

CART 360 TANGIBLE MEDIA - PROTOTYPE PROGRESS REPORT

Documentation URL: <http://anieshadesigns.com/cart360/project.html>

Github: <https://github.com/Aniesha08/cart360/tree/master/Project>

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A Written Response which addresses and relates the implicit concerns of *Why Do We Prototype?* & *Fidelity Levels* to the development process of your Physical Prototype (MINIMUM 512 WORDS).

Prototyping is an important step when working on any project. It is at the prototyping stage that one can determine the problems within the idea/object and find other ways to lead the direction of the project to better suit the project's goal. There are multiple ways of prototyping. Sketches, storyboards, 3D modelling, mini models, user testing are some examples of ways to prototype. When it comes to prototyping, it is given that there will be multiple iterations as it is a process of stepping back and forth to make improvements. A prototype does not need to have all the elements of the project from start to finish but rather it is a process where it is best if you work in parts. This way, you will have the opportunity to reflect on each part's contribution to the final project and see its true value. As for our project, we are working in a team. Therefore, it is really important that we prototype because it is the best way in which we can illustrate our ideas to each other. Another benefit of prototyping is that it will enable us to keep a record of the mistakes and problems that we face during the process of creation. It is important to start with low fidelity prototypes before moving on to mid & high fidelity prototypes.

For our project, we began by creating the appearance design of our device and then moving on to create a storyboard of the user interaction. It is there that we have found a few issues that enabled us to refine the appearance and interaction (mentioned in next section).

Next, we started making low fidelity prototypes where we experimented with mini sketches/circuits for each sensor in order to understand how the sensors work individually and how they capture data. So far, we have set up our Argon device. We were able to get the data of the humidity and temperature using the temperature sensor. We were able to make the microphone capture the sound of a clap and output it through an LED (for the purpose of testing).

Due to time constraints, we were not able to move on to the next stages of the prototype. This is what we would have done next:

Our next step would be to start combining the components together. In other words, we will need to start to figure out how to make one sensor react to another sensor. Once we are able to figure out how they work in our own home, we can start moving to the mid fidelity prototypes and then high. We will begin to test the experience aspect. As the concept of our device is rooted in providing comfort, it is important for us to prototype and find out if the experience really fulfills the intention of our project. For this, we first need to use the Argon device and see how we can use

the Particle Cloud in order to send data to each other's circuits. Next, we will need to start making the sensors react with each other by working with different combinations of scenarios of communication. Following this, we will need to test the materials for the pillow to see which will be suitable for our intention and where to place the sensors. Once the sensors are placed, we will need to test to see if they are effective once they are placed under the material. In the final stage, we need to test the completed pillow and see if it really makes us feel comfortable, present in the moment and removes our anxieties.

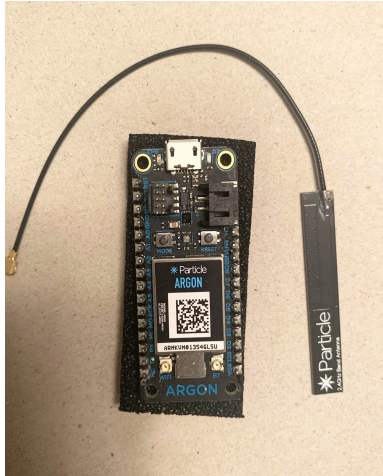
Has your Project's initial intention or supposed meaning changed over the course of researching and implementing the Physical Prototype? If YES or NO – Explain why?

Our project's initial intention and meaning has not changed over the course of implementing our physical prototype. We would still like to use this project as an opportunity to exploit our current situation in the context of the pandemic to create a unique sensorial communication device that could possibly help break the barriers of isolation which will allow us to embrace the presence of our loved ones and connect with them while in our own homes. Our device will empower the user while also challenging them. The interaction with the device and between the users is a reminder of the new normal lifestyle and our ability to adapt to it through the challenges. While removing the distractions that can be found in regular communication devices, it will enable the users to be in control of the moment that they spend with their loved one.

While the intention and meaning of our device has not changed, our concept in terms of the device's appearance and way of interaction has changed. Initially, we had thought of having our device in the shape of a rectangle (shoe-box like). With the placement of the sensors, it almost looked like a speaker/radio. After our proposal meeting, we had realized that the modular structure of the device does not really align well with the feeling that we are trying to emphasize for the users, nor the meaning. We later decided that our communication device can take the form of a pillow. The pillow itself has a symbolic meaning of comfort due to its soft texture. In terms of interaction with the pillow, we decided to use the affordances already embedded in the pillow to our advantage. It has also helped us think about how we can replace our sensors into the pillow. While the interaction with the box-like device had a didactic approach, the interaction that the user will experience with the pillow is much more playful and tangible. For example, we have incorporated a new interaction where the user will need to hug the pillow in order to let the other user know (blinking green LED in pillow) that they are trying to connect with them. When they both are present, the pillow LED will light up in solid green. We are also thinking of having notification lights that will enable the user to know if they have missed a connection. For this, we are thinking of placing a condition where if the user has not connected within 5 mins, then only to activate the notification. Missed pulsation: RED, Missed vibration = WHITE and Missed temperature = BLUE. We have thought about not giving the user the opportunity to replay the missed sensation because the intention of our device is to find the moment to connect and be present together.

Technical Evaluation of Sensors & Affordances

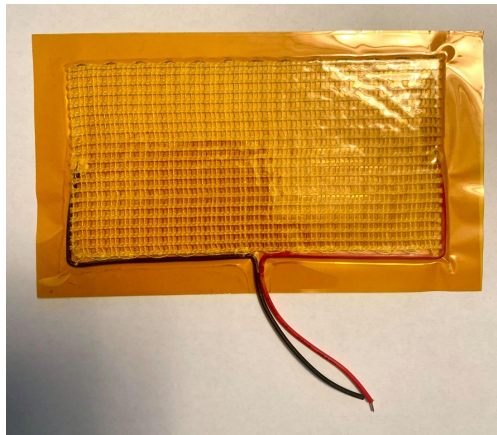
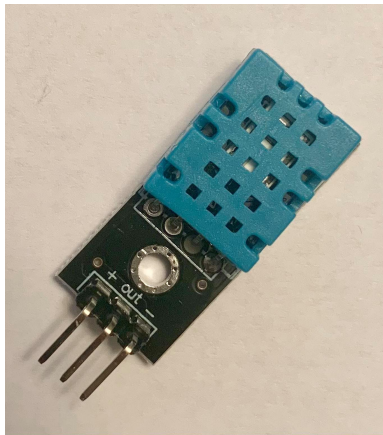
Before starting to work on our prototype, we have setup a meeting to discuss about what sensors would best suit for our project and then we proceeded to order them:



Argon from Particle

Argon is a Wi-Fi development kit from Particle that will enable the device to hold memory and help us send information from one device to another through wifi so that the devices can communicate with each other. The Argon is the heart of our pillow as the communication between the users is dependent on the data that is sent/received. For example, through the use of the Argon, we will be able to make one sensor from one pillow react to another sensor from the partner's pillow. As we will be working with the Argon instead of Arduino, it is important that we select sensors that are compatible with the Argon.

Temperature



Input: DHT11 Temperature Humidity Sensor by KeeYees

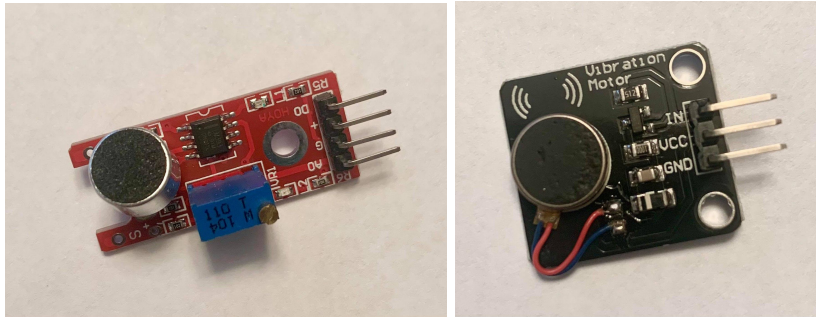
This sensor is able to record both temperature and humidity. It is compatible with different microcontrollers and operates between 3.3V and 5V.

Output: Heating Pad 5x10cm

This flexible heating pad is great to put inside the pillow. "These heating pads are constructed using a mesh of Polyester filament and Micro Metal Conductive Fiber folded into a protective Polyimide Film" (Elmwood Electronics). This enables the heating pad to heat. It is safe to work with and to incorporate into a pillow.

Interaction: User 1 will send their temperature/humidity to User 2 using the temperature sensor and user 2 will be able to feel user 1's temperature by feeling the designated spot for the temperature output. By feeling the temperature of their loved one, the user will feel a sense of relief and comfort that their loved one is present with them.

Vibration



Input: High Sensitivity Microphone Audio Amplifier

This sensor will listen to the sounds created by the user. For example, scratching the surface of the pillow.

Output: Vibration Motor Module by DAOKI & Vibration Sensor Module by SenMod

The sound received from the microphone will then be converted into values that will be able to produce vibration through the vibration motor.

Interaction: The vibration sensor can be used to convey a sense of anxiety, stress, discomfort etc. Comfort, love and happiness are not the only emotions that we as humans would like to share with our loved ones. Sometimes we need to share our negative feelings and in return, receive our loved ones' support, attention and sense of empathy. The amount of vibration (amount of sound created by the sender) will convey to the user the intensity of their loved ones anxiety.