Environmental Sensing Invention

Checkpoint 1

Team 301

Table of Contents

01

Team Organization

Team Members:

- Timothy Drafz
- Salsabil Soliman
- Fatema Alshehhi
- Sivanee Naghichetty

Charter

As a team, we are planning on applying all the knowledge we gained in electrical and mechanical skills into a new product. Our team will put full effort into designing a new environmental sensing product that aids users and is user friendly.

Mission Statement

Our team mission statement is to improve the clean energy generation industry, specifically solar energy, and make it more efficient so that users are able to get the most benefit from their solar energy source.

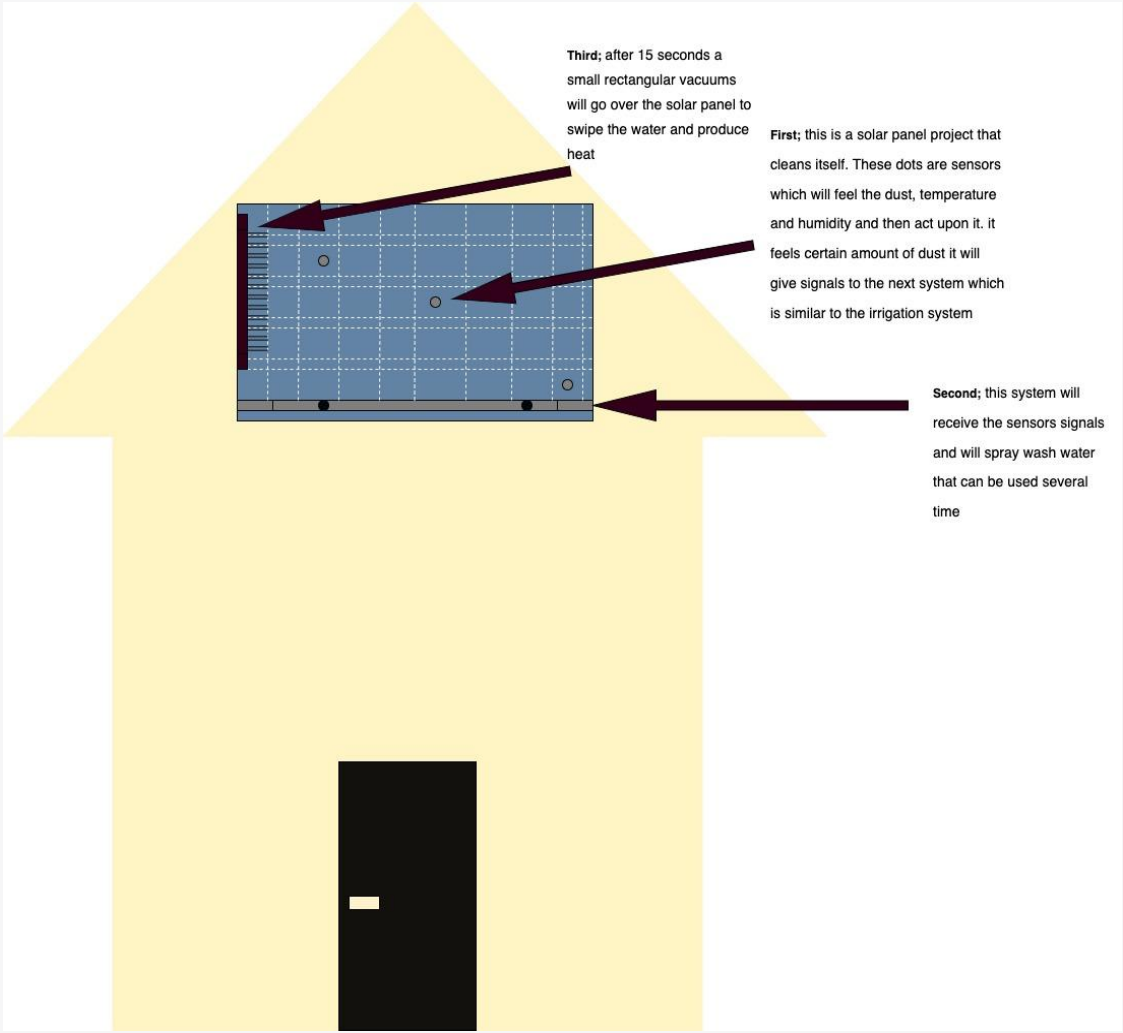
02

Overview of Three Design Concepts

First concept

A Fully equipped Solar Panel

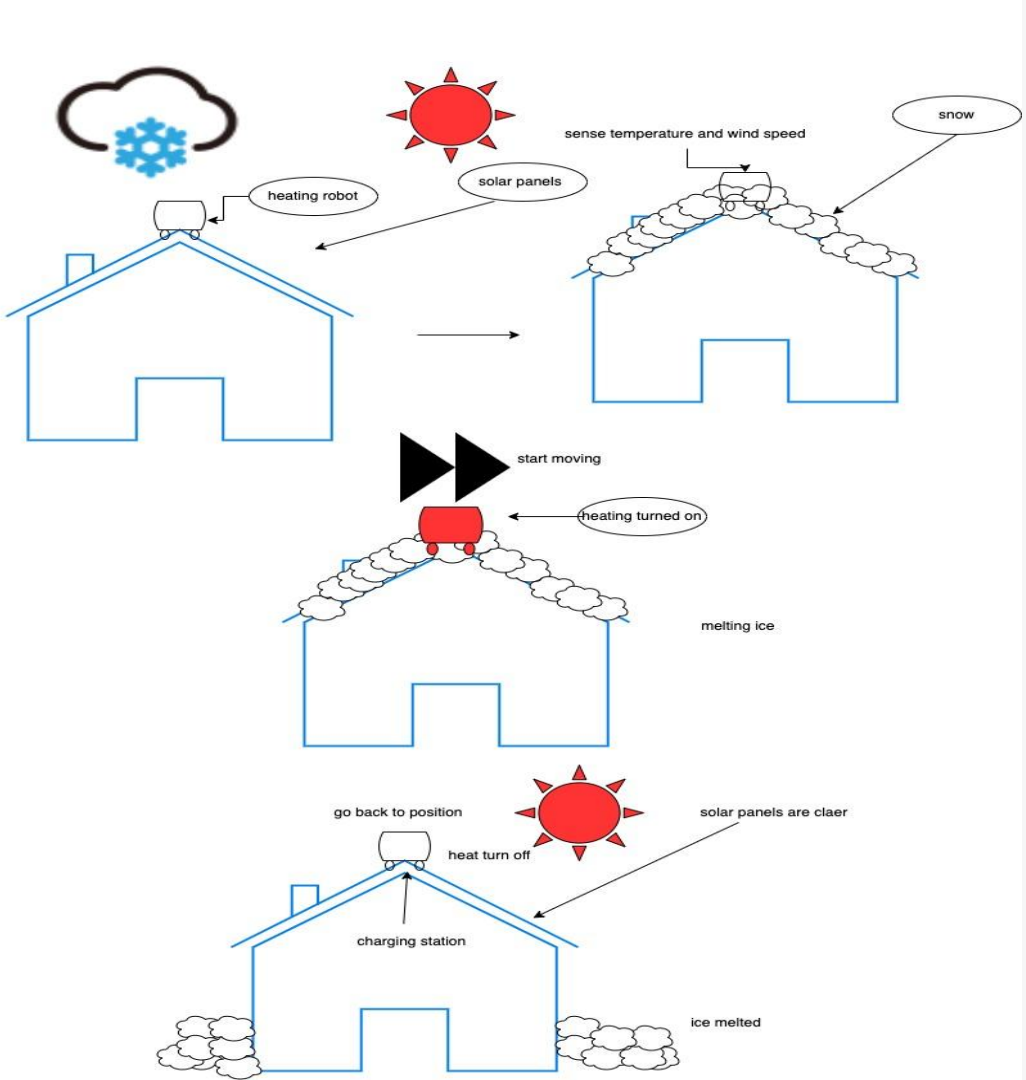
- Sense temperature and humidity
- Spray water
- Air produce and swipe dust



Second concepts

Heating robot

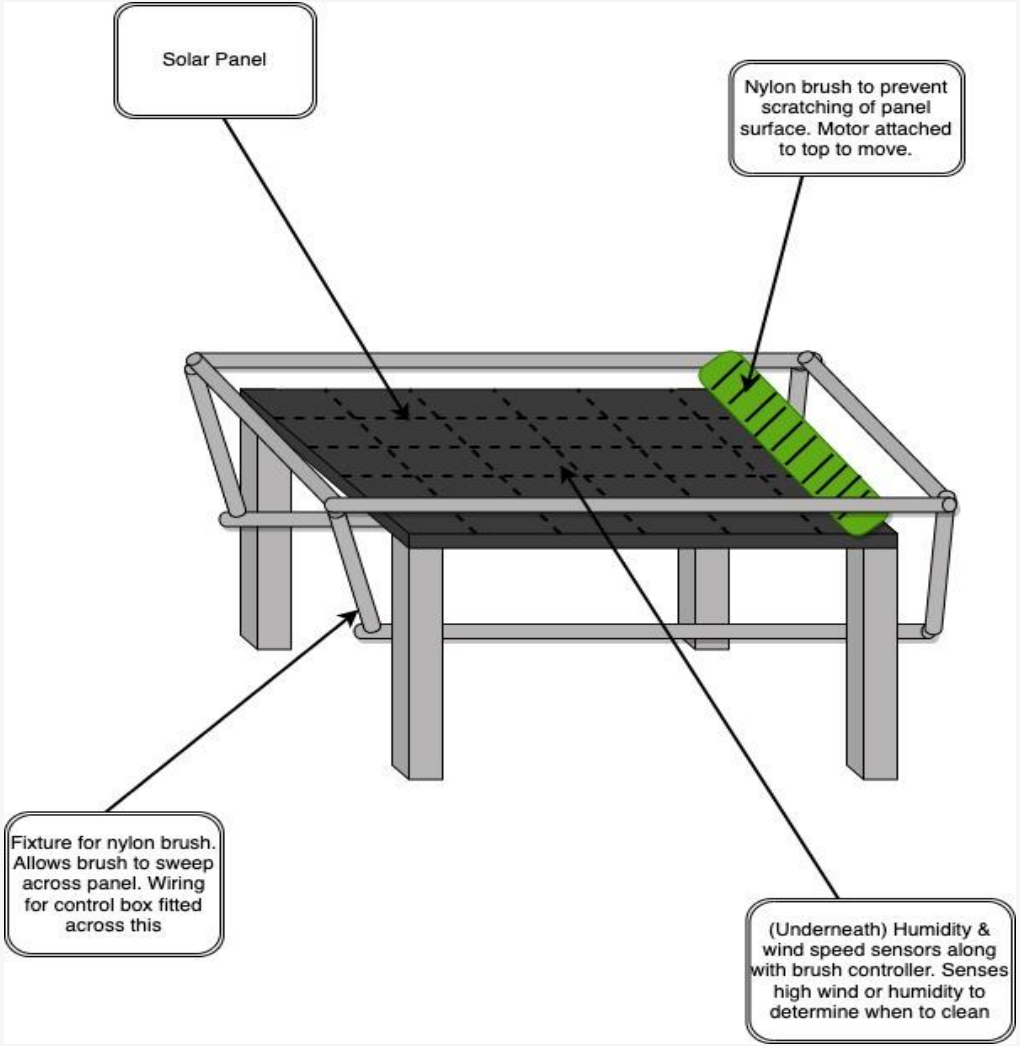
- Sense temperature and wind speed
- Heating turn on
- Moves around to melt the snow



Third concepts

Solar panel cleaning wiper

- Sense humidity and wind speed
- Knows when it needs to clean
- The brush motor turns on

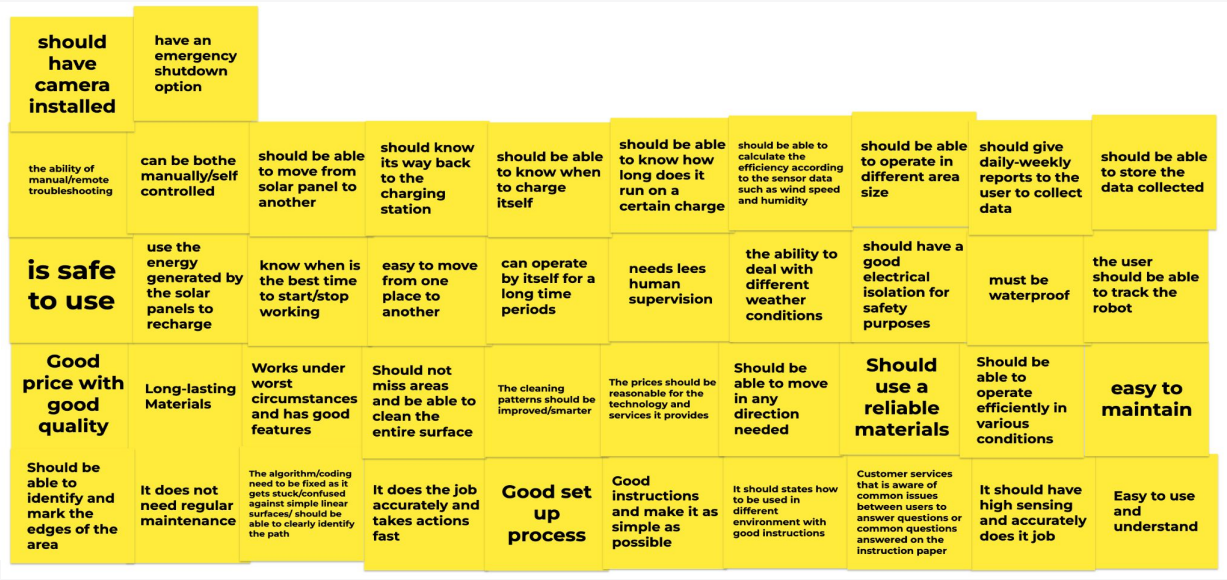


03

User Needs and Benchmarking

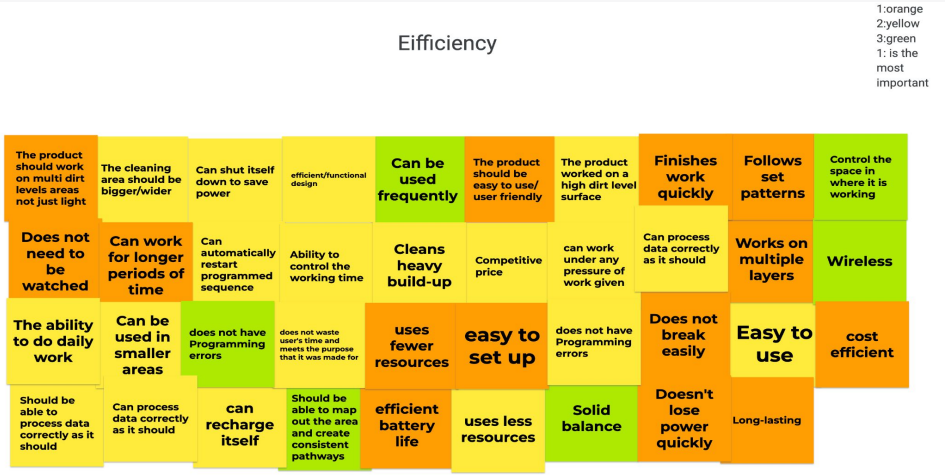
User Needs Steps

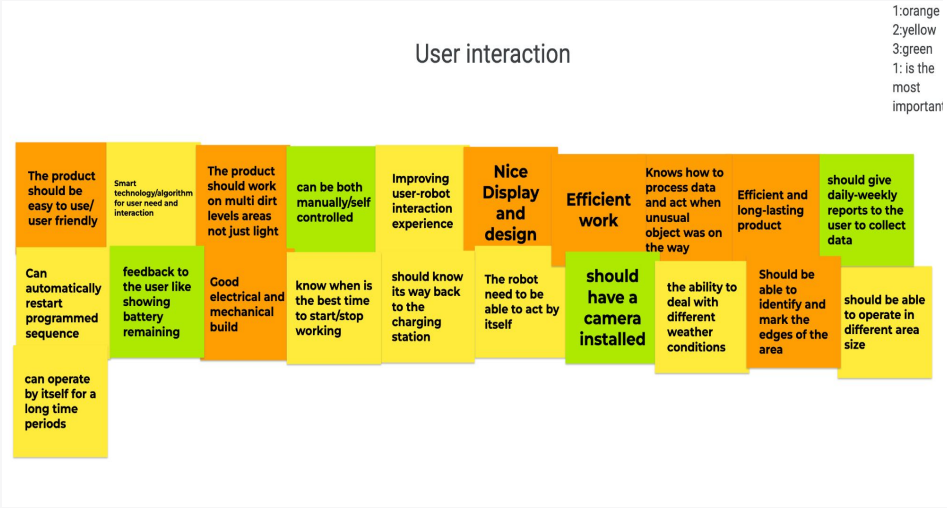
- Benchmarking to gather ideas and needs
- Brainstorming
- Categorizing

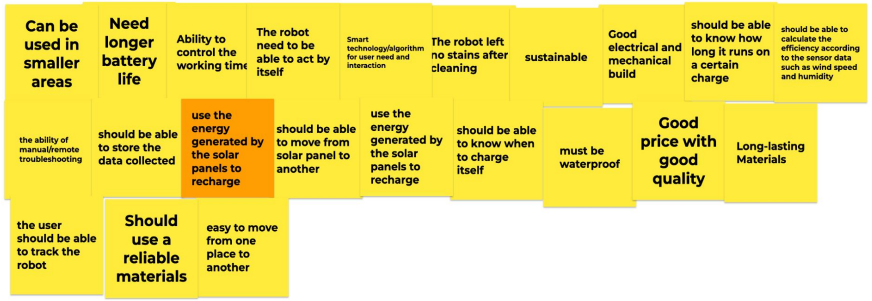


Unexpected needs:

- Easy to understand the technical side
  - The speed of the action
    - Ready to use







04

Product Requirements

What if I was the customer?

We had 7 main categories for our product

Standout requirements :

- Ready to set up
- Easy to maintain
- Good Quality with less technical complexity

Adaptive intelligence

Functionality

Interactivity

Customization

Manufacturing

Product design

Safety

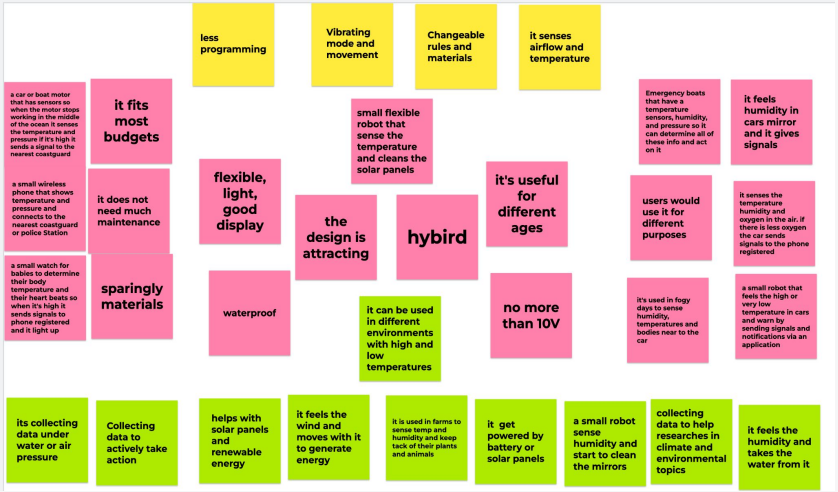
05

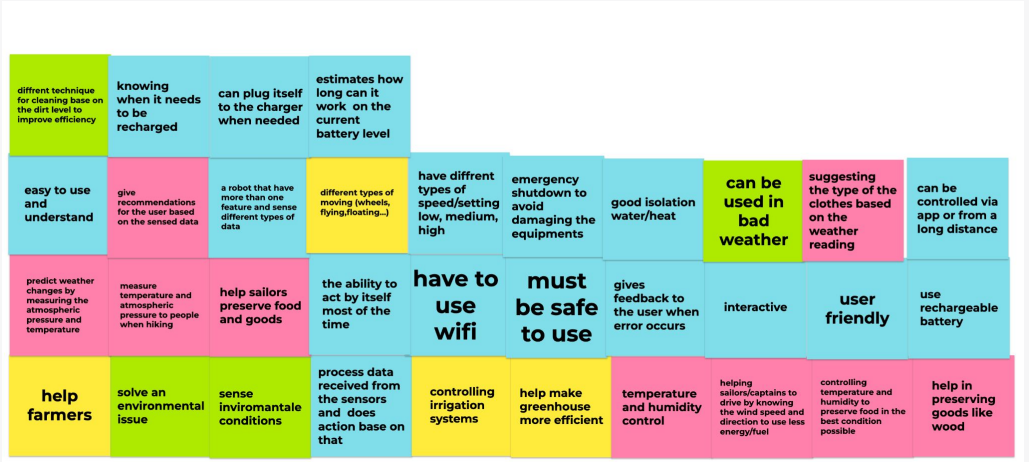
Design ideation

Brainstormed ideas

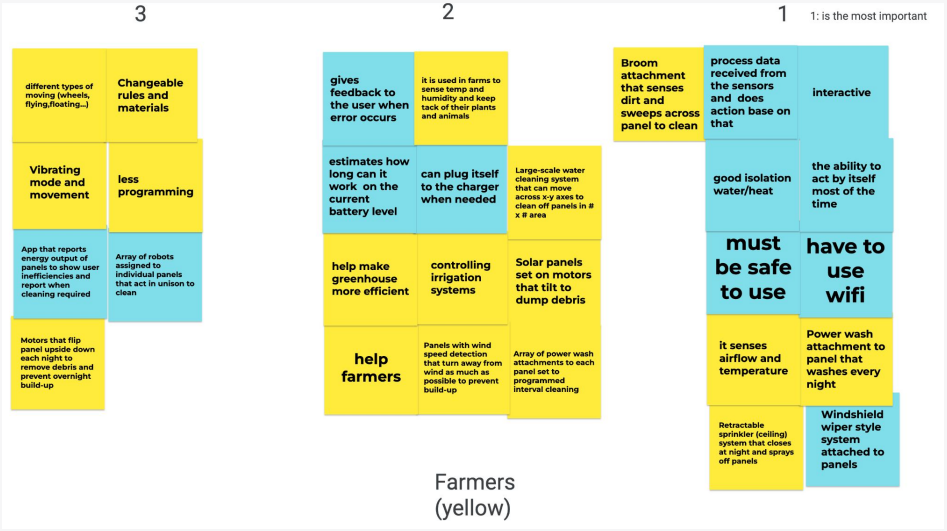
Grouping

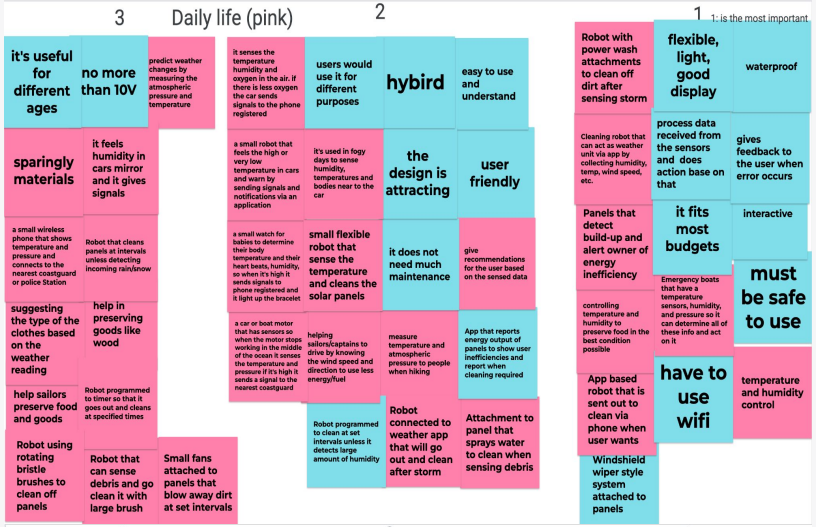
Pink	Daily Life Ideas
Green	Environmental
Yellow	Farmers Help
Blue	Common Features

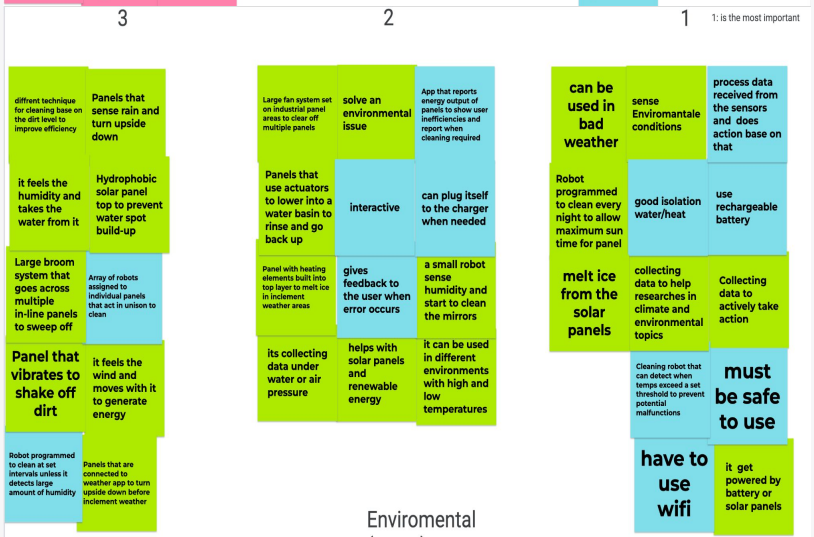




Ranking


3
2
1
1: is the most important
different types of moving (wheels, flying,floating...)
Changeable rules and materials
Vibrating mode and movement
less programming
App that reports energy output of panels to show user inefficiencies and report when cleaning required
Array of robots assigned to individual panels that act in unison to clean
Motors that flip panel upside down each night to remove debris and prevent overnight build-up
gives feedback to the user when error occurs
it is used in farms to sense temp and humidity and keep tack of their plants and animals
estimates how long can it work on the current battery level
can plug itself to the charger when needed
Large-scale water cleaning system that can move across x-y axes to clean off panels in # x # area
help make greenhouse more efficient
controlling irrigation systems
Solar panels set on motors that tilt to dump debris
help farmers
Panels with wind speed detection that turn away from wind as much as possible to prevent build-up
Array of power wash attachments to each panel set to programmed interval cleaning
Broom attachment that senses dirt and sweeps across panel to clean
process data received from the sensors and does action base on that
interactive
good isolation water/heat
the ability to act by itself most of the time
must be safe to use
have to use wifi
it senses airflow and temperature
Power wash attachment to panel that washes every night
Retractable sprinkler (ceiling) system that closes at night and sprays off panels
Windshield wiper style system attached to panels
Farmers (yellow)


3
Daily life (pink)
2
1
1: is the most important
it's useful for different ages
no more than 10V
predict weather changes by measuring the atmospheric pressure and temperature
sparingly materials
it feels humidity in cars mirror and it gives signals
a small wireless phone that shows temperature and pressure and connects to the nearest coastguard or police Station
Robot that cleans panels at intervals unless detecting incoming rain/snow
suggesting the type of the clothes based on the weather reading
help in preserving goods like wood
help sailors preserve food and goods
Robot programmed to timer so that it goes out and cleans at specified times
Robot using rotating bristle brushes to clean off panels
Robot that can sense debris and go clean it with large brush
Small fans attached to panels that blow away dirt at set intervals
it senses the temperature humidity and oxygen in the air. if there is less oxygen the car sends signals to the phone registered
users would use it for different purposes
hybird
easy to use and understand
a small robot that feels the high or very low temperature in cars and warn by sending signals and notifications via an application
it's used in fogy days to sense humidity, temperatures and bodies near to the car
the design is attracting
user friendly
a small watch for babies to determine their body temperature and their heart beats, humidity, so when it's high it sends signals to phone registered and it light up the bracelet
small flexible robot that sense the temperature and cleans the solar panels
it does not need much maintenance
give recommendations for the user based on the sensed data
a car or boat motor that has sensors so when the motor stops working in the middle of the ocean it senses the temperature and pressure if it's high it sends a signal to the nearest coastguard
helping sailors/captains to drive by knowing the wind speed and direction to use less energy/fuel
measure temperature and atmospheric pressure to people when hiking
App that reports energy output of panels to show user inefficiencies and report when cleaning required
Robot programmed to clean at set intervals unless it detects large amount of humidity
Robot connected to weather app that will go out and clean after storm
Attachment to panel that sprays water to clean when sensing debris
Robot with power wash attachments to clean off dirt after sensing storm
flexible, light, good display
waterproof
Cleaning robot that can act as weather unit via app by collecting humidity, temp, wind speed, etc.
process data received from the sensors and does action base on that
gives feedback to the user when error occurs
Panels that detect build-up and alert owner of energy inefficiency
it fits most budgets
interactive
Emergency boats that have a temperature sensors, humidity, and pressure so it can determine all of these info and act on it
must be safe to use
controlling temperature and humidity to preserve food in the best condition possible
App based robot that is sent out to clean via phone when user wants
have to use wifi
temperature and humidity control
Windshield wiper style system attached to panels


3
2
1
1: is the most important
diffrent technique for cleaning base on the dirt level to improve efficiency
Panels that sense rain and turn upside down
it feels the humidity and takes the water from it
Hydrophobic solar panel top to prevent water spot build-up
Large broom system that goes across multiple in-line panels to sweep off
Array of robots assigned to individual panels that act in unison to clean
Panel that vibrates to shake off dirt
it feels the wind and moves with it to generate energy
Robot programmed to clean at set intervals unless it detects large amount of humidity
Panels that are connected to weather app to turn upside down before inclement weather
Large fan system set on industrial panel areas to clear off multiple panels
solve an environmental issue
App that reports energy output of panels to show user inefficiencies and report when cleaning required
Panels that use actuators to lower into a water basin to rinse and go back up
interactive
can plug itself to the charger when needed
Panel with heating elements built into top layer to melt ice in inclement weather areas
gives feedback to the user when error occurs
a small robot sense humidity and start to clean the mirrors
its collecting data under water or air pressure
helps with solar panels and renewable energy
it can be used in different environments with high and low temperatures
can be used in bad weather
sense Enviromantale conditions
process data received from the sensors and does action base on that
Robot programmed to clean every night to allow maximum sun time for panel
good isolation water/heat
use rechargeable battery
melt ice from the solar panels
collecting data to help researches in climate and environmental topics
Collecting data to actively take action
Cleaning robot that can detect when temps exceed a set threshold to prevent potential malfunctions
must be safe to use
have to use wifi
it get powered by battery or solar panels
Enviromental (green)

THANKS

DO YOU HAVE ANY QUESTIONS?

Fatema Alshehhi - faalshe2@asu.edu
Salsabil Soliman - smsolima@asu.edu
Timothy Drafz - tdrafz@asu.edu
Sivanee Naghichetty - snaghich@asu.edu