

IOT BASED WEATHER REPORTING SYSTEM

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1.Abstract - The system proposed is an advanced solution for weather monitoring that uses IoT to make its real time data easily accessible over a very wide range. The system deals with monitoring weather and climate changes like temperature, humidity, using multiple sensors. These sensors send the data to the web page . The data uploaded to the web page can easily be accessible from anywhere in the world. The data gathered in these web pages can also be used for future references. The project even consists of an app that sends notifications as an effective alert system to warn people about sudden and drastic weather changes. The components in this project don't consume much power and can even be powered by solar panels. Compared to other devices that are available in the market the Smart weather monitoring system is cheaper and cost effective. This project can be of great use to meteorological departments, weather stations, aviation and marine industries and even the agricultural industry.

Key Words: Arduino Wi-Fi Module, Rain Drop Sensor ,Liquid Crystal Display , Microcontroller ATmega328 ,Buzzer, DHT11 Sensor.

2.INTRODUCTION

Present day innovations in technology mainly focus on controlling and monitoring of different devices over wirelessly over the internet such that the internet acts as a medium for communication between all the

devices. Most of this technology is focused on efficient monitoring and controlling . An efficient environmental monitoring system is required to monitor and assess the weather conditions in case of exceeding the prescribed level of parameters (e.g., noise, moisture and temperature) and for gathering data for research purposes (amount of rainfall). A system is considered as a smart system when the device equipped with sensors, microcontrollers becomes a self-protecting and self-monitoring system. Event Detection based and Spatial Process Estimation are the two categories to which applications are classified. Initially the sensor devices are deployed in environment to detect the parameters (e.g., Temperature, Humidity, noise etc.) while the data acquisition, computation and controlling action. Sensor devices are positioned at different locations to collect the data to forecast the behavior of a particular area of interest. The main aim of this paper is to design and implement a resourceful monitoring system through which the required parameters are monitored remotely using internet and the data gathered from the devices are stored in the server and to project the predictable trend on the web browser. In the atmosphere using wireless embedded computing system is proposed in this paper. The solution also provides an intelligent remote monitoring for a particular area of interest. In this paper we also current results of collected or sensed data with respect to the normal or specified ranges of particular parameters.

The embedded system is an integration of sensor devices, wireless communication which enables the user to remotely access the various parameters .

2. EXISTING SYSTEM:

The existing weather monitoring systems generally use weather stations that use multiple instruments such as thermometers, barometers, wind vanes, rain gauge etc. to measure weather and climate changes. Most of these instruments use simple analog technology which is later physically recorded and stored in a data base. This information is later sent to news reporting stations and radio stations where the weather report is given. The main parts of this system contain the hardware structure, software part or application, connectivity, user respectively.

From the following figure, we can easily understand the system and application process which can be commonly used and monitor the data in the field



Figure 1: Applications of System

3. Limitations of the existing System :

1. Existing weather monitoring systems that are used in the field generally consist of unconventional and heavy Machinery that consists of numerous moving parts that

Require constant maintenance and need to be manually Monitored and changed frequently.

2. Power requirements are one of many major constraints as these instruments are generally sited far from main power supply. This adds to the cost of using such instruments.

3. The use of thermometers to measure external temperature; however accurate is still outdated and constantly needs to be manually checked for any change in temperature.

4. Data that is collected by the instruments needs to be manually transferred from the logger to a laptop or computer via a cable.

5. Existing systems consist of large and heavy instruments that occupy a lot of space hence making it difficult to install them in remote location and places which have limited space.

6. The instruments used in the existing systems are expensive and add up to the already high cost of installation and maintenance.

7. The current system always faces problems such as delay in warning people about bad weather and sudden changes in the forecast.

4. PROPOSED SYSTEM:

The system proposed is an advanced solution for Weather monitoring that uses IoT to make its real time Data easily accessible over a very wide range. The System deals with monitoring weather and climate Changes like:

1. Temperature, humidity by using the DHT11 sensor.

2. Atmega 328 to store data onto the server.

3. Buzzer for worst weather condition alert.

4. Liquid Crystal display for displaying the values of moisture, temperature and humidity in climate.

6. ESP 01 Wi-Fi module to connect system with the mobile.

7. Raindrop sensor for detecting rainfall or snow fall.

5. LITERATURE REVIEW:

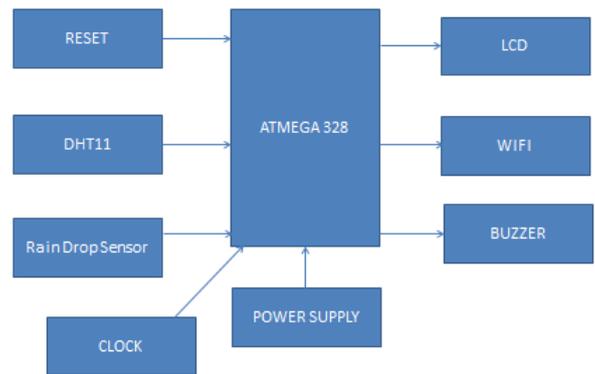
In today's world many pollution monitoring systems are Designed by different environmental parameters.

Existing system model is presented IOT based Weather Monitoring and reporting system where you can collect,

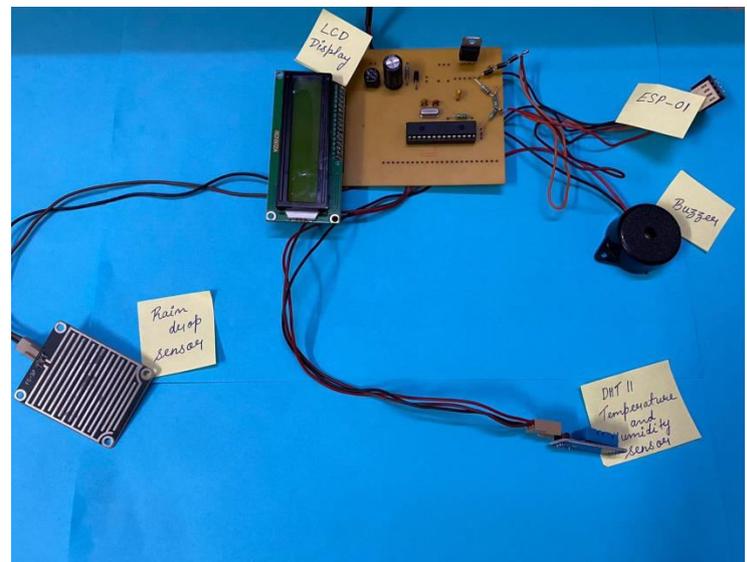
Process, analyze, and present your measured data on Web server. Wireless sensor network management Model consists of end device, router, gateway node and Management monitoring center. End device is responsible for collecting wireless sensor network data, and sending them to parent node, then data are sent to gateway node from parent node directly or by router.

After receiving the data from wireless sensor network, gateway node extracts data after analyzing and packaging them into Ethernet format data, sends them to the server. Less formally, any device that runs server software could be considered a server as well. Servers are used to manage network resources. The services or information provided through the Internet that are connected through LAN and made available for users via smart phones, web browser or other web browser devices to make the system more intelligent, adaptable and efficient.

6. SYSTEM DESIGN:



Using a Atmega 328 chip and a DHT sensor, you will develop an IoT based electronic device that streams temperature and humidity data over the internet. You can program the system in such a way that whenever there is a temperature/ humidity change, the system send the notification .



This system is fully automated and helpful for better Weather forecasting results.

In the system whenever the rain falls or weather condition has been changed its result appear onto the LCD and we get the direct notification on our mobile .

DHT11 is a temperature and humidity sensor which Gives the moisture amount in weather , whereas Rain Drop sensor gives the amount of rain. ESP 01 wi-fi module takes the data of present climate condition and provide it to us with the help of server.

7. ANALYSIS :

Temperature	Humidity	rain	Date	Time
12			12/10/2021	08:01:32pm
12	13	14	12/10/2021	08:03:13pm
28.00	72.00	52	12/10/2021	08:08:20pm
28.00	72.00	50	12/10/2021	08:08:22pm
28.00	72.00	50	12/10/2021	08:08:26pm
28.00	72.00	51	12/10/2021	08:08:29pm
28.00	72.00	49	12/10/2021	08:08:31pm
28.00	72.00	49	12/10/2021	08:08:34pm
28.00	72.00	49	12/10/2021	08:08:35pm
28.00	72.00	49	12/10/2021	08:08:38pm
28.00	72.00	48	12/10/2021	08:08:40pm
28.00	72.00	48	12/10/2021	08:08:42pm
28.00	72.00	48	12/10/2021	08:08:44pm
28.00	72.00	47	12/10/2021	08:08:46pm
28.00	72.00	48	12/10/2021	08:08:49pm
28.00	72.00	47	12/10/2021	08:08:51pm
27.00	69.00	0	13/10/2021	10:00:27pm
27.00	69.00	1	13/10/2021	10:00:29pm
27.00	69.00	0	13/10/2021	10:00:32pm
27.00	69.00	0	13/10/2021	10:00:34pm
27.00	69.00	0	13/10/2021	10:00:37pm
27.00	69.00	0	13/10/2021	10:00:39pm
27.00	69.00	0	13/10/2021	10:00:41pm
27.00	69.00	1	13/10/2021	10:00:44pm
27.00	70.00	8	13/10/2021	10:00:46pm
28.00	78.00	1	13/10/2021	10:00:49pm
28.00	81.00	0	13/10/2021	10:00:51pm

27.00	68.00	0	13/10/2021	10:47:12pm
27.00	67.00	0	13/10/2021	10:47:14pm
27.00	67.00	1	13/10/2021	10:47:18pm
27.00	68.00	0	13/10/2021	10:47:19pm
27.00	68.00	0	13/10/2021	10:47:21pm
27.00	68.00	1	13/10/2021	10:47:24pm
27.00	68.00	7	13/10/2021	10:47:26pm
27.00	68.00	0	13/10/2021	10:47:28pm
27.00	68.00	0	13/10/2021	10:47:30pm
27.00	68.00	0	13/10/2021	10:47:33pm
27.00	67.00	0	13/10/2021	10:50:44pm
27.00	67.00	0	13/10/2021	10:50:47pm
27.00	67.00	0	13/10/2021	10:50:49pm
27.00	68.00	0	13/10/2021	10:52:20pm
27.00	68.00	0	13/10/2021	10:52:22pm
27.00	68.00	9	13/10/2021	10:52:24pm
27.00	69.00	0	13/10/2021	10:52:40pm
27.00	69.00	0	13/10/2021	10:52:42pm
27.00	69.00	0	13/10/2021	10:52:44pm
27.00	69.00	0	13/10/2021	10:52:47pm
27.00	69.00	0	13/10/2021	10:52:49pm
27.00	69.00	0	13/10/2021	10:52:52pm
27.00	69.00	0	13/10/2021	10:52:56pm
27.00	69.00	0	13/10/2021	10:52:58pm
27.00	69.00	0	13/10/2021	10:53:00pm
27.00	69.00	1	13/10/2021	10:53:02pm
27.00	69.00	2	13/10/2021	10:53:05pm
27.00	69.00	9	13/10/2021	10:53:07pm
27.00	69.00	0	13/10/2021	10:53:09pm
27.00	69.00	0	13/10/2021	10:53:11pm
27.00	69.00	0	13/10/2021	10:53:14pm
27.00	69.00	0	13/10/2021	10:53:16pm
27.00	69.00	3	13/10/2021	10:53:18pm
27.00	69.00	1	13/10/2021	10:53:20pm
27.00	69.00	0	13/10/2021	10:53:22pm
27.00	70.00	0	13/10/2021	10:55:51pm
27.00	69.00	0	13/10/2021	10:55:53pm
27.00	69.00	0	13/10/2021	10:55:56pm
27.00	69.00	0	13/10/2021	10:55:58pm
27.00	69.00	0	13/10/2021	10:56:00pm
27.00	70.00	0	13/10/2021	10:56:02pm
27.00	70.00	0	13/10/2021	10:56:05pm
27.00	70.00	5	13/10/2021	10:56:07pm
27.00	70.00	1	13/10/2021	10:56:09pm
27.00	70.00	0	13/10/2021	10:56:11pm
27.00	70.00	0	13/10/2021	10:56:13pm
27.00	70.00	0	13/10/2021	10:56:16pm
27.00	70.00	0	13/10/2021	10:56:18pm
27.00	70.00	0	13/10/2021	10:56:20pm
27.00	70.00	0	13/10/2021	10:56:22pm
27.00	70.00	0	13/10/2021	10:56:25pm
27.00	70.00	0	13/10/2021	10:56:27pm

8. FEATURES:

- Low cost, compact and powerful wifi module
- Power supply: +3.3V only.
- Current Consumption: 100Ma.
- I/O voltage: 3.6V(max).
- I/O source current: 12mA (max).
- Built-in low power 32-bit MCU at 80MHz.
- 512kb Flash Memory.

9. Simulation Results:

After detecting the data from different sensor Devices, which are positioned in particular area of interest. The sensed data will be automatically sent to the web server, when a proper connection is recognized with sever device. The web server page which will allow us to monitor and control the system. By entering IP address of server which is placed for monitoring we will get the equivalent web page. The web page gives the information of the weather parameters in that particular region, where the embedded monitoring system is placed.

10. ADVANTAGES:

- IOT weather monitoring system project using
- Arduino Uno is fully automated.
- It does not require any human attention.
- We can get prior alert of weather conditions
- The low cost and efforts are less in this system

- Accuracy is high.
- Smart way to monitor Environment
- Efficient

11. CONCLUSION

- Our proposed system allows for weather parameter reporting over the internet.
- It allows the people to directly check the weather stats online.
- Thus the IOT based weather reporting system provides an efficient internet based weather reporting system for users.

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