

IOT Based Humidity & Temperature Monitoring

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Abstract- Using Internet of Things (IOT), we can control any electronic equipment at homes and industries. We can be able to read datas from any sensor and analyse it graphically from anywhere in the world. Here, we can read temperature and humidity data from the village area by placing the complete setup in the village and the weather da/ta automatically gets upload it to ThingSpeak cloud using Arduino Uno and ESP8266 module. Arduino UNO is MCU which fetches data of humidity and temperature from DHT11 sensor and Process it and give it to ESP8266 module. ESP8266 is a Wi-Fi module which will transfer the data to IOT cloud. From the cloud anyone(farmers) can access it and the data can be used for Agriculture scientist for research purpose & getting weather forecast more accurately which will at the end benefits the Farmers.

Keywords- Arduino Uno, ESP8266 module, DHT11 Sensor, Agriculture, Temperature Monitoring, Internet of Things (IoT), Arduino Software, Smart Environment.

I. INTRODUCTION

IOT is advancement that utilizations web to control the physical things, utilizing IOT we can acquire result which is more exact, fast and correct. Through IOT we can store all database in cloud's PC and can be assessable to the entire world utilizing Internet. This paper depends on one of the employments of web of things. The proposed framework delivers an answer for checking natural conditions at a specific place and the outcome will be open all through the world as this is an IoT application. The present application screens climate through some equipment segments like sensors. The Advantage of this undertaking are that we can approach of the information in regards to the

temperature and dampness around us from anyplace on the planet absent much battle. This stockpiling is done through web. Later this database is utilized appropriately to their necessities and applications. Segments can be gotten to from far place by utilizing IOT, henceforth it diminishes human work or association. This makes venture on enormous framework less. Every single diverse convention can be utilized as needs be to individual area in IOT. It is exceptionally helpful in the present time that all the data in regards to dampness and temperature ought to be extremely exact and ought to be accessible in Realtime. A large portion of this innovation is centred around proficient checking and controlling distinctive exercises. A proficient ecological checking framework is expected to screen and evaluate the conditions if there should arise an occurrence of surpassing the recommended level of parameters. Present advancements in innovation principally centres around controlling and observing of various exercises.

II. LITERATURE REVIEW

At the point when the items like condition furnished with sensor gadgets, microcontroller and different programming applications turns into a self-securing and self-observing condition and it is likewise called as keen condition. Additionally, we can see the information in different structures, for example, tables, outlines and so on [2]

With the approach of rapid Internet, an ever-increasing number of people far and wide are interconnected. Web of Things (IoT) makes this a stride further, and associate people as well as electronic gadgets which can talk among themselves [1].

Arduino is an open-source stage utilized for developing and programming of gadgets. It can get and send data to most gadgets, and even through the web to direction the particular electronic device.it utilizes an equipment called Arduino Uno circuit board and programming program (Simplified C++) to program the board. Machine with different circuits

keeping in mind the end goal to execute the particular direction. An Arduino can enable you to peruse data from input gadgets. [3]

Individuals since nineteenth century ended up ready to foresee the natural conditions. The main contrast between the crude and the cutting-edge framework is that the headway of innovation. The estimating instrument has progressed toward becoming scaled down, efficient, solid and more exact to give moment climate report without labour. Climate being a characteristic marvel dependably change with the difference in various barometrical parameters. All things considered, the normal or mean condition can be anticipated which at last gives the atmosphere of a geological zone for a long-term thought. Every one of these parameters are liable to change with change of elevation, day length (force of daylight changes), natural segments (tropical zone, or calm zone and so on.), sun point at specific spot and so on. In present day arrangement of climate gauging, the ecological information is sent to a PC based framework through a Data Acquisition Systems (DAS). Various parameters are multiplexed and finally continuing through a solitary channel to the PC to demonstrate the information.

For Broadcasting, the information taken by the sensors are recorded in satellite-based framework which imparts through remote information transmission framework and showed either in a TV or in the web broadcasting media. [4] Cloud data can be anchored and basic/speedy to get to. Any constant fluctuating data can be marked into cloud to the Automation of Weather Station System can be used measure, check and screen the atmosphere parameters to keep the monstrous mischief or hazards from ordinary disasters, in cultivating zone. An atmosphere station outfits the workplace concerning equipment to check, screen and watch the atmosphere conditions. The watched and watched atmosphere parameters information is profitable to make atmosphere figure reports and to analyse the atmosphere and environment. In this structure the atmosphere parameters estimations taken are temperature, dampness, twist course, and wind speed. Wind estimations are measure as free of various hindrances as could be permitted, while temperature estimations are taken free from coordinate daylight-based radiation or assurance and stickiness. [5]

III. SYSTEM DESCRIPTION

The primary equipment of this framework incorporates Arduino UNO with web availability, Temperature and Humidity sensor. The framework is financially savvy, low power devouring and simple to work. The information checked is gathered at the Web

server with exact date and time. The framework is composed so that framework can work 24x7 and give exact information of temperature and stickiness on ongoing premise. It can likewise be utilized in exactness cultivating.

A. Temperature and Humidity Sensor

The DHT11 Temperature and Humidity Sensor (Fig.1) is a 4-stick minimal effort profoundly solid sensor. Stick 1 is Vcc, Pin-2 is information stick which gathers information from outside world and offers information to the microcontroller. Stick arrangement for DHT11 sensor is appeared in figure. It includes a temperature and Humidity sensor complex with an adjusted computerized flag yield. It sustains high unwavering quality and amazing long-haul dependability. The DHT11 sensor incorporates a resistive-type mugginess estimation part, and interfaces with an elite 8-bit smaller scale controller, offering phenomenal quality, quick reaction, hostile to obstruction capacity and cost-adequacy. Its temperature go is 00-550C and Humidity extend is 20-90%.



Figure 1

B. Arduino Uno

Arduino (Fig.2) is an open source instrument for seeming well and good and control a greater amount of the physical world than your personal computer. It's an open-source physical processing stage in view of a basic small-scale controller board, and an improvement domain for composing programming for the board. Arduino can be utilized to create intuitive items, taking contributions from an assortment of switches or sensors, and controlling an assortment of lights, engines, and other physical yields. Arduino tasks can be remained solitary. The open-source IDE can be downloaded for free. The Arduino programming dialect is a usage of Wiring, a comparative physical figuring stage, which depends on the Processing interactive media programming condition. It contains everything expected to help the smaller scale controller; interface it to a PC with a USB link or battery to begin. Every one of the modules in the circuit are associated with Arduino module. Sensors are

associated with Arduino UNO board.



Figure 2

C. Wi-fi Microchip

ESP8266(fig.3) is low-cost Wi-Fi microchip with full TCP/IP stack and micro-controller. The Tx and Rx stick of ESP8266 is associated with the Rx and Tx of Arduino Uno. ESP8266 gets data from Arduino Uno which is bolstered by 9v battery.

This module has a ground-breaking enough on-board handling and capacity ability that enables it to be incorporated with the sensors.



Figure 3

D. Cloud Storage & Data Analysis

As indicated by its designers, "Thing Speak" is an open source Internet of Things (IOT) application and API to store and recover information from things utilizing the HTTP connection over the Internet or by using a Local Area Network. Thing Speak (Fig. 4) empowers the production of sensor logging applications, area following applications, and an informal organization of things with announcements".

Thing Speak has coordinated help from the numerical figuring programming MATLAB from MathWorks permitting Thing Speak clients to dissect and envision transferred information utilizing MATLAB without requiring the buy of a MATLAB permit from MathWorks.

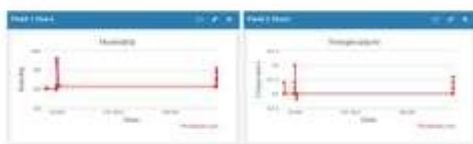


Figure 4

IV. SYSTEM ARCHITECTURE

Utilizing Internet of Things (IOT), we can control any electronic gear in homes and ventures. In addition, we can read an information from any sensor and break down it graphically from anyplace on the planet. Here, we can read temperature and moistness information from the town zone by putting the entire setup in the town and the climate information naturally gets transfer it to ThingSpeak cloud utilizing Arduino Uno and ESP8266 module. Arduino is MCU, it gets information of mugginess and temperature from DHT11 sensor and Process it and offer it to ESP8266 module.



Figure 5

ESP8266 is a Wi-Fi module which will exchange the information to IOT cloud. From the cloud anyone(farmers) can get to it and the information can be utilized for Agriculture researcher for examine reason and getting climate gauge all the more precisely which will toward the end benefits the Farmers. System Architecture diagram is shown in figure 5.

V. MONITORING SYSTEM

The proposed work actualizes an application which is utilized for observing climate conditions like temperature and mugginess of a room and furthermore it can produce reports.

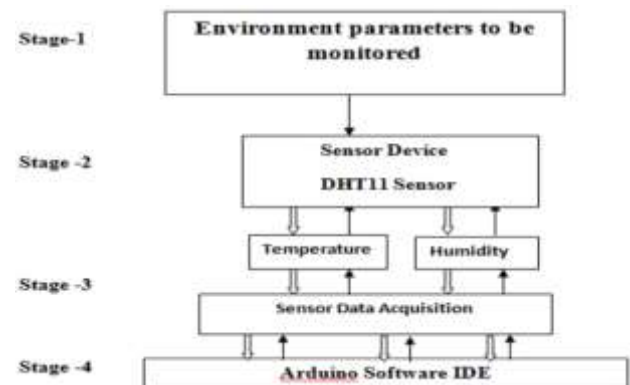


Figure 6

The proposed design incorporates the elements of every individual modules produced

for climate observing framework. The proposed demonstrate comprises of 4-phases. In the main stage to be identify the data in regards to the parameters which is to be checked for temperature and moistness. In the Second stage the DHT11 sensors are utilized to work and controlled in light of their affectability like settling the limit esteem, periodicity of detecting, messages and so on. Stage 3 incorporates the information procurement from temperature and mugginess sensors. At last, arrange 4 creates the yield of the application utilizing Arduino programming IDE reassure. It speaks to, finding the varieties from the sensor recovery information and in light of the limit an incentive to gauge the level of temperature and moistness.

VI. CIRCUIT DIAGRAM

- 3.3V stick of Arduino UNO to the VCC of DHT11 sensor (on the bread board)
- Information stick of DHT11 sensor to stick 2 on Arduino UNO board.
- 10 ω resistor is associated between the VCC and information pins of DHT11 sensor (on the bread board).
- VCC of DHT11 sensor (on the bread board) to CH_PD stick of Wi-Fi module.

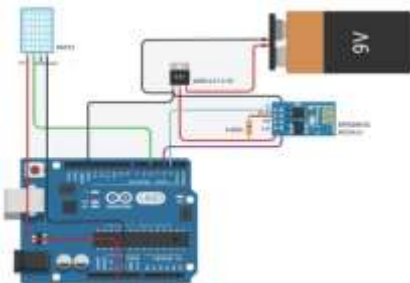


Figure 7

- VCC of Wi-Fi module to VCC of DHT11 sensor (on the bread board)
- From GND of Arduino UNO board to GND of Wi-Fi module.
- RXD of Arduino to URXD of Wi-Fi module.
- TXD of Arduino to Wi-Fi module UTXD.
- Interface Arduino UNO board to PC/Laptop utilizing USB link

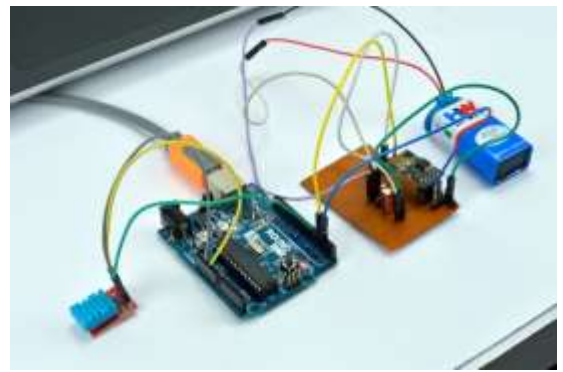


Figure 8

VII. FUTURE SCOPE

The proposed IoT based climate station can be modified to join numerous more highlights. We can add an OLED show to show the encompassing parameters into it. We can likewise include a GPS module in the outline so the area of the encompassing will likewise be sent or informed to the client alongside the encompassing parameters, like, temperature, moistness, weight, light power and so on. It can likewise be modified to such an extent that at whatever point a message or email is sent from a specific telephone number or email ID to the server, all the environmental parameters of the gadget alongside its area will be conveyed to that telephone or email id. This gadget can likewise be utilized to screen a specific room or place whose ecological parameters are required to be checked persistently.

VIII. CONCLUSION

IoT-Based temperature and mugginess checking framework give an effective and dependable framework for observing agrarian parameters. The restorative move can be made. IoT-Based observing of field not just allows client to diminish the human exertion and time, yet it additionally allows client to investigate precise changes in the air and for making conceivable move. It is less expensive in cost and devours less power. The GDP per capita in agro division can be expanded. This IoT-based framework can be reached out for controlling distinctive electronic and electrical contraption from remote areas and the framework can likewise stretched out for soil dampness and steers checking.

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