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## Smart Irrigation System using IoT

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### ABSTRACT

The main focus of this paper is to develop a smart irrigation system that can automatically water plants based on the information that it receives via different sensors.

The various sensors used in the system are moisture sensor, pH sensor, temperature sensor and etc. With the help of these sensors our system can water the plant as it's need thus, saving water and avoiding the over watering problem.

Keywords: smart irrigation, Arduino Mega 2560, soil sensor, dht 11 sensor, water pump.

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### 1. Introduction to Smart Irrigation System Using IoT

#### 1.1 Introduction

The respective paper focuses on the use of IoT in smart irrigation. So as to benefit various farmers via its technology and convenience of use. Our system is integration of various sensors and monitors such as moisture, temperature, pH sensors and technologies like ESP 8266 wi-fi module and Arduino Mega 2560 that make our system such reliable and efficient.

#### 1.2 Motivation

The main motivation behind this work was to expose farmers to the use various technologies in the farming sector which affects the yield in a positive way. And, to tackle various issues like water scarcity, management and soil health.

#### 1.3 Aim and Objective of the work

##### Project aims:

The main aim of the project is to introduce farmers to the use various technologies in the farming sector which affects the yield in a positive way. And, to tackle various issues like water scarcity, management and soil health.

##### Project objectives:

The objectives of the project are to create a model which via the use of IoT and various monitoring sensors will provide a smart and more efficient way of water irrigation. With the help of a microcontroller device Arduino Mega 2560 we are going to create a system combining of sensors like soil sensor, dht11 sensor. A wi-fi module ESP 8266 will connect the system to the software named Blynk7

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### 2. Comparisons

#### 2.1 Normal Irrigation System

In this normal irrigation experiment, the temperature values are in the range of 28 to 39 degree Celsius. The humidity values are in the range of 70 to 81 and the soil moisture values are in the range of 557 to 610. The height growth for this plant is only 20.39 percent from the start of the experiment. The diameter of the plant growth for about 75 percent. It can conclude that the plant is over watering. It can be seen that on the leaves of the plant. There were yellow and brown color at the edge of the plant surroundings it. It is a symptom of the plant was over watering. This occurs as too much water on the roots of the plant and hence, the plant cannot breathe.

## 2.2 Smart Irrigation System

In this smart irrigation experiment, the temperature values are in the range of 28 to 39 degree Celsius. The humidity values are in the range of 70 to 81 and the soil moisture values are in the range of 506 to 601. The height growth for this plant is 28.39 percent from the start of the experiment. The diameter of the plant growth for about 100 percent. It can conclude that the plant is healthy plant. From the leave, it shows that the color of the leave is very green and has only 1 or 2 brown dots. It shows that the leave came from a very good plant. From the values of the soil moisture, the values of it are not too close to 630 and 400. It means that the moisture is in good range. This smart irrigation system is very good as it waters the plant with the right amount of water. Hence, the plant is not over watered or less watered.

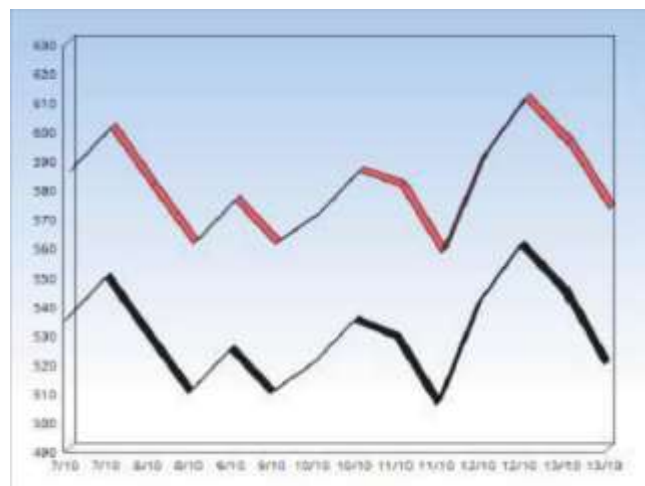


Fig. 1 – Comparison of normal and smart irrigation system.

## 3. Conclusion

This smart irrigation system using Internet of Things (IoT) project had achieved the first objective which is to investigate the whole concept of smart irrigation system using internet of things. The study is about the function of irrigation which is to water the plant with the right amount of water only when it needed water which is based on the condition of the soil. The system must have both software and hardware components which can be presented later on. The software that being studied is the Blynk application which can be used in all smartphone and it is very practical for the users to use. The hardware is the temperature sensor, humidity sensor, Arduino Mega, soil sensor. This system. creates a very good experience for the farmers to irrigate the plant. The farmers can even monitor the condition of the plant directly from the phone. With the right amount of water needed, they can save their bills on water too. Hence, this is such a great project.

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