

# Cloud Ready Temperature Sensor Using IoT

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## ABSTRACT

*The Internet of Things recently used in many things. The IOT is used for many purposes. Internet of Things (IoT) is adding value to products and applications in the recent years. The connectivity of the IoT devices over the network has widely reduced the power consumption, robustness and connectivity to access data over the network. The changes in climate led to the increased importance of environmental monitoring. In order to determine the quality of the environment, continuous tracking of the environmental parameter is needed. As the IoT is the most emerging technology; it plays an important role in collecting the information from the sensing unit. Generally sensing unit is composed of different sensors like temperature, humidity, moisture etc., the paper uses an Arduino UNO, Wi-Fi module that helps in processing and transferring the sensed data to the cloud. Thus the parameter received is stored in the cloud platform. The change in the environment is updated in the form of a database through the cloud computing method. Thing speak also provide a feature to create a public based channel to analyze and estimate it through the public.*

**Keywords:-** Sensors, Arduino UNO, Internet of Things etc.

## 1. INTRODUCTION

This paper proposes an implementation of weather monitoring system using Internet of Things (IoT). Using Internet of Things (IOT), we can control any electronic equipment in homes and industries. Moreover, you can read a data from any sensor and analyses it graphically from anywhere in the world. Internet of Things is a novel paradigm combining telecommunications [1] and any kind of device or applications using sensors, tags, microcontrollers and ARM processors. [2]The demand of service over the internet necessitated the data collection and exchange in an efficient manner. Internet of Things[3] refers to the rapidly growing network of connected objects that are able to collect and exchange data using embedded sensors. It is nowadays finding profound use in each and every sector and plays a key role in the proposed environmental monitoring system too. IoT converging with cloud computing offers a novel technique for better management of data coming from different sensors, collected and transmitted by low power, low cost microcontroller “Arduino UNO”. [4] An open source website, Thingspeak is used where the measurement of the parameters are updated. Thingspeak is an open source Internet of Things application and API to store and retrieve data from the sensors using the HTTP Protocol over the Internet. Thingspeak is an IoT analytics platform service that allows you to aggregate, visualize, and analyze live data streams in the cloud. The cloud utilizes the operations of Graphical visualization and available in the form of virtual server for the users and the objects are communicated with the cloud via possible ‘wireless internet connections’ available to the users and the majority objects uses the sensors to tell regarding the environmental analogue data. The IoT helps bring all things together and permits us to communicate with our very own things.[9]

## 2. LITERATURE SURVEY

Vinayak Aappasaheb Pujari et al. have proposed the system that uses the solar power panel. This system is used to monitor temperature, wind speed, wind direction, humidity and rain. The sensed data will be sent to GSM module and through gateway to the personal computer. A server is connected to the database. [3]

M. RahamanLaskar et al. presented paper on weather forecasting using Arduino and Cube-Sat. This proposed system uses temperature and humidity sensor (DHT11), pressure and altitude sensor (BMP180) and accelerometer (ADXL-335). The data processing unit Arduino Uno is used. Cube satellite is used to provide information of weather from anywhere without using network. A gas balloon is used to hold and carry the Cube satellite. This system is simple to construct, portable, cost efficient, low power consuming and reliable. But there are some limitations such as device may not communicate at long distance without powerful transceiver section, at higher altitude record of data with the help of gas balloon may be a problem and components may be damaged by rain or long time use. [2]

Prof.SatyashilNagrle et al. have proposed the weather monitoring system using real time data transmission. The proposed system uses VAISALA weather transmitter sensor WXT520 to transmit the data to the control room. It sense the parameters like wind speed, wind direction, precipitation, atmospheric pressure, temperature, relative humidity. This real time data is transmitted wirelessly through GSM over long

distance. This system provides flexibility as needs changes. [4]

Prof. C. H. Chavan et al. have proposed their system to develop wireless sensor network for an agricultural environment. This system uses the Wireless Sensor Networks which consisted of radio frequency transceiver, sensors, microcontrollers and power sources. Hardware of this system includes 8 bit AVR, ZigBee, Blue tooth module, temperature, humidity, soil moisture sensors, LCD. This system is reliable and efficient for agricultural parameters monitoring. [6]

Sheikh Ferdoush et al. have proposed their system for environmental monitoring applications. This system includes an in-situ base station and a number of distributed wireless sensor nodes. Base station is designed using Raspberry Pi Model B. networked sensor nodes are developed using Arduino and Zigbee modules. To access the sensor nodes and data from the outside world, a web application is developed on the base station using the Apache HTTP web server. This system is low-cost, compact, scalable, easy to customize, easy to deploy and easy to maintain. This system can be expanded by integrating additional sensing modalities to sensor nodes. Also web interface can be further developed. [5]

### 3. PROPOSED SYSTEM

The proposed system keeps track on the parameters such as moisture, temperature, humidity, rainfall, gas content and earthquake intimation with the help of the real time sensors. These parameters are continuously monitored by an open source platform called Thingspeak[12] for an interval of every 2 minutes. The data can be viewed in any one of the three formats such as JSON, XML and CSV.[13] The sensors in the proposed system collect the data such as the temperature, humidity, soil moisture, pollution level, rain water level and movement in the earth surface.[14] The Wi- Fi network helps in the process of sending the collected data to the open source platform, Thingspeak. Alternate to that, an app is made for the purpose of viewing the collected data in even more easier manner. Through the application/Thingspeak, the user will be able to know about the status of his/her own agricultural land and counter- measures can be taken after the keen observation of the parameters of the land.[15]



Fig. 1: Proposed System

#### 3.1 DHT11 Sensor

HT11 sensor is used for measuring temperature and humidity. It uses a capacitive humidity sensor and a thermostat to measure the surrounding air. This sensor is cost effective, provides low power consumption and up-to 20-meter signal transmission is possible.



Fig. 2 DHT11 Sensor

#### 3.2 BLYNK APP

Blynk is a Platform with IOS and Android apps to control Arduino, Raspberry Pi and the likes over the Internet. It's a digital dashboard where you can build a graphic interface for your project by simply dragging and dropping widgets.

#### 3.3 How Blynk Works

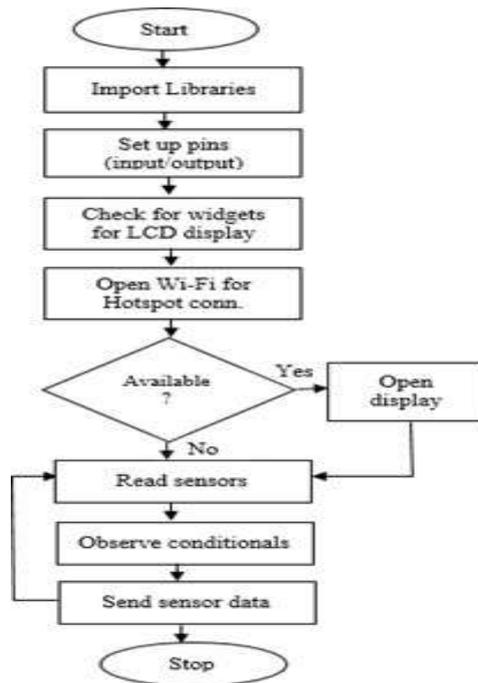
Blynk App - allows to you create amazing interfaces for your projects using various widgets we provide. Blynk Server - responsible for all the communications between the Smartphone and hardware. You can use our Blynk Cloud or run your private Blynk server locally. Its open-source could easily handle thousands of devices and can even be launched on a Raspberry Pi. Blynk Libraries - for all the popular hardware platforms - enable

communication with the server and process all the incoming and out coming commands. Now imagine: every time you press a Button in the Blynk app, the message travels to space the Blynk Cloud, where it magically finds its way to your hardware.

### 3.4 Features

- Similar API & UI for all supported hardware & devices
- Connection to the cloud using:
  - WiFi
  - Bluetooth and BLE

### 3.5 Flow-Chart



## 4. APPLICATIONS

We can also include a sensor like gas, infrared, ultrasonic sensors based on their requirements. Moreover, it is possible to control the relay, actuators through internet once a sensor values are going above/below predetermined values.

### 4.1 Advantages

- Simple and rugged in construction.
- Support for wider temperature range.
- Higher output, faster in operation.

### 4.2 Disadvantages

- Lower absolute resistance, self heating.

## 5. CONCLUSION

The main objective of this smart irrigation system is to make it more innovative, user friendly, time saving and more efficient than the existing system. Measuring four parameters such as soil moisture, temperature, humidity and pH values and the system also includes intruder detecting system. Due to server updates farmer can know about crop field nature at anytime, anywhere.

## 6. RESULT

Sensor	Sensor value range
DHT11	Temp -55c to +150c, Humidity 40%

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