

Team 203

S.I.R.E.N.

(System for Immediate Response and Environmental Notifications)

Jan, 18, 2024

I. Idea Generation

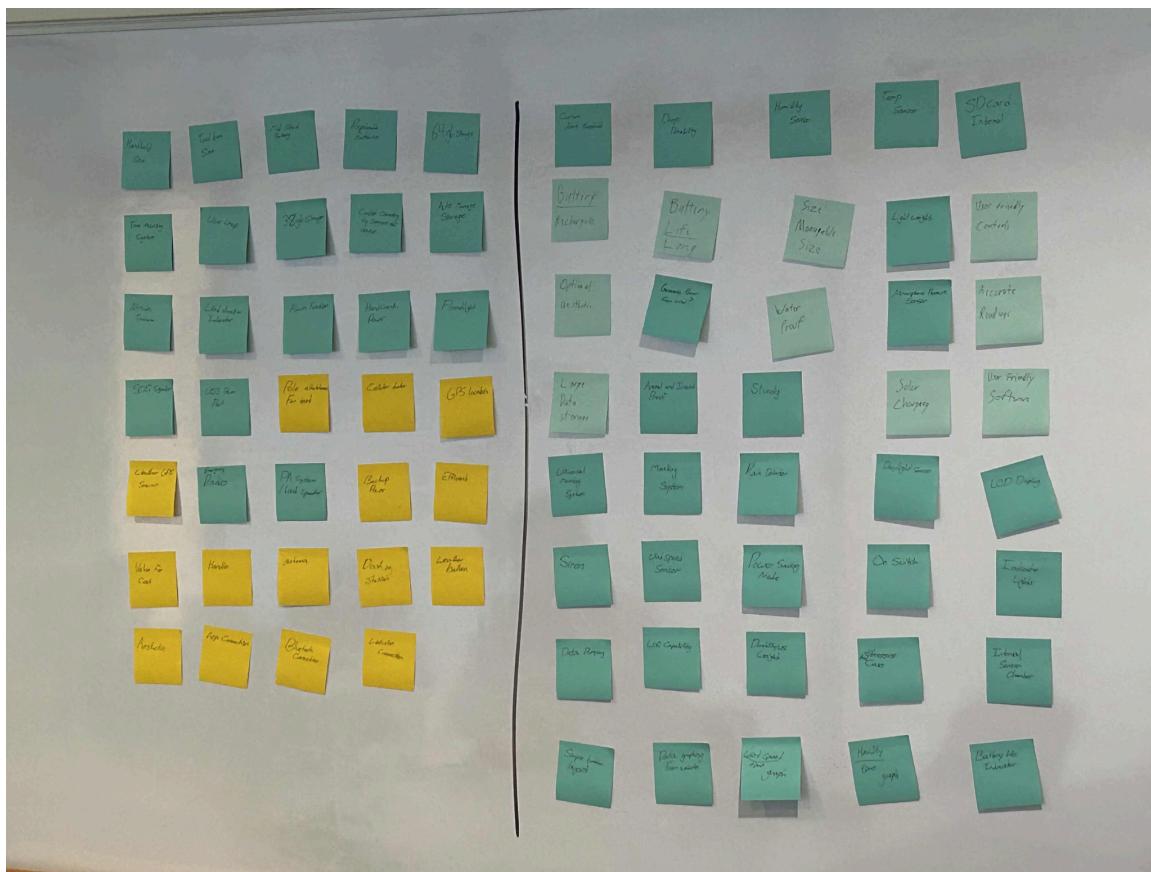
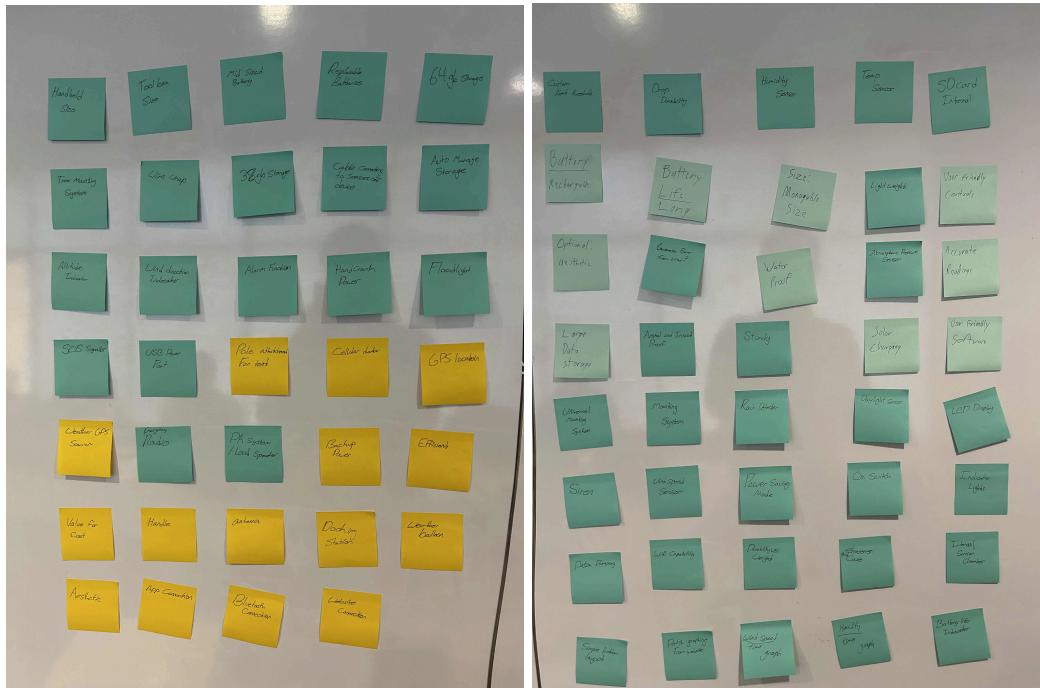


Figure 1 “Unsorted Ideas” Here was more of us throwing various ideas that sounded good using inspiration from our user needs.



Figures 2 and 3 “Zoomed in Unsorted Idea Board”

2. Sorting, Ranking, and Grouping of Concepts

Methods Used for Sorting/Ranking:

Hardware, Design, Features, and Data were our sorting methods. We created these 4 categories that were distinct from one another.

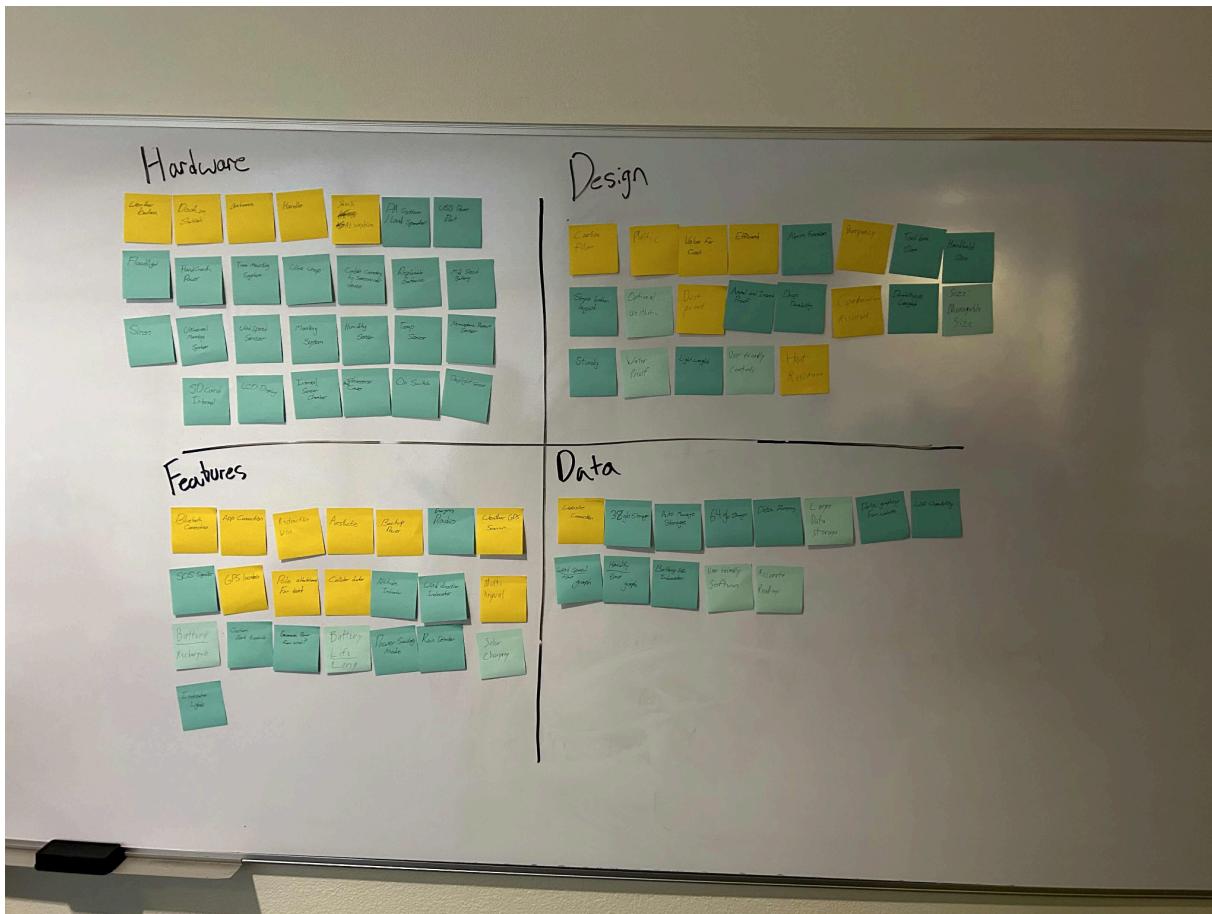


Figure 5 “Sorted Ideas”

Design Concepts Developed:

Shared Concepts:

- Raid siren
- Wind Speed and Direction Sensor
- Atmospheric pressure sensor
- Rechargeable Battery
- Stores all data on an SD card and dumps it to the website once connected to the internet

Discussion:

We took these factors and discussed possible opinions from these concepts. All in all we choose to design some kind of early warning system that alerts the user. For this we'll need a set of sensors that activates a siren.

Results:

Some kind of Alerting device such as a siren or speaker is possible since it would be either a GPIO pin or a motor driver system, which both are compatible with a microcontroller (SPI).

Temp sensor would work as it's I2C communication and programmable via pic microcontroller.

A smoke detector would not be possible with our current capabilities as it requires a radioisotope and various other chips that go above the scope of our technical abilities.

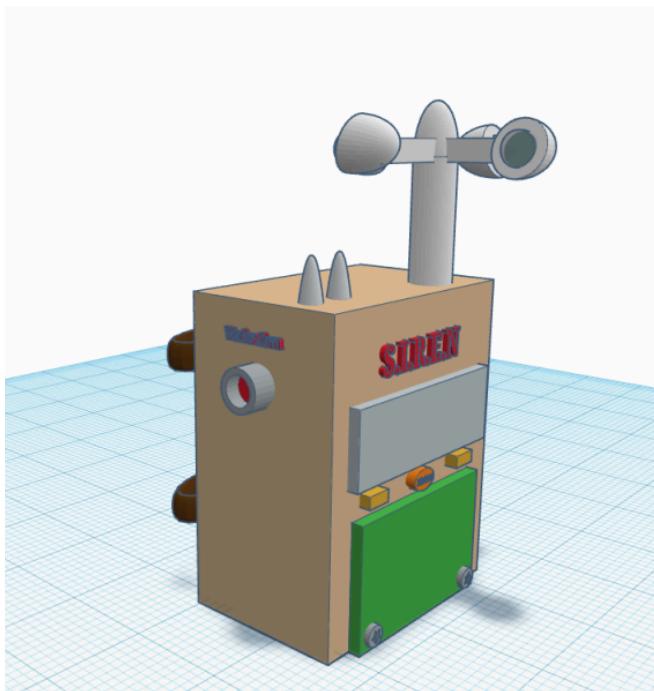
Having a light sensor is within our scope of technical abilities, which is I2C.

Concept 1:

Name: Molle Backpack Weather Device

Description: It's a device that can be attached to both a tree and a backpack that provides weather readings to the user and their company.

Visual Representation:



CAD by Ryan Tellez using tinker cad

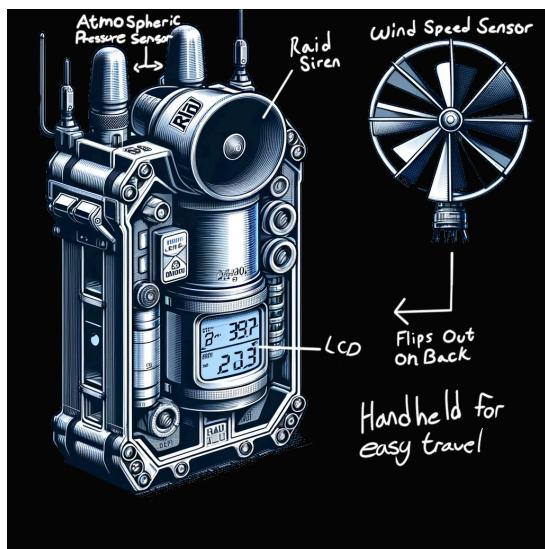
Key Features Highlighted: It can have its battery replaced without the device being removed from the placed position. It also has a button guard around the sound alert button to prevent accidentally pushing. Ryan wanted to have something that was portable and able to strap on a tree.

Concept 2:

Name: The Handheld S.I.R.E.N.

Description: Small and compact this device can be clipped onto a backpack so the weather can be checked at any time while also working as a weather alarm for the nights.

Visual Representation:



AI generated and then modified

Key Features Highlighted:

Temperature and Humidity sensors, Rugged shockproof design, rechargeable and replaceable batteries, Flashlight, and USB Charging port. Payton wanted something that could interface manually with user so we'd need some kind of display for our sensor readings and buttons to tailor the UI for the user.

Concept 3:

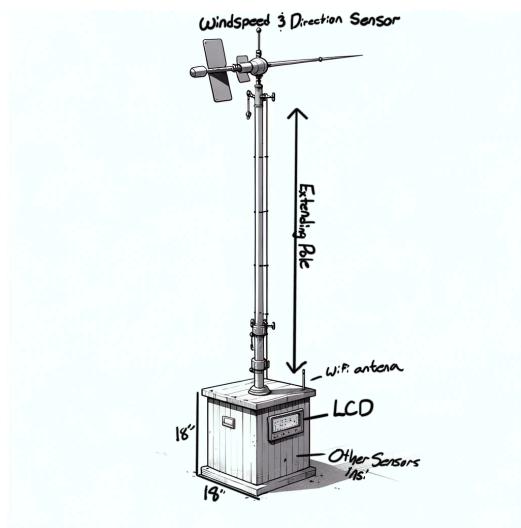
Name:

Weather Alert with extensions

Description:

This concept features an extending pole that houses both the wind speed sensor and the direction sensor. The goal with the extending pole is to allow the sensors to be more airborn to gather accurate data. While doing so, it stores the data it gathers within a SD card. Once the device comes within wifi range, it will dump the data it collected onto a linked website.

Visual Representation:



Key Features Highlighted:

The Pole will extend 6 ft into the air to allow both sensors to collect the necessary data. The screen attached to the hub will report what the sensors read. Abel wanted to include a wind sensor that was tall enough to make accurate readings on wind speed.

(design concepts 2 and 3 were made using AI)