WATER CONTROL SYSTEM IN PLANTS USING IOT

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ABSTRACT:

Most people days are very much interested in planting variety of plants in there corridor. However, they can't take care of their plants due to a lack of time. Subsequently, this paper presents an intelligent water control framework for local plants given IoT innovation. It utilizes different sensors, including highlights like the water level location in the tank with ultrasonic sensor and soil dampness sensor location of water content in the Soil-based plants alongside temperature sensor. The microcontroller utilized here is Node MCU, which shares sensoring information to the Aadfruit io server. What's more, IoT is a versatile application. Adafruit io server is a cloud server that stores continuous communication, and IoT versatile applications screen these sensor values.

I. INTRODUCTION

These days, the Thailand government has presented an approach of Thailand 4.0 to drive the web of things (IoT) through smart gadgets also framework improvement of areas like business and industry in ordinary day-to-day existence, basically zeroing in on the farming area. Thai society ought to develop vegetables, products of the soil plants for family utilization, pushed by His Majesty King Bhumibol Adulyadej advances this way of thinking of adequacy in the economy and feasible turn of events. Many people request progressively developing their local natural plants for wellbeing and security. Be that as it may, large numbers lack the opportunity and energy to deal with the plants. Subsequently, the IoT Gardening framework screens water content in Soil-based plants and naturally controls water levels in the tank. If observing and taking care of are not done accurately, it influences the plant's development rate and life expectancy, and there will be a great deal of wastage of water. If we appropriately screen our plants, we can get new foods grown from the ground that are aged, commonly contrasted with aged plants misleadingly. This paper intends to foster an IoT Gardening device that actions the degree of water in a tank and water content in a Soil-based plant, alongside temperature detection. The model incorporates Node MCU, which is taken as a microcontroller. Editing information is given by an ultrasonic sensor, soil dampness sensor, and DHT11 temperature sensor. Adafruit io server is a cloud server to save continuous information and IoT versatile applications from checking sensor values.

II. PROPOSED DESIGN METHODOLOGY

The proposed IoT-based savvy water control framework for local plants is delineated in fig 1. At first, the framework is controlled by sun powered charger, which changes over daylight energy into electrical energy utilizing the photovoltaic impact. Since it is of 9v and our Hub MCU regulator runs at 5v, 7805 voltage controller is used which changes over 9v direct current into 5v DC. Hub MCU is an open-source firmware and advancement unit whose equipment configuration can be altered and adjusted.

Hub MCU advancement unit comprises of ESP8266 WIFI empowered chip, which gives perfect WIFI network. Contribution to Node MCU will be an ultrasonic sensor that actions the degree of water present in the tank, a dirt dampness sensor to distinguish water content in a Soil-based plant, and a temperature sensor for estimating temperature. The resulting side comprises a submarine siphon entirely lowered into the water. Like these two siphons, pump1 goes about like a water repository which gives water to the tank as information, and pump2 goes about as a result from the tank, which permits water to the plant, contingent upon plant wet and dry circumstances. To communicate with adafruit io server and IoT portable application from Hub MCU, WIFI is required, which can be given by ESP8266 WIFI chip, which is inbuilt in Node MCU. Our mobile area of interest offers an Internet network to Node MCU. Adafruit io server is a cloud server that stores continuous information, and IoT portable application screens sensor values.

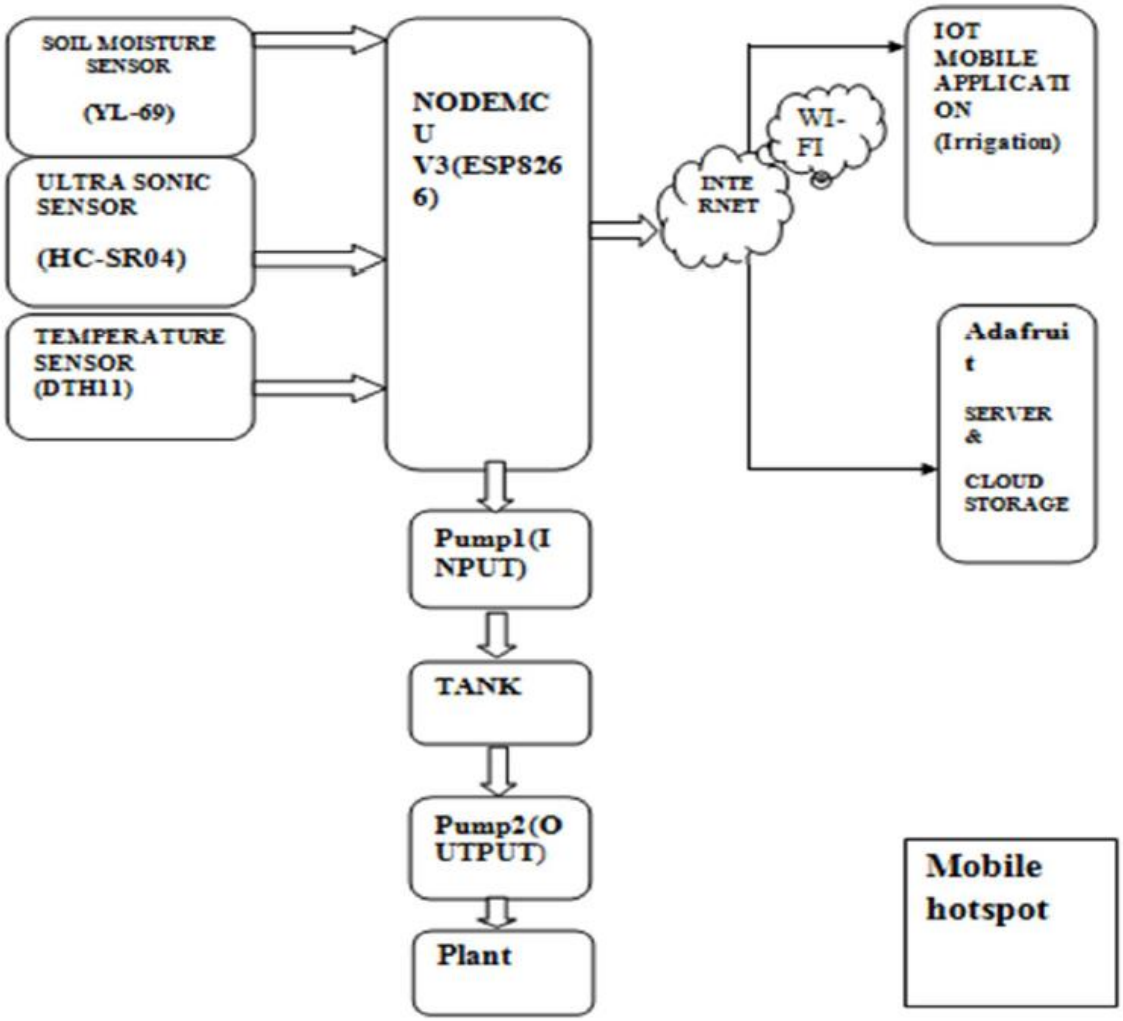

Figure 1: Proposed method block diagram

III. HARDWARE IMPLEMENTATION

A. Parts Required

1) Power Supply: The model requires both AC and DC power supply, AC necessity of 230v to the sub siphon and DC of 5v to Node MCU. The sunlight-based charger is utilized to supply give power. A sun-powered charger of 9v is used, and two batteries of 4v associated in series, which store the voltage produced by sun-powered cells, are then appended to a 7805 voltage controller to get a consistent 5v.

2) Node MCU: It is an open-source firmware and improvement unit empowered with an ESP8266 WI-FI chip, which gives a perfect WIFI network. Since it is open-source, its equipment configuration can be altered or changed.

3) HC-SR04 Ultrasonic Sensor: Ultrasonic sensor estimates the distance utilizing ultrasonic waves. After striking the objective, the ultrasonic transmitter emanates an ultrasonic wave into the climate and gets back to the beneficiary as a reflected wave. It measures the distance to the aim by estimating the time between emanation and gathering. The basic recipe determines the length: Distance=1/2×speed×time 330m/s will be the ultrasonic speed. Time will be among discharge and crowd since time is the procedure to return. The distance esteem is increased significantly (1/2).

4) YL-69 Soil Moisture Sensor: This sensor is astounding with a programmed plant watering framework. This is a primary sensor that recognizes water content in the Endlessly Soil wet or dry condition should be visible. Water is passed into the Soil with two test sensors. Obstruction gives the dampness level. More moisture in the Soil leads to greater power with less opposition. Less water in the Soil conducts unfortunate control with more blocks.

5) DHT11 Temperature and Humidity sensor: This sensor estimates temperature and moistness, producing adjusted advanced yield. This sensor can be connected to any microcontroller and come with quick outcomes. Since it is a minimal expense, what's more, it gives high dependability and long-haul solidness. It can gauge temperature between 0 - 500C and 20-90% stickiness.

6) Relay: An electromechanical switch controls high-power applications through electronic low power signals. The single post double toss (SPDT) hand-off has one regular terminal and two contacts. They are usually shut; the other is opened, and the other is typically closed. SPDT hand-off exchanging between two circuits. When no voltage is applied to the curl, one course gets current, the other doesn't, and the inverse occurs when the lock gets invigorated. There are different hand-off types like 3v, 5v, 6v, and, surprisingly, 12v. We want to choose them given the prerequisite of our venture.

7) Submersible Pump: These siphons are lowered into the water and utilized by those machines which expect siphons to work. It is a smaller, profoundly productive apparatus made of a rust-confirmation strong clay shaft with an 18W engine and a yield pipe. They are principally utilized in air coolers, aquariums, and wellsprings. It is not difficult to introduce and deal with, has low power utilization, robust quality, and water opposition. It can lift 1.85m of water and increase water to 1100L each hour.

IV. SETUP AND RESULT

A. In the IoT Gardening framework, the upsides of soil dampness sensor, ultrasonic sensor, and temperature sensor through IoT portable application are shown. At first, the dirt dampness sensor checks for a wet condition where water needs not to be poured, and in dry condition, water should surge. Then, at that point, the ultrasonic sensor checks for the degree of water by setting the edge esteem as 10cm. On the off chance that water is above 10cm, there is a compelling reason to empty water into the tank. On the off chance that under 10cm, water begins streaming into the tank naturally. Adafruit io server stores constant information alongside the graphical portrayal of these sensors.

Figure 2: Soil Moisture

V. CONCLUSION

This paper has depended on soil dampness and ultrasonic sensor, which definitively control water in the plant and the water level in the tank. IoT versatile application screens sensor values, and natural product IoT server stores constant information. Can also apply this undertaking to farming, local plants to carry on with a better way of life and get sound vegetables and matured natural products. This method is generally helpful for specialists and individuals who lack the opportunity to deal with their plants.

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