or another icon that does not mean “home”

5. Mismatch Between System and Real



- Finding:
We added the “check availability” is a universal need for each park. The feedback from the design team said that the user might be confused to believe this park has reservable facility. We added this as a placeholder for parks that might have a reservable facility. In a real life situation, the parks that do not have reservation facility will not show the button.
- Recommendation:
We need to reconsider the design of reservation access so that incase the park does not have a reservation facility a corresponding affordance capturing this state is shown. Maybe add another filter to list parks that provide facilities, and add the function as an optional one within each park’s information page.

6. Usability

- Findings:

The evaluators were unable to use some of the features in the application since they were not interactive. For example, the evaluators felt that the map would interact with them as a regular Google or apple map would. Also they were unable to see the “Filter” option on some pages as it was at the bottom of the page.

- Recommendation:

We were advised to make these options visible and interactive. Given our team’s limited experience using the prototyping software, we were unable to implement the “Pinch to zoom” feature on the map and “Floating button” for filters. We will need to invest some time in making the interactions on the prototype more realistic.

7. Appendix

7.1. Cognitive Evaluation Summary

The first task the group had us perform was to search for one state park that had swimming available. The task was fairly straight forward and would be used by a variety of users under normal circumstances. Logging in and getting to the homepage of the application was done with no issues. The majority of evaluators had no issue finding the activity page through the main menu buttons and then selecting the swimming activity to find the list of parks. Once there however, one of the evaluators noted that there was not indication that the list of parks had swimming available aside from their previous actions. Possible solutions would be to include a breadcrumb menu or some other icon communicating that the list of parks had swimming available at all locations. One of the evaluators did not use the menu buttons to search for specific activities listed by the application and instead went from the home page to the search bar. After selecting the search bar the evaluator was surprised to find a list of parks already in front of him without typing anything or filtering for anything. The evaluator then had a hard time using the filter button that was only found at the bottom of the page after some time of trying to figure out how to search for a specific activity from the list provided. The list was also the same length and included the same parks for all activities, so there was no feedback present for reassuring the user that they were on the right track.

The second task was to locate a nearby park with camping and book a camping spot. All evaluators found the search nearby function fine, but once there one evaluator had trouble trying to figure out if the locations were clickable. Aside from the blue boxes in InVision, there was no indication that the locations on the map were clickable. A possible solution would be to also include a list of the nearby locations below the map, or as a second viewing option. Other evaluators noted trouble at this screen with what to do next. The prototype didn’t allow for any

mobility on the map or a function to put in an address or change location. After selecting a park, some evaluators noted that the park details page didn't have any information listed on whether it had camping or not. Some parks in Texas don't allow overnight camping, or a campsite at all. It was hard to tell if this park had camping available, but there was a clearly labeled "Book" button over the main image for the selected park. The campsite list also didn't have any notation of what park it was for. A breadcrumb menu or some other indicator to remind and reassure the user should be implemented. The next point of contention was the calendar. It was unclear from the prototype whether a user should choose the beginning date or the date that they wanted to end on. The prototype might have limited the scope of information here. The following steps for this task were straightforward and easily performed. There was however a limited amount of deviations available for the evaluators since the prototype did not allow for any alternate paths.

7.2. Cognitive Walkthrough Forms

-- Jacob

Task #: 1 Task Name: Search for one state park with swimming available			
Step #	Will the correct action be sufficiently evident to the user? Will the user know what to do?	Will the user notice (visibility) that the correct action is available? Will the user see how to do it? (e.g. see the button and recognize its effect)	After the action is taken, will the user understand the feedback from the action correctly?
1	Yes, easy to see that I need to log in or create an account to get into the app	Yes. The options are few and very visible from the opening screen.	Yes. I was able to enter into the app with no problems.
2	Yes. Minimal choices on the screen allowed me to quickly locate what I wanted to choose.	Yes. The large buttons were helpful for choosing the right action.	Yes. The next screen listed various activities of interest.

3	Yes. The names of all activities are listed and easily found. I can also search for an activity if I choose to.	Yes. Large boxes/buttons allowed me to easily see what activity I wanted.	Somewhat. The next screen listed parks 1-5, but there was no indication other than what I had previously chosen that these parks included swimming activities. Some indicator or bread crumb should be displayed.
4	No. All state parks were listed as 5 stars and no reviews. If there were distinct qualities listed on this page, or I had a park in mind, I would select based on those details.	Yes. The review number and rating are clearly visible, and there is a place for a picture to be displayed.	Somewhat. There is still no indication that there is swimming available once I select the park. Icons that list each activity would be helpful.

Task #: 2 Task Name: Locate nearby camping, select the park, and book the camping spot			
Step #	Will the correct action be sufficiently evident to the user? Will the user know what to do?	Will the user notice (visibility) that the correct action is available? Will the user see how to do it? (e.g. see the button and recognize its effect)	After the action is taken, will the user understand the feedback from the action correctly?
1	Yes. Minimal choices on the screen allowed me to quickly locate what I wanted to choose.	Yes. The large buttons were helpful for choosing the right action.	Yes. The next screen displayed a map of “nearby” parks relative to a pre-determined point of interest.

2	Somewhat. Other than the highlighted blue sections in InVision, there was little indication that I could select the areas on the map.	Somewhat. The parks on the map were listed as different destinations, but they weren't as easily visible as I imagined they would be. A list of possible choices on the bottom half of the screen would be helpful.	Yes, the next screen listed the “park name” and details about the park. I had just chosen.
3	Yes. The check availability button is evident right when I enter this new page.	Yes. The button is easily seen in the foreground of the park images block, and looks like a conventional button.	Somewhat. Though the next page says “Campsite List” there is no indication of which park it's for. Breadcrumbs or the name of the park should be considered.
4	Yes. The campsites are all listed and show reviews and ratings for each campsite.	Yes. There is a “Book” button that appears next to available campsites.	Yes. The next page has a calendar to choose from.
5	Yes. The calendar lists the current month, and what I assume are open dates for the campsite I selected.	Yes the open dates are a different color and easily recognizable.	Yes. After I select my dates the next page displays them at the top of the page.
6	Yes. Each box has a clear title of what I should input to reserve the spot.	Yes. There are clear and visible sections for each type of information.	Yes. The review page that follows lists all the information I previously typed out. There is also clear confirmation page that sends an email to the specified email in the form. Clicking done sends me back to the main menu.

-- Yizhuo

Task #: 1 Task Name: Find a park to swim

Step #	Will the correct action be sufficiently evident to the user? Will the user know what to do?	Will the user notice (visibility) that the correct action is available? Will the user see how to do it? (e.g. see the button and recognize its effect)	After the action is taken, will the user understand the feedback from the action correctly?
1	Yes/No (and why) Yes it's clear to see the search bar or the user can choose to search nearby.	Yes/No (and why) As an typical user I think it OK to know What to do.	Yes/No (and why) Not really, it surprise me to see the list of the park when I tap the search bar. What I want to do is tap something.
2	Not really, because the filter is not in the first page. So, I assume that I can just tap the park at first.	I don't think so because when I try to search a park I really don't want to see the park list. And why can't I just type the name of the park? It seems I can just use the filter? Filter not in the middle of the button.	Ths distance doesn't has the units. ACTIVITIES and the things in it has the same size and style? The 'back' should be fixed?
3	Yes I see the search result and I know I can tap them.	Yes it's available to tap.	Yes I got the detail of the park.
4	Yes I can try to get the location and the navigation to the park.	May be future draw.	

Task #: 2 Task Name: book a campsite nearby			
Step #	Will the correct action be sufficiently evident to the user? Will the user know what to do?	Will the user notice (visibility) that the correct action is available? Will the user see how to do it? (e.g. see the button and recognize its effect)	After the action is taken, will the user understand the feedback from the action correctly?

1	Yes/No (and why) Yes, it's clear to see the search nearby picture.	Yes/No (and why) As an typical user I think it OK to know What to do.	Yes/No (and why) Not really, what I intend to see is the filter. But I still understand what show after a second.
2	Maybe because it's just a prototype, I didn't notice what should I do at first.	I try to drag the round, but it didn't work. May in the bigger scale but not let the round be cut. I can't tap the search bar at here and there is a filter at the bottom? It seems to be seam?	Yes.
3	Yes, to see the "check availability"		
4	Yes to "book" but no to see the detail of the campsite.		
5	If I choose to book, it's little confused for me to choose a day.	Not really, I don't know should I choose the begin day or just the end day. Don't know each campsite can be shared by how many people.	Yes,
6	Yes		
7	Yes		
8	Yes		
9	Yes		

-- Junshu

Task #: 1	Task Name: Find a State Park
-----------	------------------------------

Step #	Will the correct action be sufficiently evident to the user? Will the user know what to do?	Will the user notice (visibility) that the correct action is available? Will the user see how to do it? (e.g. see the button and recognize its effect)	After the action is taken, will the user understand the feedback from the action correctly?
1	Yes/No (and why) Yes, there are only three buttons at the homepage, all of them would get me into the next step.	Yes/No (and why) Yes, there are only three bottoms at the homepage, all of them would get me into the next step. The login process is clear.	Yes/No (and why) Yes. The user would either signup or login
2	Yes. The user is assigned to find a park for swimming, so the user can easily click “search by activity”.	Yes. There are three categories for searching, which are very easy to understand.	Yes. After clicking “Search by Activity”, the user would get the activity category.
3	Yes. The user is assigned to find a park for swimming and there is a “swimming” category.	Yes. The page is mainly consisting of buttons revealing different activities categories.	Yes. After clicking “Search by Activity”, the user would get the searching results.

Task #: 2 Task Name: Find a park nearby and book the camping			
Step #	Will the correct action be sufficiently evident to the user? Will the user know what to do?	Will the user notice (visibility) that the correct action is available? Will the user see how to do it? (e.g. see the button and recognize its effect)	After the action is taken, will the user understand the feedback from the action correctly?
1	Yes. “Search nearby” is straightforward.	Yes, the button is large enough to be noticed.	Yes.

2	No. I don't know where to click to find a camping site. I tried filter first and it not worked.	Yes. List view.	No. After clicking one park, the park description page would show up. But there is no evidence showing whether this park provide camping. Only after I click "check availability" (the next step) can I get to know that park offers camping.
3	Yes.	Yes.	Yes.
4	Yes. The payment process is intuitive.	Yes.	Yes. The user would receive a congratulation notification as a feedback.

7.3. Heuristic Evaluation Summary

I. Visibility of system status

- There seems to be a lack of feedback once you select which park you want to look into. There were no bread crumbs that said where I had been or if I was on the right track. I just had to trust That I was still searching for parks with "swimming" once I was there.
- **Moderate** - You could argue that because the user already selected swimming and then a park after that, that they would know they park had swimming, but that would assume they trust the system is working correctly. If I'm a new user, I won't have this trust first starting out. Every affordance you can list without cluttering the screen should be included to build trust with the user.
- Bread crumbs for each stage of park examination should make the path the user is on available to them and so they can backtrack if they went of course.

II. Match Between System and Real

- I don't know that most of the parks you listed in the locate nearby page have actual campsites to reserve. You might be able to reserve a specific area, but I'm not sure they're referred to as a traditional "campsite"
- **Minor** - There may not be a need to fix this, and I could be wrong about the campsites. I know for sure that some parks don't allow overnight camping though, and I reserved a spot at a campsite where I know there is no overnight camping through your app during the second task.

- Further research should be done on which parks allow camping, or your prototype needs to only list those parks that allow it.

III. User Control and Freedom

- There was no way for me to log out
- **Major** - This is going to be an issue if this app ever goes into production
- Adding a logout function in the off canvas menu should address this.

IV. Visibility of System Status

- The search bar is non-functioning. This could be a limitation of InVision and the prototype, but it was noted in our evaluation
- **Major** - This could hinder potential users who might want to search by keyword instead of going through the menu
- Including a searchable database of keywords like activities and park names could help users find their intended park or activity faster.

V. Consistency and Standards

- The search nearby map and all other pages have a different icon for the off canvas menu. It was also unclear as to why there were two icons for the majority of the pages
- **Minor** - This is not a huge functional issue, but does violate consistency heuristics and should be addressed.
- There should be one consistent clear icon for the menu.

VI. Visibility of System Status

- The filter in the Park List page is at the bottom of the page which would be hard for users to find and notice.
- **Major** - fixing this issue would result in an easier to use interface if users know what they are looking for in a park.
- Should be repositioned to the top of the page.

VII. Consistency and Standards

- The only page with an icon next to the back button was the discover nearby map. All other pages did not have an icon next to the back button. Additionally there was an error in the back button when trying to return to activity listing page from the camp listing after searching for swimming. It just sends you right back to the home page. I assume this was an InVision oversight.
- **Minor** - This is not a huge issue, but does break the consistency heuristic and could affect how users perceived the overall system.
- Make all back buttons with an accompanying icon or without.

VII. General Ease of Use

- The clickable area in the account page is fine for a mouse interface, but when one of the evaluators was using a phone for the tasks they found it difficult to correctly select the option they wanted.
- Moderate - This is an issue for production phases, and would only become a major issue if left out until it was in the hands of users.
- Adjusting the spacing and creating clear boxes or borders for the items in the menu should help this issue.

7.4. Heuristic Evaluation Forms

-- Jacob

Heuristic	Your assessment: What is the problem? Where is it? Why is it a problem	Severity of the problem (one of: Minor, Fix later, Fix now) & Recommendation (how should it be fixed)
Visibility of system status (e.g., are users kept informed about what is going on?)	There seems to be a lack of feedback once you select which park you want to look into. There were no bread crumbs that said where I had been or if I was on the right track. I just had to trust That I was still searching for parks with “swimming” once I was there.	Moderate. Bread crumbs for each stage of park examination should make the path the user is on available to them and so they can backtrack if they went off course.
Match between system & real world (e.g., is the language used at the interface appropriate for the user?)	I don't know that most of the parks you listed in the locate nearby page have actual campsites to reserve. You might be able to reserve a specific area, but I'm not sure they're referred to as a traditional “campsite”	Minor. For some parks, you might have just one area you can reserve that isn't a specific campsite. This would require further investigation of city/state parks

User control and freedom (e.g., Can users easily backtrack from an unwanted state? Is undo/redo supported?)	There was no way for me to log out.	Adding a logout function in the off canvas menu should address this.
Consistency and standards (are the ways of performing similar actions consistent?)		
Recognition rather than recall (e.g., are objects, actions and options always visible?)	Correct park or activity filter was not always visible, especially the further you got in the booking/examining parks process.	Moderate. Breadcrumbs should address this issue.
Aesthetics & minimalist design (e.g., Is any unnecessary and irrelevant information provided?)		
Error prevention (e.g., is it easy to make errors?)		
Help users recognize & recover from errors (e.g., can assistance be readily found?)		
General ease of use		

(e.g., is the product relatively intuitive?)		
--	--	--

-- Junshu

Heuristic	Your assessment: What is the problem? Where is it? Why is it a problem	Severity of the problem (one of: Minor, Fix later, Fix now) & Recommendation (how should it be fixed)
Visibility of system status (e.g., are users kept informed about what is going on?)	The filter in the Park List page is at the bottom of the page which would be hard for users to find and notice.	Fix now. Make the filter fix to the top of the page.
Match between system & real world (e.g., is the language used at the interface appropriate for the user?)	Yes.	
User control and freedom (e.g., Can users easily backtrack from an unwanted state? Is undo/redo supported?)	After clicking swimming, it shows the park list. But when clicking back on the park list page, it directs me to the homepage rather than the select activity page. In the account page, the user cannot go back to the homepage by clicking "back".	Fix now. It should take me back to the park list page. Fix now. Enable the user to go back to the homepage.
Consistency and standards	Only the discover nearby page has an icon of "back".	Minor. Make all of the "back" button have an icon.

(are the ways of performing similar actions consistent?)		
Recognition rather than recall (e.g., are objects, actions and options always visible?)		
Aesthetics & minimalist design (e.g., Is any unnecessary and irrelevant information provided?)		
Error prevention (e.g., is it easy to make errors?)		
Help users recognize & recover from errors (e.g., can assistance be readily found?)	In the search by nearby page, I don't know how to further my search to align with the requirement.	Fix later. Enable the filter function.
General ease of use (e.g., is the product relatively intuitive?)	The clickable area in the account page is a little bit too narrow.	Fix later. Adjusting the spacing.

-- Yizhuo

Heuristic	Your assessment: What is the problem? Where is it? Why is it a problem	Severity of the problem (one of: Minor, Fix later, Fix now) & Recommendation (how should it be fixed)
Visibility of system status (e.g., are users kept informed about what is going on?)	Search bar tap and the search nearby tap.	Search bar: Fix now, search by name and type. Search nearby: add the park list at bottom but not tap the icon in the map.
Match between system & real world (e.g., is the language used at the interface appropriate for the user?)	Search by activities and events? I don't know	Minor
User control and freedom (e.g., Can users easily backtrack from an unwanted state? Is undo/redo supported?)	Good, easy to back to the home page.	
Consistency and standards (are the ways of performing similar actions consistent?)	The search nearby page have some different icon with other page like back and account button.	Fix later. Use the same icon with homepage.

Recognition rather than recall (e.g., are objects, actions and options always visible?)	Most of time, recognition is good however sometimes I don't know what to do like I described in tasks.	
Aesthetics & minimalist design (e.g., Is any unnecessary and irrelevant information provided?)	In the search nearby page, the search bar and the filter button may have the same function? Account at every page? What the triangle at the top for?	Fix later Just have the filter? Account just in the homepage?
Error prevention (e.g., is it easy to make errors?)	The buttons are big enough which are good. However, in the homepage, I choose to use the search bar but not search by activity for the first task.	
Help users recognize & recover from errors (e.g., can assistance be readily found?)		
General ease of use (e.g., is the product relatively intuitive?)	The icon and the picture is in good shape and big enough to tap so it's easy to use.	