Team 308 User Needs, Benchmarking, and Requirements

1. Voice of the Customer Benchmarking

Search #1
Keywords: “weather station”
Search Results Link:
https://www.amazon.com/Sainlogic-10-2-inch-Thermometer-Temperature-Barometer/dp/B0C659C2LJ/ref=sr_1_1_sspa?crid=SH2NLJS7MNOX&keywords=weather+station&qid=1705369964&sprefix=weather+station%2Caps%2C156&sr=8-1-spons&sp_csd=d2lkZ2V0TmFtZT1zcF9hdGY&psc=1
Selected Product: Sainlogic Weather Station

Price: $49.99
Vendor: Amazon
Description: Indoor and outdoor weather station with a 10.2 inch display. It has a wireless thermometer and tracks humidity,barometer, weather forecast, moon phases and has an alarm. It is accurate and reliable with storage and it is easy to set up.

Positive Comments

Voice of the Customer	Restated Customer Need
“Very satisfied with this weather station. The color display is bright and easy to read. The instruction manual was very helpful with setting up the station. Have had it since Christmas and so far the accuracy has been very good.”	1. The weather station is bright and clear to read. (explicit)
“I found it very easy to setup the unit. The display is very clear. The most difficult part was trying to find a location to install the	2. The weather station is easy to set up and build. (latent)

weather gauge itself.”	
“I was extremely pleased with the product quality. I found the installation to be very straightforward. Once installed the readings were almost identical to what was being reported by our local weather station. I am encouraged that the product will stand up to our local beachfront weather conditions. Recommend for future potential purchasers.”	3. The weather station is high quality. (explicit)

Negative Comments

Voice of the Customer	Restated Customer Need
“First things first. I ordered one of these and it never shipped then went into limbo. Amazon sent a replacement and when it got here it was obvious it had already been opened and taken out of the packaging. The box also looked as though it sat on a shelf in a sunny window. No mounting hardware for the sensor or display and although the protective screen cover was still on the display I have suspicion this was possibly a returned item. Second or is it third... Wildly inaccurate. Compared to 2 different branded similar products this one is off by 1-3 degrees on temp and at least 6+ on humidity. It's also not very bright. There seems to be 3 brightness settings but mine just goes from low to high (or as high as this unit will go). When I press the button a third time nothing changes. I bought it on a deal and I guess I should have known better. I'm bummed because I really like the display and there's so many good reviews.”	1. The weather station needs the temperature to be right. (explicit)
“The product is yet another cheap import that doesn't work right out of the box. Do not buy!!!”	2. The weather station needs to be made of good material. (explicit)
“had it a couple of months and the rain gauge quit working”	3. The weather station needs to be working after a period of time. (latent)

Search #2
Keywords: “environment sensor”
Search Results Link:
https://www.amazon.com/dp/B0CCT8WMJW/ref=sspa_dk_rhf_search_pt_sub_0/?_encoding=U

TF8&ie=UTF8&sp_csd=d2lkZ2V0TmFtZT1zcF9yaGZfc2VhcmNoX3BlcnNvbmFsaXplZA%3D%3D&pd_rd_w=S9TBA&content-id=amzn1.sym.74b85f4a-bfbe-49a3-8252-7e9927a19318&pf_rd_p=74b85f4a-bfbe-49a3-8252-7e9927a19318&pf_rd_r=HCE69GGA14NPDCGB0M6E&pd_rd_wg=wyubH&pd_rd_r=a07d18e5-818d-41f6-9035-b3a4b2c392e9&ref_=sspa_dk_rhf_search_pt_sub&th=1

Selected Product: Aicevoos H12 Digital Anemometer Handheld Wind Speed Meter

Price: $59.99
Vendor: Amazon
Description: Anemometer that is handheld that tracks wind speed, temperature and humidity. The anemometer also tracks air volume.

Positive Comments

Voice of the Customer	Restated Customer Need
“This Anemometer is huge compared to my necklace, one that fits in the palm of my hand, but the bulk doesn't take away from its sensitivity. We fly a lot of kites and this helps us choose which ones to put up in the air. Overkill? Maybe, but we love our kites!”	1. The environment sensor has good sensitivity. (latent)
“I purchased this for use with long range rifle shooting. It is nice to be able to pull out this device and know the wind speed and direction before firing. It allows for much better accuracy. This is very affordable for the use I purchased it for. It has been very accurate for me so far.”	2. The environment sensor is affordable and accurate. (explicit)
“It works! Definitely a handy little tool to have around”	3. The environment sensor is useful and works. (explicit)

Negative Comments

Voice of the Customer	Restated Customer Need
“I wanted to measure the air stream coming out of the diffusers in refrigerated cases to determine if there was blockage in the case or fans weren't working well. The propeller didn't rotate and I had to give it a flick of the finger to get it to start rotating. Annoying. Also didn't like the length of time it took to get an accurate temperature reading. I gave up on that right away. I returned the anemometer and am looking for another that works well with low air speeds. It did work well on HVAC outlets, but here the air speed is higher.”	1. The environment sensor gives feedback in a timely manner. (explicit)
“Update - no longer works in light breezes, strong resistance. Defective quickly, not normal at this compliant rate, perfect for measuring the breeze for kite flying or drone flying”	2. The environment sensor still works after a certain amount of time. (latent)
“The Anemometer I received had an unbalanced fan making it struggle to register anything below .5mps. Any measurement below 5 mph will show low. For instance, 3 mph wind will show at 2.x miles per hour. It begins to register within 10% at 5mps.”	3. The environment sensor is accurate and well made. (explicit)

Search #3
Keywords: “greenhouse temperature control system”
Search Results Link:
https://www.greenhousemegastore.com/collections/climate-control/products/igrow-800-environmental-controller
Selected Product: iGrow 800 Environmental Controller

Price: $1,605.13
Vendor: Greenhouse Megastore
Description: Thermostat and sensors and controller of up to eight different outputs from fans to heaters. It also tracks the amount of energy used.

Positive Comments

Voice of the Customer	Restated Customer Need
“Can open roll up doors to reduce humidity levels.”	Prevent diseases caused by high humidity. (explicit)
“One of the best controllers on the market. Easy to set up and if you have an issue they have awesome tech support. I have had mine for 5 years with no issues..”	Easy to set up and great tech support. Reliability. (latent)
“It is a great all-in-one controller for dialing in your grow. The CO2 ppm, humidity, and temperature sensor all set up to your preferences automatically is a real game changer. Overall it is a great controller especially since you can link it up wirelessly and I would recommend it.”	Wireless control. Sensors. (explicit)

Negative Comments

Voice of the Customer	Restated Customer Need
“Really, uh there are way too many things to write. The sensor malfunctions randomly and often. There customer service is a guy named al or something, who constantly sends me 10,11,and 12 task functions that involve me busting out an actual voltmeter and literally diving in. I’ve asked them why I am even asked to do this and al’s reply is. “Well.. if you send it	Reliability. (explicit)

to us we really can't imitate the problem here. Plus almost every unit sent to us for repair turns out to be user error."	
"The 15 amp max is a little low especially if you're trying to run a heater and/or an A/C."	More power to run AC and heaters. (explicit)
"This is my second unit after 3 days of use channel 1 and 8 stop working. I googled the replacement parts to a total of $15.66. I called the company asking for a service ticket and got a reply with a bill of $600 to repair it. When I asked why is this so expansive I got no response and my ticket was deleted. Horrible customer service I'll make sure to never use this company or its products again !!!"	Reliability. (latent)

Search #4
Keywords: "Automated Greenhouse Controller"
Search Results Link: [Amazon.com : AC Infinity Controller 69 PRO, Smart Environmental Controller with Temperature, Humidity, VPD, Timer, Cycle, Schedule Controls, for Grow Tent Cooling Ventilation Lighting : Patio, Lawn & Garden]
Selected Product: AC Infinity Controller 69 PRO

Price: $139.00
Vendor: Amazon
Description: A next-gen controller designed to provide AC Infinity devices with smart programming to produce the most optimized environment. This central command unit connects with up to four different devices from fans to lights to provide each with independent climate and

time-based programming. The backlit display reads temperature in Fahrenheit or Celsius and can be switched off while programs run in the background. Built with a kickstand and includes hardware to be hung on walls. The 12-foot sensor probe with thermal-alloy head accurately detects current temperature and humidity. It also detects VPD (vapor pressure deficit), which measures ambient temperature, relative humidity, and the plant's leaf temperature in order to determine the optimal atmosphere. This allows you to monitor growing conditions more closely than if you were to rely on temperature and humidity alone. This product is a part of the UIS™ platform of growth devices and smart controllers, designed to integrate with each other to achieve your ideal environment.

Positive Comments

Voice of the Customer	Restated Customer Need
"Ok, we'll it's the best one today and is incredibly programmable. It doesn't matter if you are using their smart plugs for other manufacturers products or their direct connect devices; they work flawlessly! Set up all kinds of schedules with parameters that allow for incremental fan speeds, light schedules, feeding times. There is no end to the possibilities with this controller. Purchase an inexpensive UIS splitter and control multiple devices through just one port. Daisy chain up to 64 devices on one controller. You can program multiple intensive programs for different "seasons" and scenarios. As you can tell, I'm over the top on this company's product and cannot say enough good things. If you think that because the equipment seems less expensive than others; just know that the quality is there and backed by a 2 year warranty. I'm switching to all AC Infinity products and I'm sure that I will not be disappointed!"	1. Effortlessly manages various devices with limitless scheduling. (explicit)
"WAYYY better than the regular 69 that came with my inline fan... and not just because it's Wifi (which is enormous).... The 69 Pro turns my fan ON when my humidity gets above 72%... ramps up from lvl 1 to lvl 3 (as I set it to do)... until my RH is below that threshold. So now I can maintain a constant RH between 69 and 72... before the fan would turn on only at high lvl.. and would bounce my RH all over the place.... Now I can maintain a constant vpd of .86 - .95... which is perfect for veg...."	2. Improvement on the base model with Wi-Fi, ensures precise fan control based on humidity, maintaining a stable RH (69-72) and ideal VPD (.86-.95) for vegetables. (explicit and latent)
"I'm using this with my exhaust, humidifier, heater and light and now with automations,	3. Automated control for exhaust, humidifier, heater, and light. (explicit)

everything is fully automated for day/night time shifts. The control options are endless. Aside from watering and plant maintenance, I feel like with a bit of effort I can really set it and forget it, and come back to beautiful harvests.”	

Negative Comments

Voice of the Customer	Restated Customer Need
“If it worked consistently and well, this would be a no-brainer 5 star controller. Instead, the UI is confusing, and then even when you think you've figured it out you hit one of the numerous bugs present in the firmware and it still doesn't work as advertised. It IS possible to get it to work - but it's difficult, frustrating, and will require a lot of reading on how to get around the many bugs in the software. The iOS app is not much better - good luck getting that to work as well.”	1. Confusing UI with numerous coding bugs. (explicit)
“Unit requires powering off to regain connectivity. A lot. This is no good for anyone planning to leave their garden unattended for a day or two.”	2. Frequent loss of connectivity. (latent)
“Another not ready for production release that had potential but fatally flawed execution. AC can't release even quasi-stable firmware. Product is junk, spend more and get something useful. This controller can't even maintain fan speed.”	3. Unstable firmware, can not properly control fan speeds. (explicit)

Search #5
Keywords: Humidity Meter
Search Result Link:
https://www.amazon.com/s?k=humidity+meter&rh=p_36%3A19500-&crid=34IMMHYFR24FE&qid=1705539454&rnid=2661611011&sprefix=humiditity+%2Caps%2C145&ref=sr_nr_p_36_0_0

Selected Product: Ambient Weather WS-2000 Smart Weather Station
Price: 299.99
Vender: Ambient Weather
Description: Wireless all-in-one integrated sensor array measures wind speed/direction, temperature, humidity, rainfall, UV and solar radiation

Positive Comments

Voice of the Customer	Restated Customer Need
“I think the price is not bad considering what you get. I love the ability to add extra temp/humidity (and I think other types of) sensors. This system works well. I can see my data from the console, or from the Ambient or Weather Underground apps on my phone, from anywhere I happen to be in the world.”	The weather station gives feedback in a timely manner. (explicit)
“So after 2 years, the weather station is functioning as it did on Day 1. I still have the same lithium ion AA batteries that I started out with and can easily go another year, maybe more.”	The weather station is reliable. (explicit)
“ I'd give it 9/10 overall. Slight deductions for the console, which can be a little clunky to use, but once you get the hang of it, it's not bad at all. Otherwise, the system is largely "hands-off" once it's up and running, and all you have to do is monitor the data when you want to. Speaking of data, I think you can save weather data	The weather station needs to be easy to use. (latent)

records to a small memory card that you install in the Console. I've done this - but never actually did anything with that stored data - yet. I believe you can export it to a spreadsheet, etc.”	

Negative Comments

Voice of the Customer	Restated Customer Need
“This weather station had good ratings overall. But after a little more than a year of running, the indoor base station just decided to stop working.”	The weather station needs to be reliable. (explicit)
“When I couldn't get the battery compartment open after unpacking I knew I had made a mistake. Cheap plastic construction and the display unit is disappointedly small. I will need a magnifying glass to read the rainfall. I thought for the price it would be much better”	The weather station needs to have good material. (explicit)
“The outdoor sensor array stopped working after 6 months. On Amazon it says the support window has closed for the product and I'm not gaining traction with the manufacturer. For a $300+ product I expected better support. Extremely disappointing.”	The weather station needs to be reliable. (latent)

User Needs

Explicit user needs will be highlighted or colored yellow and latent will be highlighted and colored cyan to track user needs in this document.

Explicit

1. The weather station has bright colors.
2. The weather station is easy to read.
3. The weather station is high quality.
4. The weather station needs the temperature to be right.
5. The weather station needs to be made of good material.
6. The environment sensor is affordable.
7. The environment sensor is accurate.
8. The environment sensor is useful and works.
9. The environment sensor gives feedback in a timely manner.
10. The environment sensor is well made.
11. The system is mobile.
12. The project provides enough power to the whole system.
13. It has a serviceable internet connection.
14. The information should be accurate and precise.
15. It is efficient and user-friendly.

16. The product is made of high quality materials.
17. The software is simple and easy to use.
18. The product is fun to use.
19. The product is safe to use for all ages.
20. The product is affordable.
21. The device has the correct temperature.
22. The device has the correct humidity.
23. The device has the correct atmospheric pressure.
24. The device has the correct wind speed.
25. The device has CO2 sensors.
26. The device can detect pollution levels.
27. The device can detect harmful elements in the air.
28. The device can detect the amount of sunlight exposure.
29. The device can measure the amount of precipitation.
30. The device can detect the types of precipitation.
31. The device is reliable.
32. The device has power to control external equipment.
33. The device can communicate wirelessly.
34. The device can track energy consumption.
35. The device can determine wind direction.
36. The device can show environmental conditions with a high definition camera.
37. The device is protected from damage due to the elements.
38. The device is able to adjust to allow for changes in the environment.
39. The device tracks and records data over time.
40. The device can measure UV radiation.
41. The product has wireless control.
42. The device will be able to work in an environment.
43. The device has a clear screen to read.
44. The product has material that is safe to touch.
45. The directions to set up are easy to read.

Latent

1. The weather station is easy to set up.
2. The weather station is easy to build.
3. The weather station needs to be working after a period of time.
4. The environment sensor has good sensitivity.
5. The product should be easy to use.
6. It saves you time to be more productive.
7. The product can be interchangeable.
8. There should be an allowance for different options.
9. The device is easy to upgrade.
10. The device is easy to repair.
11. The device is powered by renewable energy.
12. The device is compatible with other software.
13. It prevents diseases caused by high humidity.
14. The product can handle the power given.
15. The internet speed should be fast.

2. Organize

Explicit

1. The weather station has bright colors.
2. The weather station is easy to read.
3. The weather station is high quality.
4. The weather station needs the temperature to be right.
5. The weather station needs to be made of good material.
6. The environment sensor is affordable.
7. The environment sensor is accurate.
8. The environment sensor is useful and works.
9. The environment sensor gives feedback in a timely manner.
10. The environment sensor is well made.
11. The system is mobile.
12. The project provides enough power to the whole system.
13. It has a serviceable internet connection.
14. The information should be accurate and precise.
15. It is efficient and user-friendly.
16. The product is made of high quality materials.
17. The software is simple and easy to use.
18. The product is fun to use.
19. The product is safe to use for all ages.
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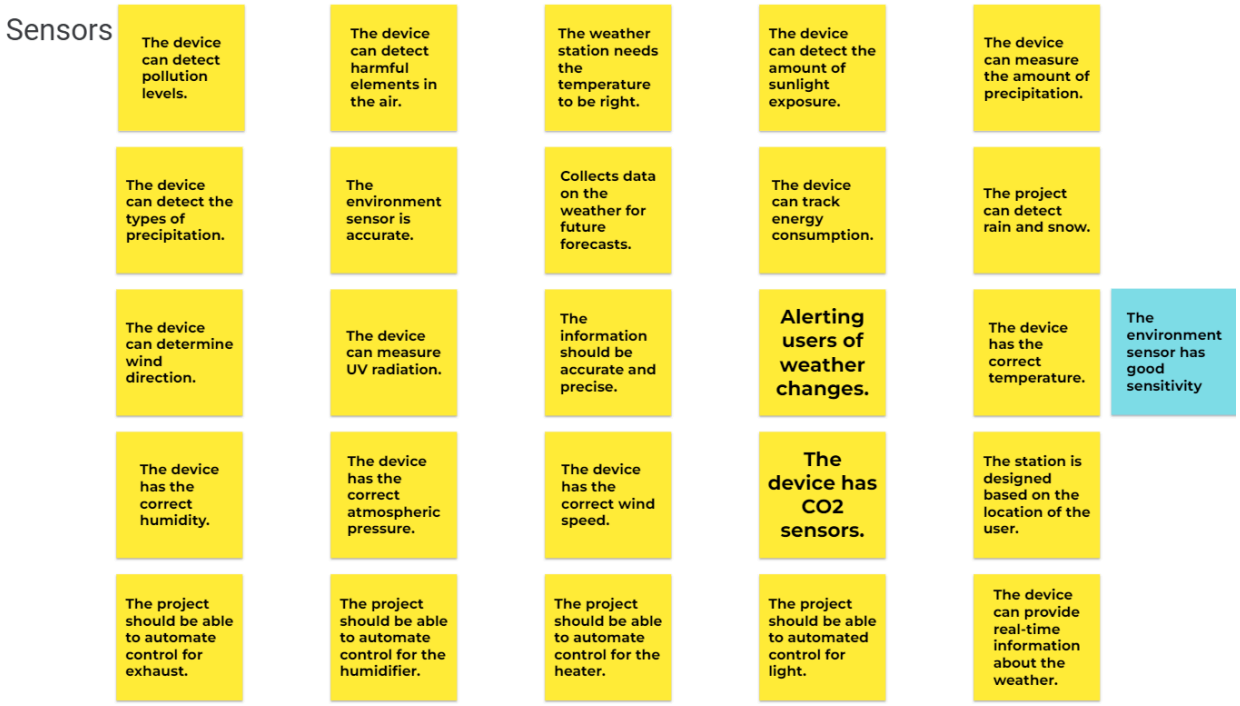
27. The device can detect harmful elements in the air.
28. The device can detect the amount of sunlight exposure.
29. The device can measure the amount of precipitation.
30. The device can detect the types of precipitation.
31. The device is reliable.
32. The device has power to control external equipment.
33. The device can communicate wirelessly.
34. The device can track energy consumption.
35. The device can determine wind direction.
36. The device can show environmental conditions with a high definition camera.
37. The device is protected from damage due to the elements.
38. The device is able to adjust to allow for changes in the environment.
39. The device tracks and records data over time.
40. The device can measure UV radiation.
41. The product has wireless control.
42. The device will be able to work in any environment.
43. The device has a clear screen to read.
44. The product has material that is safe to touch.
45. The directions to set up are easy to read.
46. The firmware should be stable.
47. The fan speed should be sustainable.
48. There should not be confusing UI with numerous coding bugs.
49. The project should be able to automate control for exhaust.
50. The project should be able to automate control for the humidifier.
51. The project should be able to automate control for the heater.
52. The project should be able to automated control for light.
53. The product on the base model has good Wi-Fi.
54. Effortlessly manages various devices.
55. There should be limitless scheduling.
56. Be able to see previous weather patterns.
57. Alerting users of weather changes.
58. The product is easy to assemble.
59. The power being used is AC.
60. The price should be reasonable.
61. The project should be able to be used in high winds.
62. Rain should not damage electronics.
63. The WiFi service should be at an adequate distance.
64. The product can help to learn about the weather.
65. The device can show moon phases.
66. The project can detect rain and snow.
67. It can catch water to use for watering plants.
68. Collects data on the weather for future forecasts.
69. The device can be protected from electricity.
70. The product can be protected from rain.
71. The project can be protected from hail.
72. The station can be protected from snow.
73. The device should be small and compact.
74. It should have a large amount of data storage.
75. The device moves based on the weather.
76. The product allows users to download data.
77. Be used for personal weather tracking.

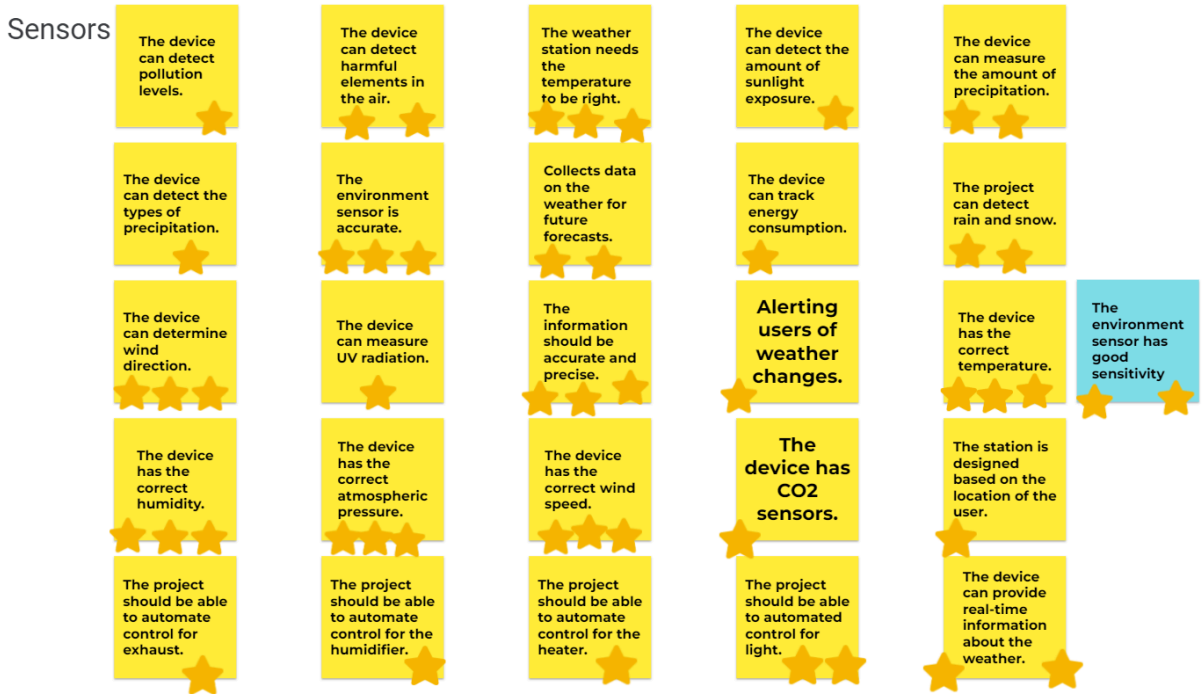
78. Multiple product features.
79. The station is designed based on the location of the user.
80. The device can provide real-time information about the weather.

Latent

1. The weather station is easy to set up.
2. The weather station is easy to build.
3. The weather station needs to be working after a period of time.
4. The environment sensor has good sensitivity.
5. The product should be easy to use.
6. It saves you time to be more productive.
7. The product can be interchangeable.
8. There should be an allowance for different options.
9. The device is easy to upgrade.
10. The device is easy to repair.
11. The device is powered by renewable energy.
12. The device is compatible with other software.
13. It prevents diseases caused by high humidity.
14. The product can handle the power given.
15. The internet speed should be fast.
16. There should not be a frequent loss of connectivity.
17. Ensure precise fan control based on humidity.
18. Easy to troubleshoot.
19. The process to recharge should be smooth.
20. The device can change to different settings.

Grouped List





Sensors

1. The device can detect pollution levels.
2. The device can detect harmful elements in the air.
3. The weather station needs the temperature to be right.
4. The device can detect the amount of sunlight exposure.
5. The device can measure the amount of precipitation.

6. The device can detect the types of precipitation.
7. The environment sensor is accurate.
8. Collects data on the weather for future forecasts.
9. The device can track energy consumption.
10. The project can detect rain and snow.
11. The device can determine wind direction.
12. The device can measure UV radiation.
13. The information should be accurate and precise.
14. Alerting users of weather changes.
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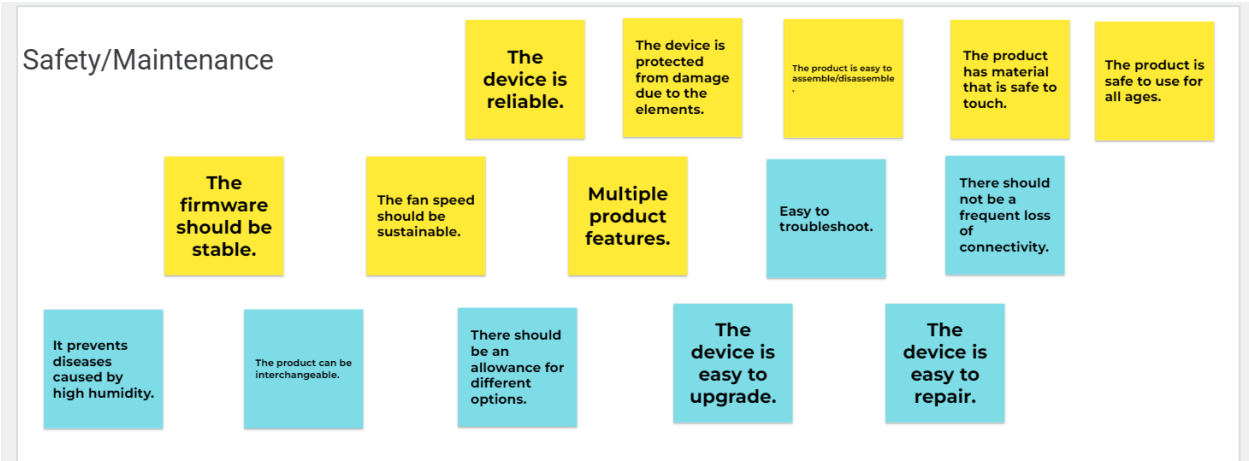
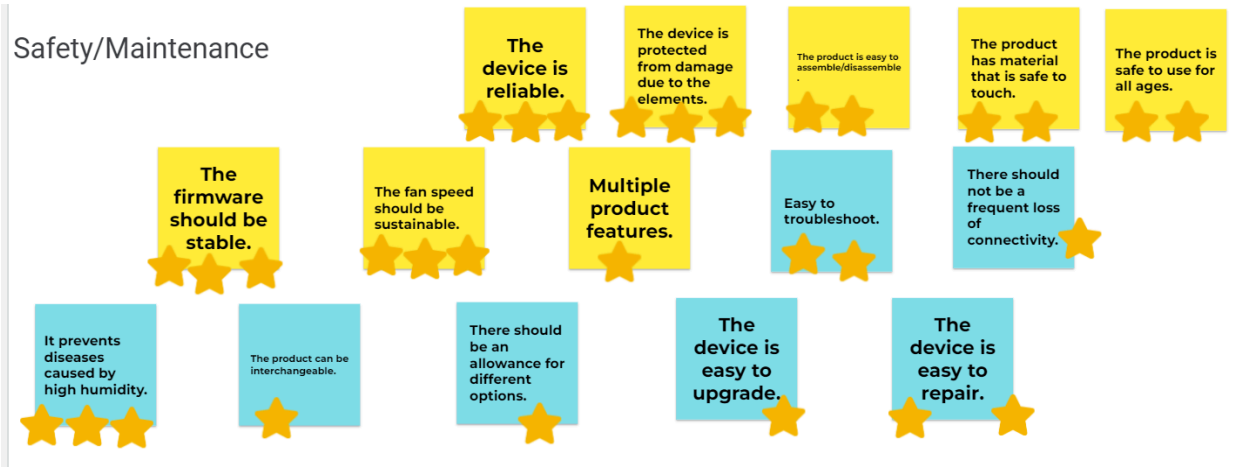
16. The device has the correct humidity.
17. The device has the correct atmospheric pressure.
18. The device has the correct wind speed.
19. The device has CO2 sensors.
20. The station is designed based on the location of the user.
21. The project should be able to automate control for exhaust.
22. The project should be able to automate control for the humidifier.
23. The project should be able to automate control for the heater.
24. The project should be able to automated control for light.
25. The device can provide real-time information about the weather.
26. The environment sensor has good sensitivity.

Usability/Software

1. The weather station has bright colors. ⭐
2. Multiple product features. ⭐⭐
3. The weather station is easy to read. ⭐⭐⭐
4. Be used for personal weather tracking. ⭐
5. The product can be protected from rain. ⭐⭐⭐
6. The project can be protected from hail. ⭐
7. The station can be protected from snow. ⭐⭐
8. The device can be protected from electricity. ⭐⭐
9. The environment sensor is useful and works. ⭐⭐
10. The environment sensor gives feedback in a timely manner ⭐⭐
11. The device can communicate wirelessly. ⭐⭐
12. The device can show moon phases. ⭐
13. The price should be reasonable. ⭐⭐⭐
14. It is efficient and user-friendly. ⭐⭐⭐
15. The device will be able to work in any environment. ⭐⭐⭐
16. The device has a clear screen to read. ⭐⭐
17. Be able to see previous weather patterns. ⭐
18. Effortlessly manages various devices. ⭐
19. The device can change to different settings. ⭐⭐
20. The internet speed should be fast. ⭐⭐

21. The device is compatible with other software.
22. It saves you time to be more productive.
23. The product should be easy to use.
24. The weather station is easy to set up.

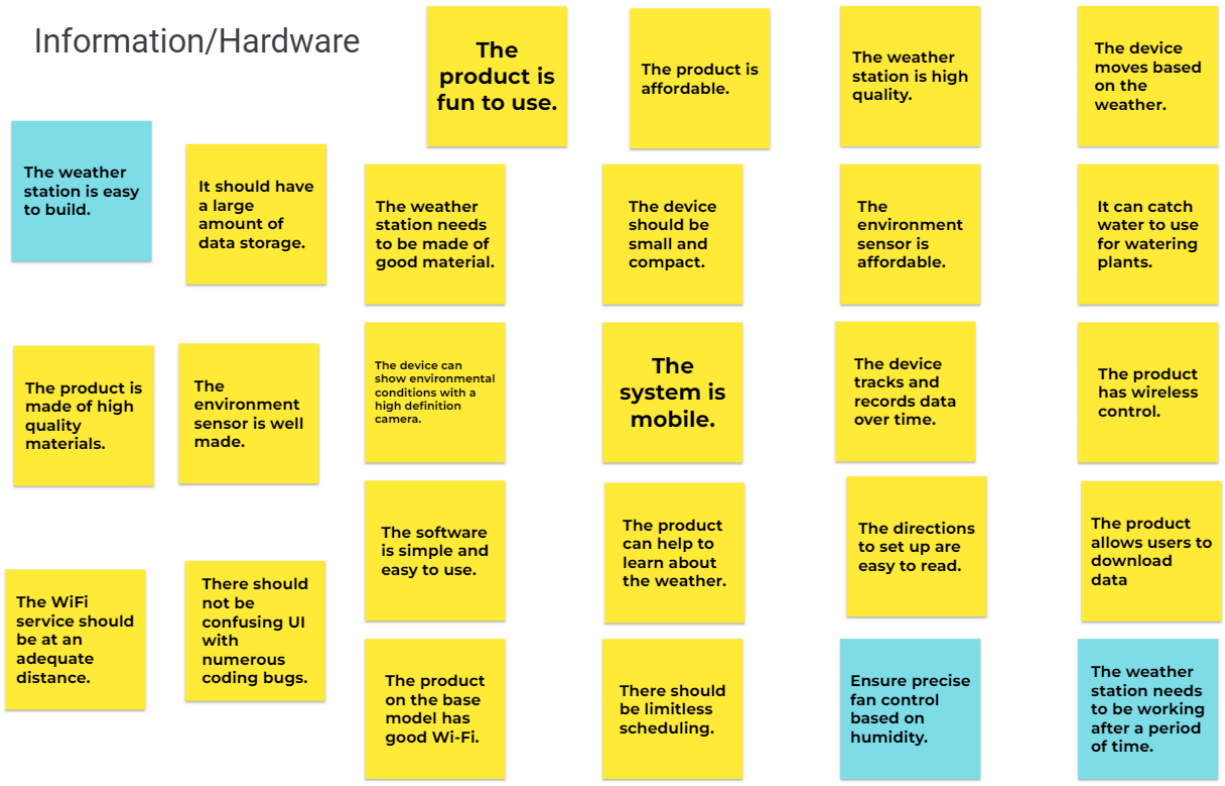


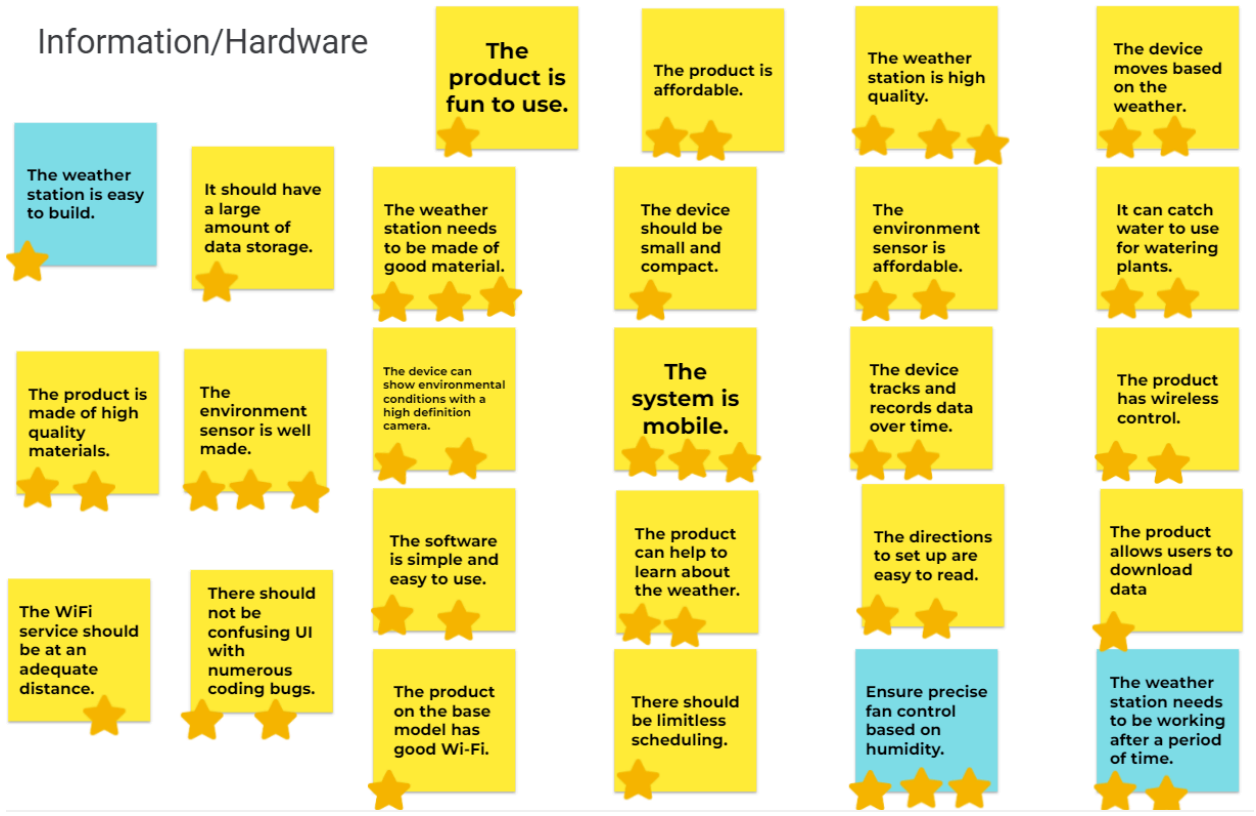


Safety/Maintenance

1. The device is reliable.
2. The device is protected from damage due to the elements.
3. The product is easy to assemble/disassemble.
4. The product has material that is safe to touch.
5. The product is safe to use for all ages.
6. The firmware should be stable.
7. The fan speed should be sustainable.
8. Multiple product features.
9. Easy to troubleshoot.
10. There should not be a frequent loss of connectivity.
11. It prevents diseases caused by high humidity.

12. The device is easy to upgrade. ⭐
13. The device is easy to repair. ⭐⭐
14. The product can be interchangeable. ⭐
15. There should be an allowance for different options. ⭐

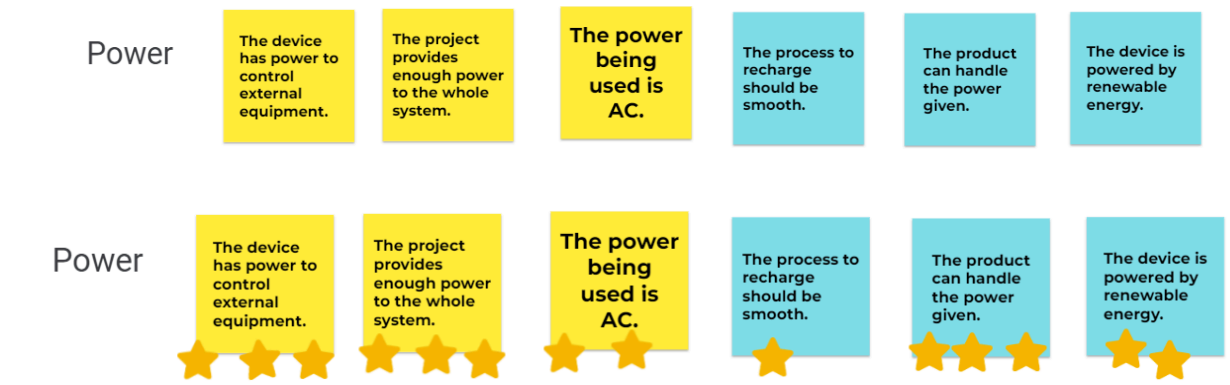




Information/Hardware

1. The weather station is high quality.
2. The product allows users to download data
3. The product can help to learn about the weather.
4. The device tracks and records data over time.
5. The device moves based on the weather.
6. It should have a large amount of data storage.
7. The weather station needs to be made of good material.
8. The device should be small and compact.
9. The environment sensor is affordable.
10. It can catch water to use for watering plants.
11. The environment sensor is well made.
12. The device can show environmental conditions with a high definition camera.
13. The system is mobile.
14. The WiFi service should be at an adequate distance.
15. The product has wireless control.
16. The product is made of high quality materials.
17. The software is simple and easy to use.
18. The product is fun to use.
19. The directions to set up are easy to read.
20. The product is affordable.

21. There should not be confusing UI with numerous coding bugs.⭐⭐
22. The product on the base model has good Wi-Fi.⭐
23. There should be limitless scheduling.⭐
24. Ensure precise fan control based on humidity.⭐⭐⭐
25. The weather station needs to be working after a period of time.⭐⭐
26. The weather station is easy to build.⭐



Power

1. The device has power to control external equipment.⭐⭐⭐
2. The project provides enough power to the whole system.⭐⭐⭐
3. The power being used is AC.⭐⭐
4. The process to recharge should be smooth.⭐
5. The product can handle the power given.⭐⭐⭐
6. The device is powered by renewable energy.⭐⭐

3. Develop Requirements

Product Requirements Document

Project Weather Station

EGR 314

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Version 1.0

Introduction

Global warming has been on the rise for the past few years. There are many people concerned about where the world is going and where it will be in the future. There are many different products out there on the market that can measure temperature, humidity, atmospheric pressure and wind speed. The team would like to create more reliable and efficient products to track the environment.

Objectives

This project uses sensors in a system for a mobile weather station to detect different weather conditions and let the user know of those weather conditions. The weather station should be able to track these conditions with a motor controller.

Stakeholders

Target group:

Individuals and organizations concerned about environmental monitoring and global warming. Encompassing environmental advocates, scientists, researchers, educational institutions, and even businesses with interests in weather-related data.

Target purchaser:

Organizations or individuals directly involved in environmental monitoring, research, or education. This could include scientific institutions, environmental agencies, educational organizations, and individuals interested in personal weather tracking.

Customer service:

Customer service would need to cater to both individual users and institutional clients. It should include technical support for setting up and using the mobile weather station, troubleshooting assistance, and responsiveness to inquiries regarding product features. Since the project involves technology like sensors and motor controllers, a customer service team should be knowledgeable about the technical aspects of the product.

Marketing & Sales:

The marketing strategy for our project would target environmental enthusiasts, scientists, and businesses. We will emphasize reliability, efficiency, and advanced sensor technology, showcasing its role in weather station technology.

Retailers:

Retailers that specialize in scientific equipment, environmental monitoring devices, or educational tools may be suitable for carrying this product.

Regulatory instances:

Depending on the region, there may be regulations regarding the use of mobile vehicles or the collection and transmission of environmental data. Compliance with environmental and data privacy regulations should be ensured, and consultation with relevant regulatory bodies may be necessary.

Use Cases

User Story #1:

Researchers and scientists can leverage the sensors of the weather station to conduct in-depth studies on weather patterns, climate change, and atmospheric conditions. The device could possibly measure temperature, humidity, atmospheric pressure, or wind speed to provide comprehensive data for detailed analyses. For instance, meteorological research projects focused on understanding local microclimates or investigating the impacts of climate change can benefit from the precise and real-time data collected by the project.

User Story #2:

Another valuable use case for the project involves everyday citizens utilizing weather data for personal purposes. Whether monitoring daily weather, conducting personal research, or engaging in casual conversations about weather patterns, the device provides real-time information to enhance individual understanding.

Aspects

1. **Hardware / Product Design**
    1. The device should have high quality materials.
    2. The device should be small and compact for the user to move around with ease.
    3. The sensors (humidity, light, temperature, etc.) within the device should be easy to use and work.
    4. The device should be weather resistant.
    5. The device should have a battery that is both sufficient and sustainable.
    6. The device should be able to have good data storage.
    7. The device should be durable and usable for at least one person.
2. **Software / Functionality**
    1. The device should be able to monitor data.
    2. The device should have a data processing algorithm.
    3. The device should control an actuator based on data.
    4. The device should provide feedback to the user.
    5. The device should be able to handle being constantly used.
3. **Interactivity & User Experience**
    1. The device should allow users to download/view data.
    2. The device should guide users through the product.
    3. The device should allow users to activate different inputs.
4. **Customization**
    1. The device should allow users to monitor for specific patterns.
    2. The device should allow users to customize parts of its appearance.
    3. The device should be able to be used by people of all ages.

5 Manufacturing

1. The device should use surface mounted components.
2. The device can have 3D printed housing.
3. The device can use metal for structural integrity.
4. The device should be designed using ECAD software (Cadence).
5. The device should be built so that repairs, modifications, and replacements can be made without rebuilding the device.

6 Safety

1. The device should have no exposed wiring
2. All actuators should be clearly labeled and be in a safe operating environment
3. The device should have clear instructions for safe use.
4. The device should not have sharp or rough edges.
5. Charging the battery should be able to be done without risk of electric shock.

Open Questions

- How can the device be safe for both the user and against the environment?
- Do two prismatic actuators moving across a designated workspace meet the mobility requirement?
- Should we meet specific dimension requirements?
- Can the device be used over a span of 24 hours?

Milestones

Team Checkpoint 1: 1/26/2024

Team Checkpoint 2: 3/12/2024

Team System Prototype: 3/29/2024

Team Checkpoint 3: 4/26/2024

Innovation Showcase: 4/26/2024