



SMART ROOFTOP GARDENING

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Abstract: The concept of this project is to allow the owners of fields to control and observe the growth of their plants in their farms. This is achieved by using a smart platform of IoT and solenoid valves to control the flow of water based on the moisture of the soil and gives real time surveillance to the owners who stay far away from the farms. This project also allows surveillance on the personnel and their o to not occur losses. It is easy to use for anyone with a Smartphone and does not require maintenance once set up. A smart irrigation system that optimises water usage is developed. This system guarantees the longevity of irrigation pumps; prevents water wastage through water recycling and prioritizes pump operations based on the level of water in reservoir. This way, it ensures that different plants are irrigated in relation to their varying water needs for effective growth. It would be useful in places where water scarcity is a challenge to the practice of irrigation. This work is primarily about the improvement of current agricultural practices by using modern technologies for betterment of agriculture and modernization the traditional agriculture system. Internet of Things (IoT) plays a crowning role in smart agriculture. The project will help root level farmers to get into smart irrigation in term of agriculture. Which provide greater service in less cost in irrigation and lowest man power. Smart irrigation is an empirical concept because IoT sensors capable of providing information about their agriculture fields and making irrigation automated by Internet of Things.

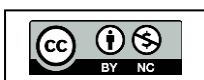
Keywords: Internet of Things, IoT, Smart Rooftop Gardening, etc.

I. INTRODUCTION

Imagine looking out over the rooftops of a city and seeing a canvas of living plants. All around the world rooftops are going green, especially in cities. These **rooftop gardens** are an environmentally friendly option that is gaining popularity. Living green roofs have many advantages, including providing more space for agriculture, adding beauty to the cityscape, and increasing the air quality. During photosynthesis, plants remove carbon dioxide from the air, and release oxygen. Over the course of a year, a single 1.5-meter by 1.5-meter section of a roof planted with grass produces enough oxygen to keep one human breathing for a year!

II. PROGRAMMING TECHNIQUES

This programming technique includes explanation about THINGSPEAK web server and it uses JSON format to convert stored data into human readable form. THINGSPEAK According to its developers, "Thing Speak is an open-source Internet of Things (IoT) application and API to store and retrieve data from things using the HTTP protocol over the Internet or via a Local Area Network. Thingspeak enables the creation of sensor logging applications, location tracking applications, and a social network of things with status updates". ThingSpeak was originally launched by ioBridge in 2010 as a service in support of IoT applications. ThingSpeak has integrated support from the numerical computing software MATLAB from Math works. Allowing ThingSpeak users to analyze and visualize uploaded data using MATLAB without requiring the purchase of a Matlab license from Math works.



ThingSpeak has a close relationship with Math works. In fact, all the ThingSpeak documentation is incorporated into the Math works' Matlab documentation site and even enabling registered Math works user accounts as valid login credentials on the ThingSpeak website. The terms of service and privacy policy of ThingSpeak.com are between the agreeing user and Math works.

III. SMART GARDENING

Smart garden monitoring systems leveraging internet of Things (IOT) can help transform your gardening process to a smart and dynamic one. The system will monitor the light intensity and moisture content of the soil at regular intervals and alert you when the plant needs watering.



Figure 1: Smart Rooftop Gardening System

A green roof, or rooftop garden, is a vegetative layer grown on a rooftop. **Green roofs provide shade, remove heat from the air, and reduce temperatures of the roof surface and surrounding air.**

IV. CONCLUSION

From the results of the installed and tested this smart irrigation system will become easy and comfortable for watering rooftop garden. The electric pump and solenoid valves are successfully OFF-ON by programmable digital timer. The performance of digital timer is perfect to maintain irrigation interval and duration. This smart irrigation system can not only be used in a rooftop garden but can be used in garden.

This project also allows surveillance on the personnel and their crops to not occur losses. It is easy to use for anyone with a Smartphone and does not require maintenance once set up.



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