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RESEARCH ARTICLE

WEATHER MONITORING SYSTEM USING INTERNETOF THINGS (IoT)

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Abstract

In most parts of the industrial and domestic applications vigilance is important and many problems can occur due to a lack of proper temperature monitoring system. In this project we will monitor the temperature in our local area.Internet of Things (IoT) is the latest concept of relating to physical devices or other objects to online and are able to connect with others. Each item says provided with different identifiers and data transfer capabilities via an internet network without human and machine intervention communication. The project aims at a simple microcontroller, NodeMCU for wireless weather monitoring and monitoring system, WiFi-WeMos ESP8266 weather monitor uses many senses such as heat, rain and carbon monoxide sensor. Then show all data in Blynk application. The project was developed using NodeMCU Microcontroller, WiFi-WeMos ESP8266, DHT 11 temperature and humidity sensor, rain sensor and MQ-7 Carbon monoxide sensor etc. It is advisable to monitor the weather in any case, any location and anytime.

Introduction:-

With the advent of high-speed Internet, and more people all over the world are connected. Internet of Things (IoT) take this step forward, and they don't just connect people but technological things that can speak in between themselves [1]. At the low cost of Wifi-enabled devices the trend will only gather more momentum. The main idea behind the Internet of Things (IoT) various connections electronic devices over the network and retrieve the file data from these devices (sensors) that can no longer be distributed to any fashion, upload it to any cloud service where one can analyze and analyze information collected. In the clouds one service can use this data to inform people about the variety means like using a buzzer or sending them an email or send them an SMS etc.

Climate monitoring is an important factor for many conditions. For example, weather conditions need to be considered to maintain healthy growth in plants. Apart from that, it was also necessary to ensure safety environment in the city or town. People who want to go going to town can easily detect the weather at the time and will be planned their easy movement. Wirelesscommunication is the transfer of information or more datadistance without using wires from the transmitter to himthe recipient. Data transfer distance may be shorter orlong. The weather

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monitoring system will collect all the detailsand we will send to an application known as Blynk. This application may allow the user to know the exact weatheralways and every day. The motive for this work is tomake it easier for people to move from one place to another.

Present Situation:
Today, there is an announcement about weather from radio or television but only for a limited time and it does not work well. In the modern world, technology is essential for a person to simplify daily life. Therefore, technology is being used in this project to help people know the weather somewhere by you only use your fingers. The weather monitoring system can be divided into categories wireless or wireless system. In wireless communication, the connection will be very easy and easy to interact with. Therefore, the weather monitoring system does not require responsible people human presence in the area [2].

Objectives:-

To measure the environment condition using the online webserver with the help of sensors like temperature sensor. Humidity sensor, dew point sensor, light intensity sensor, rain sensor, pressure sensor, smoke sensor and altitude sensor.

In this project people can measure their own home weather condition without getting help from any forecast agency.

This project is also useful to get pre alert system whenever weather will change from predetermine values.

Lirerature Review:-

In today's world many pollution control systems are in place built with various environmental parameters. There is system model introduced Io climate monitoring and a reporting system where you can collect, process, analyze, and present your measured information to a web server. The wireless network management model contains an endpoint device, router, gate node and management monitoring center. The storage device is responsible for wireless collection network data is sensed, and send it to the parent node, there data is sent to the gate area from the parent node directly or by route. After receiving data from wireless sensor network, gate node output data after analysis once to convert them to Ethernet data format, export them to a server. Under legal terms, any device that uses software can also be considered a server. Standard servers manage network resources. Services or details provided via Internet connected via LAN is also made available to users via smart phones, the web browser or other web browser devices to make the program intelligent, flexible, and efficient.

The proposed system in [3] describes the prototypes of the online monitoring system distribution converter using IoT (Internet of Things). This is the real time proposed Frame using NodeMCU, DHT11, Blynk application and some sensors. These analog numbers are taken multiplexing mode connected to configured microcontroller. Then there are the prices then sent directly via wifi module under tcpip protocol to dedicated ip shows data in real-time chart form on any web connected pc / laptop / mobile for display. Real time data is visible at the end of posting to the Android app connected to the microcontroller. The power supply is supplied with 5v dc voltage.NodeMCU generate 3.3v dc voltage which is required for wifi unit and something else.

The plan [4] proposes the appointment of a Domestic Room Temperature Monitor and Regulate assistance of IoT which provides information about home temperature and humidity nature. There are various types of sensors present in the prototype, which use the parameters can be measured. It can be used to monitor the temperature or humidity of a specific room or place. The Proposed Program continues to send data to the cloudmonitor data from anywhere. With location monitoring, the system uses an LCD to display a room temperature and humidity at the same time with energy. The model brain is this ESP8266 based module for Wi-Fi NodeMCU (12E) Temperature and Humidity sensor (DHT11) is connected to thread node. Whenever these numbers exceed the selected limit of each selected a notification is given to the mobile user via SMS. Based on user notification control room temperature remotely using a controlled Google Assistant through Artificial Intelligence. This system looks good and is very controllable using voice and text commands.

The system [5] proposes prototypes to monitor climate barriers with assistance of IoT. Parameters that can be measured during the day, temperature and humidity. Data can posted online, which can be used to predict the weather and ultimately analyze the weather patterns, and other weather purposes. The system uses a good

combination of analog and digital sensors in wireless and wireless operating modes. Daylight can be a warning using a photodiode as a wired binary switch and humidity can be measured Using wireless analog wireless cable.

The system [6] proposes a system for monitoring temperature and humidity in agriculture through IoT help. In this project the control of one channel in real time is controlled by the incompetent another used to control the flow of water in the field. The main hardware of this program includes NodeMCU with internet connection, temperature sensor and humidity. Data Monitored collected Web server with accurate date and time. System built in such a way that the system can operate 24x7 and provide precise details of temperature and humidity in real time. It can also be used for precision farming. Same system setup as well provide space for use of a variety of devices such as water pumps, remotely accessible using a mobile phone from anywhere using an internet connection. Using this program farmers can turn on and off their pump in their home or where they want to use their cell phone.

The system [7] proposed a key idea to connect a heat sensor to the NodeMCUthen collect temperature readings and display the readings on mobile. Can be use the Hadoop collection to save all temperature changes. This temperature record is probably used for future analysis, will put the NodeMCU and temperature sensor on Cloud server room and read current temperature using Blynk Server mobile application phone basically.

The system [8] proposes to monitor temperature and humidity the state of development. Introduces a new indoor heating system too humidity monitoring system. Hardware monitoring system built with NodeMCU, Wi-Fi dongle, DHT 11 sensor and android mobile phone. This project works with

Internet of Things (IoT)

IoT (Internet of Things) is an advanced system of automation and analytics that uses communication, sensitivity, big data, and artificial intelligence technology to deliver complete product systems or app. These systems allow for greater clarity, control, and performance when used in any environment industry or system.

IoT systems have applications in the industry using their unique flexibility and capabilities suitable for any location. They improve data collection, automation, performance, and much more with smart devices and powerful permitting technology.

IoT - Key features

The most important features of IoT include artificial intelligence, communication, sensors, functionality engagement, and the use of small devices. A brief review of these features is provided below

1. **AI** - IoT actually makes almost anything “smart”, which means it enhances all aspects ofa powerful life of data collection, artificial intelligence algorithms, and networks. This it could mean something as simple as upgrading your refrigerator and cabinets to find out when your favorite milk and grain drop in, and place an order with your favorite grocer.
2. **Communication** - New technology to allow communication, and especially IoT communication, means that networks are no longer tied to only major providers. Possible networks in the filevery small and cheap scale while still in use. IoT creates these smaller networksamong the devices of its system.
3. **Sensors** - IoT loses its difference without nerves. They serve as descriptive instrumentsswitch the IoT from the normal network of devices to the operating system you knowthe realization of the real world.
4. **Active Engagement** - Many modern interactions with connected technologies are possiblejust by engaging. IoT introduces a new paradigm for active content, product, and orservice involvement.
5. **Small Devices** - Devices, as predicted, are smaller, cheaper and more powerfulin time. IoT uses small-purpose devices designed to deliver its clarity, flexibility, andto do different things.
6. **3.2 IoT - Benefits**
7. The benefits of IoT are to be found in all aspects of lifestyle and business. Here is a list of some files for benefits to be provided by IoT
8. **Improved Customer Engagement** - Current analytics suffers from blindness as wellimportant errors in accuracy; and as noted, involvement often does nothing. Io totallytransforms this into achieving richer and more effective engagement with the audience.
9. **Technical Usability** - The same technology and data that develops the customerexperience also improves device usage, and contributes to the most powerful advances in technology. IoTopens up a world of critical operational and field information.

10. **Reduced Waste** - IoT makes development areas clearer. Current statistics give usirrational understanding, but IoT provides real-world information that leads to better performance resource management, automatic heating and humidity control.
11. **Advanced Data Collection** - Today's data collection suffers from its limitations and experiencedesign for use. The IoT breaks it down into those spaces, and then places it directly where people can be foundI really want to analyze our world. Allows an accurate picture of everything.

IoT - Evils

While IoT brings many benefits, it also offers many challenges.

Here is a list of its major problems

1. **Security** - IoT creates an environment for ever-connected and over-connected devicesnetworks. The system does not offer minimal control despite security measures. This leaves usersexposed to various types of attackers.
2. **Privacy** - IoT sensitivity provides personally identifiable informationwithout user participation.
3. **Confusion** - Some find that IoT systems are complex in design, deploymentand andstorage is given their use of many technologies and a large collection of new empowermenttechnology.
4. **Flexibility** - Many are concerned about the flexibility of the IoT system for easy integrationwith each other. They worry about finding themselves with too much contradictory or locked thingsprograms.
5. **Compliance** - IoT, like all other technologies in the business sector, must complyregulations. Its complexity makes the problem of compliance seem like a big challenge theremany consider the standard software compatibility as a war.

Software Section

IoT software talks about its key areas of communication and action through platforms, embedded systems, partner systems, and middleware. These unique and efficient apps are a must of data collection, device integration, real-time statistics, and app and process extensions within the IoT network. They exploit integration with critical business plans (e.g., ordering systems, robots, programming, and more) in performing related tasks.

Data Collection

This software controls hearing, measuring, simple data filtering, simple data security, and data integration. It uses certain protocols to help the senses communicate in real time, machine-to-machine networks. It then collects data from multiple devices and distributes it in accordance with the settings. It also works backwards by distributing data to devices. The the system finally transfers all the collected data to the central server.

Device Integration

Software that supports integration binds (dependent relationships) to all system devices to create the body of the IoT system. It ensures the necessary cooperation and stable communication between devices. These applications are descriptive technologies of IoT network software because without them, it is not an IoT system. They run various systems, agreements, and limitations for each device to allow communication.

Real-Time Statistics

These applications take data or input from various devices and convert it into active actions either clear patterns of human analysis. They analyze data based on various settings as well

Designs to perform automated tasks or provide information needed by the industry.

Expansion of Process and Process

These applications increase access to existing programs and software to allow for more, and more operating system. They include pre-defined devices for specific purposes such as permissions certain mobile devices or engineering devices are accessible. It supports improved production and more accurate data collection.

Internet of Things - Technologies and Agreements

IoT makes extensive use of standard agreements and communication technologies. However, the main one enable technology and IoT protocols by RFID, NFC, Bluetooth with low power, low power wireless cables, low power radio, LTE-A, and WiFi-Direct. This technology supports file specific network performance is required for an IoT system unlike a standard uniform network of common programs.

NFC and RFID
RFID (radio frequency identification) and NFC (nearby field communication) provide easy, low energy, with flexible options for ownership and access tokens, bootstrapping connections, and payments.
1. RFID technology uses 2 radio methods to identify and track tagsassociated with objects.
2. NFC has communication systems for electronic devices, usually mobileand a standard device.

Low-Energy Bluetooth
This technology supports low power, the need for long-term use of IoT activity while common exploitation technology with native support across all systems.

Low-Energy Wireless
This technology replaces the most severe famine of the IoT system. Although the senses and so on elements can reduce power for a long time, communication links (e.g., wireless) should remain in listening mode. Low power wireless not only reduces usage, but also extends the life of consumption with minimal use.

Radio Agreements
ZigBee, Z-Wave, and Thread are radio programs for building low-level private networks. These technology has low power, but they offer high throughput unlike many similar options. This is increasing network capacity of small local devices at no average cost.

LTE-A
LTE-A, or LTE Advanced, brings significant improvements to LTE technology by not only expansion its coverage, but also reduces its delay and enhances its performance. It gives IoT a lot more power by expanding its range, with its most important applications car, UAV, and the same connection.

WiFi-Direct
WiFi-Direct eliminates the need for access point. Allows P2P (peer-to-peer) connection via WiFispeed, but with low latency. WiFi-Direct removes that network object it usually holds it down, and it does not slow down by speed or throughput.

Internet of Things - General Use
IoT has applications in all industries and markets. It includes groups of users from those who want to reduce energy consumption in their home for large organizations that want to simplify their operations. It not only does it prove to be helpful, but it is almost a challenge for many industries as technology advances and moves in respect of automated machines introduced in the distant future.

Engineering, industry and infrastructure
IoT applications in these areas include productivity improvement, marketing, service delivery, and safety. IoT provides powerful ways to monitor various processes; and real appearance creates greater visibility of development opportunities.

The deep level of control provided by the IoT allows for faster and more immediate action on those opportunities, including events such as transparent customer needs, consistent product, and inefficiency inequipment, distribution network problems, and more.

Government and security
IoT has applied to the government and security allows law enforcement, defense, city planning, and economic management. Technology closes current gaps, corrects many current bugs, and too increases the reach of these efforts. For example, IoT can help city planners have a clearer view of the impact of their design, and governments have a better view of the local economy.

Home and Office
In our daily lives, IoT offers a personalized experience from home to office to the organizations with which we usually do business. This improves our overall satisfaction, it improves to produce, and improve our health and safety. For example, IoT can help us customize our office space to expand our work.

Health & Medicine
IoT pushes us forward to our drug future that thinks it uses a highly integrated network of complex medical devices. Today, IoT can dramatically increase medical research, devices, care, and emergency care. The combination of all the items gives more accuracy, more attention details, rapid response to events, and consistent development while reducing the average size of medical research and organizations.

Weather Monitor
Proposed Model:

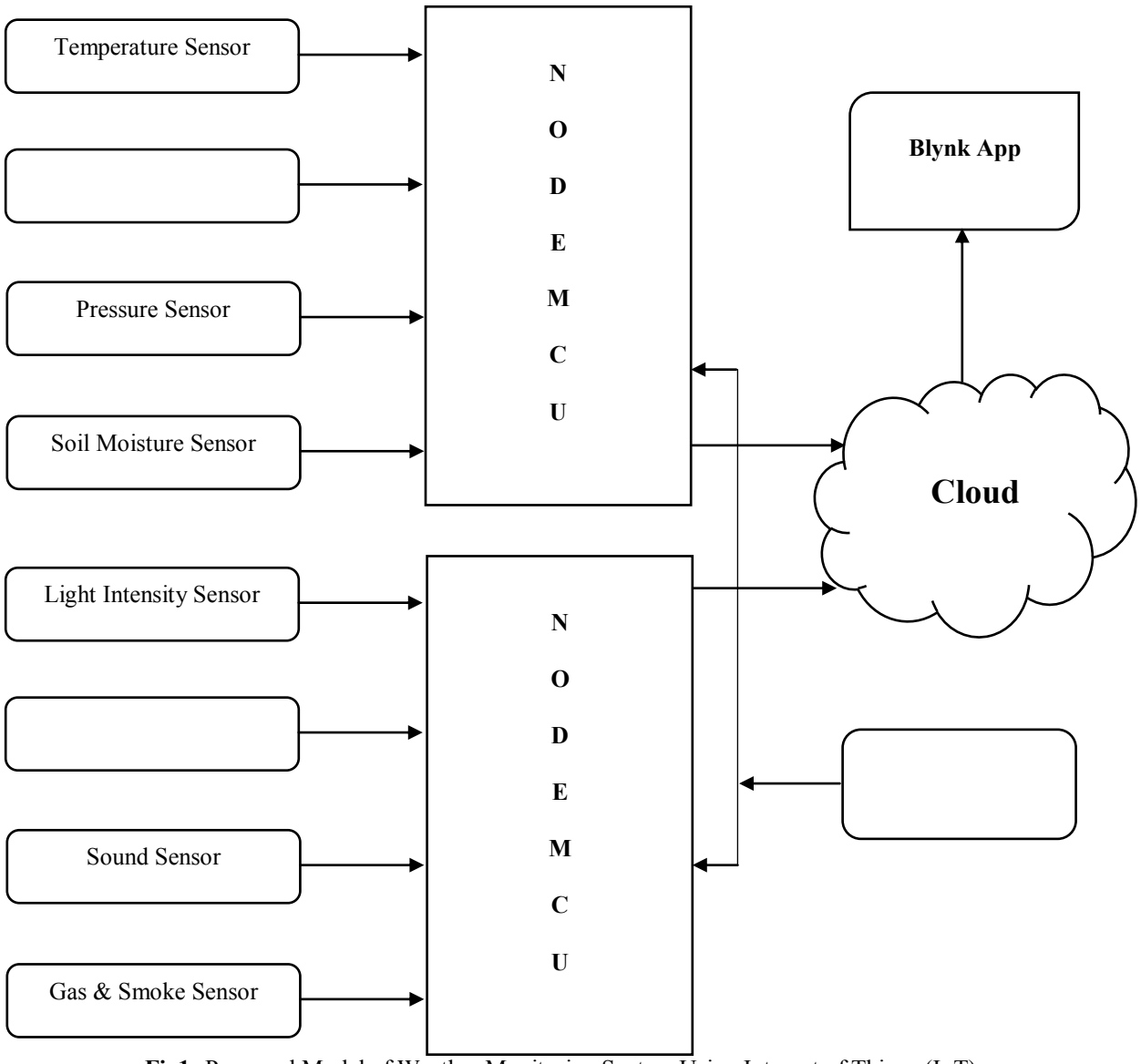

Fig1: Proposed Model of Weather Monitoring System Using Internet of Things (IoT).

Input Section:
Temperature & Humidity Sensor:
DHT11 is a basic low-temperature digital temperature sensor. It uses a capacitive humidity sensor and thermistor to measure ambient air and draws a digital signal to the data pin (no analog input pins required). Easy to use, but requires careful time to capture data. The only real feature of this sensor is that one can get new data from it once every 2 seconds, so if you use our library, sensor, reading can take up to two seconds.

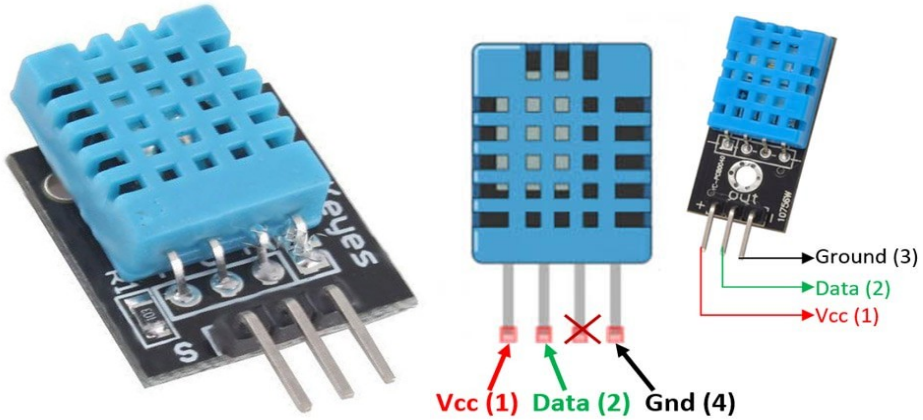

Fig 2:- Temperature & Humidity Sensor (DHT11).

Pin Identification and Configuration:

No:	Pin Name	Description
For DHT11 Sensor:		
1.	Vcc	Power supply 3.5V to 5.5V.
2.	Data	Outputs both Temperature and Humidity through serial data.
3.	NC	No Connection and hence not used.
4.	Ground	Connected to the ground of the circuit.
For DHT11 Sensor module:		
1.	Vcc	Power supply 3.5V to 5.5V.
2.	Data	Outputs both Temperature and Humidity through serial data.
3.	Ground	Connected to the ground of the circuit.

How to use DHT11 sensor:
The DHT11sensor is factory calibrated and outputs serial data hence it is highly easy to set it up. The connection diagram for this sensor is shown below-

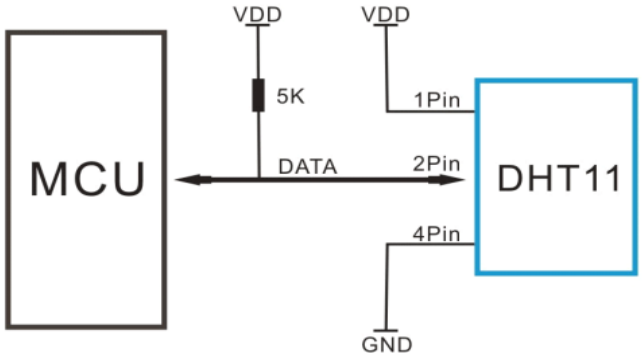

Fig 3:- Connection Diagram of DHT11.

Barometric Pressure Sensor:
A pressure sensor that measures pressure to detect height is known as a Barometric Pressure sensor. Measuring fluctuations in atmospheric pressure. The nerves need protection from moisture, rain, and water. They are usually installed in a data logger within a fenced area. Also known as the Barometric Air Pressure sensor (BAP). Its range is 600 to 1100hPa (mBar).

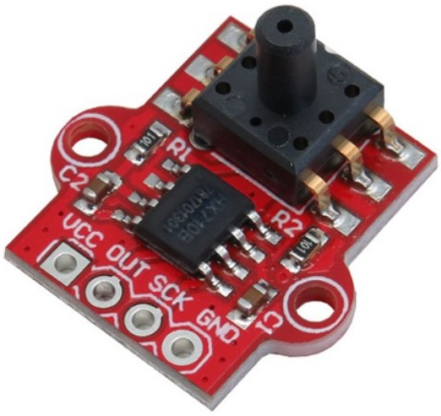

Fig 4:- Barometric Pressure Sensor.

Soil Moisture Sensor:

The Earth's Moisture Sensor uses energy to measure the dielectric allowance of the surrounding path. On the ground, dielectric clearance is a function of water content. The sensor creates a voltage equal to the dielectric allowance and therefore the water content in the ground. The sensor is in the middle of the water content above the sensor length. There is a 2 cm area of influence relative to the flat surface of the sensor, but it has little or no sensitivity at the sharp edges. Soil Moisture Sensor is used to measure moisture loss over time due to vegetative evaporation and detection, to test the moisture content of a wide variety of plants, to monitor soil moisture content to control irrigation in nursery and to improve botanical biological tests.

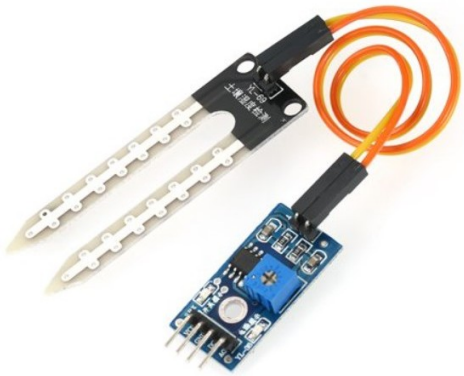

Fig 5:- Soil Moisture Sensor.

Rain Sensor:

Rain Drop Sensor is a device used to feel the rain. It has two modules- (i) a rain board, a rain receiver (ii) a control module, which compares the analog value and converts it into a digital value. The Rain Drop Sensor can be used in the smart agricultural sector to detect rain. Its operating capacity is 5V.

Fig 6:- Rain Sensor.

Sound Sensor:

The sound sensor is used to receive an acoustic wave and display a vibrating sound image. It has a built-in microphone that is sensitive to sound. The electret fil min microphone vibrates with an acoustic wave resulting in a change in capacitance and subsequent small voltage. Thereafter a small voltage is sent to the LM393 module in the module before compared to the threshold set by the blue potentiometer. When noise intensity in the surrounding area does not reach the threshold, the OUT interface emits high-quality signals; otherwise, it produces low-level symptoms.

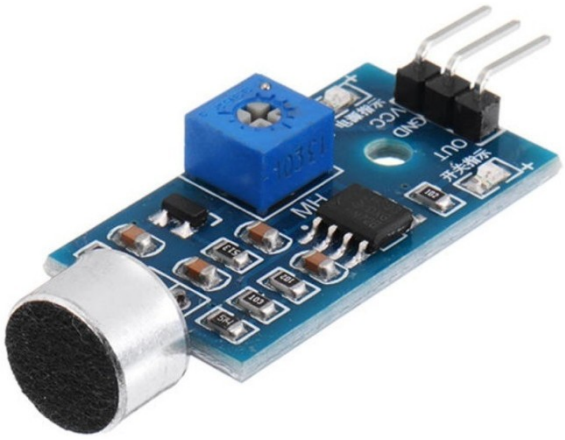

Fig 7:- Sound Sensor.

Gas and Smoke Sensor:

Gas sensors (also known as electric detectors) are electrical devices that detect and identify various types of gases. They are commonly used to detect toxic or explosive breaths and to measure gas congestion. Gas sensors vary in size, width and hearing ability. Gas sensors are used in factories and production facilities to detect gas leaks and to detect smoke and carbon monoxide in homes.

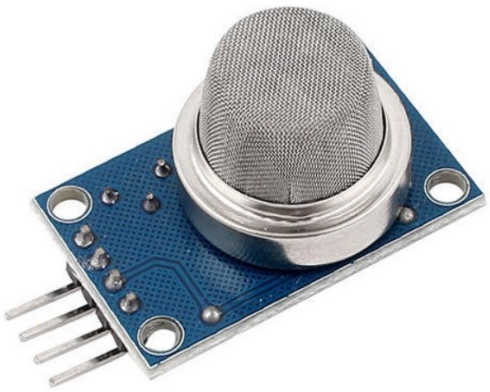

Fig 8:- Gas and Smoke Sensor.

Light Intensity sensor:

The Light sensor module uses the GL5528 photo resistor to detect natural magnitude. Sensory resistance decreases as the intensity of natural light increases. The LM358 chip is used as a voltage monitor so that you can get accurate data.

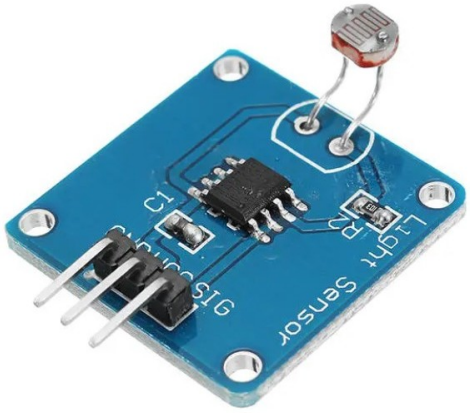

Fig 9:- Light Intensity sensor.

Processing Section

NodeMcu:

ESP8266 NodeMcu is a popular and widely used development board based on the ESP-12E WiFi Module that combines simple programming features with Arduino IDE (C \ C ++) and WiFi capabilities. Using a build-in programmer and CH340G USB-to-Serial chip, which illuminates ESP8266 and serial output to a PC, development and implementation prototyping projects are easily accomplished. Like the Arduino boards, the ESP8266 NodeMcu has GPIO connectors, voltage regulator, ADC, Micro-USB port (light and serial outlet) - all on one board. In addition the ESP8266 NodeMcu has full WiFi that takes care of the WiFi connection on the server or client.

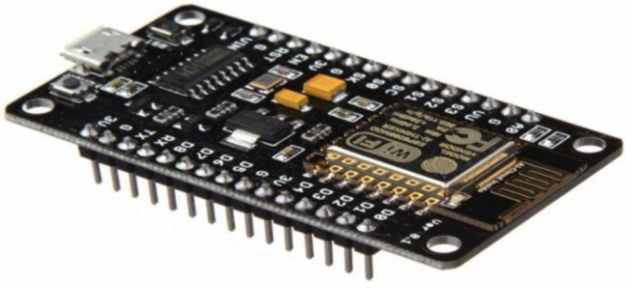

Fig10:-NODE MCU Board.

ESP8266 is a System on a Chip (SoC), developed by Chinese company Espressif. It contains a Tensilica L106 32-bit micro controller unit (MCU) and a Wi-Fi transceiver. It has 11 GPIO * pins (Standard input / output pins), as well as

analog input. This means you can configure it like any other standard Arduino or other microcontroller. In addition, you get a Wi-Fi connection, so you can use it to connect to your Wi-Fi network, connect to the Internet, host a web server with real web pages, let your smartphone connect to it, etc. The possibilities are endless! Not surprisingly, this chip has become one of the most popular IoT devices available.

It contains 32-bit low power CPU, ROM and RAM. It is a complete and independent Wi-Fi network solution that can carry software applications such as standalone device or connected to a microcontroller (MCU). The module has the built-in firmware of AT Command to be used on any MCU with COM port. ESP8266 can be illuminated and configured using Arduino IDE. Due to its large open engineer community, a large number of libraries of this popular microcontroller are available.

All ESP8266 models have the ESP8266EX core processor and the Tensilica L106 32-bit micro control unit. These are low cost, high performance, low power consumption, easy to set up, wireless SoC (System-On-Chip). Provides 2.4 GHz Wi-Fi capabilities (802.11 b / g / n, WPA / WPA2 support), general purpose / output input (13 GPIO), Inter-Integrated Circuit (I^2C), analog conversion -to-digital (10 -bit ADC), Serial Peripheral Interface (SPI), DMA interface (GPIO sharing pins), UART (on dedicated pins, and UART for transmission only can be allowed on GPIO2), as well as pulse width fluctuations (PWM).

It has a built-in programming and volume control, which allows light to turn on and off device power via micro-USB. The system operates at 3.3V.

Here is a summary of the ESP8266 NodeMcu specifications:

1. Tensilica L106 32-bit micro control unit at 80 MHz (or over 160 MHz)
2. 32 kB of RAM commands
3. User data 80 kB RAM
4. RAM of 16 kB ETS data system
5. Flash Memory 4Mb
6. USB - USB micro port for power, programs and debugging
7. 13 GPIO pins
8. 802.11 b / g / n, supports WPA / WPA2
9. STA / AP support methods
10. TCP / IP protocol stack, One socket
11. TCP / UDP server with client
12. Port baud rate configuration: 1200/2400/4800/9600/19200/38400/57600/74800/115200 bps
13. Pin is compatible with Arduino UNO, Mega
14. KEY button: configuration modes
15. 32-bit hardware time
16. Current WiFi performance: continuous transmission performance: ≈70mA (200mA MAX), deep sleep mode: <3mA
17. WiFi serial transfer rate: 110-460800bps
18. Temperature: -40 ℃~ + 125 ℃
19. Humidity: 10% -90% non-permeable
20. Weight: about 20g (0.7oz)
21. Pulse Width Variation (PWM)
22. The power of distraction
23. 3.3V operating voltage, low voltage regulator allows 5V in power input
24. maximum current with GPIO pins: 12mA (source), 20mA (drain)
25. available firmware of Arduino IDE
26. Websocket libraries are available

Cloud Server:

The cloud is often used to refer to several Internet-connected servers that can be rented as part of software or application software. Cloud-based services may include web hosting, data hosting and sharing, and software or application usage.

'Cloud' can also refer to computer computing, where several servers are connected to share load. This means that instead of using a single powerful machine, complex processes can be distributed to many smaller computers.

One of the benefits of cloud storage is that there are many distributed resources that serve as one of the more commonly called federated storage clouds. This makes the cloud more tolerant, due to the distribution of data. Cloud usage often reduces the performance of various versions of files, due to shared access to texts, files and data.

What are the benefits of a cloud server?

1. The cloud server gives the business user stability and security because any software issues are isolated from your environment. Some cloud servers will not affect your cloud server and vice versa. If another user overloads his cloud server, this will have no effect on your cloud server, unlike portable servers.
2. Cloud servers are stable, fast and secure. They avoid hardware issues that are detected by physical servers, and may be a very stable option for businesses looking to keep their IT budget down.
3. Cloud servers provide a fast service for your money. You will get more resources and faster service than you can get for the same price of a virtual server. A cloud-based website will work very quickly.
4. You get distribution through cloud servers. It is much easier and faster to upgrade by adding memory and disk space, and it is less expensive.

For cloud server support Altair Smartcore is one of the best free servers. In our project we use that server. Altair Smartcore is a cloud-based platform, which offers integrated services and features to help you easily connect your items to the digital world. Available as a Platform as a service (PaaS) or on-premises, Altair Smartcore will help make our IoT projects faster in an easy-to-use, reliable and awesome environment.

Output Section

Blynk App

Blynk is designed for Internet of Things. It can control the hardware remotely, it can display data sensor, can store data, visualize it and do many other things.

There are three main features of the platform:

1. **Blynk App** - allows you to create visual links for your projects using a variety of themes the widgets we provide.
2. **Blynk Server** - which handles all communications between smartphone and hardware. You can use our Blynk Cloud or use your private Blynk server locally. It is open source, can easily manage thousands of devices and can be implemented in NodeMcu.
3. **Blynk libraries** - for all popular hardware platforms - allow for communication on the server and process all incoming and outgoing commands.

Now imagine: every time you press a button on the Blynk app, a message goes into space Blynk Cloud, where it finds its way to your hardware. The same applies to the file the opposite direction of everything happens imaginatively.

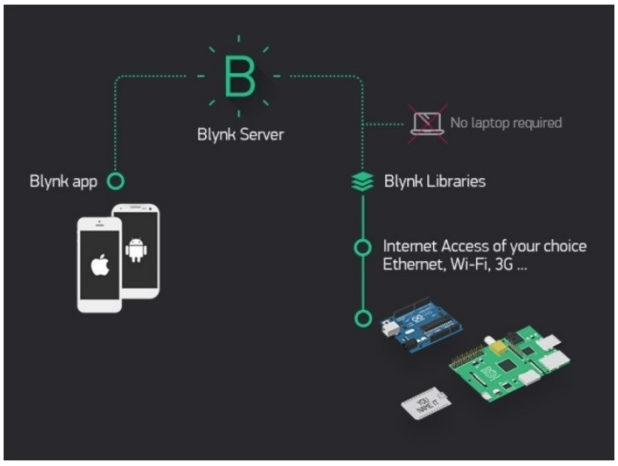

Fig 11:- Blynk Working Principle.

Methodology:-

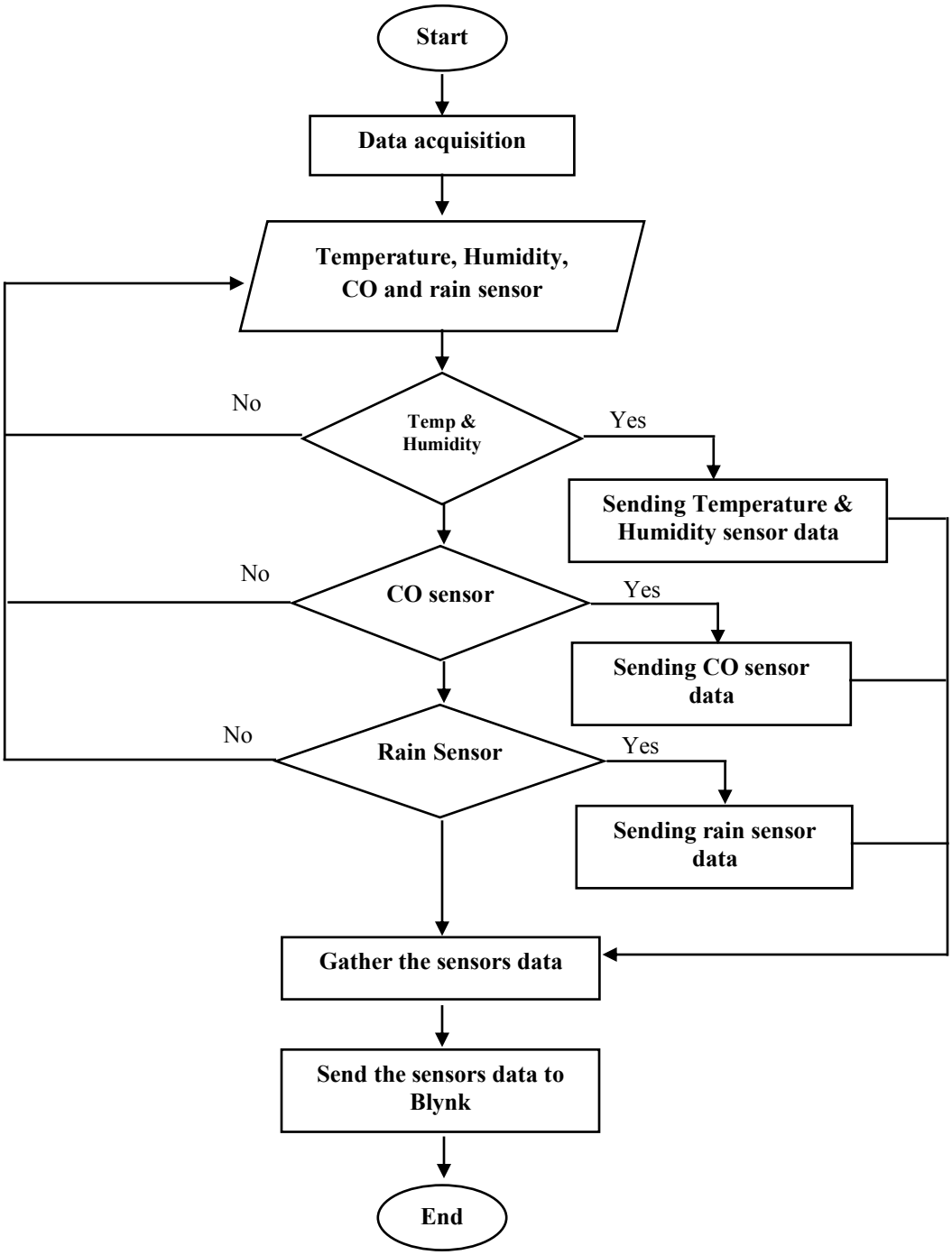

Fig 12:- Weather monitoring system process.

Project Setup:

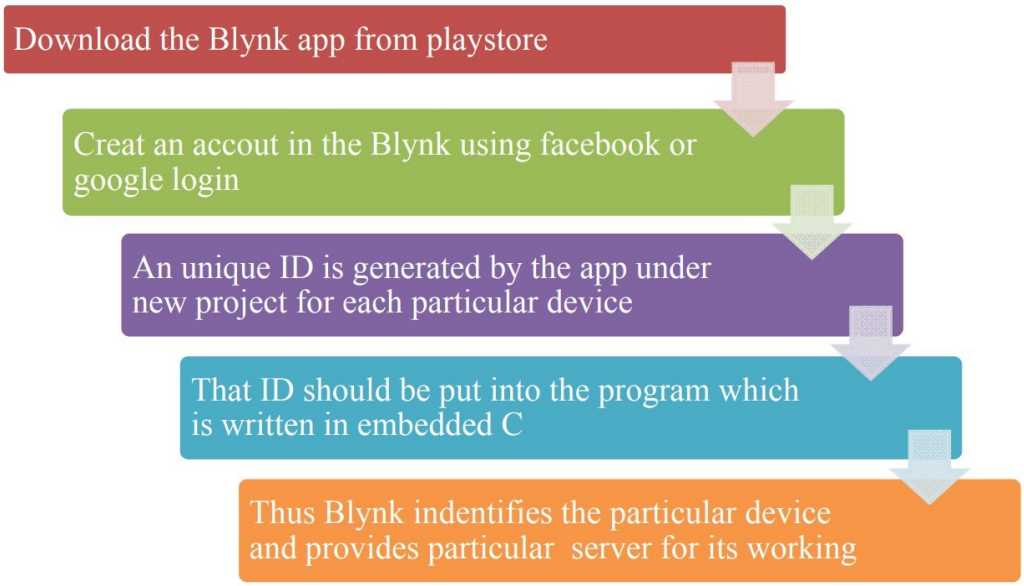

Fig 13:- Account creation in Blynk server.

The following process describes how to create an account in Blynk and generate a unique ID against a particular device. The ID is the identifier for the particular device in the Blynk server.

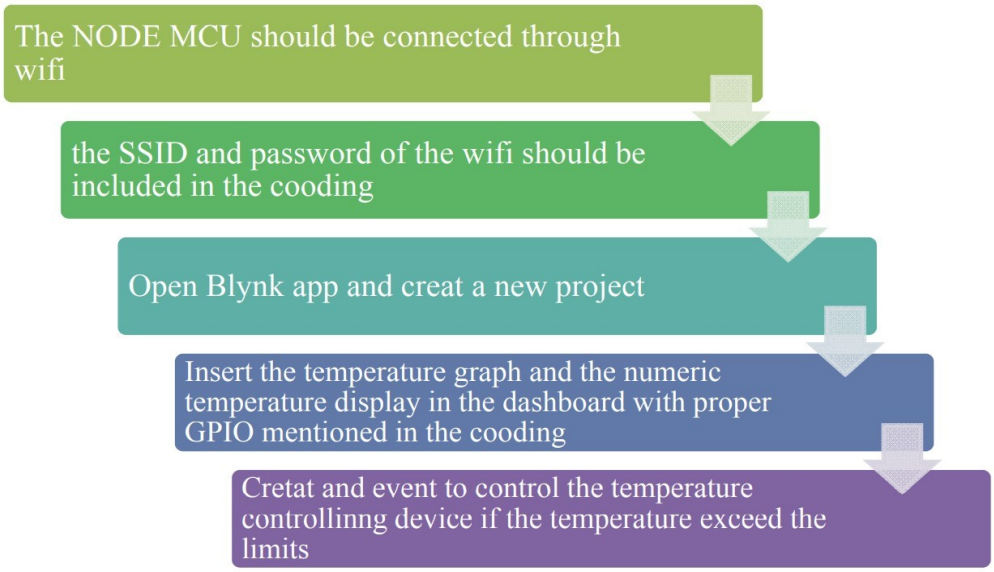

Fig 14:- Working process of the device.

Once the unique ID is generated the next step is to include that key in the coding which is written in embedded C for communication between the NODE MCU and Blynk server. The process is described below.

Blynk App settings:

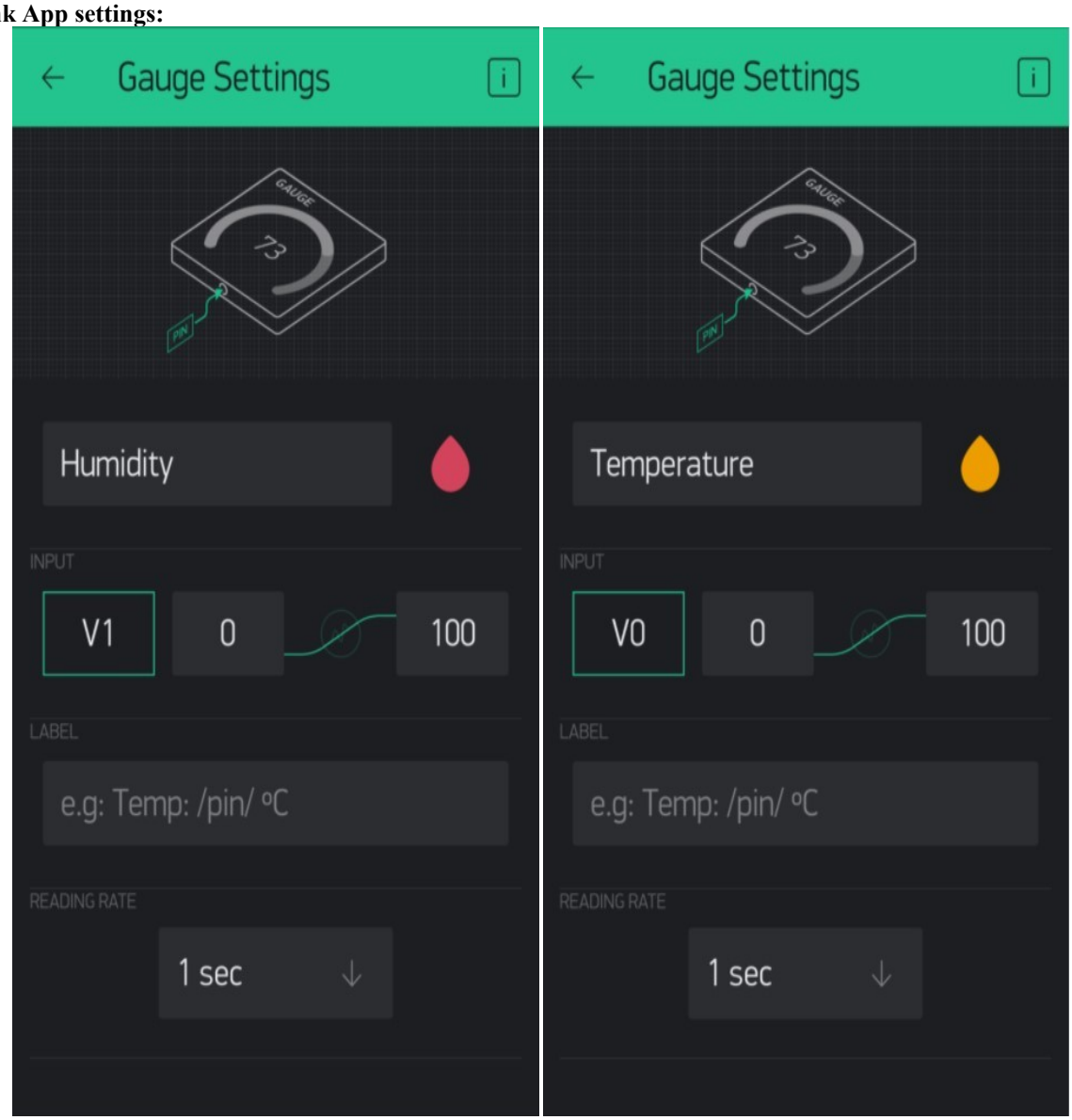

Fig 15:-Blynk app interface.

Need to setup the specific virtual pins which is written in the code for Temperature and Humidity. We can display the value using Gauge or LCD. The Blynk app provides many facilities to show the desired data value.

Result And Discussion:-

Results:

After the sensor measurements are uploaded to the cloud, the values are analyzed there and then an email or an SMS is published. It is also shown in the mobile app. Some of the sample results are as following:

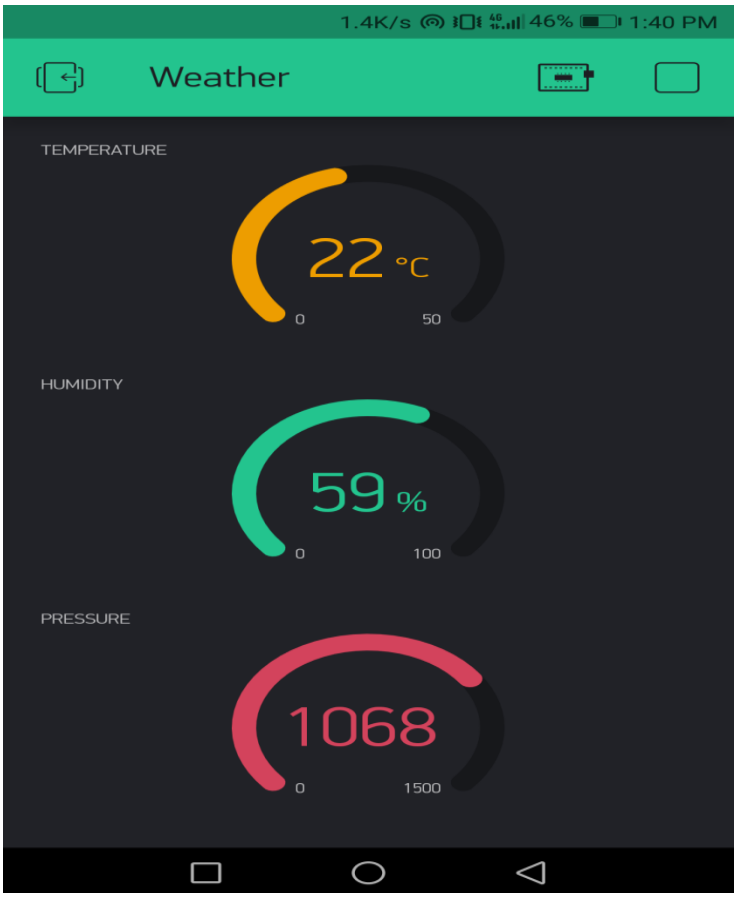

Fig16:- Output result showing in Blynk app.

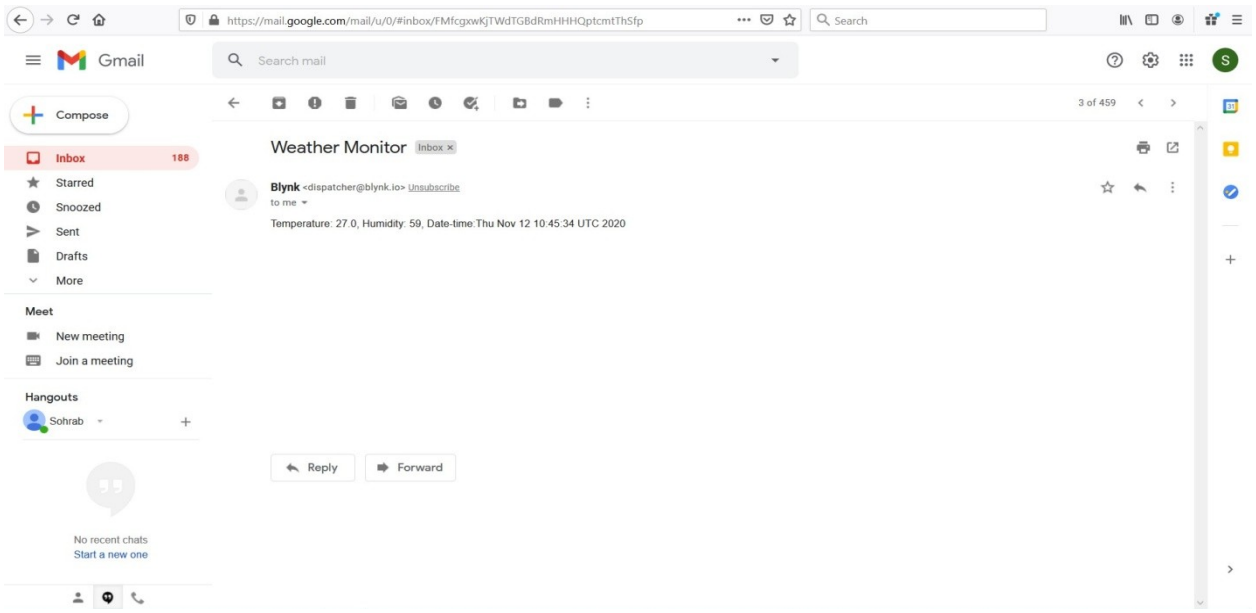

Fig 17:- Notification via E-mail.

Discussion:-

The system will detect temperature readings, carbon monoxide and rainfall conditions. After the program has detected all data, will be uploaded to the Blynk application. In the program app, everyone can search and know

directly the weather condition. The public can visit the area outside concern for air quality. To develop this project "Weather Monitoring System", divided into two software and hardware development. With the development of software, many research has been done. Programs through Arduino Compiler is the most complex part of this project. There has been a lot of trouble. Error appear every time the program is done. However, all problems are resolved after errors are detected. With the development of hardware, there are many problems and sometimes the sensor does not respond to the situation. This problem occurs when the cable connection is not available fully connected or open. Before starting the program, you need to check that all strings are tight and to see if there are any strings not connected.

Advantages:

1. IoT-Weather Monitoring project using NodeMcu is completely automated.
2. It does not need human attention.
3. We can get advance information about the weather.
4. Low cost and minimal effort in this program.
5. The accuracy is high.
6. Self-defense.
7. An intelligent way to monitor the environment.

Applications:

1. Weather forecasts play a vital role in agricultural sector.
2. It also helps in areas such as volcanoes and rain forests.
3. It is very difficult for a person to stay long time in such places.

Conclutionand Future Work:-

This project allows "Weather Monitoring System Using IoT"trying to monitor the city's climateand it is also important for the farmer. This project has earnedobjectives for which the development of a climate monitoring system is possible check weather conditions using the app Blynk. The project was also able to reflect the current weather in the weather monitoring system. Implementation of an Internet of Things (IoT) weather monitoring system it's perfect. The system provides a low power monitoring solution forclimate and environment.The monitoring system has been tested in outdoor environment and successfully updated data from the sensation. The data will be used for various types of analysis and may be shared with other persons or users. The project has the potential to be worked out monitor developing cities and industrial areas especially pollution control. To protect public health from pollution, system and affordable an efficient and low-level solution for authorities. And suitable for continuous environmental monitoring in the future.

Future Scope:

1. One can implement a few more sensors and connect it to the satellite as a global feature of this system.
2. Adding more sensor to monitor other environmental parameters such as CO2, Altitude sensor and Oxygen Sensor.
3. In aircraft, navigation and military there is a great scope of this real-time system.
4. It can also be implemented in hospitals or medical institutes for the research & study in "Effect of Weather on Health and Diseases", hence to provide better precaution alerts.

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