

PowderPal

Low-Fi Prototype and Usability Testing

CS 67: Human-Computer Interaction

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Introduction

Value Proposition

Helping Dartmouth students plan out the best skiing and snowboarding experiences!

Mission Statement

Our goal is to ensure that Dartmouth students have more enjoyable skiing and snowboarding experiences by enabling them to connect and engage with others who share similar attributes.

Problem Statement

Based on our needfinding results, the most common barriers to skiing/snowboarding include skiing/snowboarding ability, availability, and transportation. Unfortunately, these issues have yet to be addressed, which discourages many Dartmouth students from skiing/snowboarding.

Solution Overview

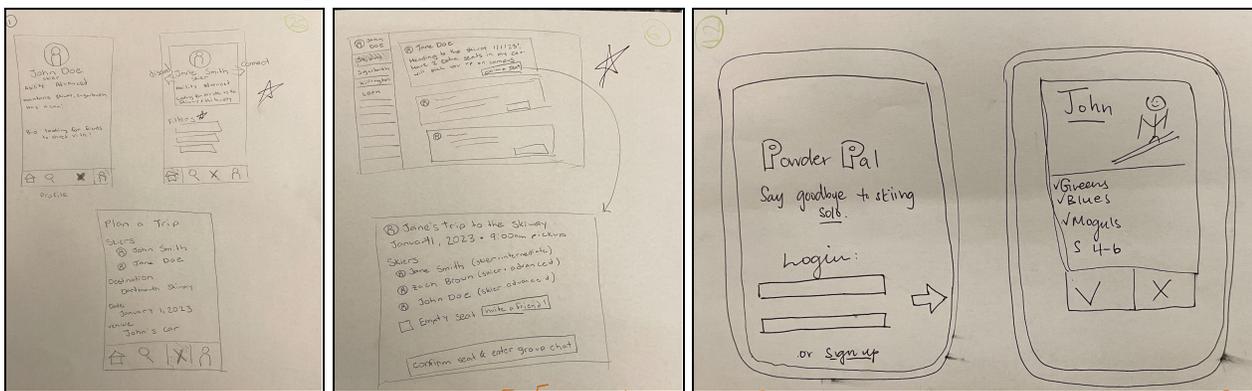
PowderPal will provide a satisfying and accessible solution for Dartmouth skiers and snowboarders looking to plan outings with others based on their skiing/snowboarding ability, availability, and transportation needs. The platform will enable users to easily find friends with whom to hit the slopes, plan an outing with friends, and communicate with the group before, during, and after their trip.

Brainstorming Session

Based on the brainstorming techniques we learned about in class, our group decided to first conduct divergent idea generation, where each member sketched 7-10 unique ideas. We decided not to limit the scope of our brainstorming session to a specific user need or How Might We statement. Instead, we each tried to generate possible solutions that covered each of the key needs we identified based on our User Research and spanned many of our How Might We statements. Leaving the scope of the question broad during divergent brainstorming allowed us to think more outside the box and generate a larger quantity of unique ideas. We also made it a point to brainstorm individually without discussing ideas during the sketching process so as to avoid fixation on a single solution or path. After generating a total of 29 unique ideas, we then engaged in convergent thinking, discussing each idea and trying to build on it. After discussing each idea, we grouped sketches into categories based on similar themes. Some of our ideas had many overlapping features, which allowed us to sketch new ideas that combined features from multiple of the original sketches. From there, we created an affinity diagram, noting strengths, weaknesses, feasibility, and originality for each idea. We noticed that our sketched ideas fell into one of seven categories, so we discussed both individual ideas and each category as a whole. Using these metrics, we were able to rank our ideas and narrow it down to our top two ideas. By committing to the divergent brainstorming process and then coming together to debate the merits of each idea, we were able to include many out of the box ideas and thoughts that may not have been expected.

Sample Sketches

Here are the three most promising sketches that we created:



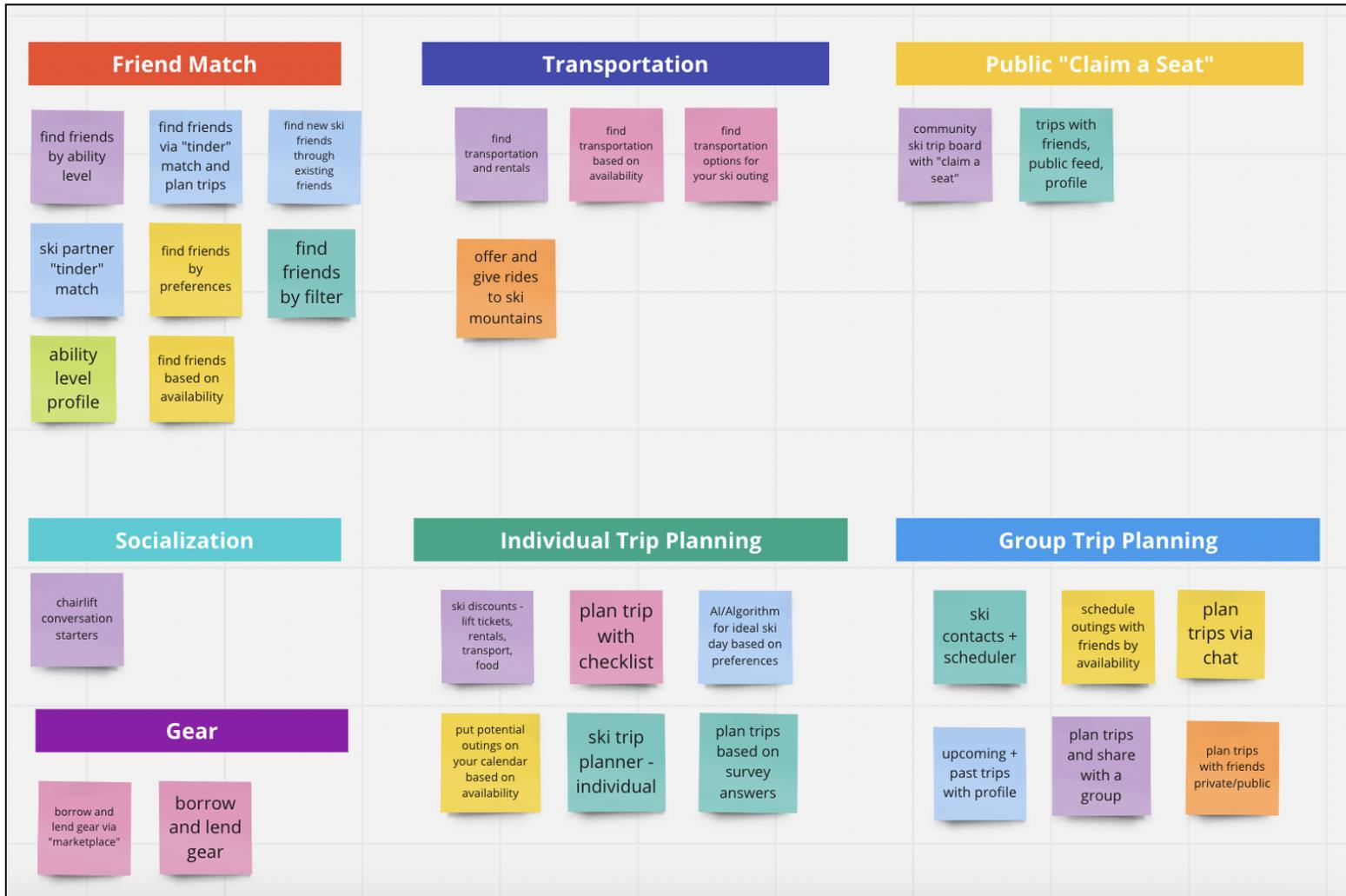
Brainstorming Debrief and Evaluation

In order to evaluate each of our ideas, we identified the strengths and weaknesses of each idea.

Additionally, we scored each sketch on a scale of 1 to 5 for originality and feasibility, with 1 being very unoriginal/unfeasible and 5 being very original/feasible. The image below contains a snapshot of our evaluation process.

ID	Description	Strengths	Weaknesses	Originality	Feasibility
7	ski discounts - lift tickets, rentals, transport, food	cool feature	hard to implement	5	2
6	community ski trip board with "claim a seat"	interactive, social, intuitive	overlaps with existing social media	4	5
8	chairlift conversation starters	interpersonal	cold hands on the lift	4	5
14	find friends by ability level	simple way of searching	other filters?	4	5
17	find transportation and rentals	simple, intuitive	not much functionality	4	5
24	plan trip with checklist	organized, checklist feature		4	5
28	borrow and lend gear via "marketplace"	filtering	willingness to share	4	5
19	find transportation based on availability	asks for needs, reaching out to friends, cross-checking schedules		4	4
21	borrow and lend gear	checks individual needs, chat feature	are friends willing to share in the first place	4	4
22	find transportation options for your ski outing	simple, intuitive, checks for transport options		4	4
26	find friends via "tinder" match and plan trips	profile, tinder idea	going back to people	4	4
29	find new ski friends through existing friends	filter for interests, aesthetic	similar to LinkedIn?	4	4
9	AI/Algorithm for ideal ski day based on preferences	visually appealing, specific, AI	complex to implement, low-use	4	2
11	upcoming + past trips with profile	combines outings with profile, not cluttered	nonspecific fields	3	5
12	ski partner "tinder" match	finding new people, intuitive, fun	no filtering, hard to "go back"	3	5
13	ski contacts + scheduler	intuitive	guest account?	3	5
18	find friends by preferences	profile features, seeing friends		3	5
27	plan trips based on survey answers	fun survey to potentially "match" with friends	no matching functionality yet	3	5
2	trips with friends, public feed, profile	customizable	not intuitive, screen very busy	3	4
3	ski trip planner - individual	lots of info, detailed	not customizable, too much detail?	3	4

Affinity Diagram



Link to Miro Board: https://miro.com/app/board/uXjVMRXNBYw=?share_link_id=94615480052

Refined Sketches of Top 2 Ideas

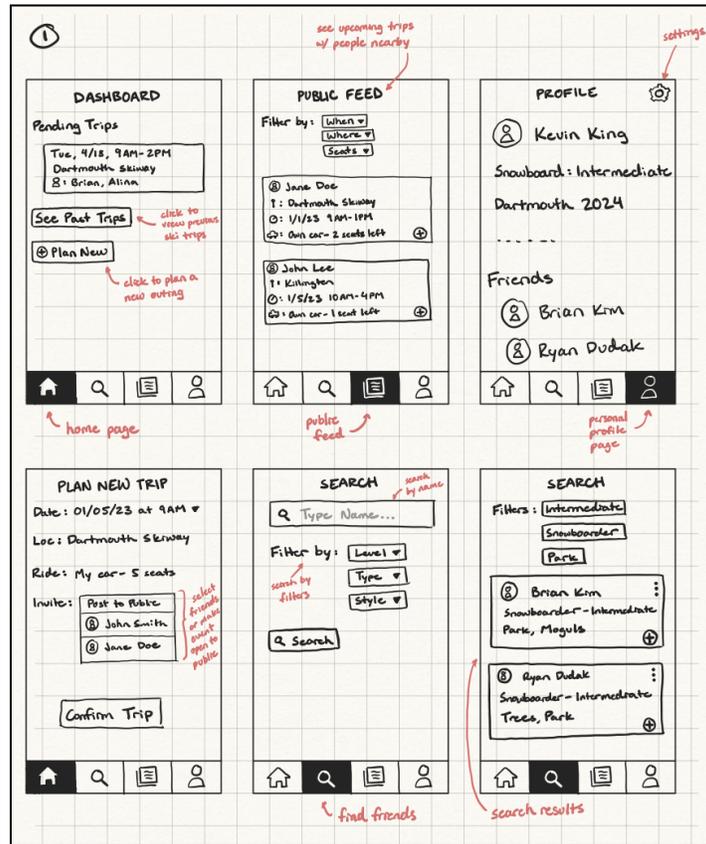


Figure 1: Social media platform for Dartmouth students to plan trips to ski resorts, join in on trips with people that have more convenient modes of transportation, and connect with potential new skiing/snowboarding partners through shared friends and publicly-available trips.

Pros	Cons
<ul style="list-style-type: none"> Public feed enables users to connect with other skiers/snowboarders who are not in the users' immediate friend circles and go on outings with them. Comprehensive way of planning a new ski outing by setting the time, location, and mode of transportation. It also allows you to invite friends or post the upcoming trip to the public feed for non-friends to join in. Search function allows users to filter by the specific qualities they are looking for in new ski partners. 	<ul style="list-style-type: none"> It may be difficult to connect with friends outside of a user's current social network, as friendship networks are generally densely connected, with few ties extending beyond. May be a safety concern, some users might not want to post on the public feed or may just want to post to some subsection of the community.

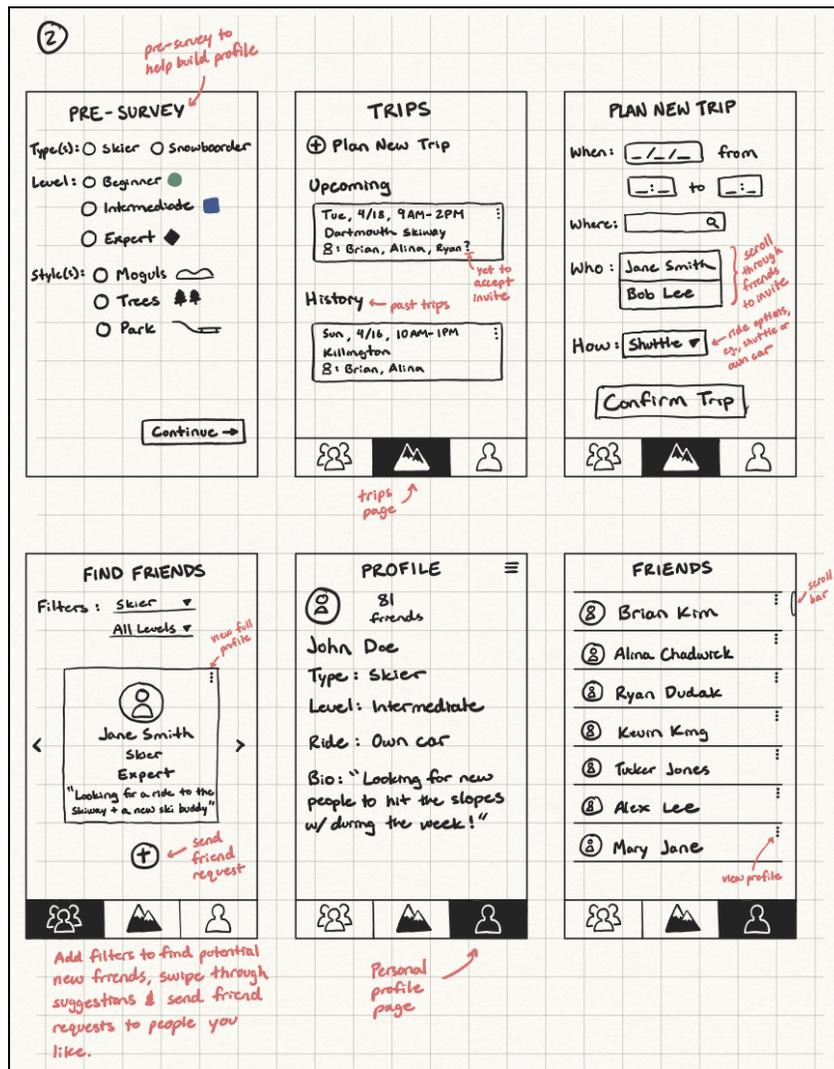
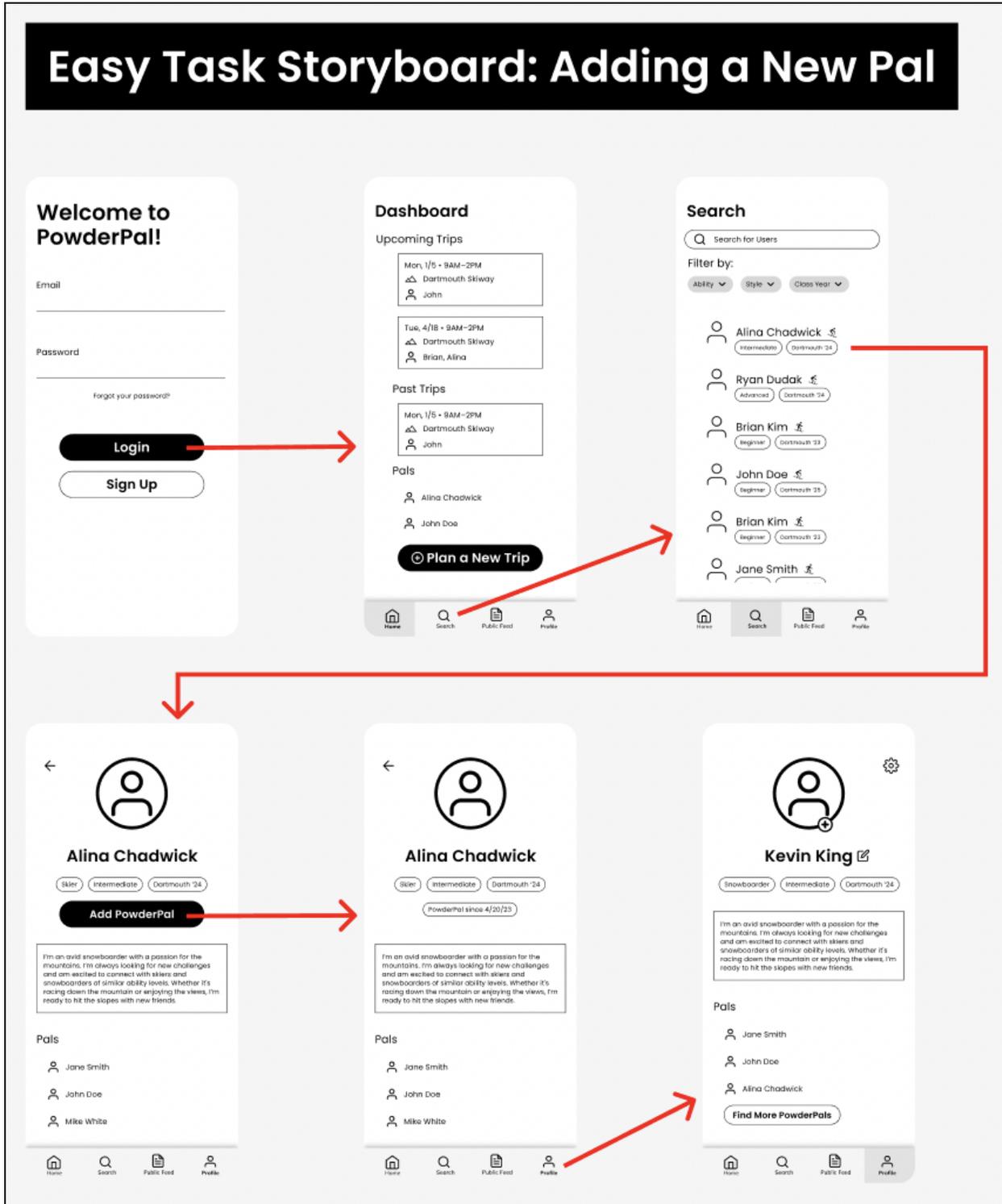


Figure 2: Social media platform for Dartmouth students to plan trips to ski resorts, join in on trips with people that have more convenient modes of transportation, and connect with potential new skiing/snowboarding partners that share a similar level and style according to survey questions answered during onboarding.

Pros	Cons
<ul style="list-style-type: none"> • Pre-survey gets a user's profile started, which allows for other users to search for new friends that fit their ideal partner profile for the slopes. • Intuitive way of allowing users to connect with potential ski/snowboard partners based on specific qualities. 	<ul style="list-style-type: none"> • Users might be biased to skip individuals they don't know or might miss out based on categorical characteristics. • Users may have additional preferences for skiing/snowboarding partners that aren't reflected in the pre-survey.

Task Storyboard: Idea 1

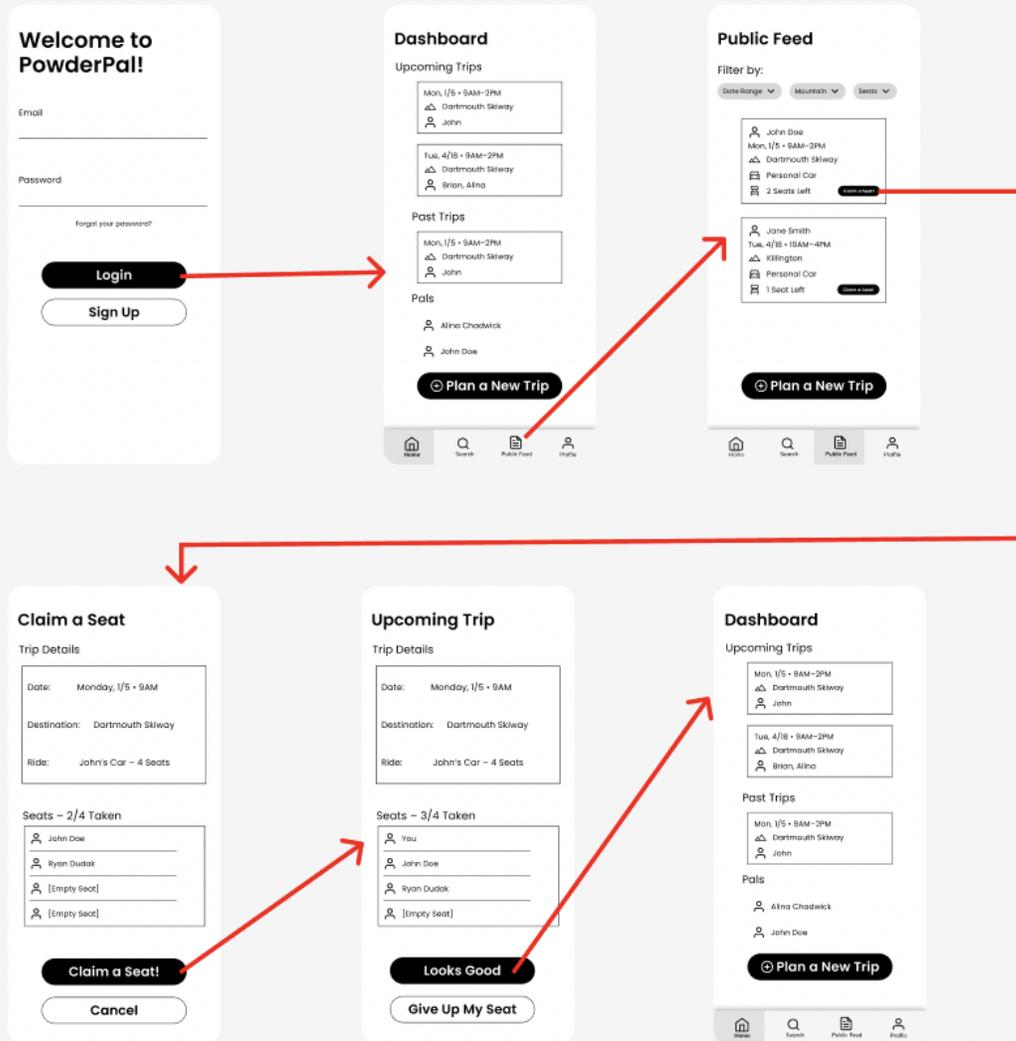
Simple Task



Task Description: Searching for new friends and adding a pal from the search tab.

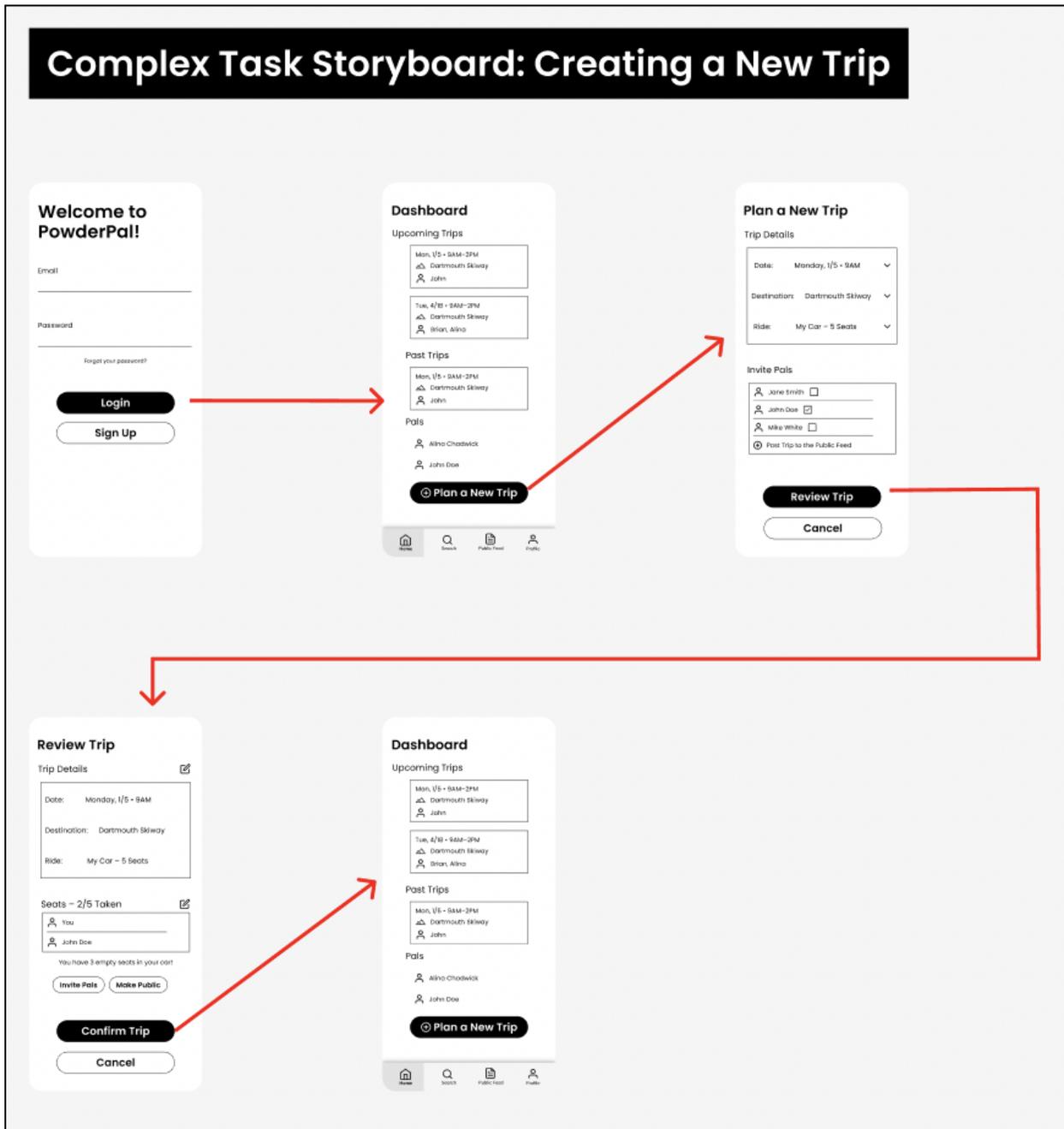
Medium Task

Medium Task Storyboard: Claiming a Seat on a Trip



Task Description: Claiming a set on an existing trip by finding a trip via the public feed.

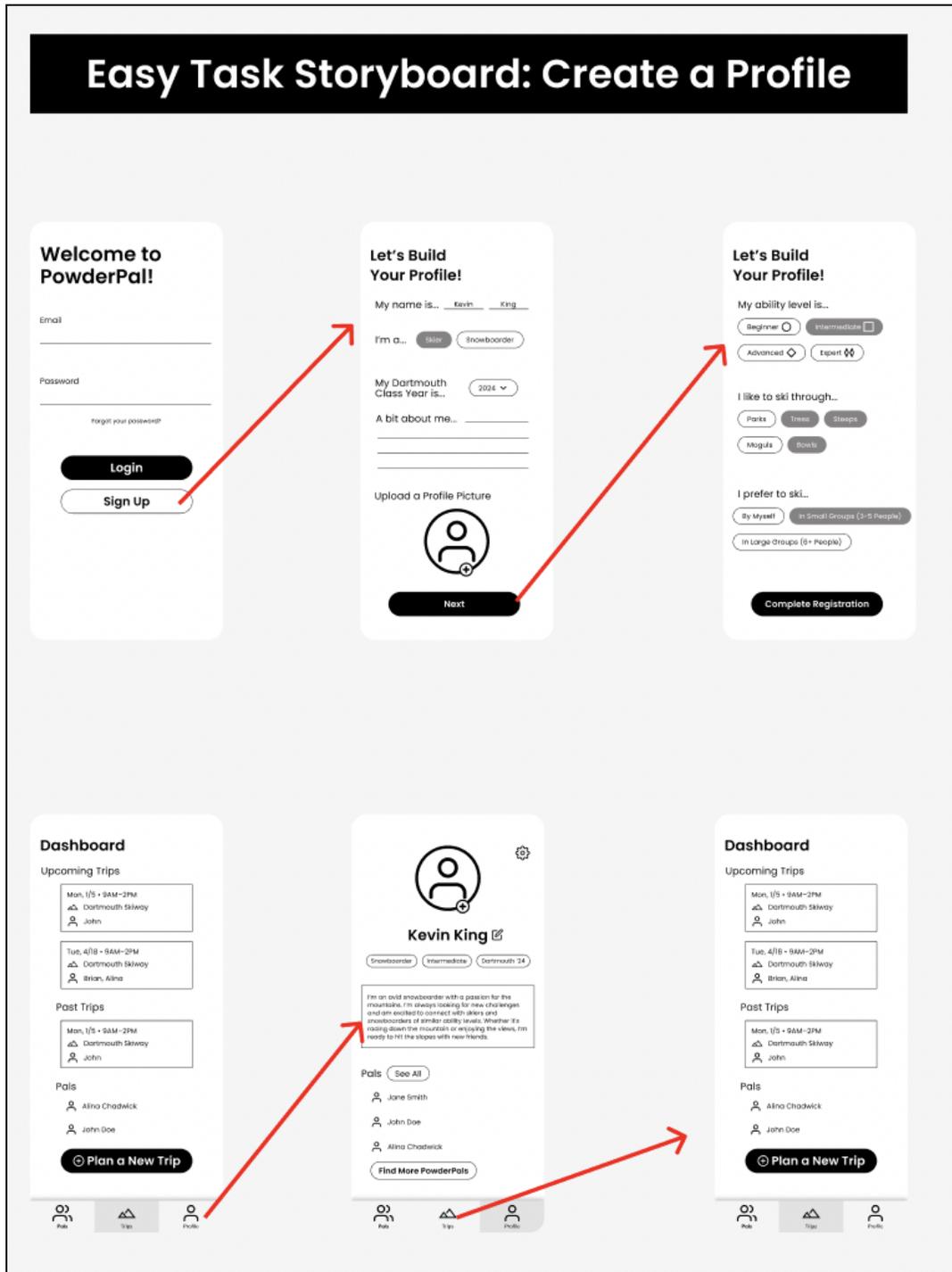
Complex Task



Task Description: Creating a new trip via the 'plan a new trip' interface.

Task Storyboard: Idea 2

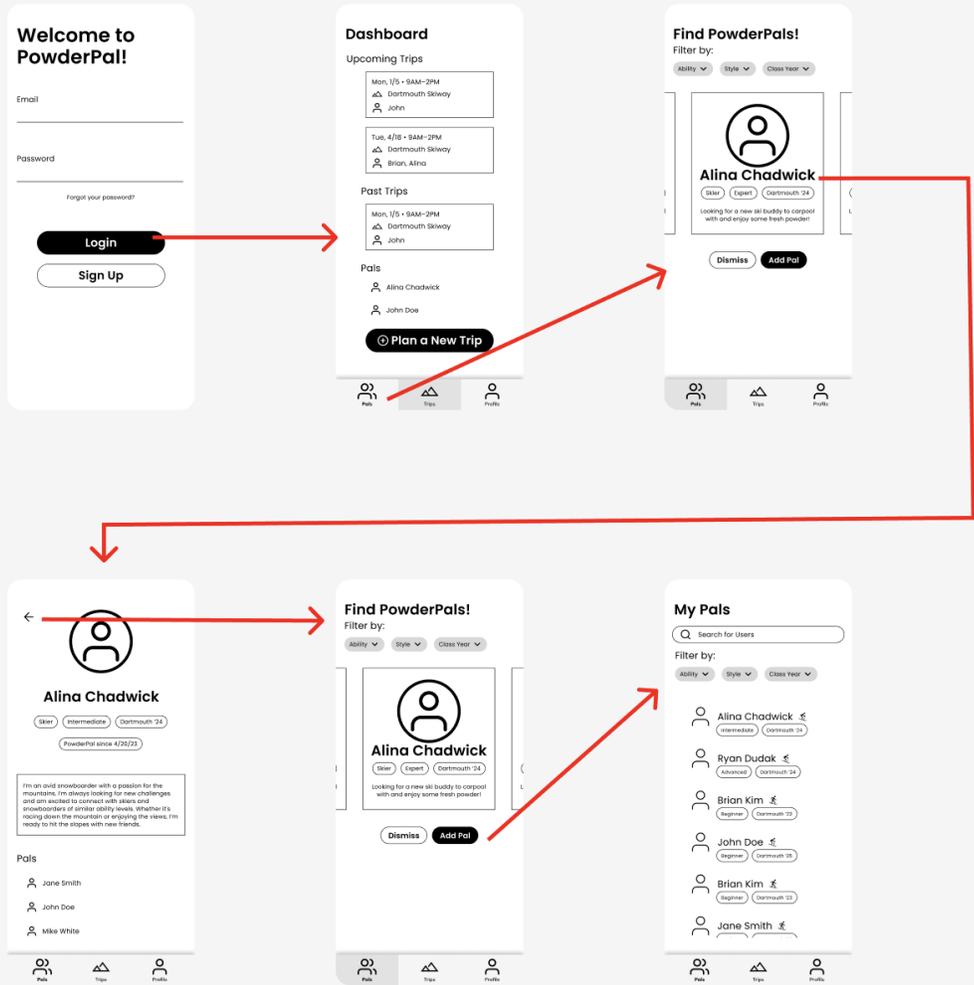
Simple Task



Task Description: Building a profile and inputting user information.

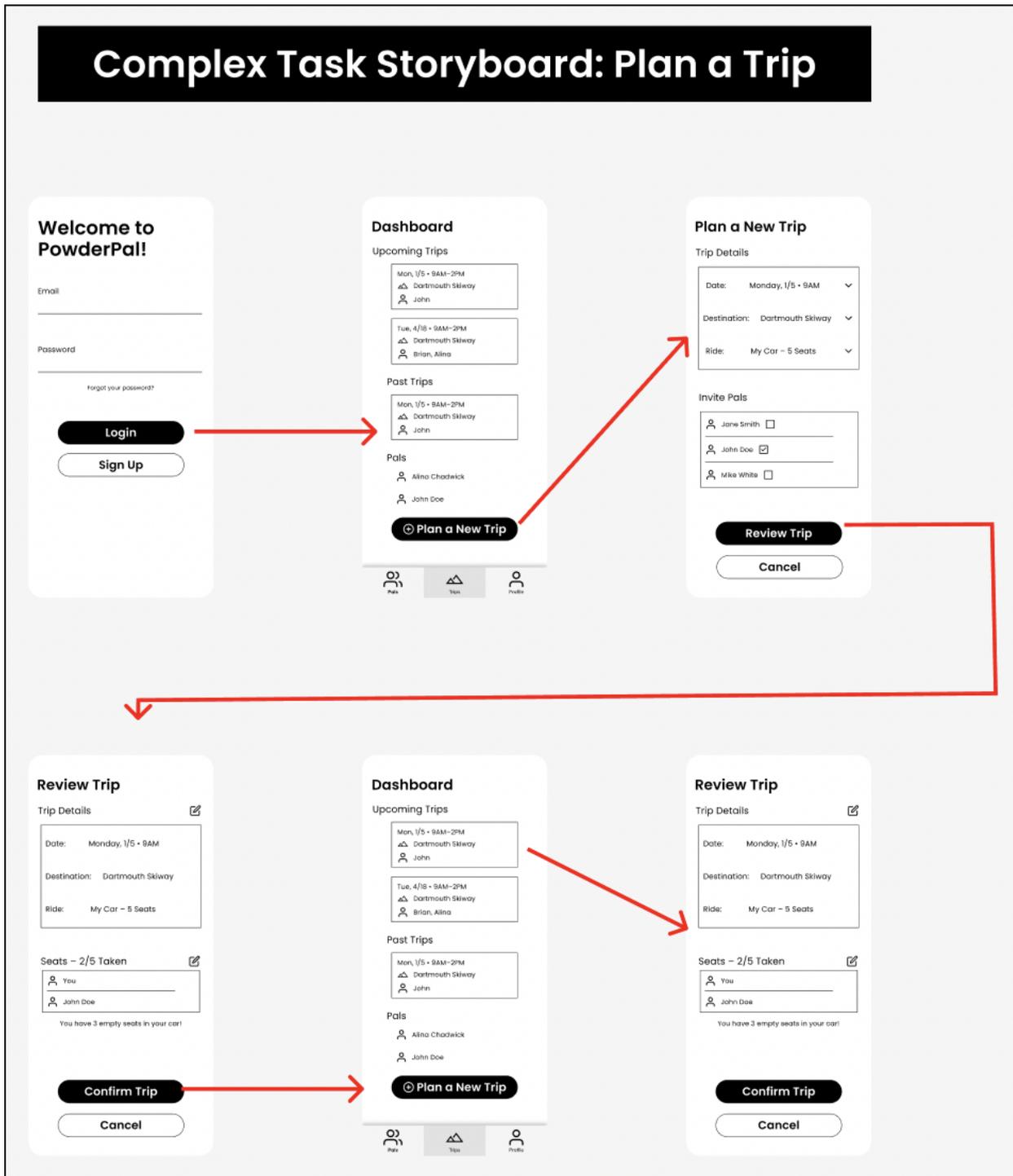
Medium Task

Medium Task Storyboard: Find Pals



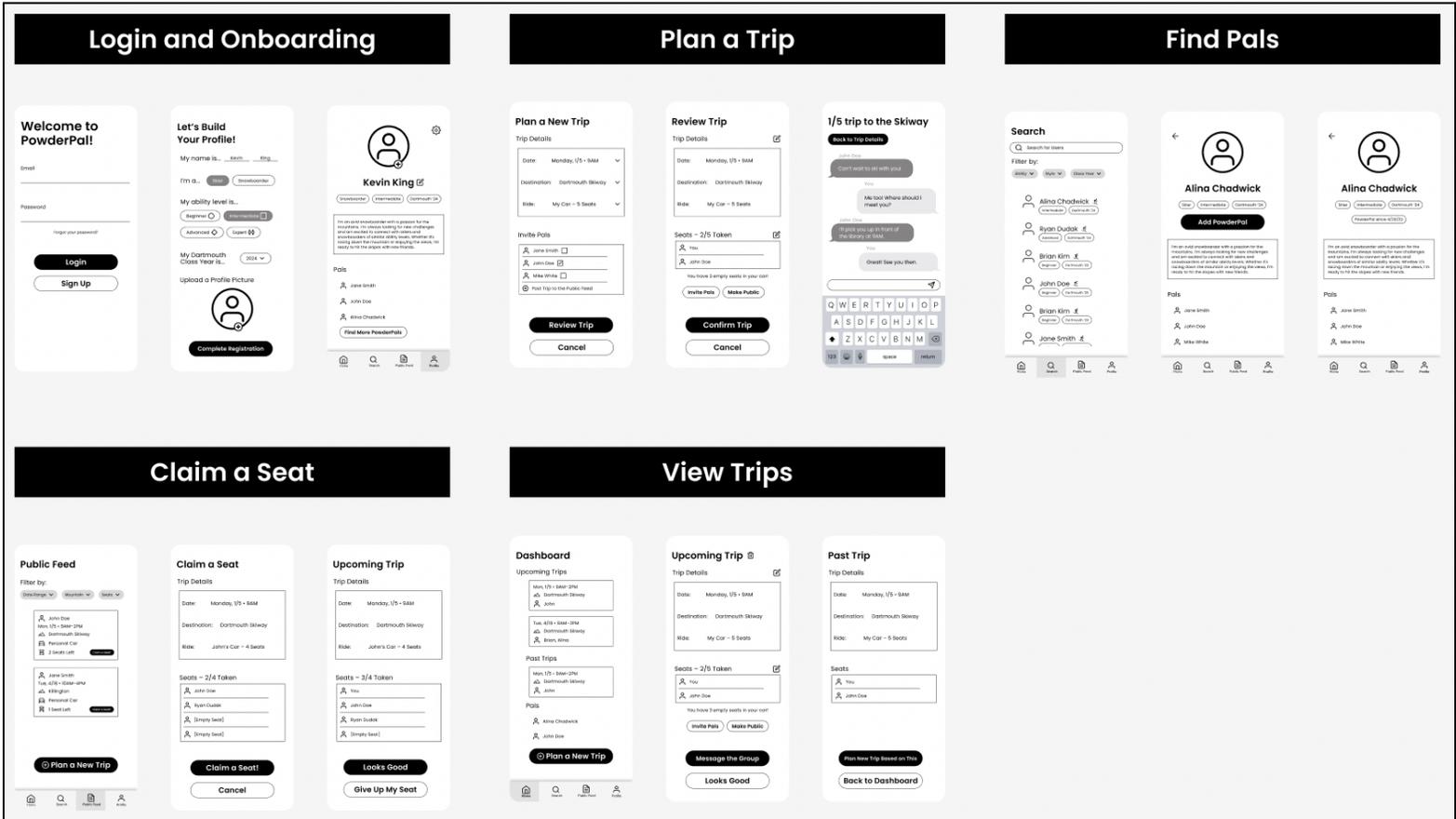
Task Description: Adding friends ('pals') through our tinder-like interface.

Complex Task



Task Description: Planning a trip via the interactive dashboard.

Lo-Fi Prototype: Idea 1



Link to Figma:

<https://www.figma.com/file/rGjv25mqg0uAzBrIS03Bid/PowderPal-Lo-Fis?node-id=47-7897&t=f48nPgX5ahdxvmSb-0>

Key Interaction Elements

- Home Dashboard
 - Click on any of the upcoming or past trips to view their details (e.g., date/time, location, who else is coming/came)
 - Click on your pals' names to view their profiles
- Search Page
 - Search bar allows you to type names in directly to look them up
 - Filters
 - Ability - Beginner, Intermediate, Advanced
 - Style - Skier, Snowboarder
 - Dartmouth Class Year - 2023, 2024, 2025, 2026, etc.
 - Click on any of the name that comes up as search results to view their profile
- Other Users' Profiles
 - Button to send a friend request
 - Scroll through their friends (listed at the bottom of their profile page)
- Personal Profile Page
 - Plus button by the profile icon lets you add a profile picture
 - Notepad icon next to your name lets you edit your profile
 - Scroll through your friends and click the "Find More PowderPals" button to search for new ones
- Public Feed
 - Filters: Dates/Times, Location/Mountain, Number of Seats Available in Car
 - "Plan New Trip" button
- Plan New Trip
 - Dropdown menus to set date/time of trip, mountain you're planning on going to, mode of transportation, and friends you want to invite
 - You can also post the new trip to the public feed so people in your community can join the outing as well

Lo-Fi Prototype: Idea 2

Login and Onboarding

Welcome to PowderPal!

Email

Password

[Login](#) [Sign Up](#)

Let's Build Your Profile!

My name is...

I'm a...

My Dartmouth Class Year is...

A bit about me...

Upload a Profile Picture

[Next](#)

Let's Build Your Profile!

My ability level is...

I like to ski through...

I prefer to ski...

Kevin King

Pals

- Jane Smith
- John Doe
- Alina Chadwick

[Find More PowderPals](#)

Plan a Trip

Plan a New Trip

Trip Details

Date:

Destination:

Ride:

Invite Pals

- Jane Smith
- John Doe
- Mike White

[Review Trip](#) [Cancel](#)

Review Trip

Trip Details

Date:

Destination:

Ride:

Seats - 2/5 Taken

- You
- John Doe

You have 3 empty seats in your car!

[Confirm Trip](#) [Cancel](#)

1/5 trip to the Skiway

[Back to Trip Details](#)

John Doe: Can't wait to ski with you!

You: Me too! Where should I meet you?

John Doe: If you can get in front of the lobby at 8AM.

You: Great! See you then.

Find Pals

Find PowderPals!

Filter by:

Ryan Dudak

Looking for a new ski buddy to carpool with and enjoy some fresh powder?

[Dismiss](#) [Add Pal](#)

Alina Chadwick

Powerful skier 4/20/23

I'm an avid snowboarder with a passion for the mountains. I'm always looking for new challenges and am excited to connect with skiers and snowboarders of similar ability levels. Whether it's riding down the mountain or enjoying the views, I'm ready to hit the slopes with new friends.

Pals

- Jane Smith
- John Doe
- Mike White

My Pals

Search for Users

Filter by:

- Alina Chadwick
- Ryan Dudak
- Brian Kim
- John Doe
- Brian Kim
- Jane Smith

View Trips

Dashboard

Upcoming Trips

- Mon, 1/5 - 8AM-2PM
Dartmouth Skiway
John
- Tue, 4/18 - 9AM-2PM
Dartmouth Skiway
Brian, Alina

Past Trips

- Mon, 1/5 - 8AM-2PM
Dartmouth Skiway
John

Pals

- Alina Chadwick
- John Doe

[Plan a New Trip](#)

Upcoming Trip

Trip Details

Date:

Destination:

Ride:

Seats - 2/5 Taken

- You
- John Doe

You have 3 empty seats in your car!

[Message the Group](#) [Looks Good](#)

Past Trip

Trip Details

Date:

Destination:

Ride:

Seats

- You
- John Doe

[Plan New Trip Based on This](#) [Back to Dashboard](#)

Link to Figma:

<https://www.figma.com/file/rGjv25mqg0uAzBrIS03Bid/PowderPal-Lo-Fis?node-id=47-8783&t=f48nPgX5ahdxvmSb-0>

Key Interaction Elements

- Pre-Survey to Build Your Profile
 - Textboxes for inputting your name
 - Option to select whether you ski or snowboard
 - Dropdown menu to select your Dartmouth class year
 - A section for you to write about yourself (short bio)
 - Click the plus sign next to the profile icon to upload a profile photo
- Plan a Trip
 - Dropdown menus to set date/time of trip, mountain you're planning on going to, and mode of transportation.
 - Check boxes next to the names of people you want to invite
 - Click "Review Trip" to show all the selections you made, then "Confirm Trip" to send it out to your friends.
- Find PowderPals
 - Filters: Ability (e.g., beginner), Style (e.g., ski or snowboard), class year
 - Carousel feature to easily scroll through potential pals
 - Buttons to "dismiss" if you don't want to add them as a friend and "Add Pal" to send them a friend request
 - Click on the user to view their profile
- My Pals
 - Search bar to look up specific friends
 - Filters: Ability (e.g., beginner), Style (e.g., ski or snowboard), class year
 - Scroll (vertically) to view your friends
- Trips Dashboard
 - Click on any of the upcoming or past trips to view their details (e.g., date/time, location, who else is coming/came)
 - Button to plan a new trip
 - When you're viewing an upcoming trip, you can click the notebook/pencil icon to edit its details
 - Buttons to message the group, save any changes you might have made, return to the dashboard, and "Plan New Trip Based on This"

Usability Testing Method

Participants

We re-recruited 1 of our interviewees from P2 and recruited 2 new participants as well. All of these participants are Dartmouth Students who have various skill levels and backgrounds in skiing/snowboarding.

Participant 1: Callie M. Dartmouth '24, intermediate skier.

Participant 2: Scarlett F. Dartmouth '24, beginner skier, Return interviewee from P2.

Participant 3: Julian P. Dartmouth '23, intermediate skier.

Environment

The environment in which we conducted user testing varied, but was mostly in typical places on campus where users might use our platform. For example, Callie's user testing was conducted in a cafe in town, and Scarlett's and Julian's interviews took place in their dorm rooms.

Method

To begin the testing session, we explained the first idea to our participants and introduced the three tasks we wanted them to complete. Then, we gave them the opportunity to clarify or ask questions and walked them through how to interact with our LoFi. Afterwards, they were able to interact with the prototype and the process was repeated for the second idea.

During the testing, we let the participants react in live time to our prototypes and let us know their impressions, while we took notes.

Team Member Roles

Alina - User tested with Callie

Ryan - User tested with Scarlett

Brian - User tested with Julian

Tasks Evaluated

First Idea:

1. Easy task: Searching for new friends and adding a pal from the search tab
2. Medium task: Claiming a set on an existing trip by finding a trip via the public feed
3. Complex task: Creating a new trip via the 'plan a new trip' interface

Second Idea:

1. Easy task: Building a profile and inputting user information
2. Medium task: Adding friends ('pals') through our tinder-like interface.
3. Complex task: Planning a trip via the interactive dashboard

Test Measures

While each participant was completing each task, we paid attention to how they reacted to the interface and how long it took each participant to complete each task. We made note of any verbal or physical feedback they had, whether direct or indirect. When a user made a mistake or got lost, we helped them navigate back to the task at hand but also made note of that.

User Testing Results

Callie - For the first idea, Callie's thoughts were as follows: She was very easily able to navigate and perform the tasks easily but was distracted by the 'Pals' portion of the dashboard. She also was confused whether a user, when being invited on a trip, has the ability to decline the trip if they have scheduling issues or something like that. As well, she found it annoying to have to click into a profile to find their ability levels and suggested that we list ability levels of the user posting a trip on the public feed. Finally, she said it might be easier to order the pages as Home, Feed, Search, then profile.

For the second idea, Callie was also easily able to navigate and perform the tasks easily but was again distracted by the 'Pals' portion of the trips page. She said she preferred the layout of finding friends in boxes as opposed to a list but wouldn't mind if it was scrollable as opposed to swipeable. She also added that she likes the public feed portion and wishes we incorporated that into the second idea.

Scarlette - For the first idea, Scarlette was able to complete all three tasks with minimal difficulty. She found the easy task extremely intuitive. For the medium task, Scarlette noted that it would be easier to click on the entire trip card than the small "Claim a Seat" button within the card. For the complex task, she was confused about the specifics of the "make public" feature since the interaction had not been completely built out in Figma.

For the second idea, Scarlette had no difficulty completing the easy task, and said she really enjoyed the survey questions and answer choices. Scarlette struggled with the medium task, not understanding that she should scroll horizontally through the profile cards. She noted that she preferred the traditional search bar and filters from Idea 1. Scarlette found the complex task easy since it was similar to a task she performed with Idea 1. However, she didn't realize that there was no way to make a trip public with Idea 2 and said she liked this feature of Idea 1.

Julian - For the first idea, Julian accomplished all three tasks quickly. As he had previously done the easy task with other applications before, he found it simple to do. When doing the medium task, he recommended renaming “Public Feed” to something that matches the feature more. Julian also mentioned that completing the complex task was more satisfying than using iMessage to plan out trips with his friends.

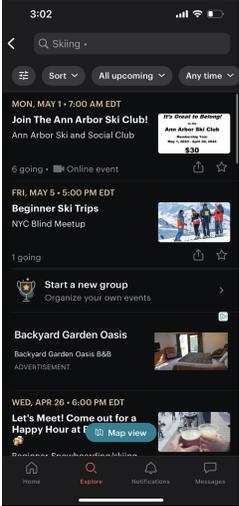
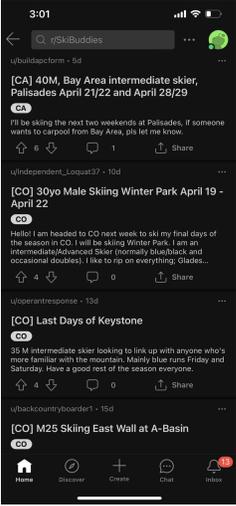
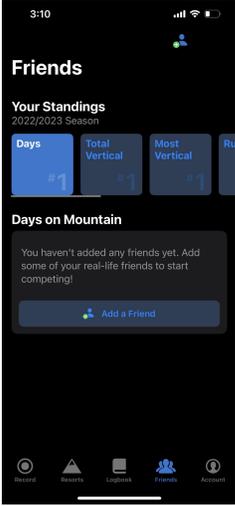
For the second idea, Julian also quickly finished the easy task because he had done it before with other applications. However, for the medium task, Julian was confused as to why the “Find PowderPals” feature was under the “Pals” tab, and would have appreciated it if there was some more detail in the tab name. He also said that the complex task was easier this time because it felt like he had already done it before with the complex task for the first idea.

Interpretation of User Testing

Ultimately, the user testing resulted in helpful feedback that we will implement in future stages of our application. Most of the improvements that were recommended by the users included minor UI updates (such as renaming and reordering tabs) that can easily be accomplished. It is also important to note that for the most part, the users were able to quickly accomplish the tasks. Additionally, they all praised the usefulness of our application, which encourages us to continue our work. While we still have a lot of work to do to progress from our low-fidelity prototype to a high-fidelity application, the information we received will help make the user interaction with PowderPal more intuitive.

Market Research

When looking at potential competitors, we saw a significant lack of both computer and mobile applications that focused specifically on connecting skiers/snowboarders. Apps related to skiing typically showed information such as weather conditions and maps of the terrain, but did not highlight their social features (if they had any to begin with). The differentiating factor of our application is thus to have it focused specifically on connecting skiers/snowboarders and helping them plan out their schedules; what is particularly unique about our application is how we will help them create these plans, including features such as max group size, transportation method, and chat groups.

“Meetup” App	r/SkiBuddies in the “Reddit” App	“Slopes” App
		

The “Meetup” app is focused on connecting people with similar interests, and while these interests do include skiing (as shown in the search results above), the events listed were typically for large groups in densely populated areas; neither of which applies to what Dartmouth skiers/snowboarders would want (small groups in a sparsely populated area).

Out of the many skiing subreddit communities that Reddit has, the “SkiBuddies” subreddit helps connect people looking for skiing/snowboarding partners. Users typically post attributes about themselves (for example, a 40-year-old male from the Bay Area in California that is an intermediate skier), and wait for a reply from another user, an inefficient process.

The “Slopes” app is one of the most popular skiing apps on the App Store, and also has a dedicated social feature that most of these top apps seem to lack. The “Friends” feature allows users to see the location of their friends, compete statistically with their friends, and keep track of their previous skiing/snowboarding outings with their friends. However, the “Friends” feature requires that the user knows other skiers/snowboarders and their phone numbers beforehand, and focuses more on details about map visualization, fitness data, and other information.

Discussion

Throughout this process, we learned a lot about how getting input and feedback from many people of diverse backgrounds can generate a larger quantity of ideas and spur interesting discussion. Throughout the sketching and lo-fi design process, we collected informal feedback from friends and other students, which helped us guide our solution and develop new design iterations. Most of the feedback we received was positive, which reassured us that our solution is satisfying a need within our target user population.

As we attempted to brainstorm ideas for our product, one of the key things we aimed to do was think of how certain ideas paired with one another. It was helpful to see our features visually and group them together to get a better idea of how we wanted the product to flow. We carried out our process by initially identifying the key problems we wanted to address in our product, then subsequently tailoring the features to those needs. For instance, one of the primary categories we focused on was enabling users to meet new people to ski or snowboard with. With that in mind, we came up with different ways to achieve this, whether it was implementing a public feed feature in Idea 1 or the ability to swipe through potential new friends in Idea 2.

Through our user testing process, most of the positive feedback was related to the intuitive navigation of the lo-fi prototypes. This was reassuring to hear as we paid close attention to reducing the memory burden for users by designing a seamless flow from page to page. We also received positive feedback regarding the use of filters to search for potential new friends on the platform.

Most of the negative feedback that we received was related to the functionality of certain features but also made helpful suggestions on how to improve the overall user experience. For instance, though the public feed feature received positive reviews, it was something that we should further develop and make clearer on what its purpose is, whether it was renaming it to match the feature more accurately or tying it better to the trips planning page. When we go through the “mid-fi” prototyping phase and re-evaluate our overall design, we hope to continue addressing the navigation of the app as well as focusing more on reducing the need for explainability for each feature. It will be essential for us to design a product that doesn't leave users with any questions and build on what is natural.