e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:07/Issue:04/April-2025 Impact Factor- 8.187 www.irjmets.com

RASPBERRY PI BASED WEATHER REPORTING OVER IOT

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DOI: https://www.doi.org/10.56726/IRJMETS71939

ABSTRACT

This paper represents the real time monitoring and streamlining downfall conditions over the internet. The system spectators three parameters videlicet temperature, humidity and downfall. These values are also displayed on television and also streamlined over the IoT gecko.com. When the area is dry it shows zero value. When the system detects drop, it shows the value of the increase in downfall. When the temperature increases the value gets streamlined. The user can observe the downfall status of a particular area from any remote position. For this purpose we've affected ARM predicated Raspberry Pi 3 board. Raspbian operating system is named to use with Linux Kernel for Raspberry Pi 3. Python Language is used for programming because IDLE understands Python. By readings, the user can get a fair idea of the downfall of a particular area on the monitor. This system proves to be useful for knowing the downfall of the localized area. Weather condition plays an truly important part in our quotidian life. Collecting of data about the different parameters of the downfall is necessary for planning in home and surroundings. Recent developments in Internet of goods made possible to collect the data. In this system some digital as well as analogue sensors like DHT11, BMP180, LDR and pronounced scale with ULN2803 are used for environmental parameter measuring. This data from input sensors is also read by garçon that isRaspberry Pi itself and stored in CSV as well as text lines. The sensors gather the data of various environmental parameters and give it to boo PI which act as a base station. The Raspberry Pi also transmits the data using WIFI and the reused data will be displayed on laptop through piercing the garçon that is on the receiver side.

Keywords: Embedded System, Raspberry Pi, IoT, HTTP.

I. INTRODUCTION

Weather or Climate is important part of mortal life. Detectors are essential factors not only applicable to the diligence for process control but also in diurnal life for safety of structure's and business inflow measuring, environmental parameters dimension. IoT means Internet of effects. It provides internetworking of physical bias, structures, vehicles and other factors like detectors and selectors. By giving network connectivity to systems bedded with electronics, software, detectors and selectors; these objects are suitable to collect and change data. By using IoT objects to be tasted or controlled ever through being network. It gives occasion to connect physical world with computer- grounded systems. IoT improves effectiveness, delicacy, profitable benefits along with reduced force. IoT fabrics help for the commerce between " effects ". Also supports for more complex structures like distributed computing and development of distributed operations. Now a days utmost of IoT fabrics feel to concentrate on real- time data logging results. The data of the measured parameters aren't useful if they aren't transmitted presto and accurate manner to the druggies. thus, transmitted and recycling the measured data is a veritably important aspect of the ultramodern rainfall cast. Transmission of the measured data could be done by a number of means WI- FI link, GSM/ GPRS link, satellite link direct, wired link, etc. Weather soothsaying has to be dependable and accurate, anyhow of its operation. Also, it has to give simple access to all the measured parameters. The quality of detectors and perfection of measures may vary, and the position of rainfall soothsaying station can determine the delicacy and trustability of the rainfall data collection.Raspberry Pi, acting as data jack process the converted affair of Detectors from analog to digital. The logged data can also be transferred to a desktop or any other examiner has GUI for farther analysis. So by using fluently attained factors and less complicated circuitry important rainfall station can be make Now a day's colorful rainfall factors like wind and numerous other cause great impact on humans day to day life.

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II. LITERTURE REVIEW

1. Paper Name: Interactive Weather Monitoring and Control System, Name : A F Pauzi and M Z Hasan, Description : Weather forecast these days is unpredictable too be exact because of the climate changes drastically over weather.

2. Paper Name : Real-time Weather Monitoring System using Raspberry Pi , Name : Puja Sharma and Shiva Prakash,

Description : The proposed system will remove this problem since it monitors real-time weather conditions.

3. Paper Name : Predictive Weather Analytics using Machine Learning, Name : Jamal Mabrouki , Mourade Azrour, Driss Dhiba,

Description : The proposed system is based on the internet of things technology and embedded system.

4. Paper Name : Energy-efficient Design for Raspberry Pi Weather Stations, Name : Girija C, Harshalatha H,

Andreanna Grace Shires,

Description : To implement this need to deploy the sensor devices in the environment for collecting the data and analysis.

5. Paper Name : Scalability in IoT Weather Reporting Systems, Name : Patel, J., et al,

Description : Addressing scalability in IoT weather reporting systems is crucial for their success ,especially as the number of deployed sensors increases.

III. BLOCK DIAGRAM

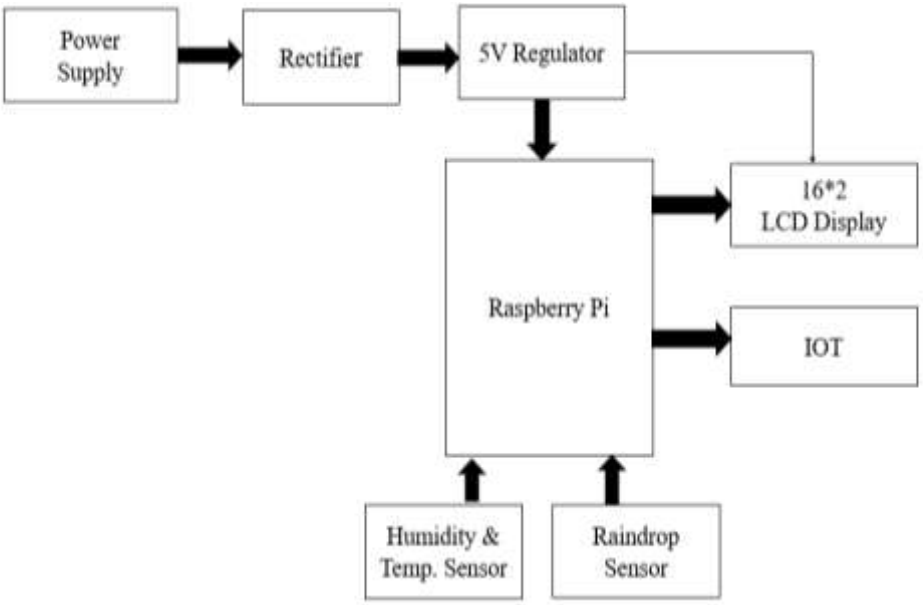

Figure 1: Block Diagram

Raspberry pi is the rearmost wireless technology. Proposed System will fantasize and store colorful rainfall parameters as given over with the help of detectors connived to Raspberry will get all data, SD card on Pi stores the collected data as like memory card. also at the affair side TV is to be connected for showing the result and on off relays for garçon access. Also 5V, 1A power force is given to the Raspberry Pi board through micro USB niche. An SD card of 8 GB is used to store the operating system as well as all programs and lines demanded for this design. Keyboard and mouse is connected to the Raspberry Pi board through USB anchorages. Examiner is connected to the Raspberry Pi board through HDMI harborage using HDMI to VGA string. Ethernet harborage is used to give internet connection other system via LAN. To know the current rainfall status at remote position, the stoner can to log in on web cybersurfer by entering username and word given for particular garçon by the stoner. Web operation opens after entering word and with the affair graphical representation also gain. jeer pi reused data will streamlined continuously on pall garçon & stoner will get to know the stored data on hourly and diurnal base.This point is the Raspberry Pi Model B, modification 2.0, which has 512 MB of RAM, an

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Ethernet harborage, HDMI affair, RCA compound videotape affair, audio affair, two USB anchorages, and 0.1 ″-spaced legs that give access to general purpose inputs and labors(GPIO). The jeer Pi requires an SD card with an operating system on it(not included). The Raspberry Pi is veritably popular, with lots of illustration systems and information available online.

IV. COMPONENTS

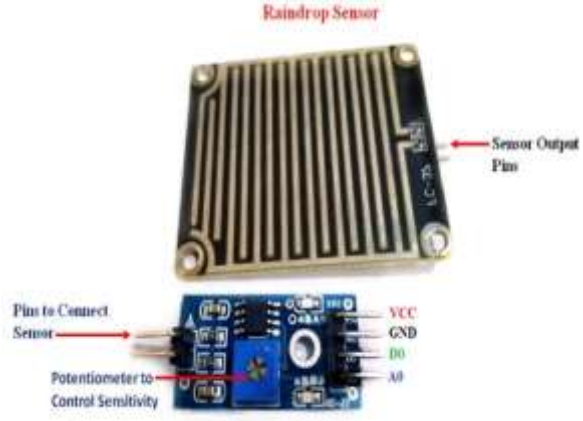
- **Raspberry Pi3-**

The Raspberry Pi 3 is a low cost, credit- card sized computer that entrapments into a computer examiner or television, and uses a standard keyboard and mouse. It's a able little device that enables people of all periods to explore computing, and to learn how to program in languages like Scratch and Python.

- **DHT11 Sensor-**

The DHT11 sensor comes in a single row 4-pin package and operates from 3.5 to 5.5V power supply. It can measure temperature from 0-50 °C with an accuracy of ±2°C and relative humidity ranging from 20-95 with an accuracy of ±5% .

- **Rain Drop Sensor-**



The rain detector module is an easy tool for rain discovery. It can be used as a switch when droplet falls through the raining board and also for measuring downfall intensity. The module features, a rain board and the control board that's separate for further convenience, power index LED and an malleable perceptivity though a potentiometer.

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- **16*2 LCD Display-**

A 16 × 2 TV display is a liquid demitasse display that can show 16 characters in each of its two rows, furnishing a aggregate of 32 characters of information. It's generally used to display alphanumeric information in colorful electronic bias.

- **Blynk IOT Platform-**

Blynk is a popular IoT platform that allows users to build applications for controlling and moni toring IoT devices remotely. The Blynk platform will be used to create a user-friendly interface for real-time monitoring of vehicle performance metrics, battery status, and energy consumption.

V. ALGORITHM

Step 1: Initialization of the system.

Step 2: Read temperature and humidity from **DHT11/DHT22 sensor**.

Step 3: Filter out incorrect or fluctuating sensor readings.

Step 4: Data Transmission over IoT.

Step 5: Display real-time data on an **LCD screen.**

Step 6: Compare sensor values with predefined thresholds.

Step 7: Repeat steps 2-6 Process.

VI. CONCLUSION

Weather vaticination is a veritably important factor, which forecasts the climate in a region grounded upon the values of rainfall parameters. So the calculated results from this system can be made use in vaticinating the rainfall of that position for a period of time. As we made use of Raspberry pi in this model, immediate alert communication ore-mail can be transferred to the mobile phone, when the parameters changes are drastic. The technology changes day by day. Using the detectors for air temperature, air moisture, light, soil humidity, and rain discovery in combination with Raspberry Pi a prototype had been developed. Data from the detectors is transmitted to ramify where it can be viewed encyclopedically which will be fluently accessible to everyone. This IoT grounded system gives real- time monitoring of environmental parameters. This system monitors temperature, moisture, pressure, altitude, light intensity and rain water position. Data can be seen from anywhere in the world. By using this system the customer can continuously cover different environmental parameters without any commerce with fresh garçon.

ACKNOWLEDGEMENTS

I would like to thank out mentor Dr.N.B.Dhaigude for his support and greatfull guidance.

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