

Appendix

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[zahra](#), [noor](#), [tom](#), [camilla](#)

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prototypes

[figma](#) clickable prototype

[protopie](#) clickable prototype (desktop version)*

scan QR code with [ProtoPie Player app](#) (mobile version)*



*using protopie will require downloading two Google fonts: [Patrick Hand](#) and [Indie Flower](#) for optimal usage. You can use without installing the fonts but it will ruin the visual experience.



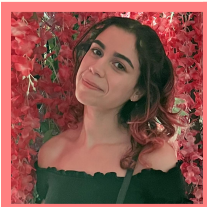
[tulip](#) is a nature scrapbooking mobile app that encourages students and other individuals with tight schedules to build a habit of going outside to enjoy nature and reduce stress levels!

duration: 3 months (January 9th to March 17 2023)

type: smartphone mobile application

development context: course assignment for CS 247B: Design for Behavior Change, Stanford

Meet Our Team



Zahra: UX Researcher

I love hiking, and my favorite fruit is guava.



Noor: Product Manager

hey! My favorite way to spend time outdoors is hitting the beach with friends. I love pomegranates.



Camilla: UX Researcher

My favorite thing to do outdoors is sip on some kombucha and feel the grass under my feet. My favorite fruit is grapefruit.



Tom: Designer


I love going on hikes and playing soccer, and my favorite fruit is watermelon!



Jasper: Engineer

My name is Jasper, and I enjoy taking long walks around campus and going to the gym to stay healthy. My favorite fruit is mango.

Project summary

We set out to create an app that would help users build the habit of spending more time in the great outdoors. As students, our time outside often seems far too infrequent relative to the long hours of learning and working. On far too many days, the only time we spend in the sun is on the walk or bike ride to class. We have created a Nature Scrapbooking app called  **Tulip** that is designed to help users get outside and reap the numerous benefits of the elements!

Problem Finding (The Challenge)

Justification for choosing problem

We chose to focus on getting college students to spend more time in nature due to the extremely prevalent issue of college students not engaging with nature nearly enough. We personally all felt a desire to spend more time outside, as did every single one of our interviewees.

What is known about the problem/challenge?

Literature Review and Comparative Analysis

According to our literature review research, we found out that going outside is incredibly important for wellbeing. On top of that, just being outside might not be enough. For example, simply sitting on your porch surrounded by concrete is not necessarily going to add to well-being. One has to be around nature, in either blue or green spaces (being around natural water sources or greenery). For more information about our literature review, please visit <https://highercommonsense.com/cs247b/team-8-literature-review/>

Our comparative research revealed that many apps are either incredibly niche and just there to provide information about events or trails, or they are AR focused game apps intended to make kids go outdoors. There are also wearables that can help motivate users to increase their steps, which subsequently would increase their time spent outside. For a more in-depth look at our comparative research, please visit <https://highercommonsense.com/cs247b/team-8-comparative-research-and-analysis/> .



Challenge Significance

This challenge is significant because even just a little bit of time outside can reduce stress levels and improve wellbeing. It was shown that 10-50 minutes in nature per day is enough to reap the benefits, according to a study run by Cornell University.

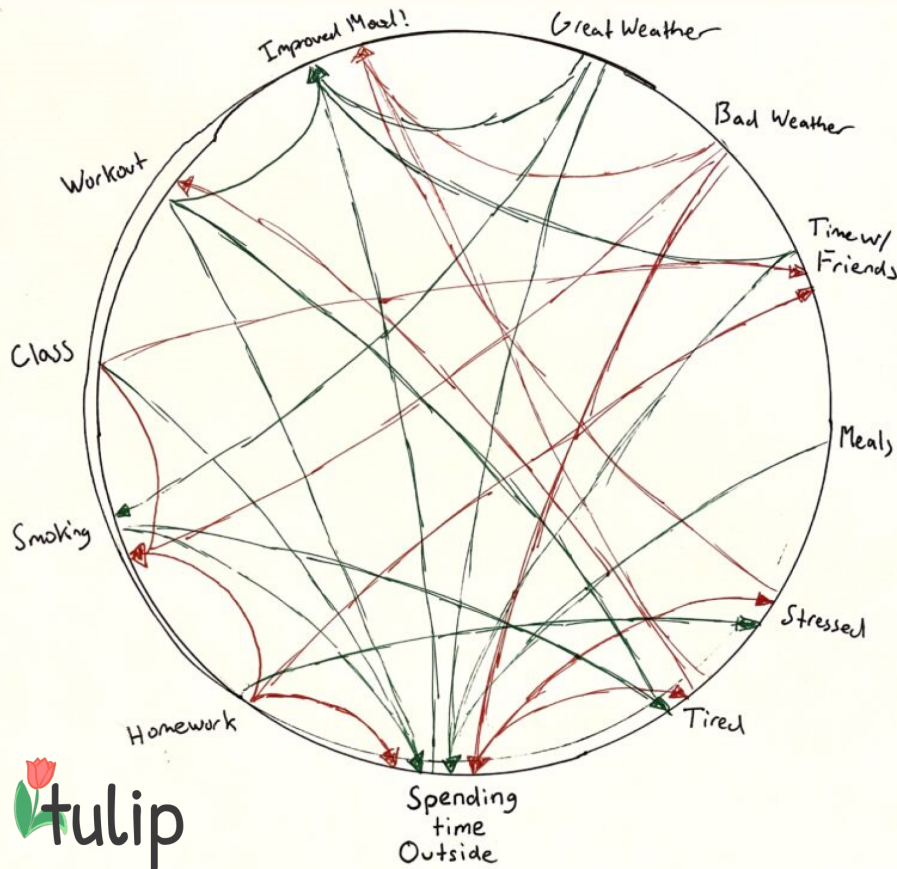
Market Gaps

Competitors in our market fall into two categories: AR based games or information gathering. Usually the information gathering apps tend to be niche. For example, a random person is not going to download an app about different trails in the area unless they already have an interest in trails. AR based games like pokemon go are a great way to get people of all ages to go outside—if you like pokemon or gaming. Thus, we wanted to make an app that had more of a universal appeal but could still get people to go outside.

Baseline Study & Synthesis

Our target audience is busy college students who have a desire to spend more time outdoors. We decided to start with a small “nudge” by asking them to enjoy one snack/meal/drink outside per day. We wanted to know how long they spent outside and how they felt after doing it. We found that people generally had many other factors that influenced whether or not they enjoyed eating outside. These include the weather, who they are with, or whether they were in a particularly bad mood. If the weather was bad or they were already super

stressed, eating outside did not help at all



Thus, we decided to switch directions completely and move towards a more scrapbook-photo collection app. We decided to do this partially because it would emphasize more of a nature-based approach rather than purely just sitting outside, and also because it might not be affected by as many outside factors as eating outside was.

Personas & Journey Maps

Our personas were AC, an overworked college student who works in a lab, and Sandy Cheeks, an artsy student who wants more fulfilling time outside. We focused on these students because the majority of our interviewees/people who participated in our baseline study fell under either of these categories.



AC
Student, Lab Worker, Basketball Player

Spend more time outside

Journey Step	Morning/Breakfast	Lunch	Afternoon	Dinner	Evening
Feeling	Sleepy, hungry, anxious	hopeful, focused	want a snack, sedentary	slightly anxious, more relaxed	nervous, anticipation
Thought	Trying to get mentally prepared to go to the gym, need to stretch to loosen and warm to take a shower	We just had a lunch with a good amount, I should find time to train basketball team	Almost done with lab, Where should I meet my friends at Treasurer, What is the best way to eat my snack outside	Dinner wasn't bad, I hope my sleep is better tonight	late night training?, what should I put on, what to snack on tomorrow
Pain Points and opportunities	getting out early in the morning and walking is difficult, Spending time inside too long / taking a long time to go and get ready to go to a lab	journaling is a way for me to get focused on what I need to do today, I feel like I work too much on lab and school, Sometimes endless meeting stress me out as a student	Finding a good spot to meet a friend in Treasurer is impossible sometimes, Sometimes when I go to the gym that I can't stay that long to go because of the weather	I sleep past my alarm and take naps around this time, preventing me from going outside, I like to stay out extra long after basketball with friends, walking to poetry events and writing poetry lets me go outside	Trying to keep track of my hands and a good time to meet them if they work and I like, Feeling tired after a big meal, not wanting to go outside

Sandy Cheeks
21 year old student, social smoker

Spending more quality time outdoors

Journey Step	Morning/Breakfast	Lunch	Afternoon	Dinner	Evening
Feeling	groggy, sleepy, excited for coffee	energized, enjoying commute to class	excited to see friends, focused, high	bloated, stressed	winding down, excited to engage with hobby
Thought	"I need coffee", "Should I smoke before class?"	"Talking to my housemates during lunch was fun", "Time for more classes"	"I love being with my friends", "Time for homework", "I'm glad classes are over for the day"	"I have a lot of homework to do tonight", "We should smoke and do homework together"	"I'm glad I have time to draw tonight", "I need to go to bed early", "I need to shower before going to bed"
Pain Points and opportunities	Sometimes smoking in the morning brings her outside, but its not quality outdoor time, Making coffee inside saves money for a college student but could possibly bring it outside	Commuting by walking can increase outdoor time more than biking, asking friends to eat outside together could improve mood	Smoking brings her outside, but she could do it in a more nature-oriented place, Doing work outside	Stress about homework leads to smoking—maybe bring it outside, A post dinner walk could help calm stress	Engaging in hobbies earlier in day outside could be useful, going to bed early and waking up early increases time outside

Pictured above are AC and Sandy Cheek's journey maps. For more information on our personas and journey maps, please visit <https://highercommonsense.com/cs247b/team-8-project-work-for-5a/>

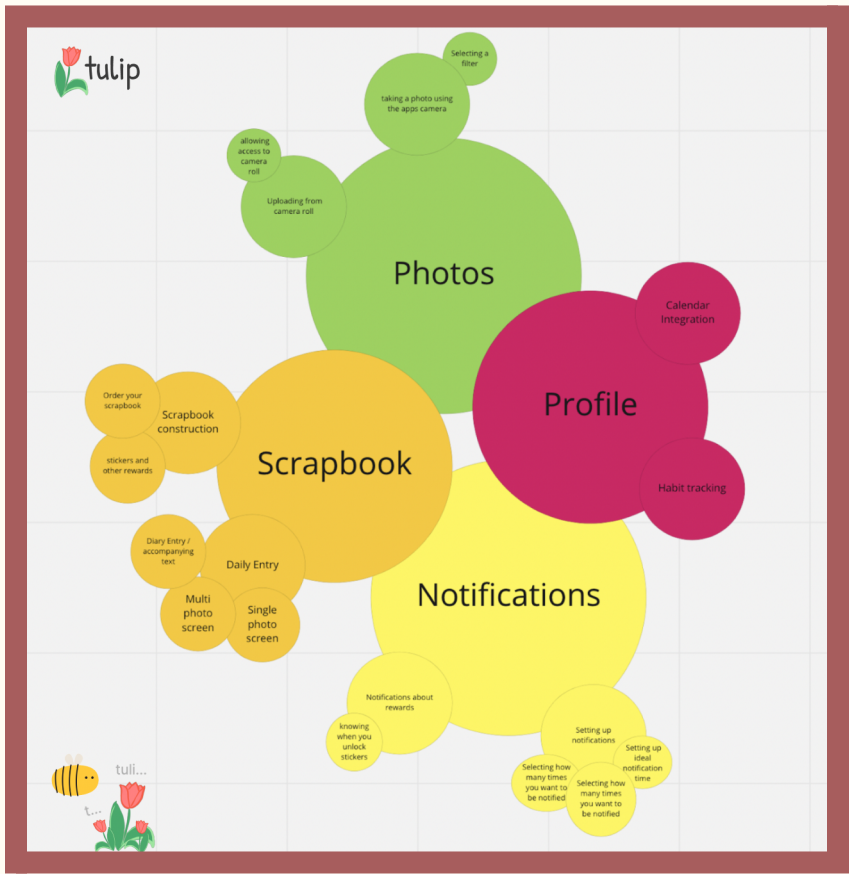
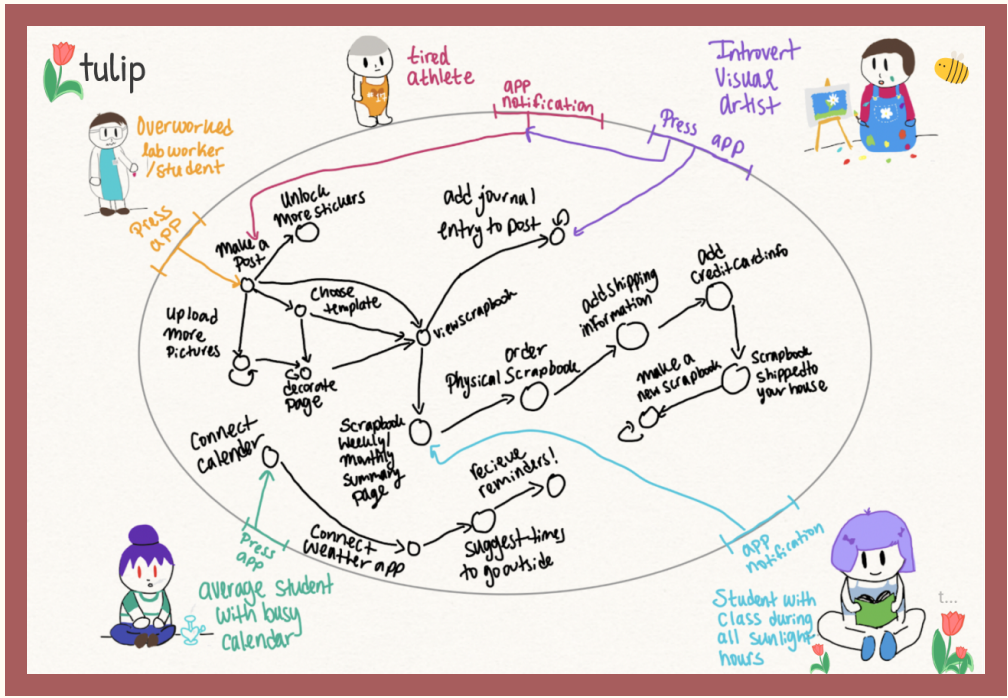
Solution Finding

Intervention Study

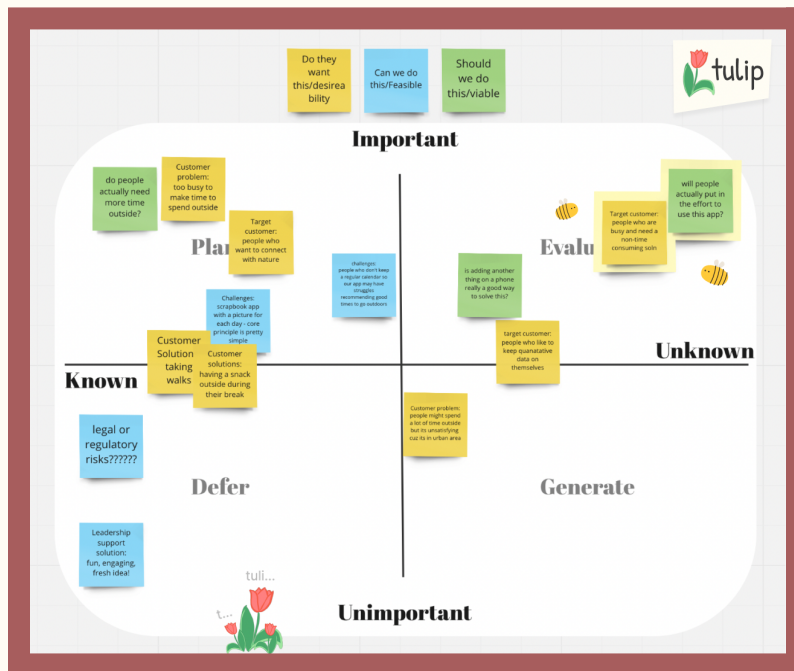
For our intervention study, we asked people to eat one meal or have a drink outside five days in a row. At the end of the day, we requested that each participant fill out a questionnaire with information about the activity they did and the perceived benefits/mood changes that occurred. We arrived at this intervention because our research showed that even 10-50 minutes outside leads to significant improvements in mood, focus, stress, and depression. Additionally, it leads to improved blood pressure and heart rate. We chose the specific intervention of getting participants to spend their time outside during a meal because our user research showed that our users were very busy and oftentimes were not able to find time during the day to spend outside.

Design architecture

Our story mapping, bubble mapping, and system path diagramming very heavily dictated the final design and architecture of our app. For instance, from the story map and system path, it was clear we wanted the "new scrapbook entry" functionality to be front and center, and the most easily accessible feature of the app. Things such as the scrapbook ordering, organizing, and stickering were pushed further behind to draw more attention to the regular features. Finally, the bubble mapping showed how we were going to group the specific screens and features we needed into tasks and wireflows.



Assumption mapping & testing



The first assumption we tested was that our reward system will actually motivate our users to continuously put in the effort to create a scrapbook in such a way that the time they spend outside will be sufficiently increased or improved. Since this assumption involves whether or not users will remain consistent over time, it was difficult to test directly. However, we could compare users who received rewards or who didn't receive rewards during the course of the test. We asked participants daily to spend time outside and send us back a picture. Some of our participants were told that they would be rewarded with stickers (physical ones in this case, to be placed on a laptop or water bottle), and some were not. The results of the test did show a difference in the motivation of the two different groups. By the end of the study, people who were told they would receive stickers were more consistent than those who weren't. However, the sample size was low, and the experiment went by quickly. Had we had more time and resources, we would have liked to test this with more participants over a larger period of time.

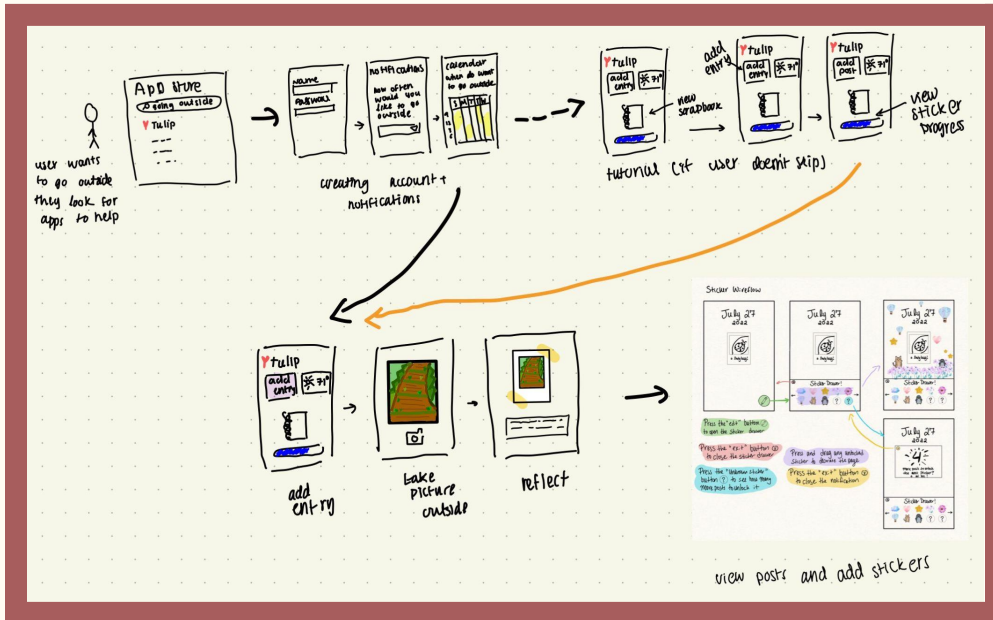
The second assumption we tested was that taking a picture a day of the outdoors will actually encourage people to spend more time outdoors. For a few days, we asked people to take pictures outside. We measured the amount of time they spent outdoors when they took the picture, whether they remembered to take a picture at all, and whether the experience of taking a picture outside added or took away from the quality of their experience outside. While our participants did not spend as much time outside as we would have liked,

we know from our research that even just 15 minutes (about the average they spent) is highly beneficial. From these assumption tests, we decided to move forward with our scrapbook idea.

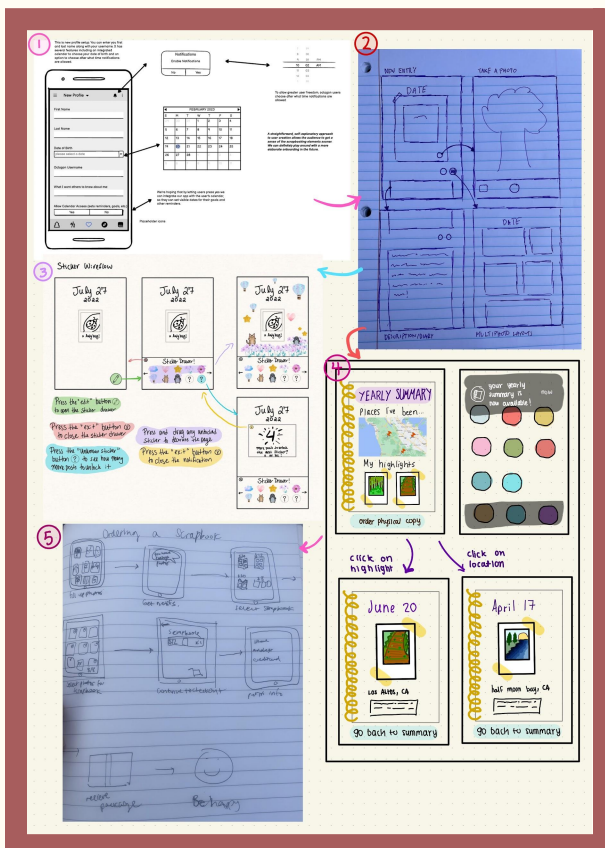


Building a SolutionWireflows to sketchy screens

New wireflow (core tasks)



Old wireflow (more details here <https://highercommonsense.com/cs247b/team-8-project-work-for-7a/>)

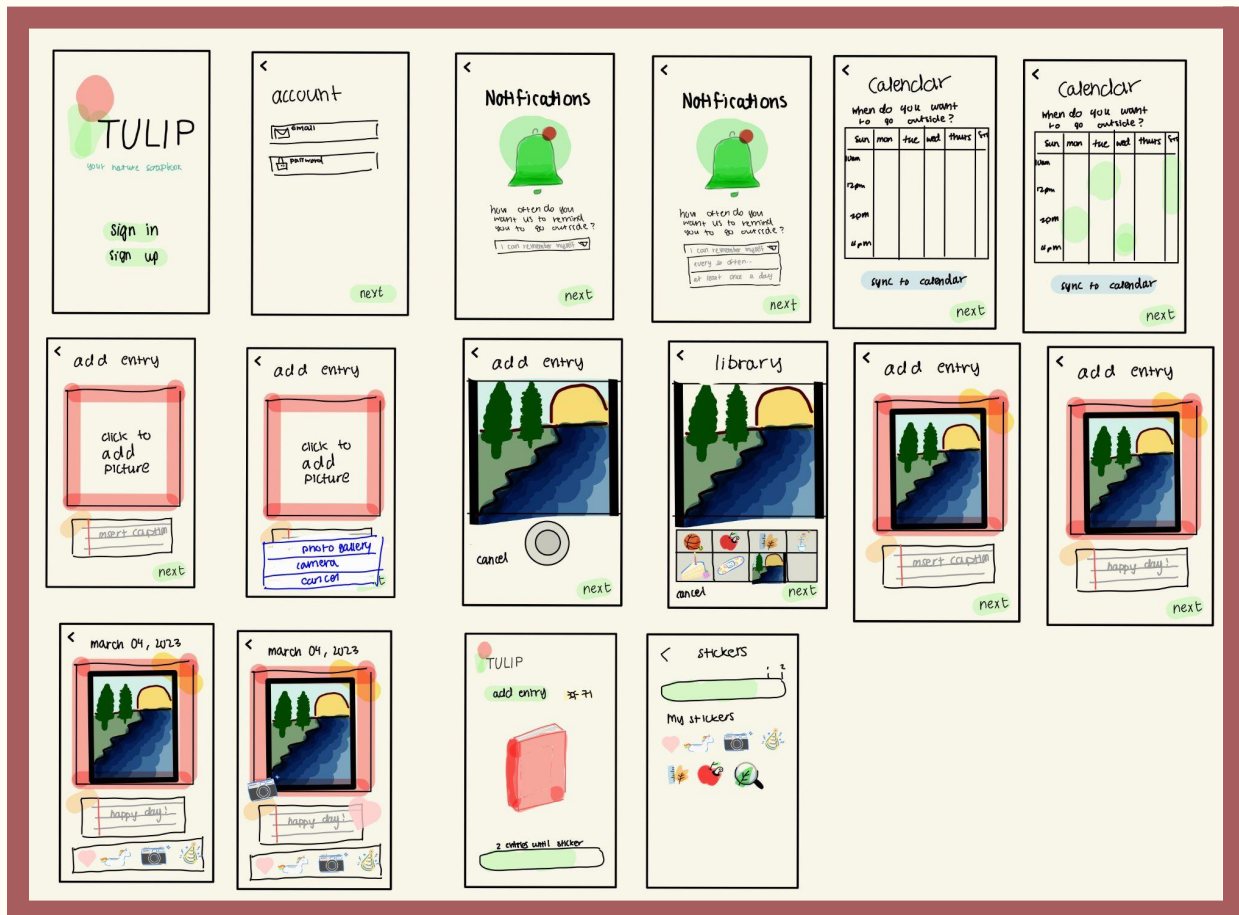


Our wireflow included our core tasks:

- Onboarding: making an account and setting up notifications. Setting notifications is essential for users to remember to go outside and document it using Tulip.
- Making an entry: the user adds a picture in a given template and enters a diary entry for the day.
- Collecting stickers: we use rewards to motivate users to form a habit of going outside. When a user completes a certain task (i.e. uploading their first post, achieving a one-week streak), they earn a sticker. The flow shows how the user can decorate their entry with the sticker.

Our happy path starts when the user first downloads Tulip, goes through the onboarding, goes outside to make their first entry and earns their first sticker after making that entry. Our wireflow helped us better understand the different pages our app would have, and different connections between the pages. We also updated our wireflow to make our app more focused on the short term rewards to begin with (the stickers). We assumed the stickers would encourage users to make new entries and hence, go outdoors more often.

New sketchy screens



Old sketchy screens (images and details) here

<https://highercommonsense.com/cs247b/team-8-sketchy-screens-2/>

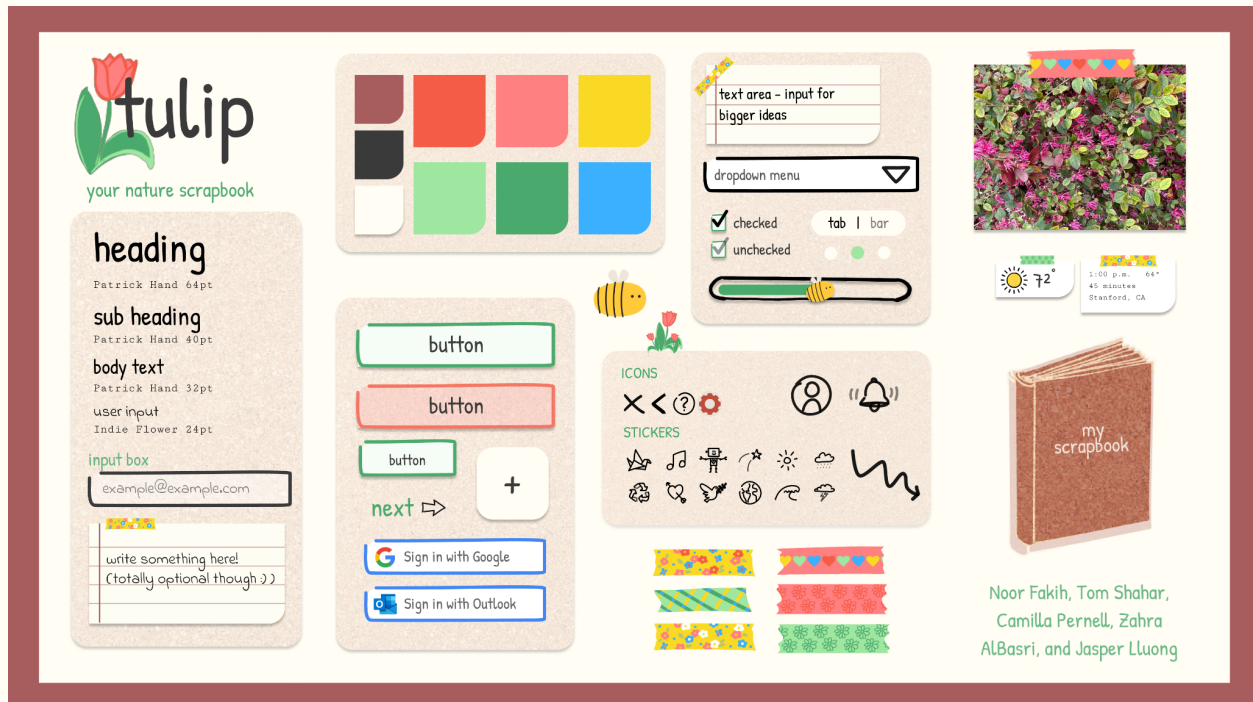
Our home page includes Tulip's tagline to ensure people understand our app's purpose. We chose a simple create account page that looks similar to most create account/ log in pages. The simplicity of our onboarding aims to keep the user engaged. We have two notification centered flows to gain perspective of the user's goals and their schedule. We use an interface similar to that of LettuceMeet and other similar websites. If a user is not familiar with such platforms, they might feel confused so we decided to add a help page in our final prototype.

Since our app is not a social media and is a scrapbook, we kept the photo entry and the written entry in one page. This is to give the user an idea of what their entry will look like in a scrapbook page before officially adding it. We kept the stickers at the bottom of the entry page for easy access. This is also similar to having a keyboard with stickers at the bottom of the page, so it should be familiar to the user.

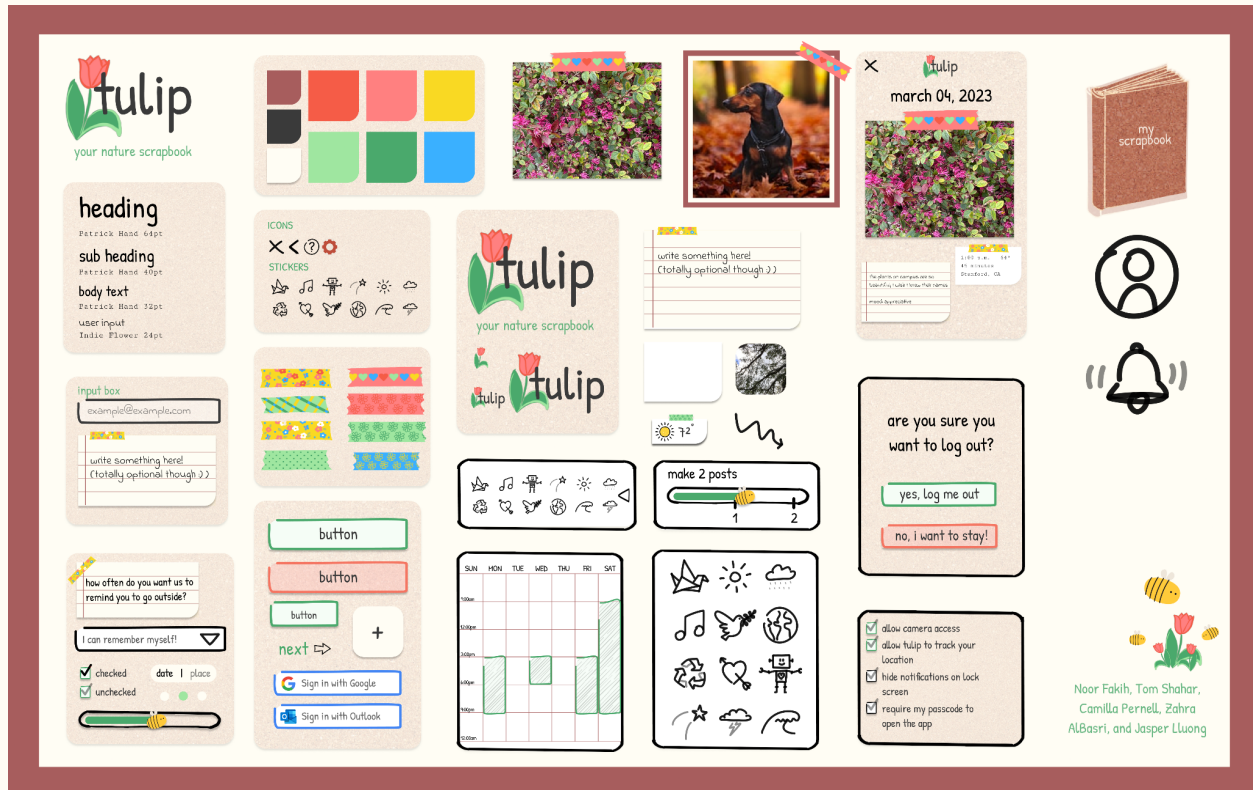
Our logged in home page (last row) includes an add entry button at the top to encourage the user to go outside. Next to it, we keep a weather widget so that the user doesn't have to manually check the weather app when deciding to go outside. The layout of this page is inspired by a phone's lock screen. We also chose to have the view scrapbook button shaped as a scrapbook to add to the scrappy feel of the app. This, however, could be confusing to the user since it's not a traditional button. Our sticker progress bar at the bottom is also a gamification choice to encourage the user to go outside and collect more stickers.

Branding -- Mood Boards & Style Tiles

Style tile



Component board



Our app aims to elicit creativity and craftiness from the user. The scrappy feel and rounded fonts encourage the user to embrace imperfection and let go of expectations of what a perfect day to go outside is.

We chose to use untraditional buttons and a lot of hand drawn components to add to the crafty, creative feel of our app. We chose our fonts to be rounded and to look like handwriting to give Tulip a more authentic feel. We chose our colors based on images of nature. Our colors should complement and not clash with the user's images.

Usability Testing

We assigned the user to complete the onboarding process and add an entry to the scrapbook. Below we list our main issues and how we addressed them:

- Unclear notification process: users were not sure whether they were being asked to set up the amount of times they would be notified in a day or a week, and others were wary of a dropdown menu on the notification screen, as it might mean the process is complicated. Hence, we decided to change our process to have a default value for how often a user is notified as shown in our prototype and updated sketchy screens. We also decided to have a more forgiving way to choose windows of time

you could spend outside by using the highlight areas in the calendar as shown in our updated sketchy screens and prototype as well.

- People were unsure if the book on the home screen was clickable. We plan on highlighting clickable items to make the scrapbook look more clickable.
- Sticker tab: people were confused about our original sidebar pull-out sticker tab. We decided to leave the sticker tab open so the user can easily see and access the sticker tab.

More details on usability testing and issues can be found here

<https://highercommonsense.com/cs247b/team-8-usability-report-2/>

Prototype

Clickable Prototypes



[figma](#) clickable prototype

[protopie](#) clickable prototype (desktop version)*

scan QR code with [ProtoPie Player app](#) (mobile version)*

*using protopie will require downloading two Google fonts:

[Patrick Hand](#) and [Indie Flower](#) for optimal usage.

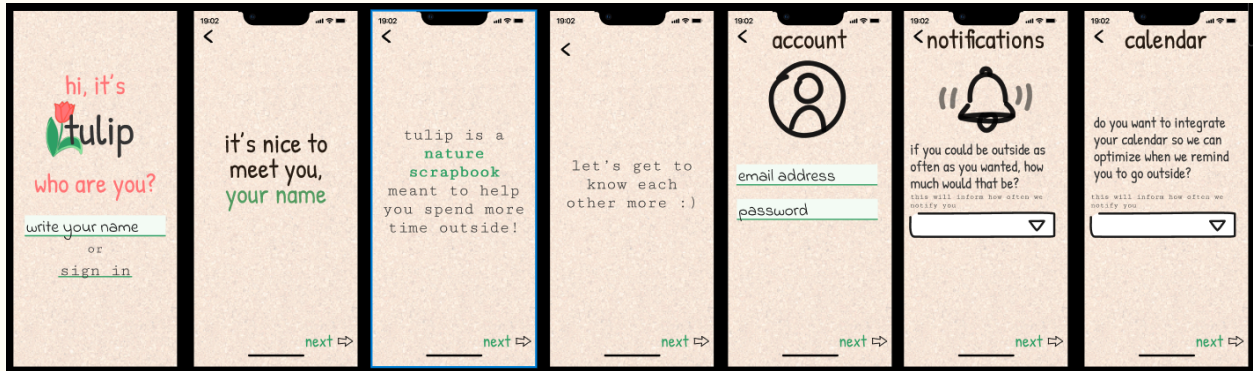
You can use it without installing the fonts but it will ruin the visual experience.

The ultimate difference between the figma and protopie will be the **level of interactivity** allowed. The ProtoPie is able to handle limited user input and therefore will be a more realistic experience. With the ProtoPie the user is also able to test out the sticker decoration functionality by dragging stickers from the sticker drawer and onto the scrapbook page. They can resize the sticker using a pinching-like motion.

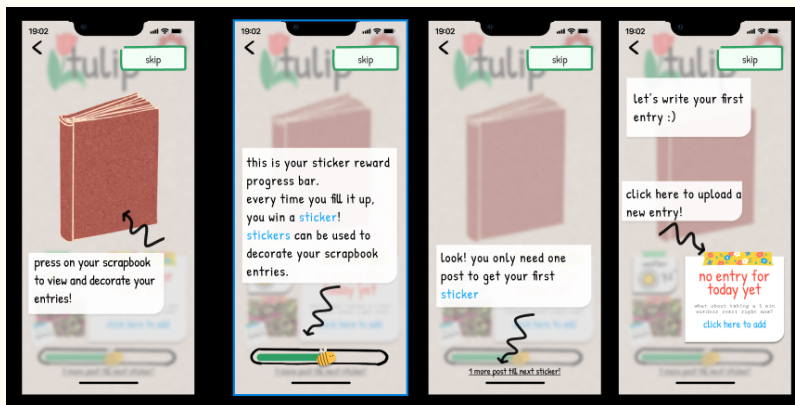


Prototype Process

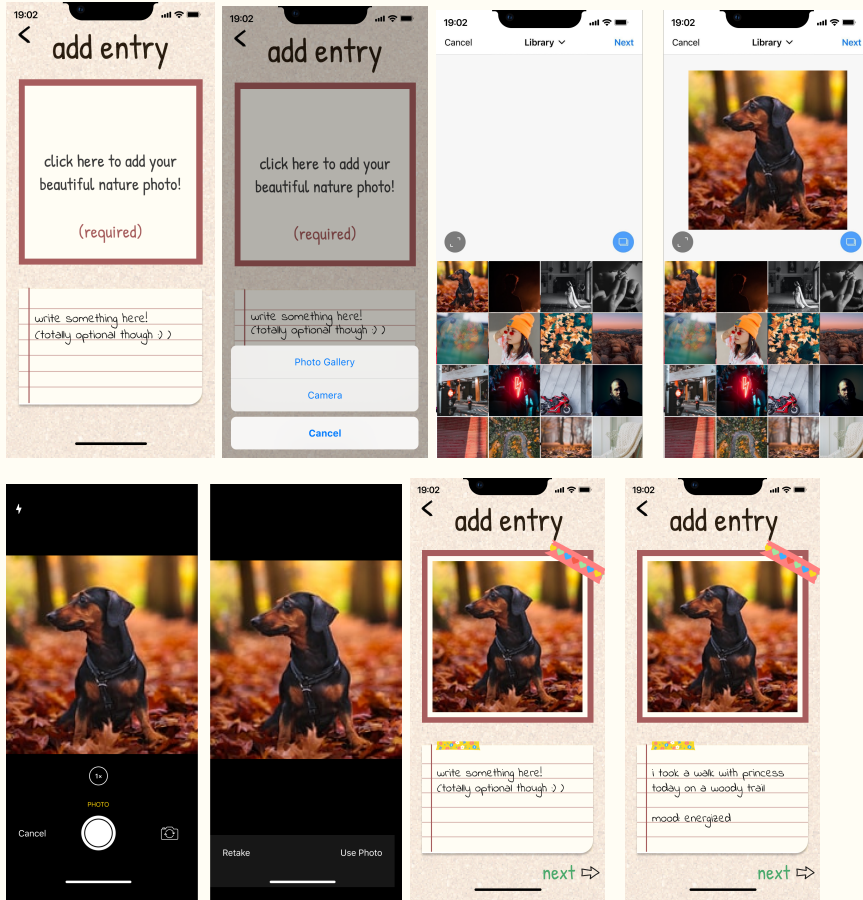
Onboarding



Tutorial



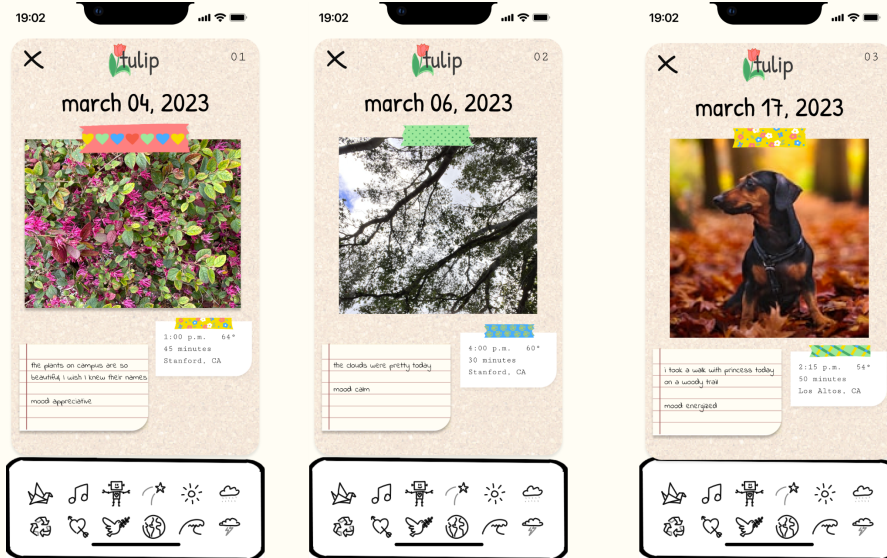
Adding an entry



Homepage and settings (logged in)



Viewing entries



We chose a cork background to give our app a scrapbook feel. We also add washi tape and sticky notes to the main page to add to that scrapbook feel. Besides what was included in our sketchy screens, we added a tutorial to ensure users knew how to use our app since it has unconventional aspects to it. The unconventional aspects include the scrapbook as a button and the sticker progress bar. Our design decisions for our old prototype were justified in the previous subparts of Building a Solution section.

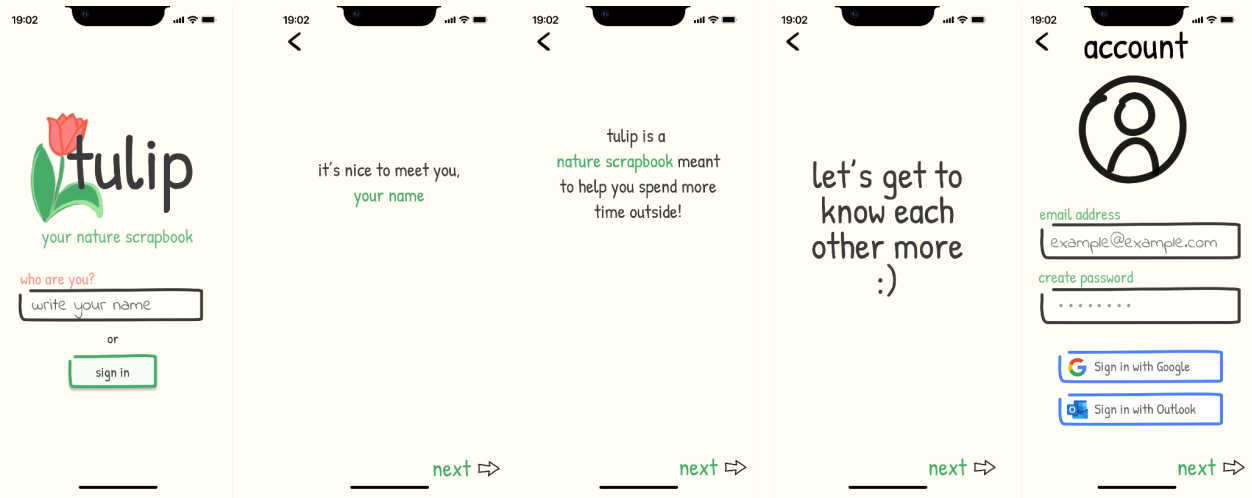
In our final prototype, we changed the background of most non-scrapbook pages to make it cream. This change is to emphasize other elements in the page. We also reordered and resized components in the first page to make it less cluttered as users noted that the first page "had a lot going on". A more detailed justification of our changes can be found here

<https://highercommonsense.com/cs247b/team-8-usability-report-2/>.

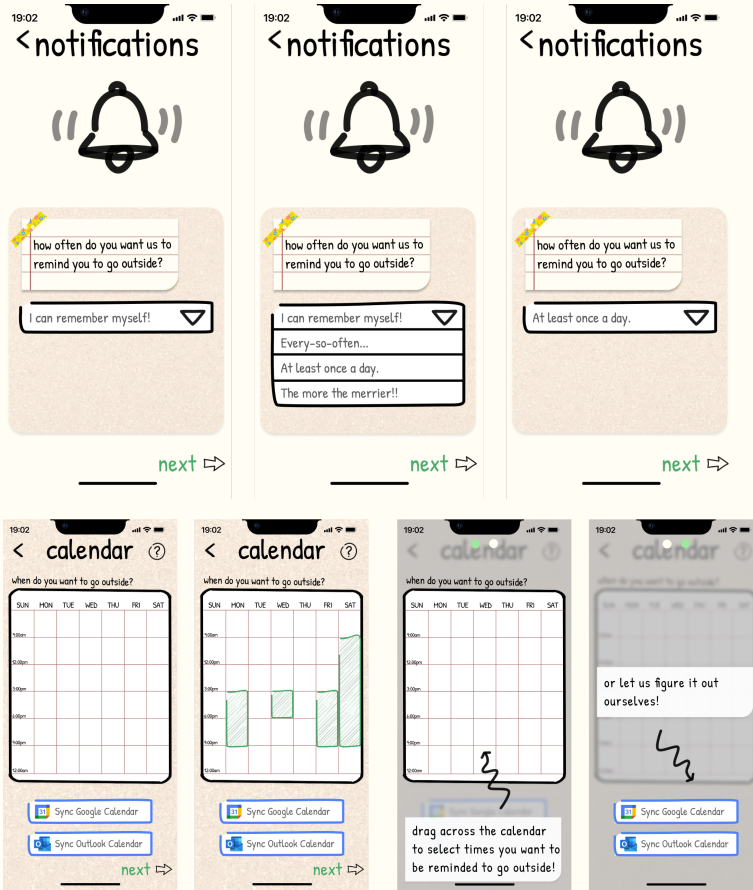
Final prototype flow

Our design decisions for our final prototype were described above. Below is the user flow. Note that the viewing and adding entries tasks did not change.

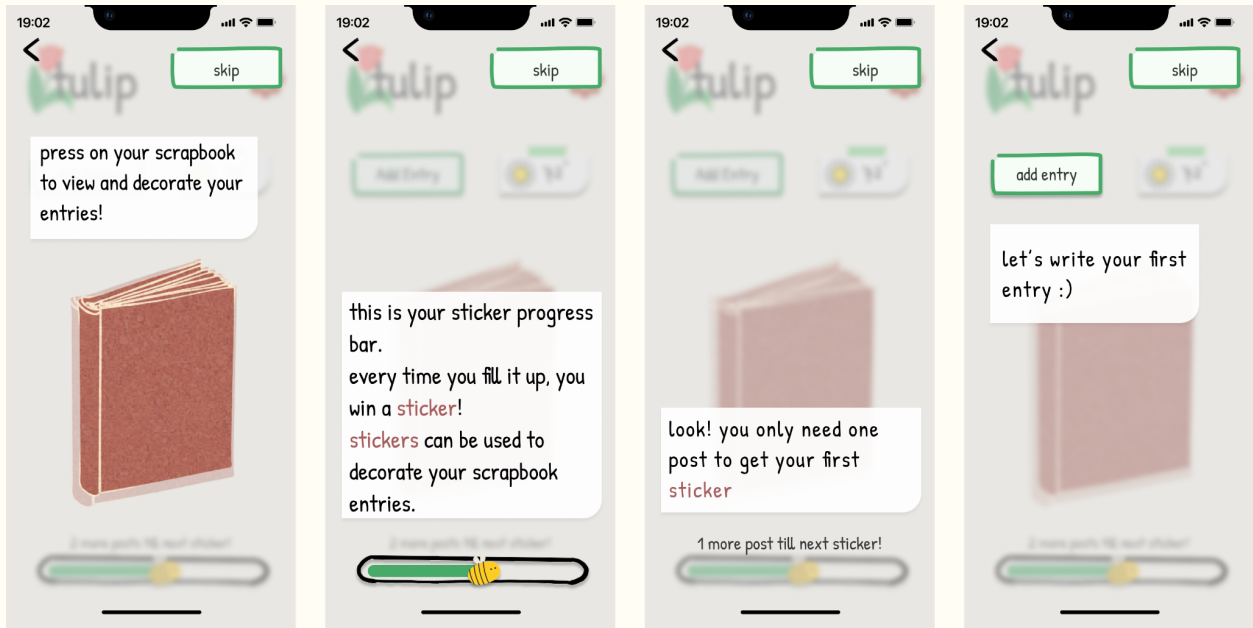
Onboarding



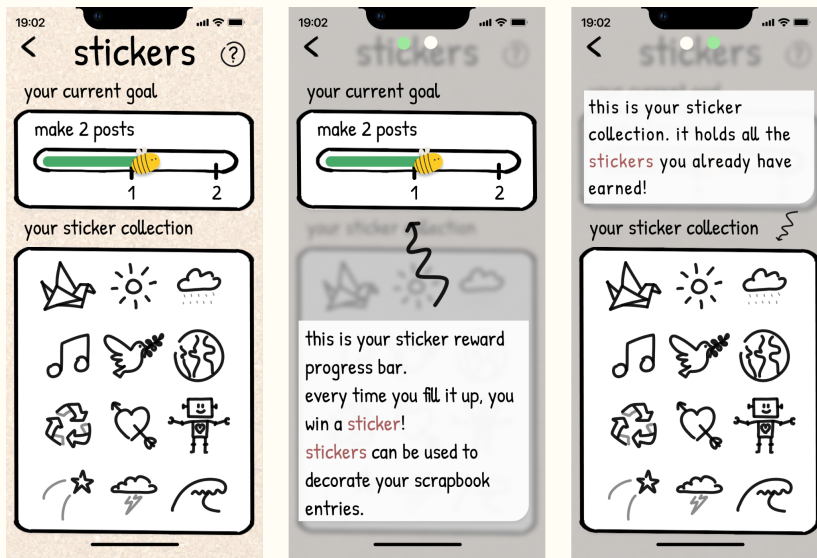
Notifications & calendar integration



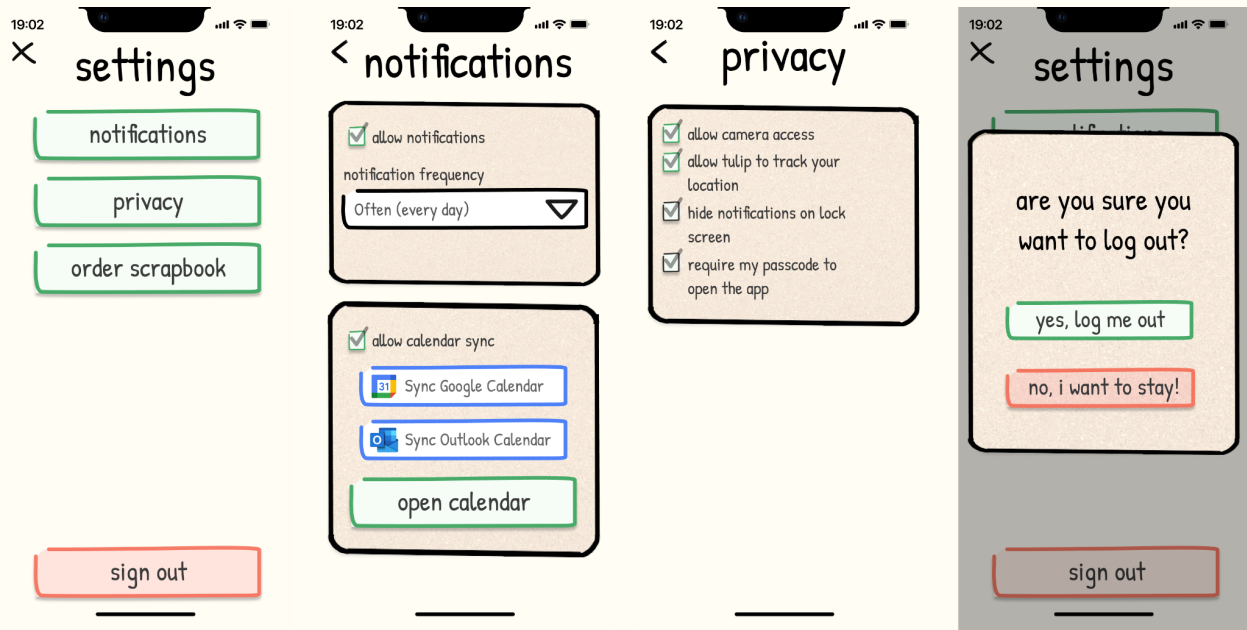
Walkthrough



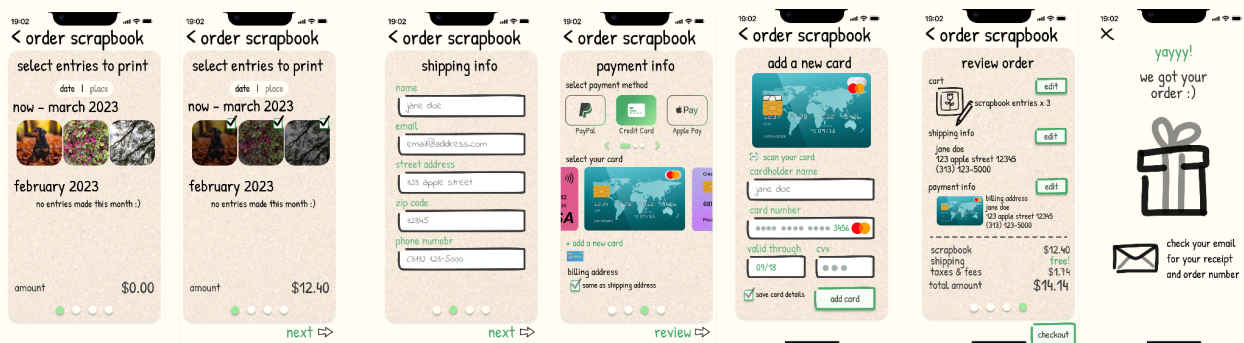
Stickers



Settings



Ordering scrapbook



Ethics

Persuasive technology

cs247b ethics focus week 2

Summary

The largest tech companies are the owners of the biggest persuasive technologies. Berdichevsky and Neuenschwander stated "creators of a persuasive technology should never seek to persuade anyone of

something they themselves would not consent to be persuaded of.” Persuasive technologies, created by ones in power usually through coercion and deception, can be a cause for probable harm, so we should seek to minimize the harm of persuasive technology.

Feature

We want users to go outside, to take a picture, and to enjoy the outdoors in very natural ways that many people do. In that vein, our scrapbook feature is something that we wished we had when going outside. Many of us use Snapchat, Pokemon Go, or another camera/AR feature. In this way, students who seek to go outside more can maximize the benefits of persuasive technology and leverage current persuasive technologies they already use.

Broader Impact

Since we have to consider that the user can only spend limited time on their phone outdoors for whatever reason (environmental, safety, etc.), we want to make sure that the time the users spend isn't used just to maximize company profit but instead user enjoyment. A responsibility we have as the owners of this app is to ensure that the tools we make aren't being used for things like harm, fake news, and hate speech.

Privacy

cs247b ethics focus week 4

Summary

This article by Julia Angwin explores the extent of tracking and monitoring of activity and data. In the nation's top 50 websites, they installed 64 pieces of tracking technology on average. There are over 100 middlemen or tracking companies that act as data brokers. By creating rich databases and smarter algorithms, companies can profit by gathering data that they say is harmless but is actually used to create targeted ads and reinforce problematic narratives.

Feature

By not tracking any user data and allowing users to turn off things like location and notification/calendar reminders, we give not just the freedom but the peace of mind that there is no duplicitous or manipulative intent behind the location tracking feature. Users choose how frequent they want to be notified.

Broader Impact

If we were a real company, we would not condone the selling of user data nor would we allow targeted ads for our users. Individual behaviors are a growing interest and by refusing our app to collect data in this way, companies lose their grip on our digital freedom. This would allow us to keep our app in the hands of the original creator instead of following a corporation's narrative.

Rewards

cs247b ethics focus week 5

Summary

Wendy Wood argues that habits are built in the moment, from the onset of experiencing pleasure. The studies of how habits form reveal that effects of rewards stretch far into the future, so you can practice an action without thinking about it. This is very deep, as it hints that our behaviors are not necessarily the best action; they are just habits that we hold onto from the past and have produced rewards, either previously or currently.

Feature

By maximizing scrapbook visibility and allowing the user to see the scrapbook's previous entries, we want the user to feel rewarded from the first time they open the app. This will make it so that the action of opening the app and going outside to take a picture is a rewarding action.

Broader Impact

For a product to be successful, it has to minimize the harm it causes. This is difficult for companies that have a goal to make money. Companies like Facebook, Instagram, and TikTok focus on making you addicted to their scrolling algorithm for hours on end. We focus on getting everyday students to absorb Vitamin D to reduce risk of autoimmune and cardiovascular disease ([Holick](#)) and improve their mood and sleep ([Burns](#)).

Conclusion

Moving forward, our group would have loved to continue fleshing out the experience of the scrapbook, adding ways to customize look, feel, and layout, bringing the experience as close to a notebook as possible on a phone. The developers among us even wished that we had a chance to build a more functional prototype,

where we could try out daily uploading photos ourselves. We got attached enough to our idea that we wish we could use it! Our next foray into behavior design, for those of us headed in that direction, will hopefully include even more behavior change techniques beyond our gamified reward system and habit tracking solution; Concepts that we didn't quite think fit this project but could be perfect for our next one!

Thank you for reading,



The Tulip Team

Tom, Zahra, Noor, Camilla, and Jasper