

Smart Plant Management System(SPMS)

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Abstract— A houseplant is a [plant](#) that is grown indoors in places such as [residences](#) and [offices](#), namely for decorative purposes, but studies have also shown them to have positive psychological effects and as well as help with indoor air purification.As more and more people engage in keeping a house plants not often it is that they have proper knowledge about how to maintain one properly so that it grows to its finest. Here is where Smart Plant Management System (SPMS) will come into picture

Key words— Internet of Things

1. INTRODUCTION

SPMS is a smart plant monitoring device.Just plug it into any plant and it will display the "happiness" level of the plant

SPMS uses an Arduino attached to a moisture sensor, which is inserted into the soil of the plant.This sensor will read the moisture content of the soil, and then the Arduino calculates what face to display.While it's important to stay on top of watering your houseplants in order to help your plants stay in good shape, there is such a thing as [giving them too much water](#) or giving them too little water that you encounter wilting and brown spots popping up on plant leaves which is sign of your plant on verge of dying .To identify the condition of the plant the statistics of the plant is obtained using the soil moisturizer sensor.

These complex statistics of this sensor cannot be interpreted by the common man..So we are creating an independent,portable device that will understand the complex computations of the sensor and give the results using emotes(emoji)

2. Purpose of our project

This project SPMS (Artificial Plant Emotion eXpresser) was designed and developed to easily facilitate and monitor the plant records. This project will help one to speed up the process of plant monitoring and management of plant's records. This aims to solve the minor problems identified en every process encountered by the personnel-in-charge from monitoring and maintaining plant's optimal health.This will serve as a benefit to one and to the plant at the same time.

By creating SPMS with Mobile Support one will no longer worry about watering the plant and some other information

form and ledger such as optimal sunlight exposure and so on. .Can be used by huge gardens as well as home gardens It saves the time from going to places to check their condition.

3. Value proposition and practical concept

In the 21st century plants preservation has come to prime importance to ensure that we as a human race maintain and live in a sustainable environment that supports the demands of the current generation with guaranteeing the same for all future generations to come. Our device SPMS is a great reminder to water your plants if you have a bad habit of forgetting to water them.SPMS uses an Arduino attached to a moisture sensor, which is inserted into the soil of the plant. This sensor will read the moisture content of the soil, and then the Arduino calculates what face to display.

a. Personal Use

SPMS will be very beneficial for those people who are not well versed about when to water their plants.Moreover with soil sensor it removes the hassle to understand the complex statistics of soil and in turn relays the result with human like expressions

b. Market Proposal

This project can be implemented on gardens where the whole garden the uses a series of interconnected SPMS device and all its collective information can go to some kind of database where the garden owners can find out t the areas where water is needed to the plants

4. Emotes that will be displayed by SPMS

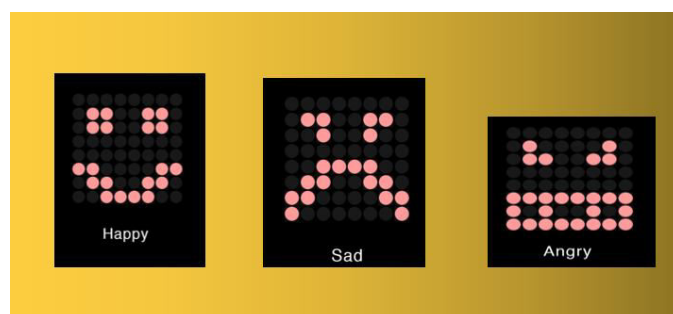


Fig 1: Emotes shown by SPMS

5. Circuit Diagram

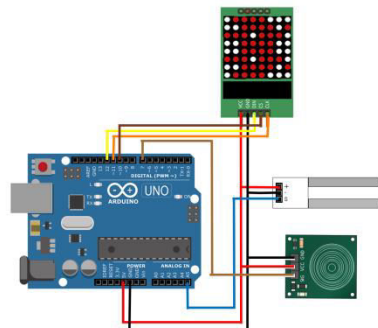


Fig 2:Circuit Diagram

6. Survey Analysis

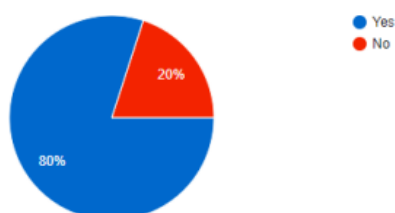
A survey regarding what are the issues faced by the people regarding gardening in their day to day life . This survey contains 3 questions in multiple choice format

Question 1 : This question states whether their plants soil dry up and plant have a stunted growth which are the symptoms of water deficiency of plant

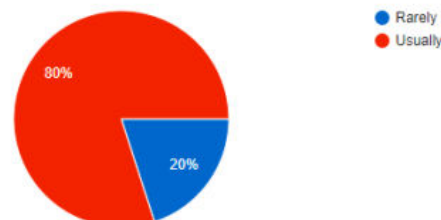
Question 2: This question states whether their plants leaves turn yellow and the tip turns brown which are the symptoms of overwatering your plants

Question 3: This question states whether they understand the statistics of soil since our project will convert the complex statistics and relay the output in Emotes(emoji)

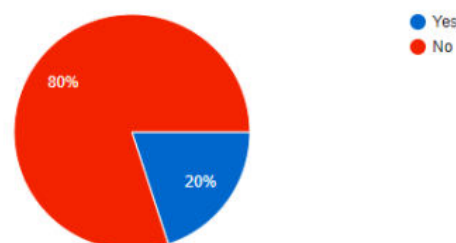
Does the soil around the plant dries up and have stunted growth?



How often do your plant's leaves turn yellow and the tips turn brown?



Do you understand the statistics of soil?



Here is where Smart Plant Management System(SPMS) will come into picture .

Symptoms like drying of the soil near the plant and stunt in growth lead to Underwatering of plants

Symptoms like yellowing of plants leaves and tips of leaves turning brown lead of Overwatering of Plants

Thus if people know when the plans needs water and when it is too much this issues can be solved but various factors like sunlight,nutrition of soil depend about how much water is required.This can be found out by using a soil moisturizer sensor.

These complex statistics of this sensor cannot be interpreted by the common man.So we are creating an independent,portable device that will understand the complex computations of the sensor and give the results using emotes(emoji)

7. Literature Survey

*Plant Physiology

Book by Eduardo Zeiger and Lincoln Taiz

* Introduction to plant biotechnology

Book by H. S. Chawla

8. Flow of the process

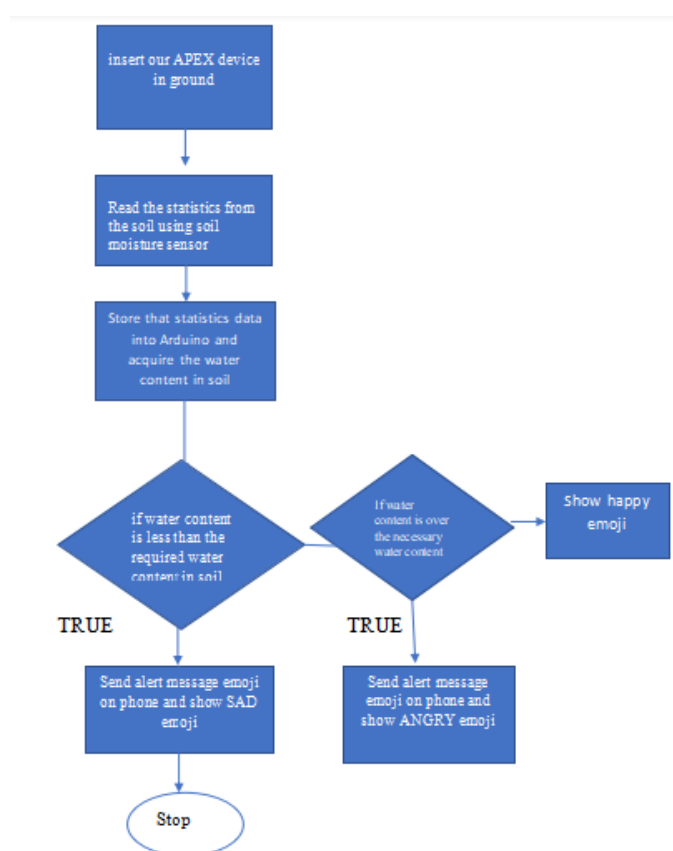


Fig 2: Flowchart for 1 reading from plant

9. Technologies used in this project

Hardware Components	Software Components
Arduino Uno	Arduino IDE
Moisture Sensor	
8*8 LED matrix	

Capacitive Sensor	Touch	
Male connectors	female	
9v battery jack		

10. Advantages of our project

- These can also be used for home use to treat a plant as a pet animal.
- Can be used by huge gardens as well as home gardens
- System can be operated at night, water loss from evaporation is thus minimized
- Portable plant analyzer

11. Future scope and conclusion

- Irrigation process starts and stops exactly when required, thus optimising energy requirements
- Usage of more different sensors related to botany can bring more statistical data
- Introducing chatbot feature in phone to ask any questions related to botany or SPMS
- SPMS (Artificial Plant Emotion eXpressor) is a smart, informative, advance, comparatively simple, cost efficient and plant monitoring device that will speed up the process of plant monitoring and management of plants records

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