Team Prototype 2: Wellness Jacket

Introduction

Tasked with designing a wellness jacket, our design process consisted of four phases: sketching, storyboarding, wireframing, and physical prototyping. Our goal was to make a jacket that provides wearers with information about their skin temperature, the outside temperature, heart rate, breathing rate, and blood pressure as well as syncs with their phone to receive text messages and answer incoming calls. We imagine that the user's phone would connect to the wellness jacket via Bluetooth, so while close at hand, users would not need to frequently interact with their phone. We began our process by using FigJam in Figma to sketch and brainstorm ideas. Next, we used Figma to asynchronously collaborate on the creation of wireframes which were then printed and fashioned into a physical wearable prototype. We used iMovie to edit our videos which were captured asynchronously. Throughout the process to provide a better understanding for the look and feel of the product as a wearable device on the arm. We provided feedback to one another and collected feedback from potential users of the product.

Brainstorm

We began the brainstorming process by creating a FigJam file in Figma and challenged ourselves to create 10 sketches within 10 minutes. Figures 1, 3, and 4 show the sketches that were created during the initial phase of the process. We each took turns describing our sketches, sharing what we liked and where we saw overlap with our own ideas. Figure 1 shows the device situated on the forearm above the wrist. Depicted is the temperature and blood pressure with the time the reading was taken. Additionally, there is a "New reading" button to indicate to users that they can update their health metrics with new medical readings. The sketch in Figure 1 was heavily influenced by the concept as shown in Figure 2, although the orientation of the screen differs.

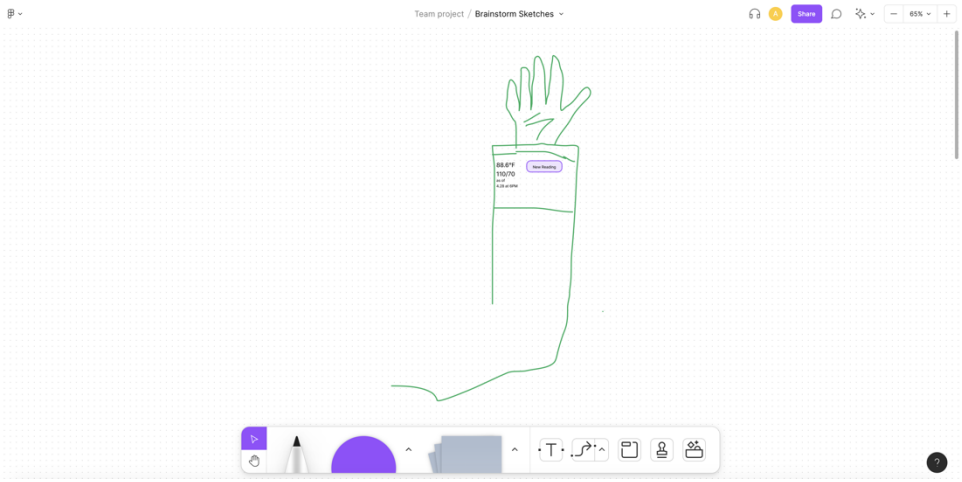

Figure 1: Sketch One

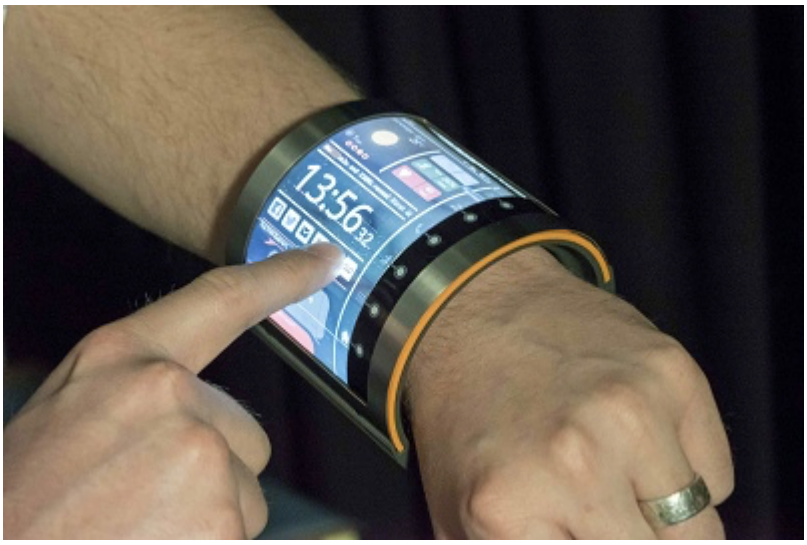

Figure 2: Example of wearable device with a large touch screen (Aleksandrova, 2016)

Figure 3 suggests a different type of screen placement on the back of the arm that is annotated as an OLED display. To explore and magnify the contents of the arm interface, the screen is drawn larger with an arrow pointing to the sketch of the arm. Positioned in the top left is the blood pressure monitor reading with the outdoor temperature pictured below. In the top right is an EKG showing the heart rate at 86 beats per minute and below the temperature of the body. In the bottom right is a connection icon signaling that the screen is connected to a nearby device. Also included in the sketch is a depiction of the exoskeleton of sensors that are interwoven within the jacket's materials to sense and collect various types of data such as blood pressure, skin temperature, heart rate, and outdoor temperature.

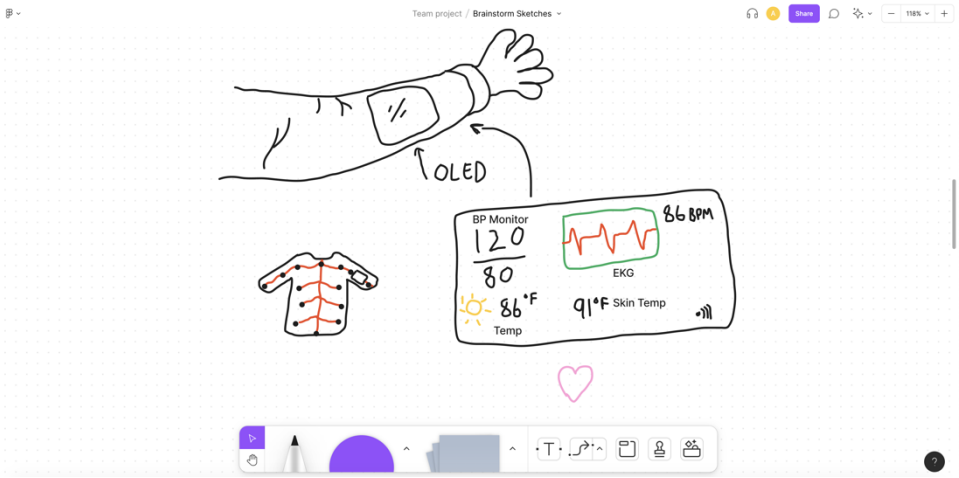

Figure 3: Sketch Two

Figure 4 focuses on potential elements to include within the wellness jacket display. Although not depicted, the configuration described during the brainstorm session is like the sketch in Figure 3 with the screen positioned on the back of the arm. At the top, left of the sketch is a heart showing the heart rate to the right and a blood pressure meter below to indicate whether the user has good, elevated, or bad blood pressure. In the center is a sneaker and rectangle to represent the total number

of steps. Below the step counter on the left is the outdoor temperature and to the right is a text message notification. Beneath is a music player drawn with the album cover, play, skip, and volume buttons. The image of the person scratching their head represents a video call taking place on the screen. To the right of that is an image gallery of photos that can be easily accessed on the go and beneath that is a media player depicting a scene from a Netflix show.

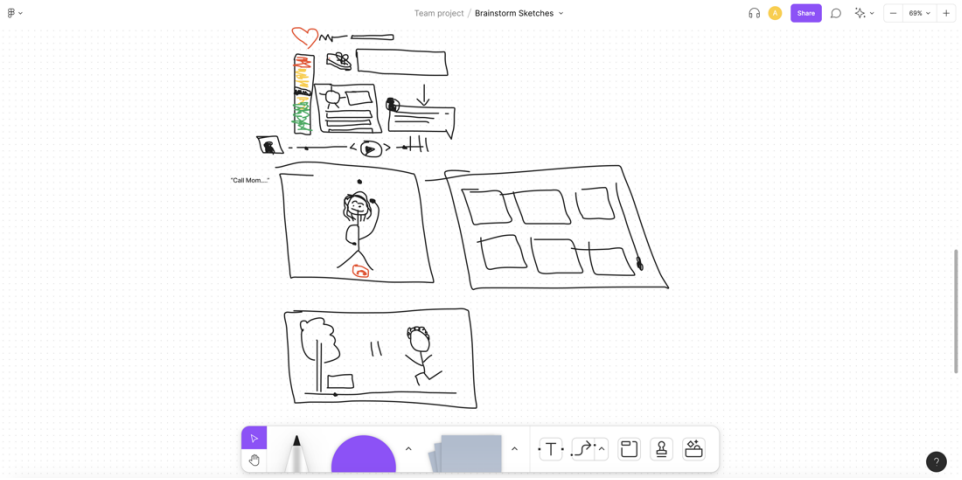

Figure 4: Sketch Three

Within all three sketches, similarities include the use of color to highlight key moments in the sketch. Figure 1 shows a purple button, Figure 3 uses color within the EKG, the temperature reading, and the jack sensing exoskeleton, and Figure 4 uses colors for the blood pressure reading and the end call button. We also noticed that each of our sketches depicted items that looked like widgets having influence from other wearable devices such as smart watches. In deciding on the orientation of the screen, we experimented with moving our arms from a resting position to either look at our forearm (screen orientation in Figure 1) or look at the back of our arm (screen orientation in Figure 2). While both arm movements felt natural, we realized looking at the back of our arms was a more familiar movement since people move their arm in a similar fashion to look at their watch. Additionally, placing a screen along the back of our arm provided more screen real estate compared to confining the screen to the wrist area on the forearm.

Prototype

After deciding on the placement and position of the screen as well as agreeing on the concept of using widgets within the experience, we measured our arms as a reference for the screen size. The width of the screen is 2.25 inches and 5 inches in length and converted to pixels is 216 pixels by 480 pixels. We decided to create the UI for the wellness jacket in Figma due to its collaborative nature which allowed for the most flexibility working remote asynchronously. We chose to create a mid-fidelity wireframe that uses sample text and icons (sourced from the noun project) to tell a story but maintain a greyscale color scheme to ensure we receive the right type of feedback at this stage in the process. The digital display on the jacket is designed to be a flexible material that moves with the body, not a stiff board that restricts motion. Figure 5 shows the wellness jacket digital dashboard with annotations describing each part. Starting at the top, center and moving clockwise is the health monitoring widgets showcasing a user's heart rate, blood pressure, breathing ratee, and temperature. Next is the date and

time followed by a temperature widget that shows a 5-day forecast. Swiping within the widget would reveal the 5-day forecast for another location the user had selected. Next is a step counter followed by an interactive map to use to access directions to and from various locations. To the left is a music player, above is a calendar of events, and the last item is a series of notifications. The idea is that as this dashboard concept expands, users would have the ability to customize their dashboard and swap widgets. For example, instead of Google Maps, Apple Maps or Waze can be used within the dashboard. Or perhaps instead of a map, a video player takes the place to easily stream media on the go. The modular design of the wellness jacket allows for flexibility and adaptability as a user's needs change and evolve.

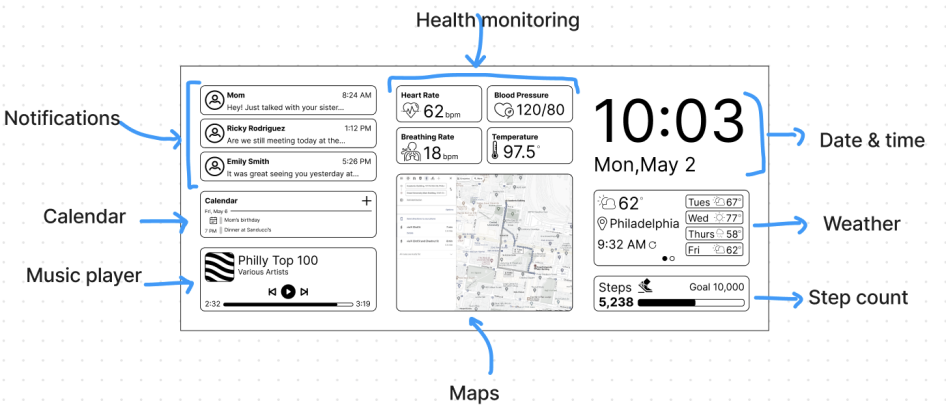

Figure 5: Wellness jacket digital dashboard

After deciding on the initial UI of the dashboard, we brainstormed the storyboard for the video demonstration. Since we are working to produce the prototype within a short span of time, we decided to capture the storyboard textually as shown in Figure 6. Our first idea was to capture the changes in health monitoring, the map functionality, and the step counter by showing a user go for a jog. This would nicely show a wide range of functionality while also showing the wide range of motion a person maintains while wearing the wellness jacket. Our second idea was to capture a video call conversation between two people to inform potential users of the wellness jacket's ubiquitous nature. Our third idea was to capture the flexibility of the wellness jacket enabling a user to complete a blood pressure test anytime and anywhere with ease of use. While continuing to refine the UI, we also decided to show the process of responding to a text message notification using the wellness jacket.

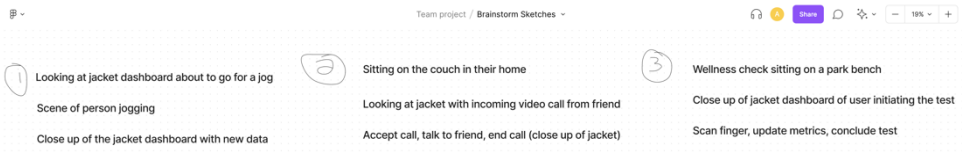

Figure 6: Text based storyboard ideas

A collection of digital screens can be viewed in Figma using the link to prototype (full link in the Appendix). Before printing the UI from Figma to make the physical prototype, we collected feedback from three individuals. In looking at the flow to respond to text messages as shown in Figure 7, if a user taps on a text message, a grey overlay covers the calendar widget and music player widget to allow for

the notifications to take up more space to reply. At first the individual providing feedback was confused as to why they could no longer see the calendar and music widget, but once I explained it was to provide focus and more room for notifications while interacting with them, that interaction flow made sense to the user. Therefore, we decided to keep this flow but if we were to collect additional feedback suggesting this flow is confusing, we would need to make changes in a future iteration.

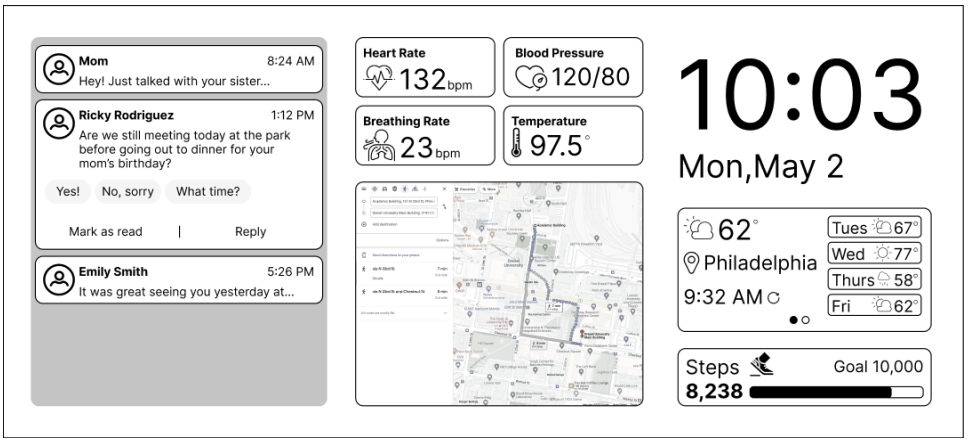

Figure 7: Dashboard text message overlay

The second individual focused on providing feedback on the video call functionality of the wellness jacket. They suggested to move the answer/decline buttons so they're not positioned on the person's chest, which they found to be inappropriate. Since an individual will move within a real video call and the buttons are centered within the screen, we decided to keep the buttons in the same position. The individual also suggested making the call incoming screen a little brighter and was unsure where the camera was located on the wellness jacket which led them to believe the picture in the top right corner was a profile picture and not a live video feed. Additionally, the individual wanted to know where to tap to make a phone call. We did not focus on placing calls in this iteration of the prototype. Overall, they thought that the interface looked very clean and smooth and compared it to the Apple watch they're familiar with using.

Figure 8: Video call overlay and buttons

The third individual focused on providing feedback on initiating the blood pressure test. The individual suggested making the "Check blood pressure" button glow or highlight as seen in Figure 9. We will incorporate this feedback into a higher fidelity prototype when we introduce additional colors. Furthermore, they shared adding additional signifiers to show how the different widgets could be removed, added, or changed such as adding a timer or email widget.

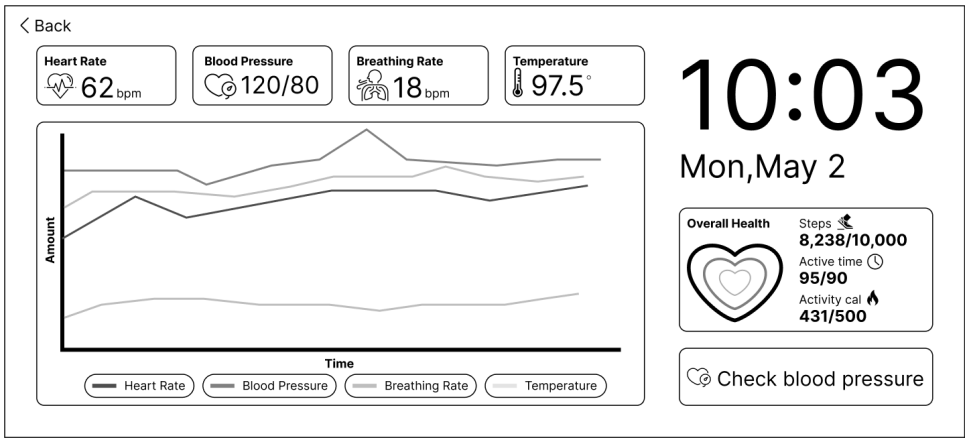

Figure 9: Health overview screen

After iterating on the feedback received, we each took a different approach to creating a physical prototype. We took inspiration from the physical prototype as seen in Figure 10.

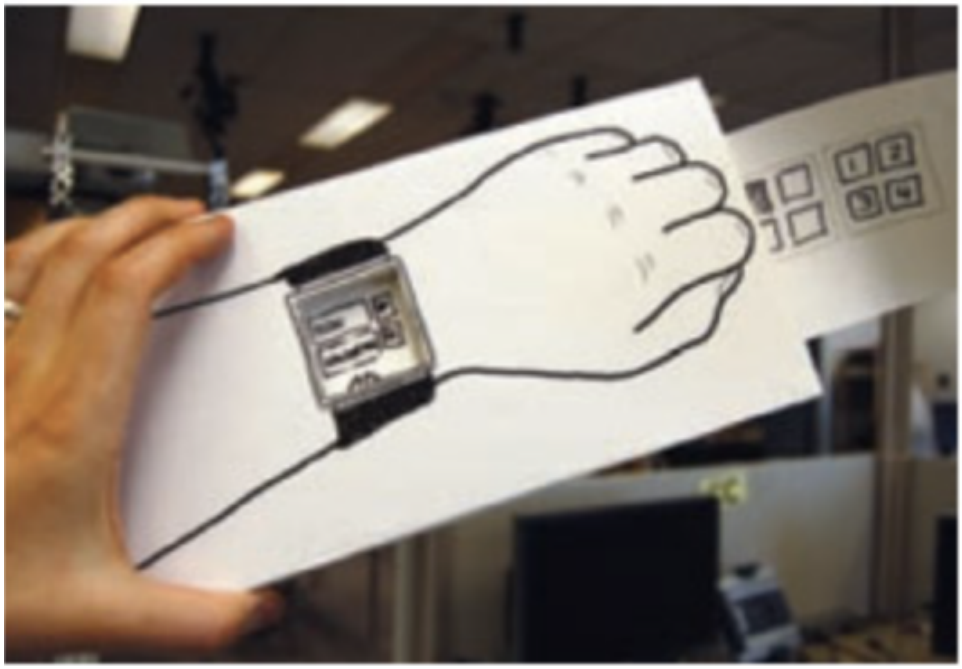

Figure 10: Inspiration for our physical prototype device (Greenberg, 2012)

One approach was to print the UI screens from Figma to use in a physical prototype. We used scissors to cut out the screens and tape to secure the screen to the correct location on the wellness jacket. In Figure 11 we can see that the printed screen was secured to a foam board and in Figure 12 it was secured directly to the jacket using tape. The first approach allowed for the screens to get swapped in and out more easily but the second approach provided more flexibility for the user to move their arm and was more secure to the jacket. The third approach as seen in Figure 13 used the digital prototype on

Figma and had the user secure a smart phone to their arm. Since the interactions were tap based instead of a more complex gesture in the demonstrated flow, this approach worked well for our needs.

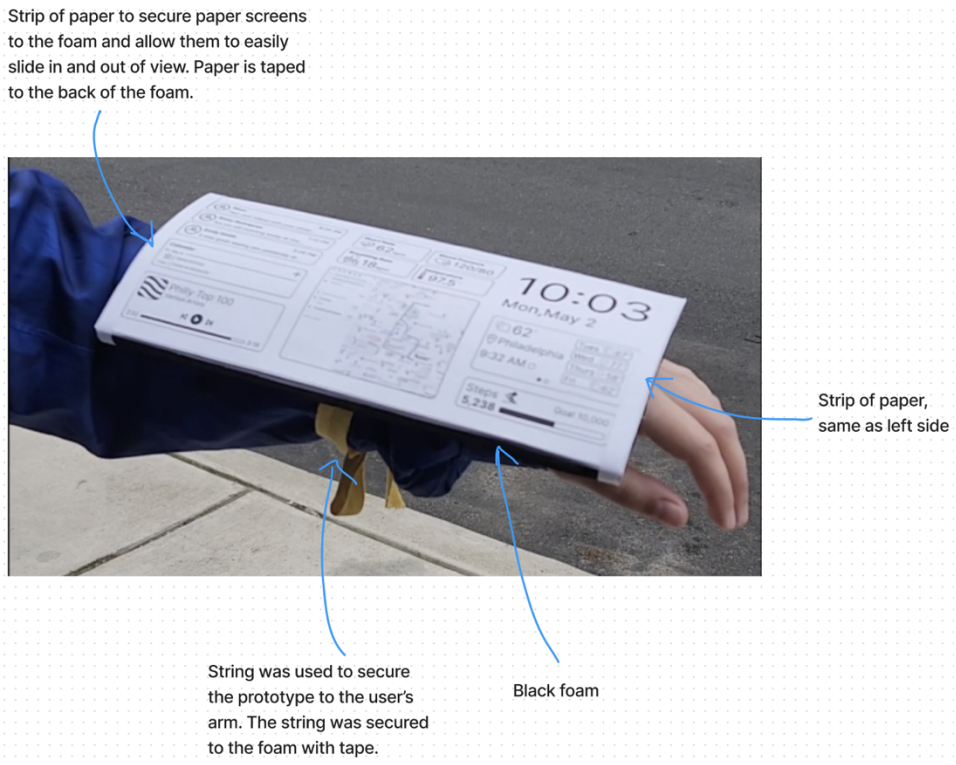

Figure 11: Annotated physical prototype version 1

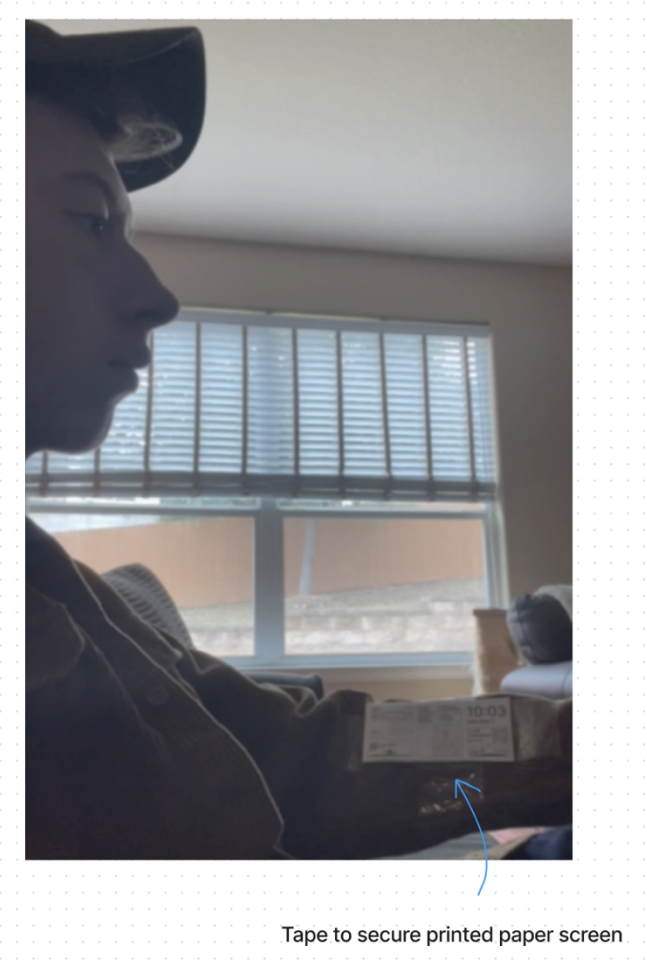

Figure 12: Annotated physical prototype version 2

Figure 13: Annotated physical prototype version 3

In making our video, we used a combination of techniques as seen in visioning videos and video prototypes. We wanted to emphasize the functionality of the prototype while also highlighting visions for future technology. We each recorded one flow in the prototype asynchronously and used iMovie to edit the video clips. You can watch the video demonstration to see the physical prototype in action (full link in the Appendix).

Conclusion

Overall, the physical prototype afforded additional complex gesture interactions that could not be as easily conveyed in a digital prototype such as swiping. Additionally, the physical prototype helped us to understand our design in context. For example, the printed screens in Figure 11 felt too large, and did not scale correctly when printed. Using lightweight materials helped us to convey that the wellness jacket will not restrict movement when in use and help us further enhance the ergonomics of the jacket as we iterate. Our process of sketching, wireframing, storyboarding, and physical prototyping felt like a natural progression for the project as we refined our ideas and iterated in each stage of the process. In the future, as we collect additional feedback that solidifies our ideas, we will proceed to a higher fidelity wireframe, otherwise we will continue to ideate at the low fidelity stage until the idea is more concrete.

Appendix

https://thenounproject.com/

https://www.figma.com/proto/u5CE2HwhNw8jzLgaNgAOng/Team-Prototype-2?node-id=10%3A2&scaling=min-zoom&page-id=0%3A1&starting-point-node-id=10%3A2&show-proto-sidebar=1

https://1513041.mediaspace.kaltura.com/media/teamLenaPrototype2Demonstration/1_ue07r9bn

References

Aleksandrova, D. (2016, February 29). *Organic LCD technology - paving the way to flexible displays*. FlexEnable. Retrieved May 8, 2022, from https://www.flexenable.com/blog/organic-lcd-technology-paving-the-way-to-flexible-displays/

Greenberg, Carpendale, Marquardt and Buxton. (2012). **Sketching User Experiences: The Workbook**. Morgan Kaufman.