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Product Design Specification (PDS): Happy Plant

**Executive Summary**

Plant monitoring system. The device we are creating is designed to help keep track of a plant’s health. It is used to indicate when your plant needs to be taken care of. If it needs more water, this device will tell you. If it needs more sunlight, this device will tell you. People who own plants end up killing their plants all too often, and this system is designed to help with that. All the users need to do is insert the sensor in the soil of their plant and the device will take it from there.

**Brief Market Analysis**

This product is intended to appeal to those who love plants, but can never seem to keep them alive for long. Our product competition will be all the existing plant monitors products on the market; especially the ones have displays.

**Why is your product different?**

1st, Our product will have a LED display next to the plant. This LED display takes batteries and you can place it anywhere in the house.

The LED display will show information like name of the plants, moisture level, and time need to watery…etc. The unique part of our product is the emoji display. Different emojis indicate the health level of the plants. For example, happy face means the plant is in a very health condition. Ok face means the plant is getting close to be watered, but not merging. The sad face means the plant is in a bad condition. Anyway, what emojis to use and health of the plants are depending on the owner, this can be customized and programed.

2nd, our product will add a LED light that acting like the sun and will turn on when the moisture level is too high. This function will keep the plants in a healthy condition when the plants are overwatered. According to the articles online, that the different light color can provide different plants need and make the leaf’s look better and healthier.

**What price will do you think you can sell this for, and why?** ~$49.99

This price was estimated based on our total purchase of the components and prices of similar products on the market.

**Requirements**

**MUST**

* Use moisture sensor to collect plant data
* Collect plant data every hour
* Green LED to indicate plant needs watering

**SHOULD**

* Use photoresistor to detect amount of sunlight plant intakes
* Red LED to indicate plant needs more sunlight
* Blue LED to indicate overwatering

**MAY**

* Incorporate watering System
* Use music to indicate plant needs watering through synthesizer

**System Architecture**

2 AA Batteries (3v)

ATMEGA 32U4

Soil moisture sensor

Light Sensor

Display

Watering System

LEDs

RC filter

Audio amplifier

Speaker

Display

Data

Watering signal

LEDs

PWM

5v

Moisture voltage

Light intensity voltage

3v

Must

Should

May

Happy Plant☺️

Figure 1. Plant Monitoring System Diagram

**Design Specification**

* Sensor: Sparkfun SEN-13637
* Processor: MEGA32U4
* Actuator: LEDs, Display: 32x32 RGB LED Matrix Panel
* Power: AA batteries and power converter
* Arduino: yes
* Development environment: Arduino IDE