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Design and Implementation of Weather Monitoring System Using Internet of Things (IOT)

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Abstract: *The system nominated in this paper is a modern solution for monitoring weather conditions in a certain location and make information found anywhere in the world. The proficiency behind this is Internet of Things (IoT). This is a modern and competent solution for connecting the things to the Internet. The equipment deals with monitoring the environmental conditions as well as controlling conditions like temperature, humidity, light intensity, CO level with the use of sensors and send the monitored and recorded information to the web page and plot the sensor data as graphical statistics. The data updated can be accessible on internet from any part of the world as the data can be viewed globally.*

Keywords: *(IoT) Embedded Computing System; Microcontroller 8051; Embedded Software, Smart Environment.*

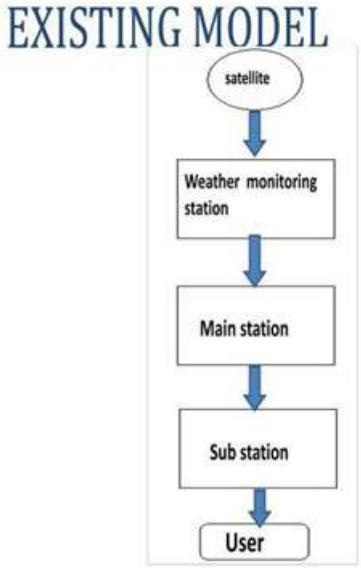
I. Introduction

In the current modernization in technology focus mainly on controlling and monitoring various activities. Most of this technology focuses effectively on monitoring and controlling various activities. An effective environmental monitoring system is required to monitor and assess the situations during the instance of exceeding the suggested level of parameters (eg = humidity). When the objects are atmosphere equipped with sensor devices, microcontroller and many software applications start becoming self-protective and self-monitoring the atmospheric changes and is also recruited as smart environment. The buzzer makes the beeping sound automatically when some incident occurs. By Using the embedded intelligence in the environment this makes the environment interactive with other aims and thus its an crucial application that smart environment aims at. The main motive of this paper is to build such an efficient system through which we could remotely monitor the required parameters using hyperspace as well as the information gathered from sensors are contained in a server and to display the estimated progression on the world wide web. The embedded system also intelligent and resourceful monitoring system used remotely for a specific area of interest.

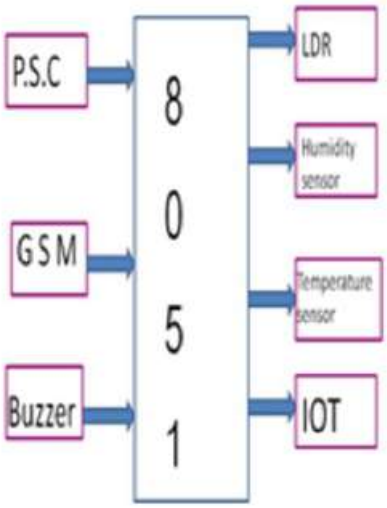
II. Proposed Model

For monitoring temperature, humidity and light we use the proposed embedded device. The proposed model has a 4-sequence. Tier 1 is environment, sensor devices in tier 2, sensor data acquisition and in Tier 3 there is decision making and in Tier 4 is the intelligent environment. Tier-1 gives information about the parameters which are to be monitored for noise and air pollution control. As we know that Tier-2 has a part to play among sensors which handles the sensor devices with suitable features are controlled depending upon their sensitivity and their sensing range. Now Tier-2 and Tier-3 necessary sense and control operations will be taking place depending upon the status like fixation of the threshold value, recurrence of sensing, substance or messages (buzzer). Critical situations and normal working conditions are determined based on the data analysis executed in between Tier-2 and Tier-3. Data acquisition from sensor devices and decision making is specified in Tier-3 which specifies the condition that data is symbolizing which parameter.

Tier-4 is used to handle the intelligent environment which means this tier will determine all the sensor data variations and set the threshold value depending upon determining the temperature and humidity levels. The end users can graze the data using mobile phones, PC etc.



III. Block Diagram



Power supply circuit
It gives input voltage to micro controller. It converts the 230v 50Hz AC to 5v DC.

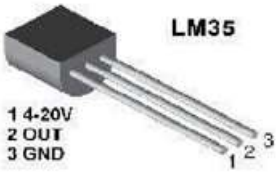
Global System for mobile communication (GSM)
GSM module is used to establish communication between a computer and a GSM –GPRS system. Global system for mobile communication is an architecture used for mobile communication in most of the countries.

Buzzer
A buzzer is a device that makes beeping noise. Where ever there is any change in temperature, humidity or any other climatic changes in environment the buzzer makes a beep sound.

LDR (Light-Dependent Resistor)
LDR stands for 'Light Dependent Resistor. LDR is such an instrument that changes with the intensity of the light that is falling on it. It permits them to be recycled in light sensing circuits. LDR is a light controlled resistor. As intensity of incident light increases LDR's resistance decreases.

LDR (Light-Dependent Resistor)

Temperature Sensor



LM35 is an integrated circuit sensor. It is used to measure temperature with power generation. Ratio of the temperature (in ^{0}C). The LM35 No external setting or trim is required. And +/- maintains the accuracy of the variable.

Humidity Sensor

As we all know humidity is due to the water presence in the air. The water amount in air can disturb the human relief and can also cause several issues in the industries during manufacturing processes. Also the vapours of water in air influences various physical, chemical and biological proceedings.

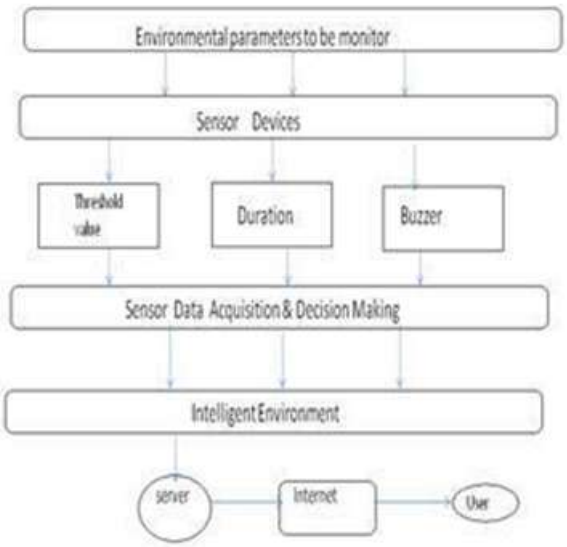
Internet Of Things (IOT)

IOT is used for internetworking processes embedded with electronic, software and network integration. Generally IOT is used for advanced integration of devices that is used in variety of protocols and applications.

IV. Flow Chart

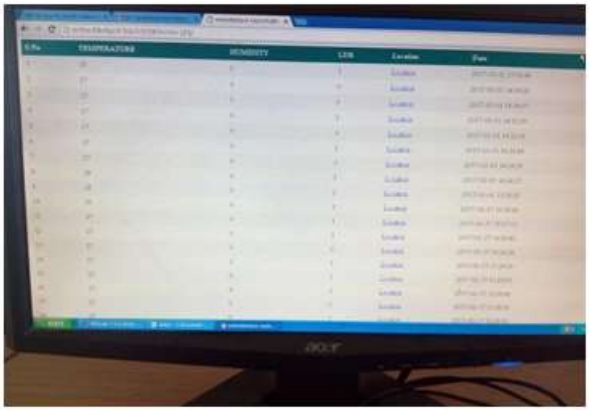
V. System Architecture

In the executed system a microcontroller (AT89SC51) is a major processing unit for the whole system and for all the sensor and devices that are connected with the microcontroller. The sensors are managed by a microcontroller to retrieve data from it and process the further analysis by updating with sensor data to the web connected via GSM module.

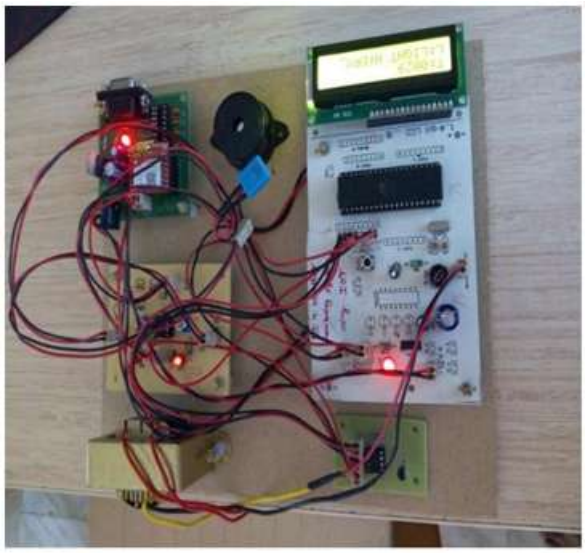


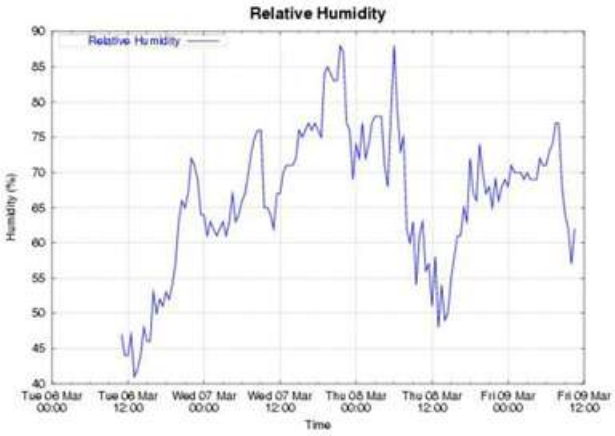
VI. Simulation Results

After the sensor senses the data placed in a particular region of interest the sensed data will be sent to the web automatically.

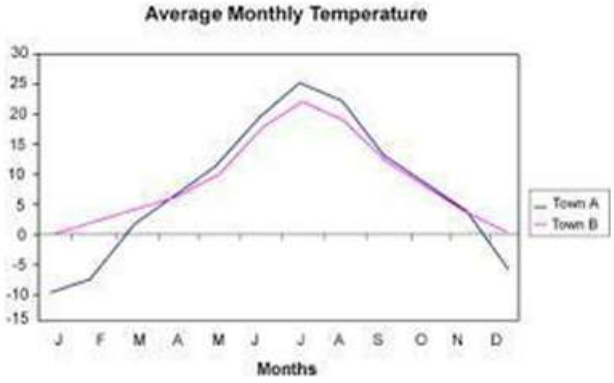


Humidity reading





Temperature readings



VII. Conclusion

With the use of embedded devices or protocols in the environment for surveillance enables self security to the environment. To perform this we need to position the sensor devices in the environment for further analysis and to collect the information. With the help of the sensors that are positioned in the environment, environment can be brought to real life that means we can use it for interaction with several objects through web. Through Wi-Fi the end result will be collected by the user. Thus the low cost embedded system is presented in this paper with help of different models for monitoring the environmental changes.

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