INFO / COMM 3450 / INFO 5355 2021S

Assignment 3 (Individual Part)

Prototyping: Design the Thing Right

Instructor: Qian Yang (qy242)

In the previous assignment, your group has identified a meaningful challenge your user group faces and envisioned a *preferred future* for them. You and your group have also identified *contextual factors* and user insights that are critical to creating successful solutions. In this assignment, you will further explore various approaches to your favorite idea, before selecting the one that is most valuable from a user standpoint.

Assignment release: April 15th, 2021 (Thursday)

Assignment due: **April 28th, 2021 noon EST** (Wednesday)

Learning goals

- Designing interaction flow via sketching and storyboarding
- Rapid prototyping with users

Suggested Timeline

There is a wellness-day break during this assignment. Start early so that you can fully enjoy those days off!

- Finish the Preparation part by the end of the first weekend (April 18th)
- Spend at least five days on Part 1. The best approach is to spend 15-30 minutes *every day* on it rather than setting aside a big chunk of time on the same day.
- Start working on Part 2 at least half a week before the due date.

Submission Instruction

Follow the instructions and edit this file. After you have completed all the tasks, **save the file as a pdf** and submit it to Canvas. As always, do not include students' full names or netIDs in the assignment to allow for anonymous grading.

Lead TA of the Assignment: Pin-Sung Ku (pk537). If there is a math error in your grades, please contact the lead TA. For all other questions, post on Piazza.

Grading rubric

- **Q1 IXD - sketching - completeness (4 pts)**
  The student iteratively improved and refined their design ideas through sketching. The sketches illustrated this evolution of ideas.

- **Q1 IXD - sketching - novelty (5 pts)**
  All design ideas are distinctive from each other. Each envisioned a different type of technology or a different type of interaction. No existing technology can realize this vision entirely yet.

- **Q1 IXD - storyboard - evidence of understanding (4 pts)**
  The storyboards focus on the envisioned interactions and the situated user experiences rather than interface details.

- **Q1 IXD - storyboard - relevance and justification (5 pts)**
  The design ideas can move users closer to the preferred future, addressing their functional needs within the previously identified contextual constraints.

- **Q2 prototyping - interview and notes - completeness (4 pts)**

- **Q2 prototyping - interview reflection - evidence of understanding (4 pts)**
  The student gained new insights into the participant's needs, desires, mental models, and emotions. At least some of the insights are actionable from an interactions design perspective (i.e. what designs they might find helpful; what they might find *not* helpful, how they would react to certain product behaviors).

- **Q2 final design - justification (4 pts)**
  The final design is grounded in user research and/or prototyping interview findings. The rationale can convince the grading TA that this design would be effective and meaningful to the user group in question.

Assignment Background

To provide some context for the grading TA, please copy-paste the following from your previous assignments.

~ Copy & paste from A3 Group Part Submission (verbatim)~

The preferred future

People recovering from eating disorders can find ways to consistently maintain healthy eating habits independently after recovery without relapsing

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Functional goal(s)

The computational technologies should enable individuals recovering from eating disorders to find healthy, consistent ways to independently maintain recovery and prevent relapse

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Contextual factors

- Unaware or unhelpful friends and family
- Inaccessible professional help affecting
- Individual recovering from eating disorder struggling with other mental illnesses or problems as well
- Financial constraints affecting food choices that are possible during recovery
- Social surroundings and unavoidable interactions posing challenges often, during recovery

Your favorite idea out of the 8 *you* came up with
(We will call it your "seed idea.")

- People recovering use some kind of technological/digital calendar that could help track their progress or habits by a simple lights/color system. Everyday they can push a button or have something light up on this calendar, and after a longer period of time they could look back and easily see the general big picture of how they have been feeling or what they have been thinking, in addition to any habits that they may have followed or not followed that day.

~ Copy & paste from A2 Individual Part Submission (Update it if necessary)~

User study participants criteria

1. **Inclusion criteria**
    - Students who either have already recovered, or who are in the process of recovering from an eating disorder/unhealthy eating habits
    - People who have personally known a someone with an eating disorder
2. **Exclusion criteria**

- People who have not previously had an eating disorder
- People who have not personally known someone with an eating disorder
- Students who have not already recovered or who are in the process of recovering

Preparation: Schedule Prototyping User Interviews

This assignment invites you to develop, refine, and prototype your design ideas. At the end of this assignment, you will share the ideas and prototypes with your target users and get their feedback. Considering that recruiting user study participants and scheduling sometimes take a long time, you are encouraged to do so as early as possible.

You will schedule at least two (>=2) prototyping user interviews, with at least two (>=2) different participants. Ideally, these participants should squarely fit the inclusion/exclusion criteria listed above. In other words, they should be similar to your contextual interview participants. If your target user group is particularly difficult to find, you still need to include at least one participant who meets all the criteria. For the other interview(s,) you are allowed to recruit participants who meet only some criteria.

If your participants' availability allows, **you can schedule multiple interviews with the same participant**, such that they can give you feedback as you iterate on your design ideas.

Each interview typically lasts for 20-30 minutes. The prototyping interviews can be shorter for those participants who you will interview multiple times. For public health reasons, these interviews should be defaulted to take place remotely.

Set the interviews to be more than 3 days ahead of the assignment deadline (before April 25th), so that you will have some time to write up their responses and further revise your designs.

Part 1. Developing Design Concepts Into Interaction Designs

You have identified one idea; one direction towards moving your target users to the preferred future. Now you will move on to exploring various approaches to realizing this idea, before

selecting some of them that are most valuable based on your understanding of the users' point of view.

Step 1. Envision a wide variety of ways your seed idea would work. For example, the alarm clock design idea "releasing the smell of bacon to motivate users to get out of bed" can be developed into...

1. The alarm clock includes a mobile phone app and it connects to a toaster oven. The app reminds users to put a slice of bacon into the drawer every night before going to bed. The app will turn the oven on 20 minutes before the alarm runs off. The app does not offer a snooze or "turn off oven" option; The user needs to go to the kitchen, turn off the oven, and can then enjoy the bacon for breakfast! If the user fails to do so, the app will let the bacon burn for 5 minutes (hopefully that smell will wake the user up!). The system will then turn the oven off for safety.

2. The alarm clock includes a mobile phone app and it connects to a fragrance diffuser. The system turns on the diffuser a few minutes before the alarm runs off and starts releasing pleasant smells of the user's choice. This will continue until the user turns off the alarm.

3. …

As the example demonstrates, in comparison to your seed idea, the ideas here should **provide much more details about (i) how exactly this solution will work and (ii) how the users can interact with it.** Recall the user journey map that you outlined based on the user interviews. You are now envisioning various new ways users might experience that journey. You are designing "interactions".

Sketch these ideas out as you ideate because sketching helps you think through how the interactions will unfold. The sketches should focus on *how the solution will work* rather than *how it will look*. The sketches should be fast and dirty, especially in the beginning. As your ideas become clearer and more throughout, the sketches naturally become more detailed and elaborate.

Step 2. Storyboarding. After you have found clarity in each idea (in how the interactions would unfold and manifest the design goals), you can start sketching a storyboard for that idea. The storyboard puts a user in a realistic scenario and demonstrates a storyline about how the user goes about interacting with your technology product/service.

No drawings of any concrete user interfaces are allowed on storyboards. Just like sketching, storyboarding is a way to help you think through the interactions, not interface details. For example, if you are storyboarding the bacon/toaster-oven alarm clock, you should be considering how and when exactly the system will get the user to put in bacon, what if the user doesn't have bacon in stock, what if the user doesn't follow the instructions or forgets to put in the bacon, what if the user decides to cancel the alarm after the app has turned the

oven on, what if the user sleeps through the alarm, etc. You should *not* be considering what the app interface will look like. Focus on interactions.

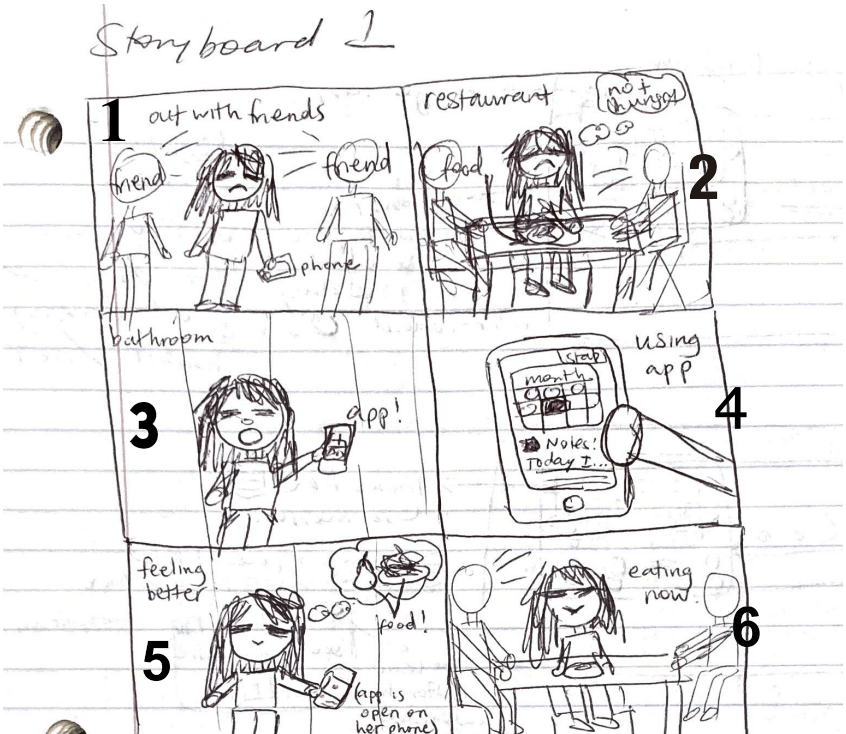
Step 3. Improve the storyboards. After you have sketched a first draft of the storyboards, use the following checklist to self-check if your storyboards have included the necessary information. If not, revise your storyboards.

- Setup
    - Character: Who is the user at the center of the scenario?
    - Goal: What is the character trying to achieve by using the product?
    - Setting: Where and when does the scenario take place?
- What triggers the beginning of the story?
- For each scene
    - What happens in that scene? What are behaviors performed by the user and by the technology product respectively?
    - What emotions/experiences the user is having?
- For the last scene
    - How does the story end? Does it end in a way that aligns with the "preferred future" statement? (If not, improve your design.)

***** Your Task Q1 *****

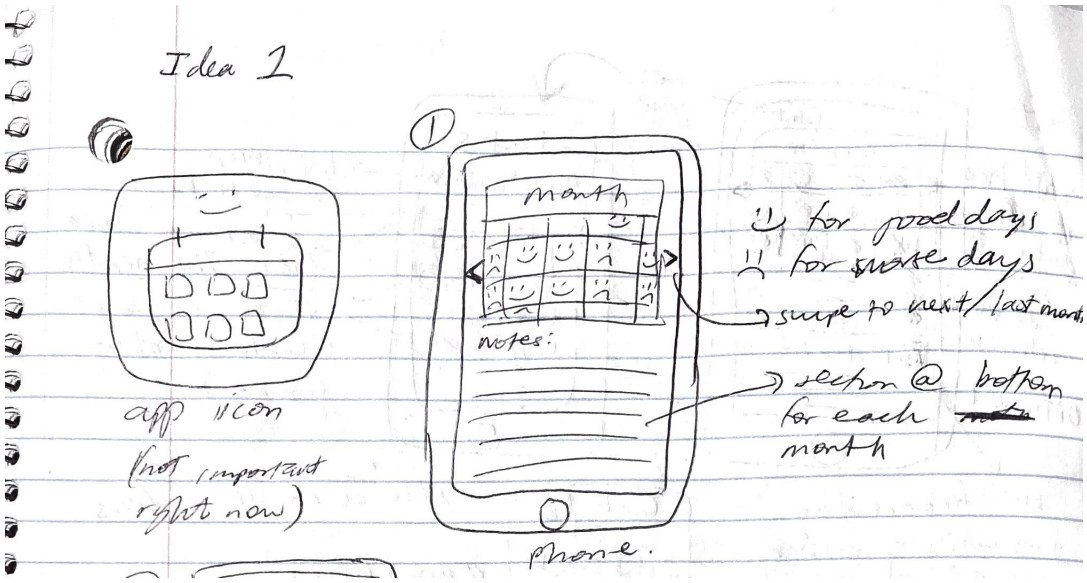
Envision and sketch 5 distinctive ideas; 5 ways in which the seed idea can be manifested. Iterate on each of these ideas until 1) you have thought clearly and thoroughly about how the interactions will unfold. 2) you are satisfied with the user experience that the envisioned interactions create. **Each idea should have gone through at least 2 iterations. Submit all iterations of the sketches.**
Attach the storyboard at the beginning of each design idea (before all the sketches.)

Idea #1 Storyboard
Idea 1 was for this calendar to be more like a phone app. It would also be handy for on-the-go

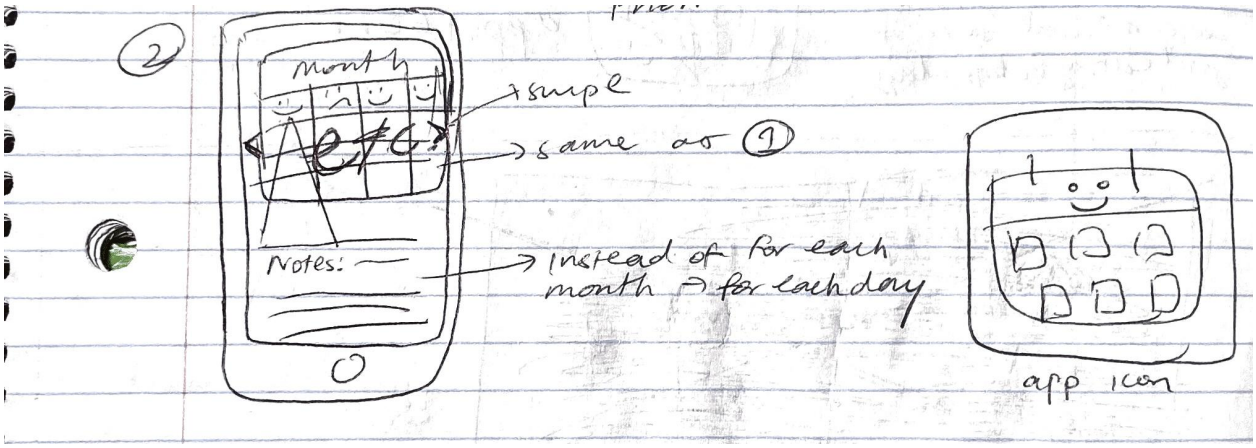


Idea #1 Sketches

Iteration 1

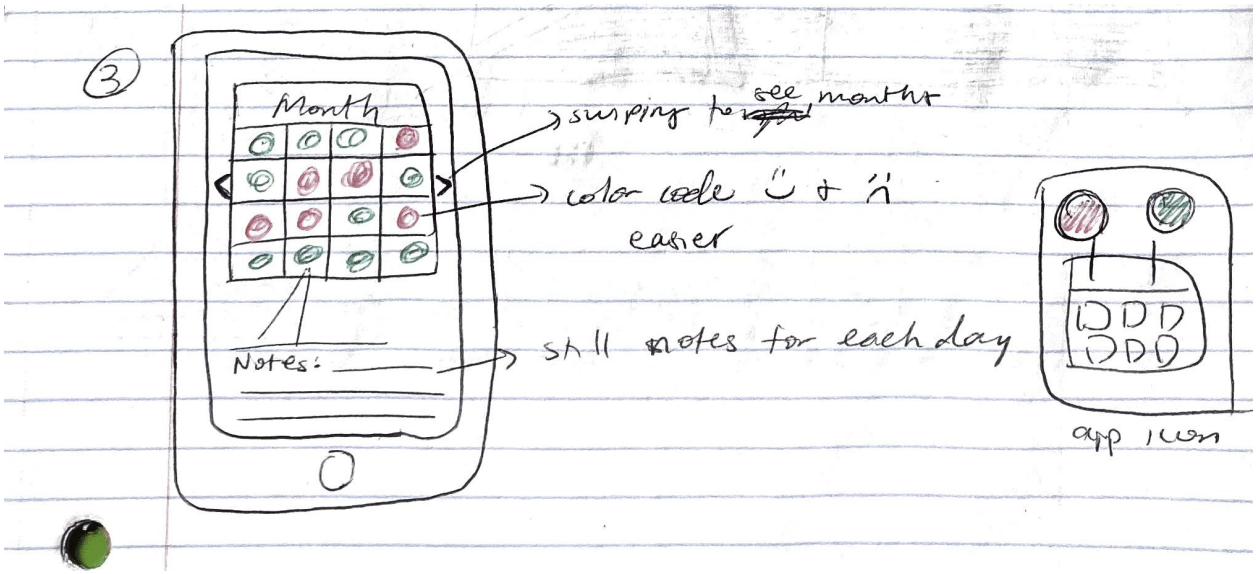


Iteration 2



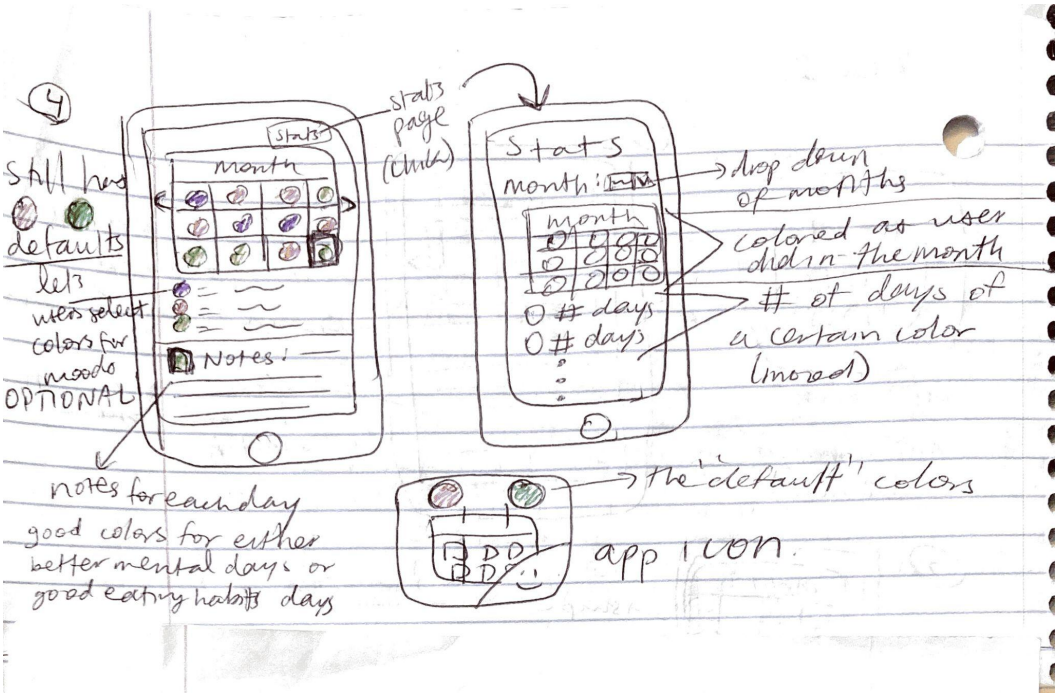
Instead of there being one section for notes for each month, I decided to change it. In iteration 2, when the user selects a day, there will be a new section of notes at the bottom. There will be a section for notes per day, not per month.

Iteration 3



Here, I changed it so that instead of there being a :) and a :(faces to indicate good/bad mental health days or days in which healthy eating habits were/were not followed, there would be colors. This is easier for users to get a more general sense of the entire month and their progress.

Iteration 4

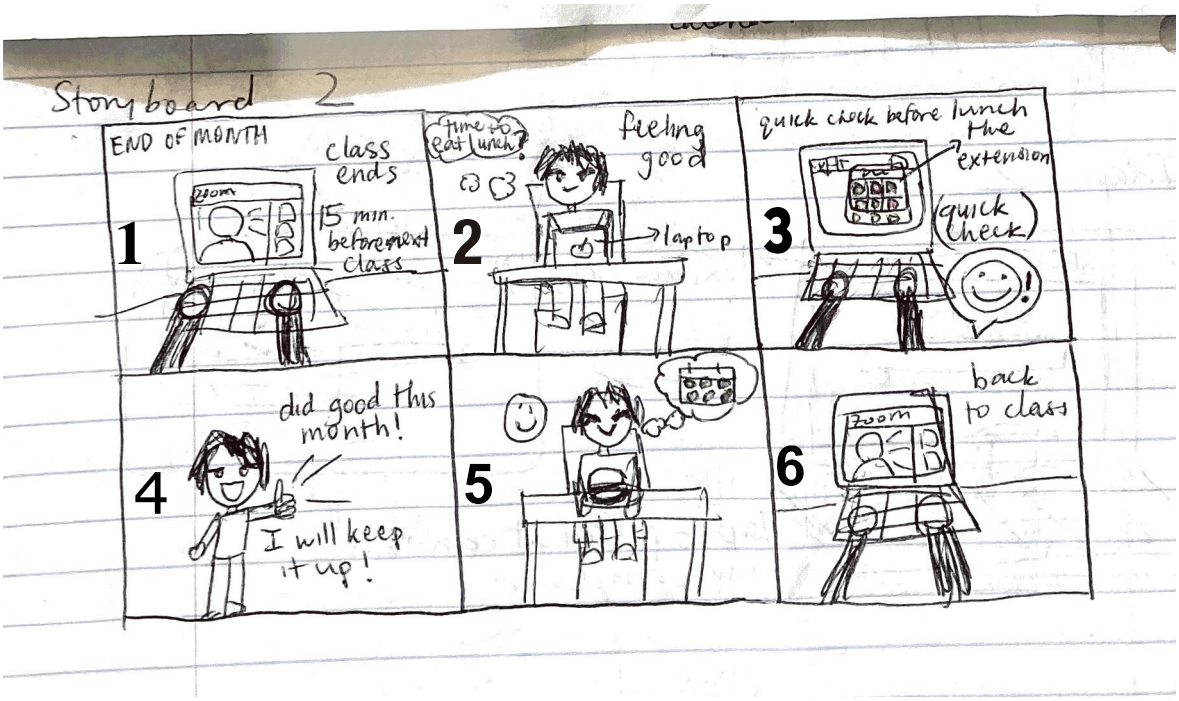


In this iteration, there is now a stats page for users to click to see their overall progress for the selected month in the dropdown menu, such as the number of days for each color. The

users also are now able to select the colors that they want to represent whatever they indicated. It would be more personalized and customizable.

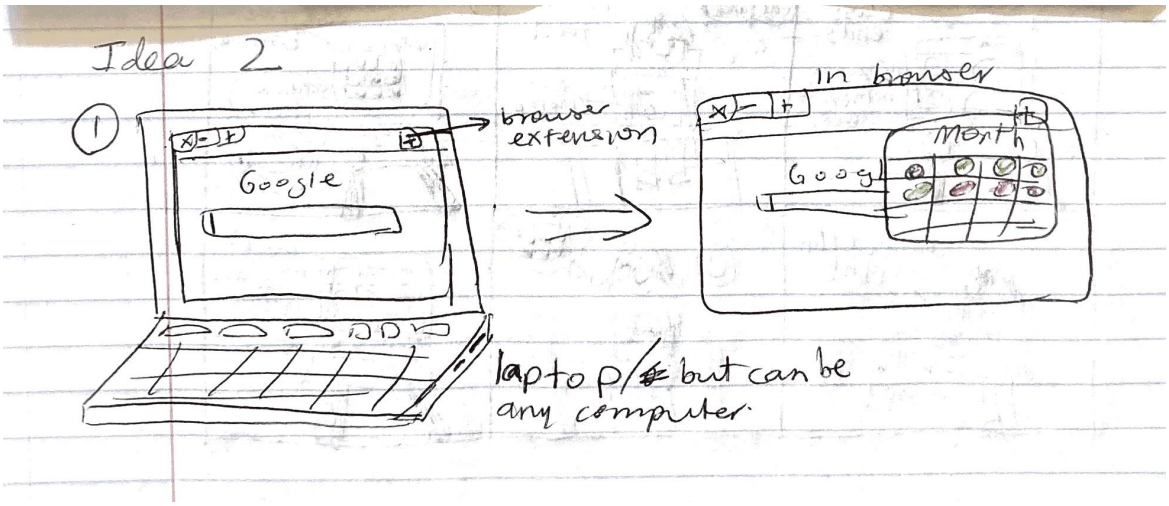
Idea #2 Storyboard

Idea 2 was more like a browser extension. It wouldn't be as in-depth, and would be handy for very quick documentations of one's mood/eating habits

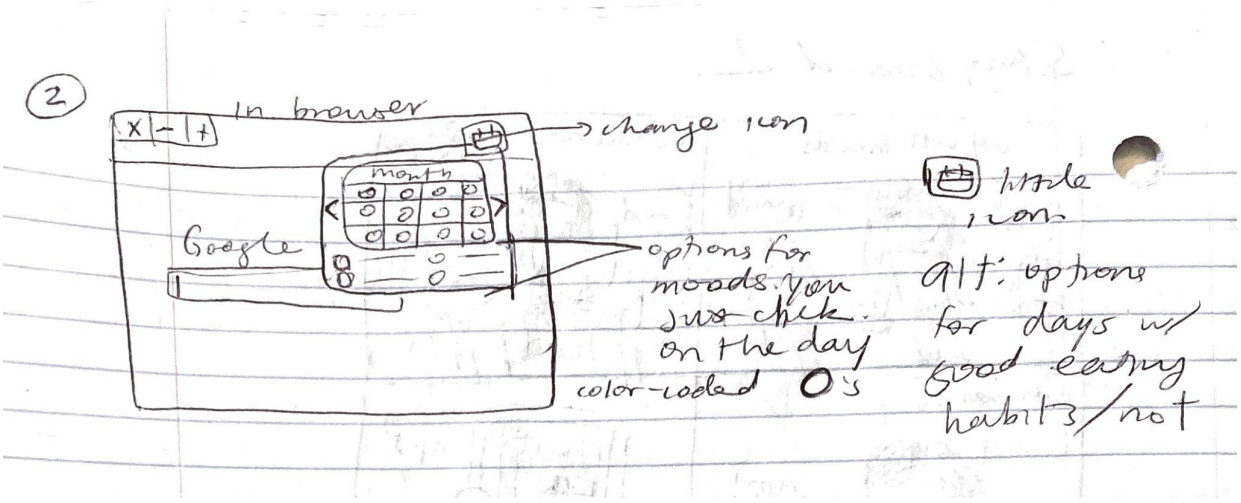


Idea #2 Sketches

Iteration 1

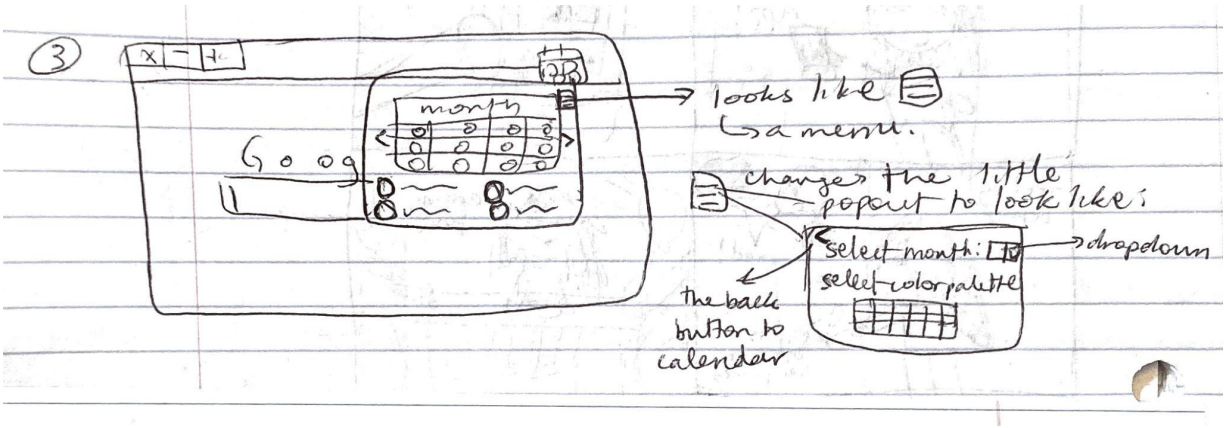


Iteration 2



In iteration 2, I added options for pre-set moods or other eating habits, possibly done when installing the browser extension. Rather than having the user have to type out in this small pop-out the personalized colors and meanings, it made more sense for it to just come up as buttons to select.

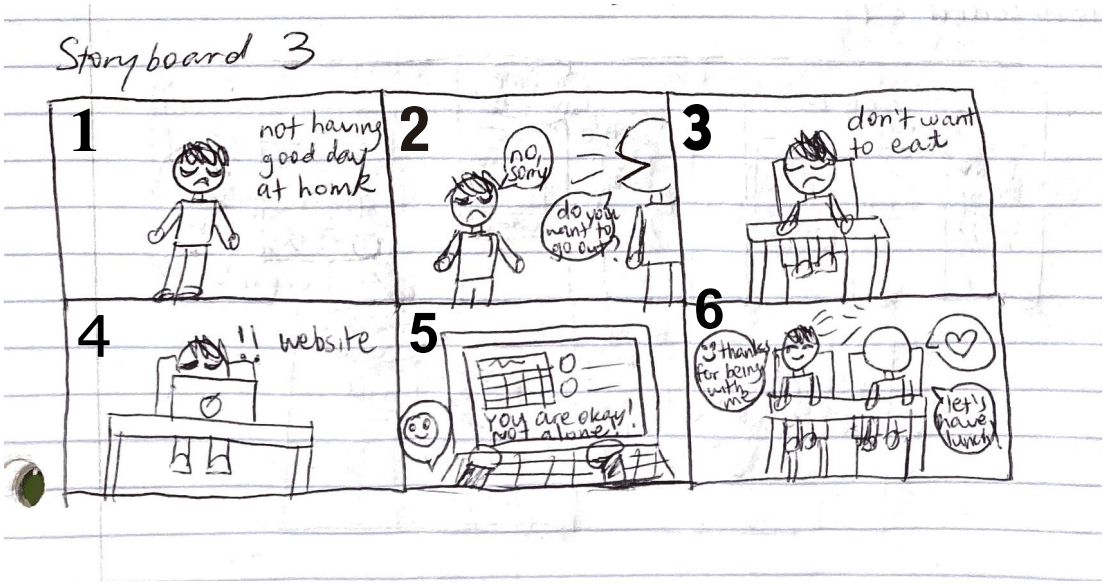
Iteration 3



Instead of having the user have to pre-set color meanings when installing, it actually made more sense for there to be a more accessible settings or menu page. Here, the user can select the month to be displayed via dropdown menu, as well as select the color palette and color meanings.

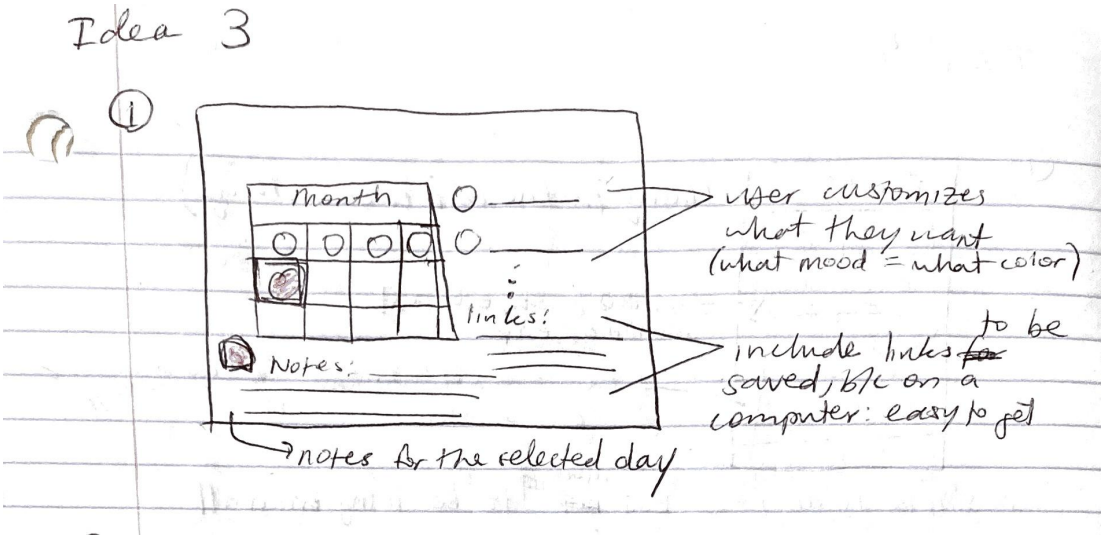
Idea #3 Storyboard

Idea 3 was the calendar as a website. It would have more functions, because there is just so much more you can do on a larger screen with access to the internet, as opposed to a smaller screen like a mobile app.

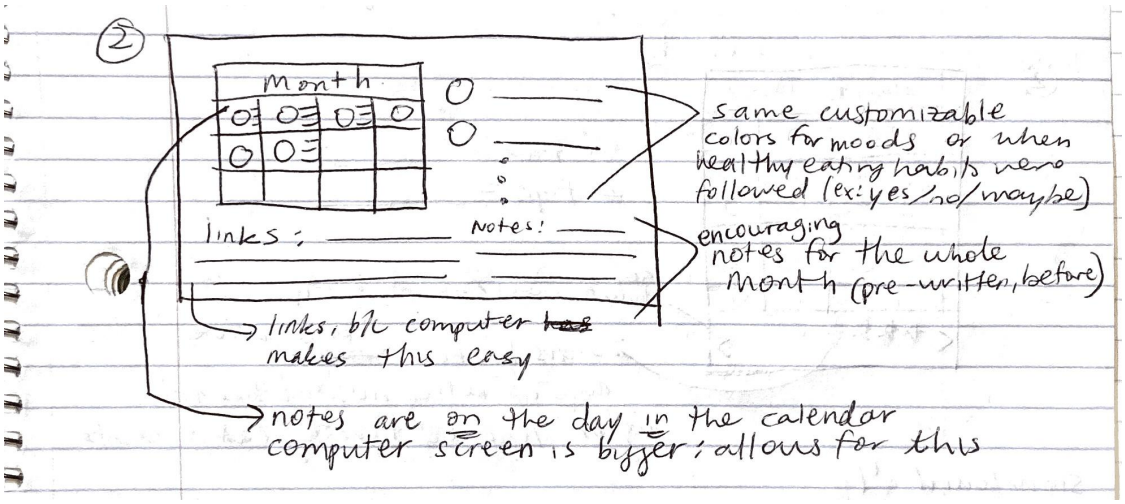


Idea #3 Sketches

Iteration 1



Iteration 2



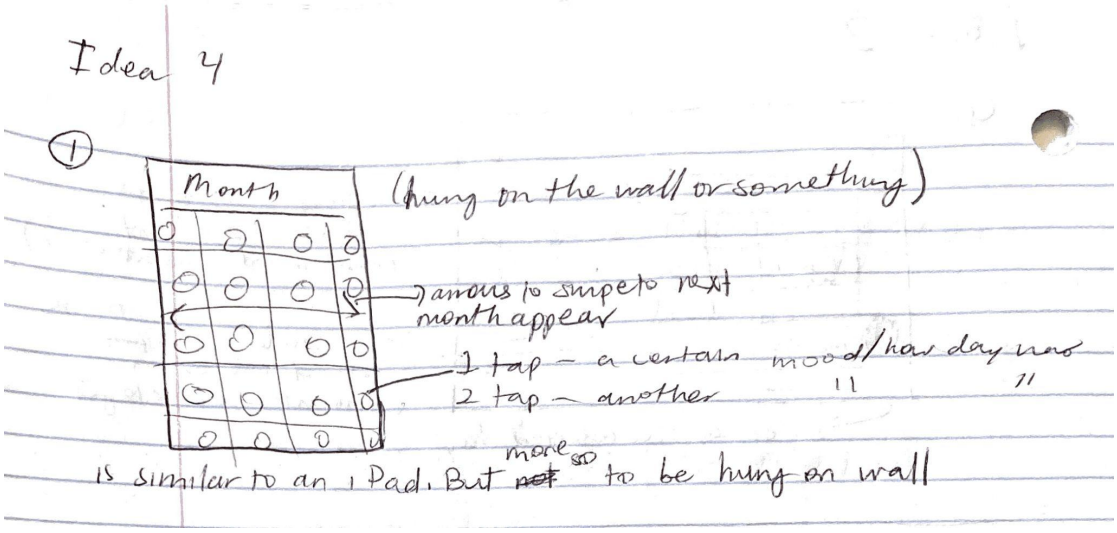
This iteration added notes next to each day, leaving room for more links or other supportive/encouraging things users wanted to save at the bottom, as well as another notes section that could be used to summarize the entire month as a whole.

Idea #4 Storyboard

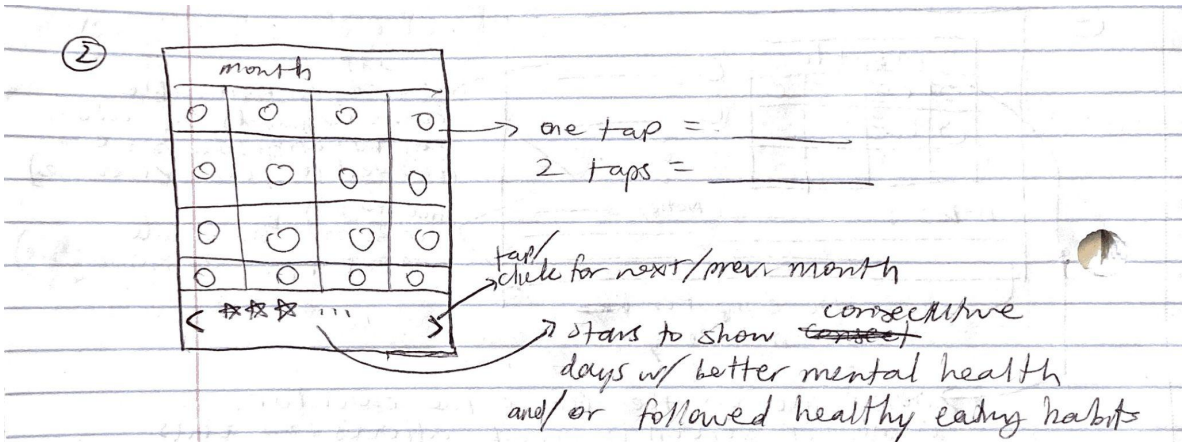
This idea was for something that was similar to an iPad, in that it would be a larger screen as well as touchscreen. However, it wouldn't really be handheld, and instead would be hung up on the wall. This could be useful for taking quick overall glances at. (Storyboard goes from left to right starting on the top row)

Idea #4 Sketches

Iteration 1



Iteration 2

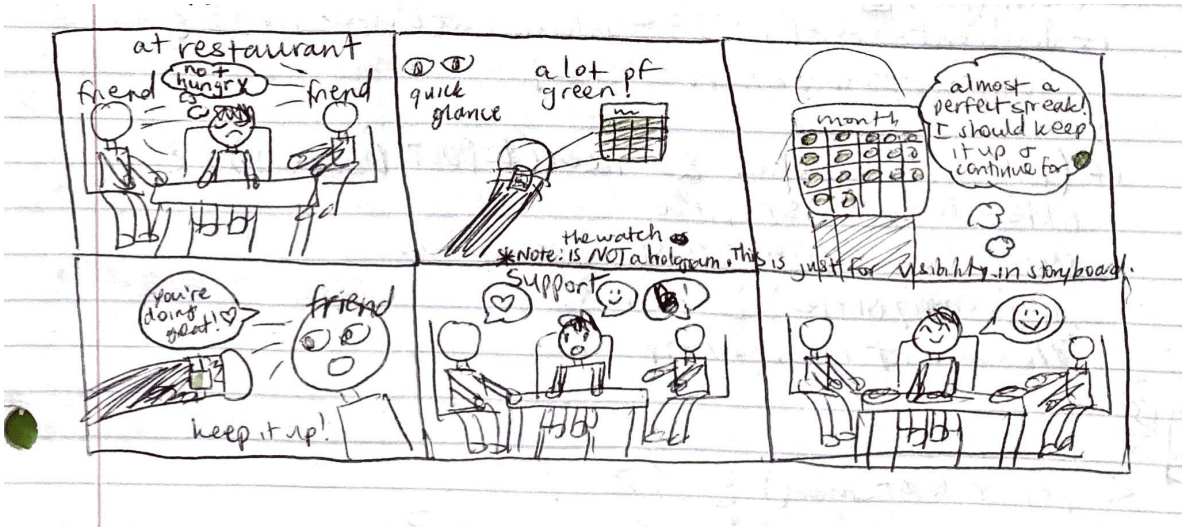


This iteration made the calendar part a bit smaller, and added a "star" system at the bottom. By taking a quick glance, users could see how many days in a row they had better mental health days or partook in healthy eating habits.

Idea #5 Storyboard

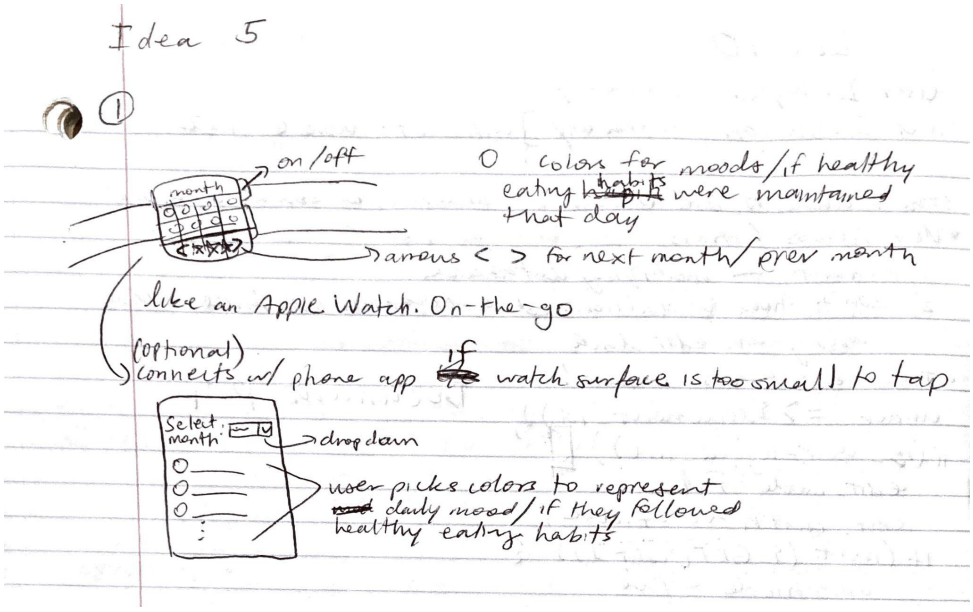
This last idea was a bit more creative, and took the form of something like an Apple Watch. It would be good for very on-the-go moments or for in the middle of situations, and would be easy to take quick glances at. It would connect with an optional mobile app of some sort in case more personalizations/customizations were wanted by the user, as well as in case the watch screen was too small to be used effectively. (Storyboard goes from left to right starting from top row)

*Note: in the storyboard panel 2, the watch would not actually become a kind of hologram. This was just done for visibility within the storyboard.

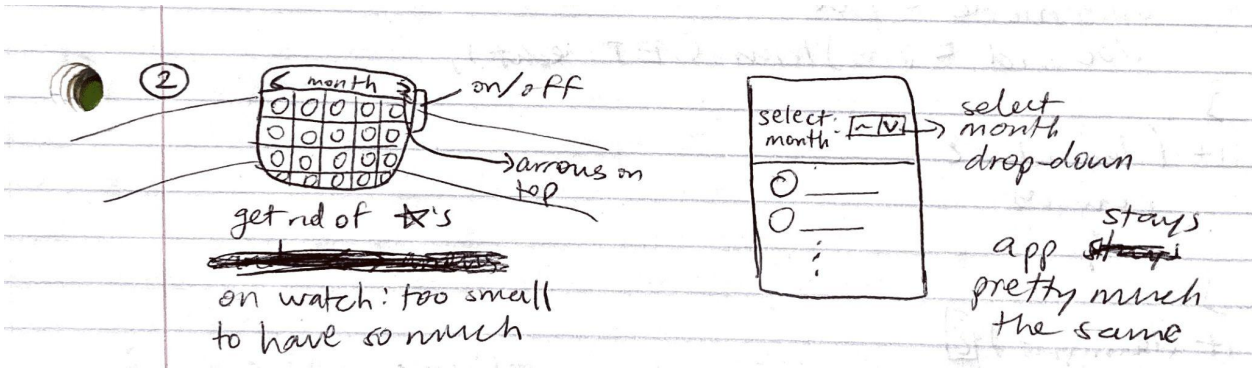


Idea #5 Sketches

Iteration 1



Iteration 2



This iteration got rid of the star system because it would make it harder for users to get a good look at the calendar. The arrow system at top would also work if the user swiped left or right, because it would be touchscreen. The connected optional app would pretty much stay the same.

FAQ

Can ideas be non-technological solutions? Generally no, non-computational solutions (e.g. policies and legal solutions) are beyond the scope of this course. However, we interpret "technology" very broadly here. If you can provide a justification for why something is a "technology", we will not disqualify that idea.

Do ideas need to be technologically feasible? For digital/information technology ideas, their technical feasibility needs to be within existing or near-existing technologies today. Think about this as if you were working in a large software/hardware company and you could in theory apply some resources to develop the product. So, no teleportation or psychic mind-reading, but yes computer vision, AI, smart algorithms, advanced materials, etc.

My design includes an "AI" that will automatically do A, B, and C…. You as a designer will not need to implement the system or algorithm you designed. However, a good designer needs to understand the constraints and capabilities of technology; They can weigh the development effort and investment required by their design against the UX benefits it brings. This is what differentiates a UX designer from a science-fiction writer. -- If you designed an "AI", you will need to provide some high-level information about how the "AI" is gonna work (e.g. what data it will use) and evidence that this is within the reach of current or near-future AI technologies.

How diverse should the interaction flows be? The ideas you come up with should be *substantially different from each other*, that is, they should not be variations of each other (i.e., they cannot all be mobile/web apps). The idea is to innovate, not to replicate, reinvent, or slightly revise existing solutions.

The file with photos of my sketches is too large to submit. What do I do? Find a way to reduce the file size before you submit it to Canvas. The easiest way might be to reduce the size of your browser and then take a screenshot of your sketch. Use the screenshot instead of raw images in your submission.

Part 2. Prototype Design and Testing

It is now time to get feedback from your users, before moving on to fleshing out even more details about the interactions you have envisioned.

Schedule a 30-minute feedback session with each participant separately. During the section, you will present each of your storyboards to the participant, answer any questions they might have, and probe for feedback on such a technological solution.

Interview your participants in ways similar to how you conducted the contextual interviews, except that you will be asking about their (imagine) experiences of using your product design rather than other people's.

- The primary goal of these interviews is **to understand the users. Consider your design as a probe into whether, *why*, *and how* they think, feel, and behave in ways you envisioned. These insights are the most valuable because they will remain valid even after you revise your designs 100 times;**
    - Ask many "why" questions. When interpreting their answers and asking follow-up questions, focus on their motivations, emotions, experiences, and contextual factors.
- **Inviting users to draw on or revise the storyboard** directly is a great way to elicit rich insights.
- Refrain from "selling" or defending your design. Refrain from explaining to the participant why you made certain design decisions, or how they are supposed to feel/behave when interacting with the product.
- Listen closely to both positive and negative feedback, **especially negative feedback**. Positive feedback helps you understand the users (which the contextual interviews already did). Negative feedback helps to improve your designs. Try to identify unintended consequences of your design -- What are the unintended harms of your design that you will need to mitigate? What are the unexpected benefits of this design that you can leverage?

Take notes during the interview and use these insights as you continue to revise and improve your design.

Selecting one final design idea. After the interviews, based on the renewed understanding of your user group, you will revise your designs and create one final interaction design idea. The final idea could be an improved version of one idea that you demonstrated to the participants; it could be a synthesis of a number of different ideas, or it can be a new one that was inspired by the interviews.

Justify your choice (It should be 150 words or less) and represent this idea with a final storyboard.

***** Your Task Q2 *****

Interview One

Participant: The participant meets the inclusion criteria because she is someone who previously had an eating disorder and has already recovered.

Raw Interview Notes

- Storyboard 1
  - interesting idea
  - phone app in restaurant would be useful
  - asked about the red coloring in panel 4
  - (after explaining): "okay, that makes sense"
  - looked a little confused when the character was suddenly :)
  - asked why she was confused
  - "it seems a little unrealistic"
  - "I don't think that she'd just automatically feel better"
- Storyboard 2
  - "This feels more relatable"
  - when asked what that meant — "Just that this is something I'd use even now"
  - browser extension idea was cool
  - would be quick and easy
  - seeing the many green circles in the calendar made sense
  - asked if colors would mean something else for another character
  - felt that this situation made more sense
- Storyboard 3
  - website would be useful
  - still more realistic than idea 1
  - saw that character was not automatically :) after using
  - encouraging notes are nice
  - but how helpful would they actually be
  - "Maybe some way for others to post encouragement?"
  - the character probably wouldn't have been so immediately happy but the friend being there was good
  - but this seemed more probable than storyboard 1

- Storyboard 4
    - cool concept
    - more "futuristic" than others — digital calendar on wall
    - "How would the colors change?"
    - star system would be helpful
    - placement of calendar is useful
    - looking at overall progress
    - unsure how much someone would be thinking about a calendar when out with friends, but could just be her — others might
    - "Would there be a version of this as an app?" (or just wall-hung) — suggesting that an app version of this would be useful even though storyboard 1 was an app?
        - (note: maybe implement some concepts here in app)
- Storyboard 5
    - seems convenient to have
    - small screen - this would be hard to use effectively?
    - good example of situation where this would be useful
    - support of friends was relatable especially in recovery
    - friends seeing the character's watch was sweet
    - a little drastic — the change from not being hungry to suddenly eating
    - would seem better if the watch had more on it

Summary and Reflection

- the change from having a bad day —> using the technology —> suddenly happy was unrealistic
- seeing visual progress is a good thing, and it is useful
- support from other is also something to keep in mind as very helpful in recovery
- while relapses may always happen, it is also good to have some kind of reward for everyday, as progress continues onwards

While recovering from an eating disorder, it does appear that having a way to track progress is a good thing. It is good to remember that when recovering, it is okay to have worse days, whether that means worse days in terms of mental health, or worse days in terms of not following healthy eating habits. Having a quick and easy way to glance over one's good/bad habits over the course of a month would be incredibly useful, especially when in the middle of a situation where one would *want* to see their progress, or just as a daily reminder to take care of oneself. The color-coding of the calendar appeared to be the best way to be able to very quickly look over a month-long period of time and track how well you would be doing, and having this calendar be more suited for on-the-go capabilities such as an app or a watch seemed to be very useful.

Interview Two

Participant: The participant meets the inclusion criteria because they had previously had an eating disorder and have recovered.

Raw Interview Notes

- Storyboard 1
  - good concept for an app
  - wondered if something like this existed already
  - was able to infer what the colors meant/would be used for
  - thought this situation may not happen like this
  - "What kinds of notes would make this character feel that good right away?"
  - the character would realistically not just feel better right away
  - using the app really quickly while in a restaurant made sense
  - getting to customize color meanings might even be fun as well
- Storyboard 2
  - using a browser extension fast during a lunch break
  - character did something they would do
  - not sure if this would be a scheduled thing to do everyday or only when the character wanted to
  - thinking about the green circles while eating lunch was wholesome
  - doing a quick check was nice — "I guess this would be less for in an emergency or when feeling low"
  - daily check, not daily meditation or reflection
- Storyboard 3
  - "Would this website have an area for notes?"
  - (after getting explained more what this idea would have included): "This would be so nice!"
  - the links were not used in the storyboard, but they would have definitely including some links to music on YouTube for comfort
  - the support of the friend was really good to see for the character
  - said that they would let their friends also write encouraging things
  - noted that the last panel didn't have them automatically eating after using the website — the friend was just there to help talk to them
  - the colors to be customized would be useful but also fun, just like the app =
- Storyboard 4
  - "Would this be like a projection?" — (after explaining) found the idea still interesting
  - confused how the color system would work — would the character be able to customize them?
  - would be so useful somewhere in front of a mirror or near one
  - normal to feel a little nervous before going out, especially if going out to eat
  - would be nice to have this calendar while out with friends though
  - liked the star system

    - wondered if this would have a place to see other months all at once
    - or all progress so far
    - would be so nice to look at from afar and see all the glowing colors
- Storyboard 5
    - laughed a bit and said that they wouldn't be able to see the screen
    - "I hope that there'd be a zoom feature"
    - said that this would be really convenient because you wouldn't have to even pull out your phone
    - would be more inconspicuous and subtle
    - easier to check things if you wanted to see how you were doing
    - would be nice if this watch had messages of encouragement — would be like on-the-go nice messages

Summary and Reflection

- the colors and ability to choose what colors would mean certain things would be useful, but also could even be fun to customize
- on-the-go technologies would be the most useful, because you would always have them on hand should you need it

Being able to track progress is also something that was important to this participant. It would be really useful to be able to look at progress over a month and see how many days were better or worse. Mental health is important to look after in recovery, and recovery does not only include having better eating habits, but also having a change in attitude towards food and towards oneself, which can be hard. So, having a technology that could potentially help with this, such as helping to track progress or offer encouragement would be useful. It would also be useful to have an overarching way to look at the entire statistics through starting recovery or starting to use the technology, to the present.

Your final design idea

Description: The final design would be a mobile app that has a calendar on it, with the ability for users to pre-set what certain colors would represent (i.e. red = did not follow healthy eating habits that day, green = did follow healthy eating habits, yellow = tried to follow healthy eating habits, etc.). When one day is selected, there would be a place for users to write notes/diary their thoughts. At the bottom there would be a star system, which would track the "best" colors and add one star for each day in a row the user marks the day with that color (i.e. 4 green days in a row would be 4 stars). There would also be a settings/statistics page in which the user could go to and select the month they want to view/change settings for, as well as a place for the user to pre-set the colors and view their overall statistics for that month.

Justification: This idea is a synthesis of some of the ideas that I had presented above. The general frame of this idea is taken from Idea 1, in which I believe that a mobile app would be

the best way for users to effectively take advantage of the affordances that this calendar will have. It combines the star system taken from Idea 4, because I think that this adds yet another way for users to track their progress and habits. This choice was based on both of the interview insights, as both interviews emphasized how helpful it may be to visually see their progress and overall habits in a quick format that would be easily accessible in many different situations. A mobile app would be the best way to do this, because compared to Idea 5, the watch, the app would allow for many more features and wouldn't be confined to whatever could be seen on the small watch screen. Compared to Ideas 2, 3, and 4, the mobile app would allow for more on-the-go access, and wouldn't require a computer or have to be hung on a wall and left at home. However, it would include more of the complexer parts of those ideas such as the star system and color customization, things that the watch wouldn't really be effective in having.

The final storyboard: (the storyboard reads from left to right, starting with the top row)

In this storyboard, I have showcased some of the features that are in this idea. In the beginning, the character is a little nervous and questions if they should even still go out with their friends. After looking at the app, and seeing that they have had 3 good days in a row, they feel a little better that they have made such progress for the month and they decide to still go out with friends. At the restaurant, they start to feel a little uneasy again, and goes to the bathroom to type out these thoughts before coming back and additionally having the support of their friends. They feel much better at the end from a combination of these things, and the app showcases that while it is obviously not the only support that one would need in recovery, it would certainly help at least a little.

** Congratulations! You have reached the end of the assignment! **