

## Multifunctional Smart Energy System By Internet Of Things

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### ABSTRACT

In present era, water scarcity occurs in agricultural sector. Therefore an automatic plant irrigation system has to be designed for the proper water supply in the fields. This project deals with an automatic plant irrigation system which automatically senses the moisture content by soil moisture sensor, Arduino Uno, motor driver and ESP8266 WI-FI connector. It is programmed to sense the moisture content and provide sufficient water to irrigation system. A weather monitoring system, which can provides us the information of the weather in our neighboring environment. It can provide us with details about the surrounding temperature, barometric pressure, humidity, etc. we can calculate other data parameters such as the dew point. The components used in this prototype is the ESP8266 based WI-FI connector, Arduino Uno, DHT sensors.

**Keywords** -Water scarcity, Plant Irrigation system, Weather monitoring system, Dew point.

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### I. INTRODUCTION

This project deals with Internet of Things (IOT). We will work on basics to advance level Arduino based IOT projects. Thereby we will gain great understanding of IOT and how IOT is going to change the way we live in the near future. Apart from gaining practical skills on Internet of Things, we will work with various sensors like DHT sensor, soil moisture sensor, Arduino Board including programming, ESP 8266 WIFI-connector, Thing-speak IOT analytics and virtuino mobile application. We'll design and develop the following projects:

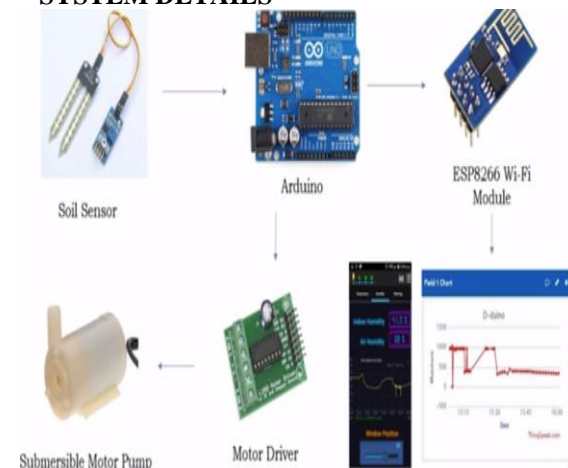
- Weather Monitoring System
- Smart Irrigation System

Irrigation is essentially the artificial supply of water to assist the growth and production of crops and any other vegetation. Irrigation is primarily used for agriculture. Different techniques and watering schemes are employed based on the topographical characteristics, the location and the crops sold. It is also used for landscape maintenance like domestic lawns, public parks and sports stadiums. Although irrigation as a technique existed since ages, some challenges co-existed with it. Increase in demand and dearth of water as a resource is the major challenge of irrigation system in present era. Efficiency of irrigation system has to be improved drastically. To counter these inefficiencies in traditional irrigation systems, a smart irrigation system is employed. A smart irrigation system is a combination of automated irrigation system and sensor network which is accessible remotely.

### II. SYSTEM REQUIREMENTS

- ARDUINO
- ESP8266 WIFI CONNECTOR
- SOIL MOISTURE SENSOR
- MOTOR DRIVER
- DHT11 SENSOR
- THINGSPEAK

### SYSTEM DETAILS



### III. NECESSITY OF THE SYSTEM

As we know, there is water scarcity in irrigation field this project helps in preventing the wastage of water. Also it senses the weather conditions and provides sufficient amount of water required. The weather monitoring system is permanently installed as a part of the monitoring

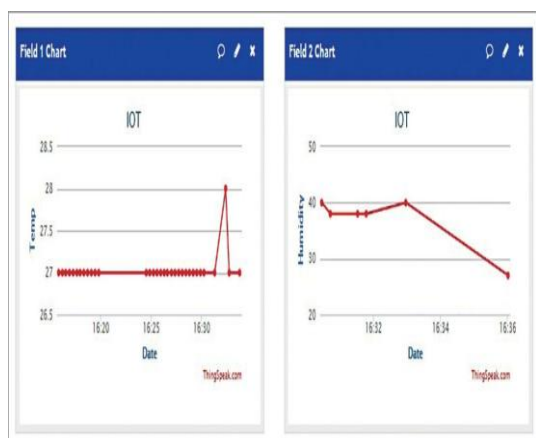
system for each wind and solar energy projects by feeding data into SCADA system

#### IV. IMPLEMENTATION METHODOLOGY

In smart irrigation system, we use more or less number of sensors depending upon the increase or decrease in area of irrigation, so that it will work according to the climatic conditions. According to the soil condition the resistance will be maximum or minimum (for dry soil-maximum resistance, wet soil-minimum resistance). After sensing the value, it will automatically decide whether the pump has to be turned on/off. In weather monitoring system, we use DHT11 sensor to sense the temperature and humidity. The ESP8266 WI-FI connector analysis the data by using thing-speak platform which works on programming the Arduino Uno. The software used in here is Arduino programming. The Arduino and ESP 8266 are interfaced so that the ESP8266 is powered up and analyses the data from sensor networks. Now from the esp8266, the data is sent to thing-speak and the required results can be obtained in the form of waveforms.

#### V. RESULTS

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.



#### VI. CONCLUSION

This miniature model of automatic plant irrigation is being tested in two different soils. One soil is wet and the other is dry. Only in the dry condition the pump will start working, since the requirement of water is more for that soil for the proper growth of the crops and in wet soil the pump won't work since the soil does not need any water due to the presence of water in it hence this project will conserve water during irrigation. And Weather monitoring system has been tested under the various climatic conditions and it analyses the data in IOT platform.

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