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Weather Data Vertical of Geospatial Data Centre

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Abstract : *A weather station can be described as an instrument or device, which provides us with the information of the weather in our neighboring environment. Proposed device basically senses the temperature, humidity, light intensity, and rainfall. There are various types of sensors present in the prototype, using which all the aforementioned parameters can be measured. It can be used to monitor the mentioned parameters of a particular place. The brain of the prototype is the ESP8266 based Wi-Fi module Nodemcu. Four sensors are connected to the Nodemcu This system is based on finding the real time data of weather conditions. This system will have an application which will provide information anytime. Here with the help of Nodemcu we can send data to the server and the data will be stored in server. This stored data will be useful for research and study.*
Keywords – *ESP8266, Humidity, IoT, Nodemcu, Sensors*

I. INTRODUCTION

Weather information is necessary for the planning and perpetration of watershed programmes, especially in understanding factors like groundwater recharge, the relationship between recharge & discharge and in aspects like irrigation planning. Downfall and other rainfall data aren't fluently available and the rainfall data is precious. The only long- term data available are the meteorological datasets available on India Water Portal (at quarter position). There are no hard data and numbers or major data available during the planning and perpetration of utmost watershed development programmes in India. Other measurable parameters are, cloud cover, sun hours and dematerialize-transpiration. Some of this information is gathered using satellite data for rainfall soothsaying. The rainfall parameters can be measured at one place through the installation of a rainfall station and can be homemade or automatic. When direct solar radiation isn't blocked by shadows, it's endured as sun, a combination of bright light and radiant heat. When blocked by shadows or reflected off other objects, sun is diffused. Sources indicate an" Average over the entire earth"of"164 watts per forecourt cadence over a 24-hour day". A photon starting at the center of the Sun and changing direction every time it encounters a charged flyspeck would take between and times to get to the surface. Rain needles are allowed to be the most ancient rainfall instruments, and they are believed to have been used in India more than times agone. A rain hand is really just a cylinder that catches rain. However, it means an inch of rain has fallen, If an inch collects in the cylinder. It's that simple. Utmost standard rain needles have a wide channel leading into the cylinder and are calibrated so that one-tenth of an inch of rain measures one inch when it collects outside. The channel is 10 times the cross-sectional area of the tube. Downfall as low as.01 elevation can be measured with this instrument. Sun intensity measurement is also a major factor in todays world. Sun intensity measurement can be useful in many ways. This type of data can be used for monitoring solar panel. Sun intensity can be measured in luminous and all this data can be used.

II. BLOCK DIAGRAM

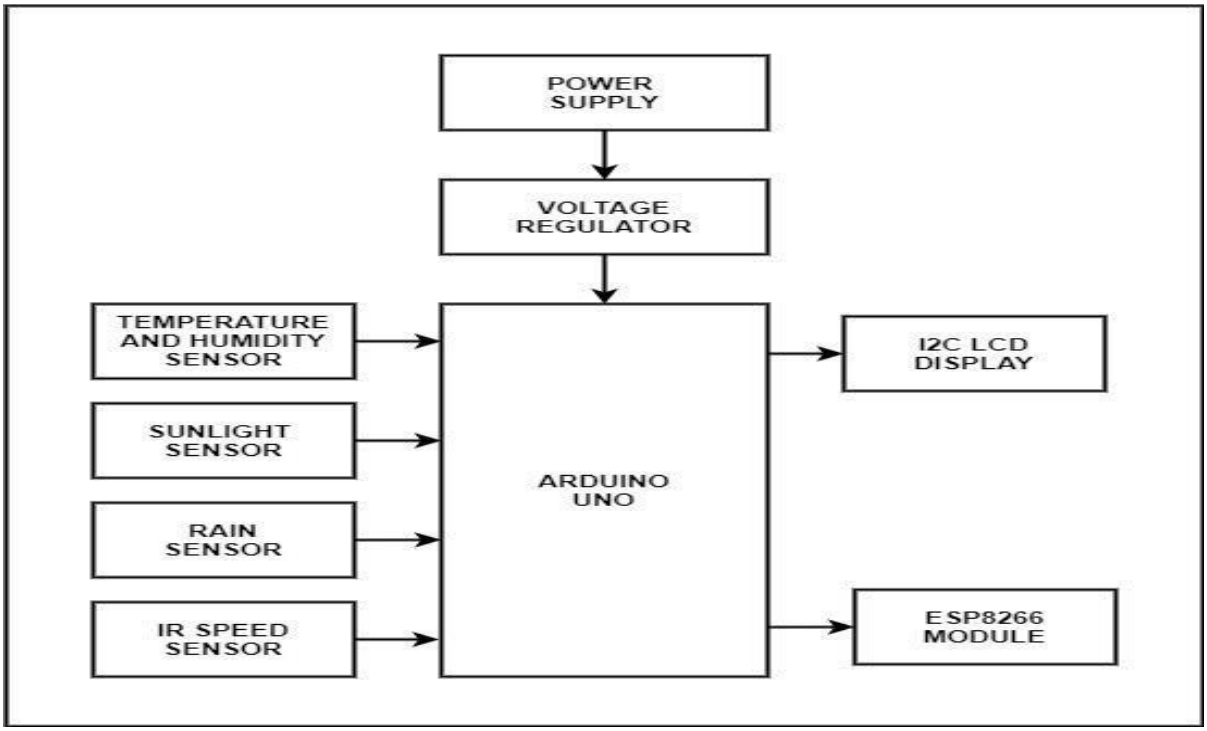

Fig. 1: Block Diagram of Weather Data Vertical of Geospatial Data Centre

The fig. 1 shows Block diagram of weather data vertical of geospatial data centre. In this block diagram main block is Arduino uno. On the left side four blocks are connected to Arduino uno. First block is temperature and humidity sensor which measure temperature and humidity of surrounding area. second block is sunlight sensor which measure sun intensity in lux. Third sensor is rain sensor which measure the rain fall. Fourth sensor is IR speed sensor which measure the wind speed. There are 2 blocks on right side which are 12c LCD display and ESP8266 module respectively. Power supply block supplies power to the voltage regulator and voltage regulator block regulates the voltage supply to the Arduino uno.

III. METHODOLOGY

The proposed system consists of mainly four main sensors which are for measuring temperature, humidity, sun intensity, rain fall, wind speed. Focus of this system is to collect data from this sensor and upload it to the website where it can be monitored on daily basis all the data will be real time data which will updated time by time. All this data can be used to analyze and use it for research purpose and many other useful purposes. The system uses Arduino microcontroller along with ESP8266 module to make it IoT enabled. Sensors such as DHT11 for measurement of temperature and humidity, rainfall sensor, IR speed sensor and sunlight sensor are used in this system. The system uses Arduino microcontroller along with ESP8266 module to make it IoT enabled. Data from all these sensors is read by Arduino UNO and then displayed on the I2C LCD Display. The data is then sent to cloud server using ESP8266 module. Power supply is connected across voltage regulator which supplies voltage to the Arduino uno. voltage regulator regulates the voltage. ESP8266 module helps for connection between Arduino and the server where values are going to be collected and stored. The server will be classified as per the parameters like rain fall then sun intensity then wind speed and then humidity and temperature. All this data can be monitored anytime and can be made available anytime. At first measuring device are set in proper position without any obstruction of anything.

All the measuring devices are connected through ESP8266 which allows transportation of data from Arduino to the server. All the data will be stored on the server in classified format according to the parameters. All the data stored will be published on the website which can be viewed anytime from anywhere on the server. All this data will be also useful for academic purposed which should be analyzed properly.

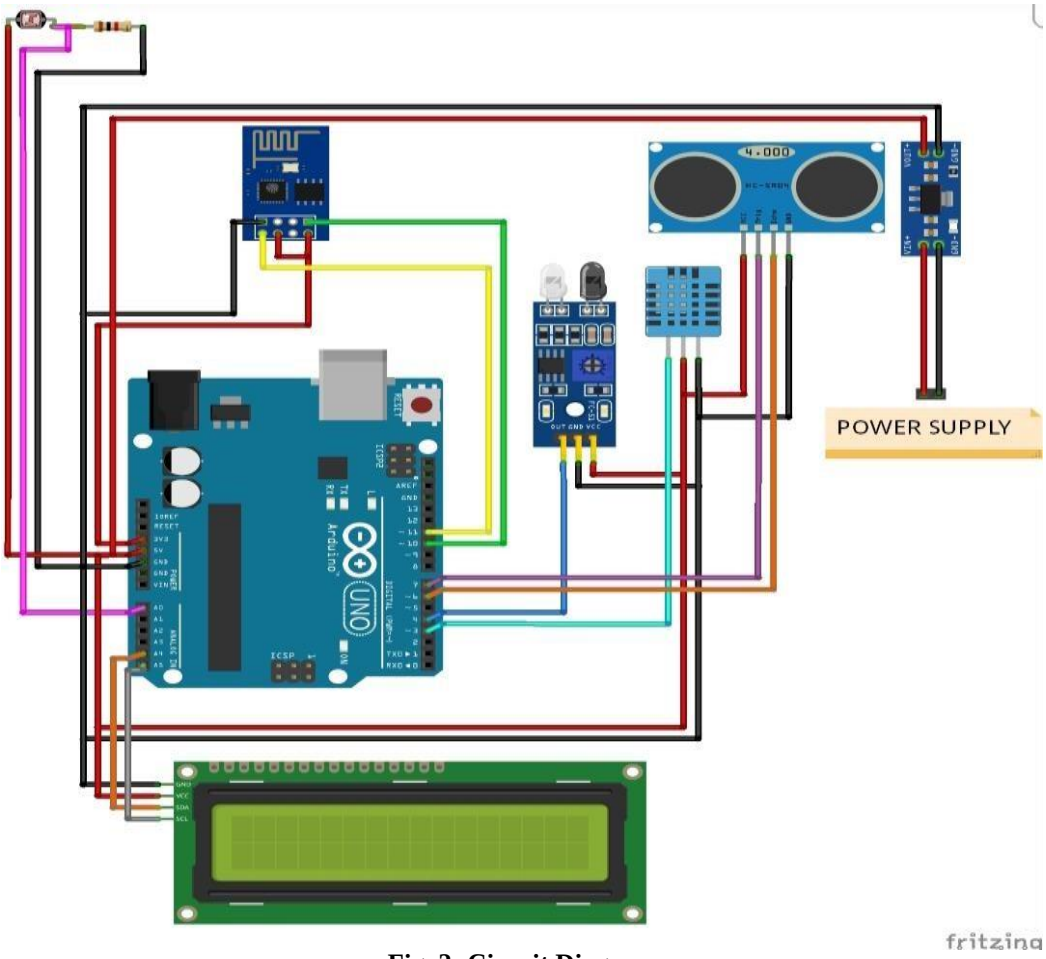

Fig. 2: Circuit Diagram

IV. LITERATURE SURVEY

[1]. Abhay Sharma, This proposed methodology mainly combines by two-studies which is fields-based control system & data collecting technique, The aim is to create a macroscale database system depend upon the employed features to create the present data. The main objective mentioned here were chosen based on the sensors which is used to build this system and design an effective weather monitoring system.

[2]. Ravi Kishore Kodali and Snehashish Mandal, They have proposed a methodology with aim of providing information about the neighbouring weather parameters such as temperature & humidity, atmospheric pressure, etc. Proposed device senses the temperature, pressure, humidity, light intensity, rain value. There are several kinds of sensor existing in this proposed system, all the parameters can be measured with the help of these sensors.

[3]. Yamanouchi, Hideya Ochiai, Y K Reddy, Hiroshi Esaki and Hideki Sunahara proposed system have find the high density real time weather monitoring. Which is help to reduce the damage of disaster. This paper we describe the how to install low cost weather monitoring system and this system is useful for environment..

[4].Dr. Kumar Chinnaiyan, C. V Saranya have propesed system have tracking to sun dynamic and finding sun intensity The module can be tracked with the help of the stepper motor. That does not used any sensor. They are cost effective. This stepper motor done by the step angle. The step angle was calculated from various angular position. The calculation of various angles based on the formula of the intensities. This system is helpful for finding sun intensity.

[5]. P. Sushmita, G. Sointensities Proposed system aims to develop a system which will monitor the weather parameters anywhere. Proposed system have many sensors such as temprature sensors, gas sensor, humidity sensor. LPC1678 microcontroller is also used in given system. It sends data by using the microcontroller all this data is stored and shown in Excel sheet and all the data can be send on sms using gsm model

[6].Munandar, Hanif Fakhrurroja, Muhammad Ilham Rizqyawan, Rian Putra Pratama, Jony Winaryo Wibowo, Irfan Asfy Fakhry Anto, have proposed a system which implements real time weather monitoring

system with mobile application. Proposed system uses AWS connection for sending data on web server and all this data comes from sensor . Data from weather sensor is taken from the AWS-Davis Instrument using the Weather Link software. The data is transmitted through the data logger using serial communication, uploaded via FTP, and stored on a webserver.

V. RESULT

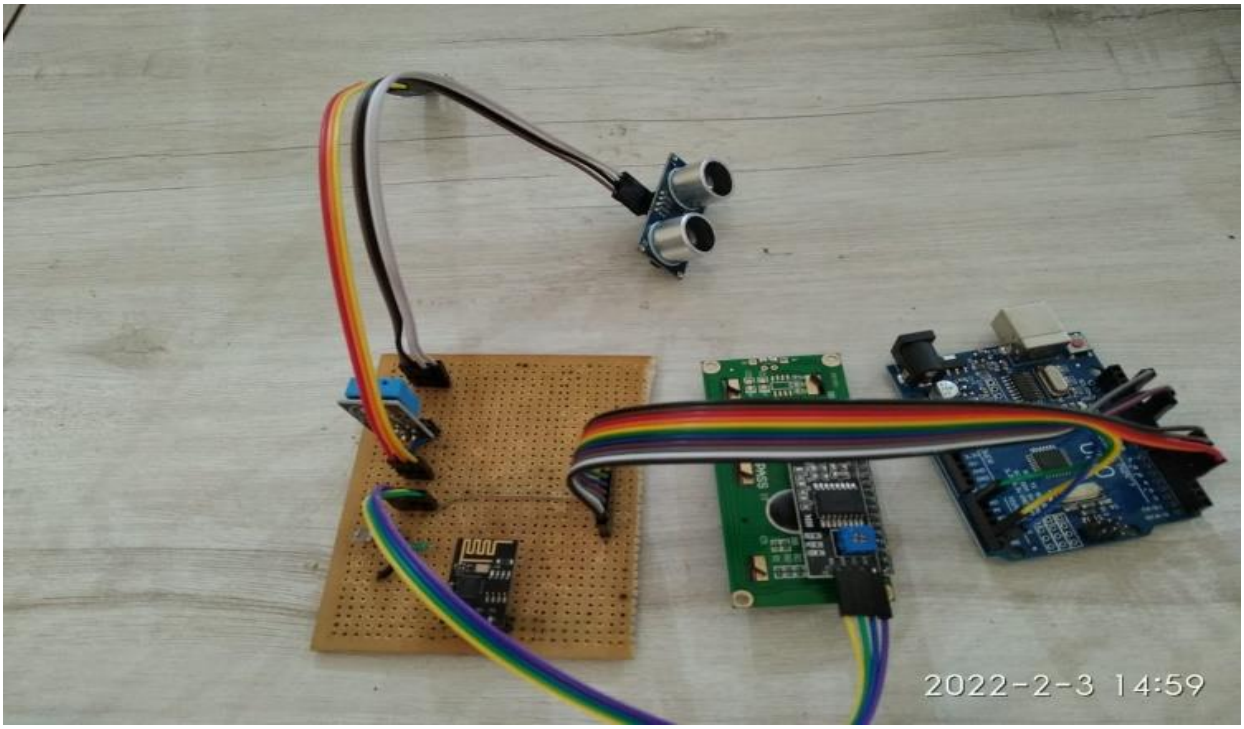

Fig 3. Weather monitoring system

In fig. 3 it is showing weather monitoring system which contains Arduino, ultrasonic sensor which helps to measure rain parameter, DHT11 which is used to measure temperature and humidity. LDR which is used to measure sun intensity. IR sensor for measuring wind speed. ESP8266 which helps to transfer data to the server.

In fig. 4 it showing 3 graphs first graph is basically humidity and it shows the graph from collected data. Second graph is basically wind and it shows the graph from collected data. Third graph is basically sunlight and shows the graph from collected data in luminous.

In fig. 5 it is showing graph of rain from the collected data according to the different time. In field chart 2 it is showing graph of temperature from collected data.

VI. CONCLUSION

This proposed system is useful for monitoring Geospatial Data of surrounding weather parameters. The main focus is analysis of a particular location's weather conditions. This system is focusing on parameters such as temperature, humidity, rain level, sunlight and wind speed. We are using different sensors such as DHT11 Sensor, LDR, Rain Sensor, Speed Sensor which is used for measuring all these parameters. all the gathered information is visualize at one place by using an IoT enabled platform. IoT platform will be used for analyzing collected data and its results will be available to the end user through this platform. This collected data will be helpful for monitoring future analysis and it can be easily accessible to other end users.

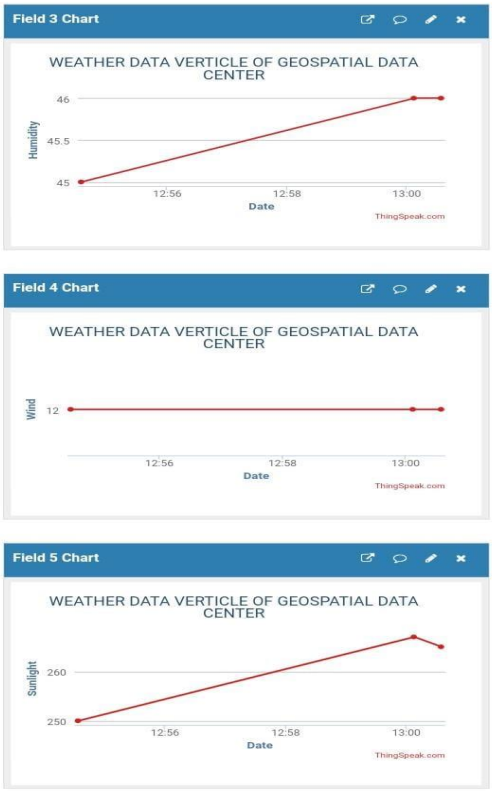

Fig 4. Result graph

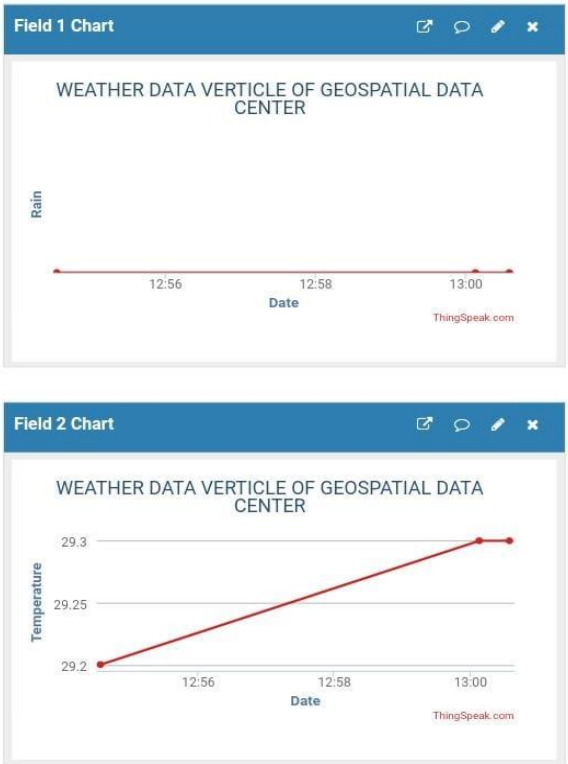

Fig 5. Result graph

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