IOT Base Temperature Data Logger using Think Speak Cloud and Auto Excel Report Generation

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Abstract: The system proposed in this paper gives idea about advanced result for covering the Temperature conditions at a particular place or a lab and make the information visible anywhere in the world. The technology behind this called Internet of Effects (IoT), which is an advanced, effective result for connecting any effects to the internet and to connect the entire world of effects in a network. Then effects might be anything like electronic widgets, detectors or automotive electronic outfit. The system deals with monitoring and controlling the temperature conditions with detectors and sends the information to the Cloud and also compasses the detector data in the form of graphical statistics. The data streamlined from the enforced system can be accessible each over in the world through internet.

1. Introduction

The importance of Temperature monitoring is important to factor in many aspects like Chemical labs and many other places are required to be monitored and maintain the temperature to ensure a safe working environment in industries. Due to this technology, the process of reading the environmental parameters became easier compared to the older method.

The LM35 sensors are the miniaturized electronic devices used to measure the physical and environmental temperature and monitor the conditions, the results will be accurate and the entire system will be faster and low power consuming. The system in this paper debriefs the implemented flow of the temperature monitoring station with auto excel report generation. It includes the wireless communication technology IEEE 802.11 b/g which is also similar to Wi-Fi in general terms.

The system monitors the temperature conditions and updates the information to the think speak cloud. The reason behind sending the data to the cloud is to maintain and record the conditions of a particular place it can be known anywhere in the world. The system consists of temperature sensor LM35, Node MCu Module, power supply, etc. Analysing the requirements of the application, that the temperature conditions should be monitored and updated all the time continuously to the cloud. In our application, we have to make the system informative anywhere worldwide. The other communication technologies like ZigBee, RF Link, and Bluetooth can make the communication nearly in the same range but Wi-Fi broadcast the information. The World Wide Web (www) needs to behave a client-server configuration for communication. The client needs to be connected to the server with its IP address which can be universally accessible.

The system is equipped with a sensor and other devices should act as clients to send the data to the cloud. For connection between the sensor network and the internet, we are using a Wi-Fi module as a communication media and interface by the microcontroller. A Wi-Fi module requires a source code with an API key for connecting the cloud. Once the Configuration of the Wi-Fi module with the internet is done then it starts uploading, acts as a client, and sends the sensor data to the cloud. The criteria for connecting all the sensors and controllers to the internet are the Internet of Things (IoT). The concept of connecting devices like sensors, and automobile equipment together via the internet is the main topology of the Internet of Things (IoT).

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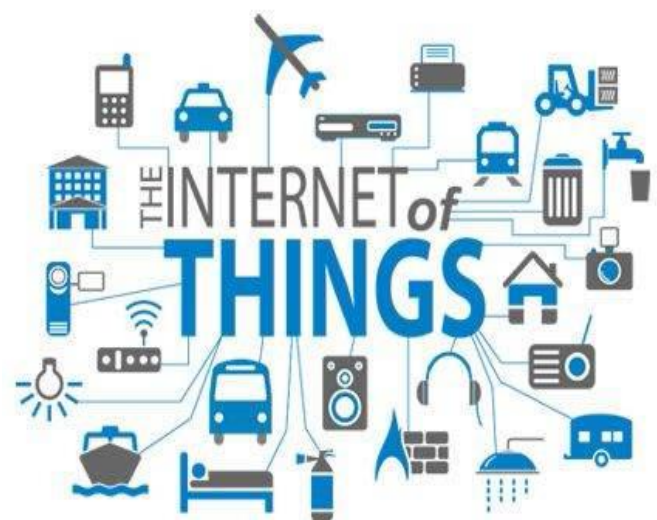**E-mail address:** pravinnawathe17@gmail.com ; kshirsagarshivani@gmail.com
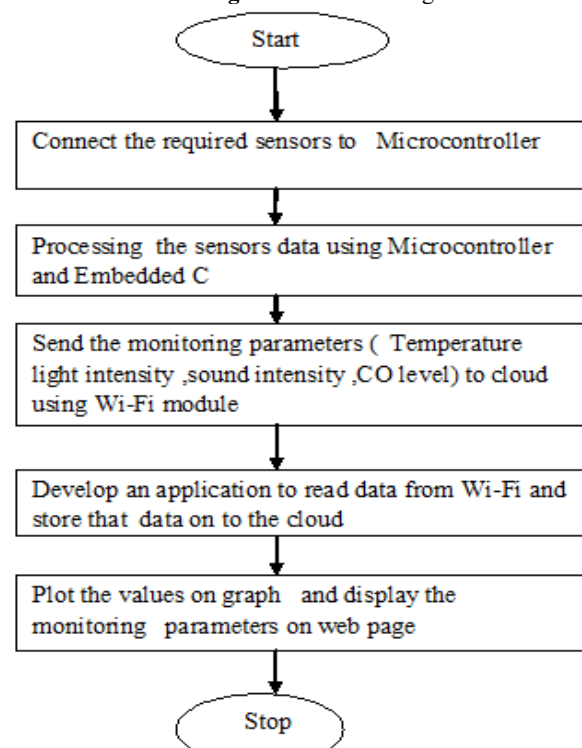
Fig. 1: Internet of things

Fig.2: Flow Chart

2. Proposed Algorithm

In the proposed model tier 4 deals with the control section. Which means it will identify the change and variations in the sensor data and send value on the cloud depending on. The identified level of temperature. In this tier sensed data will be processed to store in the cloud i.e.in to excel sheets and also it will show a graph of the sensed parameters with respect to the specified values. The end users can browse the data using android phones, PCs, tablet etc.

IoT offer a wide-range of connectivity of devices with various protocols and various topologies of applications for obtaining the complete machine to machine (M2M) interaction. IoT is having a wide range of application area. The example wearable instrumentation like a smart wrist bands, navigation pills, etc. All are the methods require an internet to interface and update the health report to the cloud as well as on smart phone.

3. System Development

The enforced conception consists of a microcontroller (ATmega328) as a main control unit for the entire System and all the detectors connected to the regulator.

The detectors can be operated by the proper interfacing of the microcontroller with power force and detectors as we try to recoup the data from the detector we need interfacing.

Arduino is an open- source IDE tool for making Systems that can smell physical realities via detector or transducer and control further of the physical world than a desktop computer. It's an open-source computing platform grounded on a simple 28 leg micro-controller with an IDE board, and a development terrain for writing and reading data via software for the board. Arduino can be used to develop interactive objects, take inputs from colourful switches or detectors, and control affair bias like motor pointers, s, etc. Arduino systems can be stand- alone or they can communicate with software via IC running on your computer (e.g. Flash, Processing, Max MSP). The boards can be assembled by hand, or pre-assembled boards are also available on the request the open-source IDE can be downloaded free.
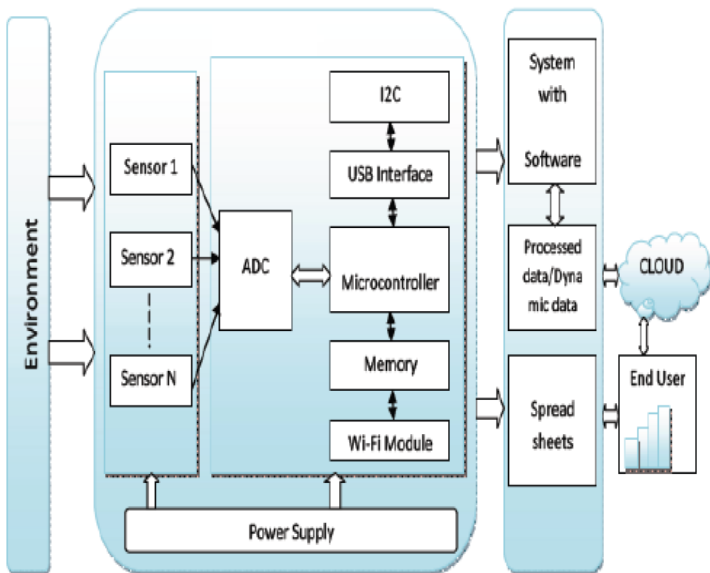
board for monitoring and ADC will convert the corresponding detector inputs to their digital value and from that value, the corresponding environmental parameter will be estimated.

3.1 Thing Speak

According to inventors, Thing Speak is an open source Internet of Effects (IOT) platform and API. Store and trace back data from effects using the HTTP Protocol over the Internet via an Original Area Network.

Thing Speak enables the upload data via detector logging Operations, position shadowing, and a social. Network of effects with status updates. Thing Speak has integrated support of the numerical computing software called MATLAB from Math Works allowing Thing Speak druggies to assay and fantasize the uploaded data using Mat lab without taking or purchase of a Mat lab license from Math works.

ThingSpeak could be a excellent platform for IoT grounded systems. By using channels and websites handed by ThingSpeak we will cover any data over the web from anywhere and that we can indeed control our system over the web. ThingSpeak 'Collects' data from detectors,' Dissect and Fantasize' data and' Acts' by driving a response. Then we're explaining about a way to setup ThingSpeak account for this design. First of all, stoner must produce an account onThingSpeak.com, also subscribe up and click on on' Get Started'. Now head to the' Channels' menu and click on on the'New Channel' option within the same runner. Now you may see a form for creating the channel, fill the Name and figure as per your choice. Also fill'Temperature'in'Field 1' field. Tick the check box' Make Public' option below the shape and ultimately Save the channel. Now your new channel is prepared. Now click on'API keys' tab and note the Write and skim API key, then we're only using Write key. you wish to repeat and bury this key within the law (see below). Now stoner must upload the program to ESP8266 using Arduino IDE. After uploading, open " PRIVATE VIEW" icon in ThingSpeak website and observe the covered temperature value on graph as shown below.
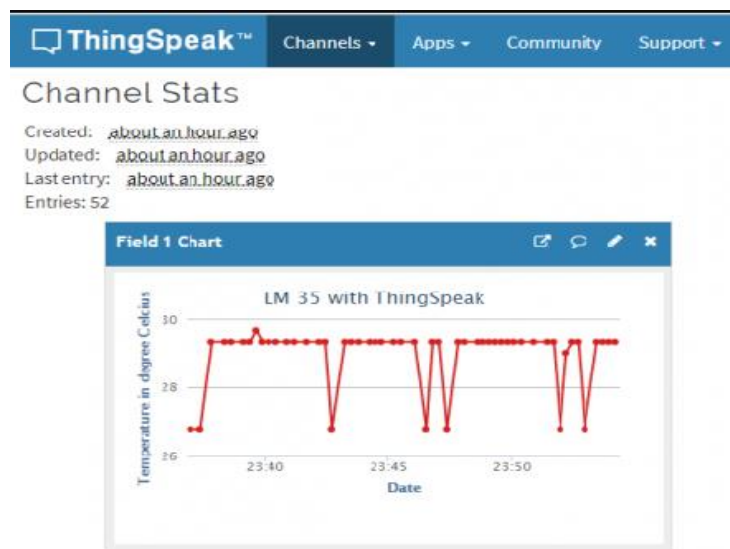

Fig. 3: Block Diagram of system

The Arduino programming language is Bedded C, perpetration of wiring an analogous physical computing platform like turbo C, which is grounded on the Processing pipelining conception of the multimedia programming terrain. It has 14 digital I/ O legs (of which 6 are used as PWM labors), 6 analog inputs, a 16 MHz oscillator with ceramic resonator, a USB connection, a power barrel jack, an ICSP title, and a reset button. It contains everything demanded to support the micro-controller; connect it to a computer with a USB string and power it with an AC-to-DC appendage or battery to get started. All the modules in the circuit are connected to the Arduino module. Detectors are connected to the Arduino UNO

Fig. 4: Think Speak Graph

3.3 Wi-Fi Module

Then we used a ESP8266 Wi-Fi module which having TCP/ IP protocol mound integrated on chip. So that it can give to any microcontroller to get connected with Wi-Fi network. The ESP8266 is a pre-programmed SOC and all microcontrollers have to communicate with it through UART interface protocol. It works with a force voltage of3.3 v. The module is configured via AT commands and the microcontroller should be programmed as to shoot the AT commands in a needed manner to configure the module in customer mode. The module can be used in both customer as well as garcon modes.

Associating your item to the web through Wi-Fi ™ blend is bettered with the application ofpre-confirmed WiFi ™ modules from LSR. The modules'pre-ensured figure, little bottom shaped print, and rich factors make them ideal for system operations, for illustration, brilliant vitality, home observing, detector systems, and home diversion control. The ESP8266 is suitable to do either easing an operation or unpacking all Wi-Fi systems administration capacities from another
operation processor.
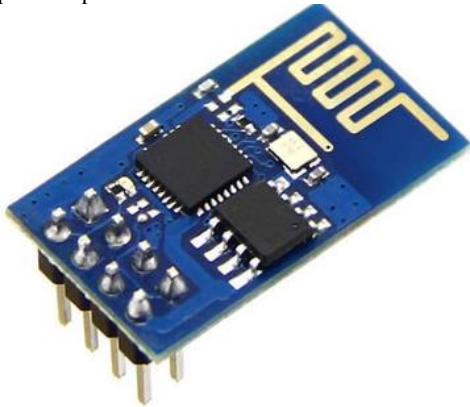
Fig. 5: Esp8266 Wi-Fi

Sensors: the system consists of Lm 35 Temperature Sensor which is available in To-92 plastic package and it has 3 pins which are input 5v 2nd is output and 3rd pin is GND which is connected to the common ground of the system if we connect separate Ground then it doesn't give a proper reading as we require the sensor to measure the primary environmental factors which is the temperature in our condition this sensor will give the analog voltage as representing one particular weather factor. The microcontroller will convert this analog voltage into digital data.
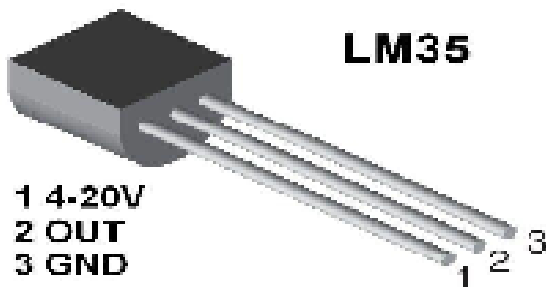
Fig. 6: Temperature Sensor

The LM35 is an integrated circuit sensor that can be used to measure temperature with an electrical output signal is proportional with the temperature (in oC). The Temperature Sensor is shown in Figure6. The scale factor of sensor is .01V/oC. The LM35 doesn't require any external calibration, trimming, and maintains an accuracy of 0.4oC at room temperature and 0.8oC over a range of 0 oC to +100oC.

4. Working

In this design, we're going to log and cover temperature data over internet using ThingSpeak IoT . And we can view the logged data and graph over time in their website. It's made using ESP8266 WiFi module and LM35 temperature detector. ESP8266 WiFi chip reads the current temperature from LM35 using ADC and sends it to ThingSpeak garçon for live monitoring from anywhere in the world.

This design monitors the current room temperature by using LM35 temperature detector and updates it to ThingSpeak IoT garçon by using ESP8266 WiFi SoC. Affair of temperature detector i.e., LM35 is connected to analog input leg A0 of ESP8266.

After uploading the law to ESP8266 module, open the periodical examiner and press RST leg of ESP8266. The module will connect to ThingSpeak garçon through internet. Now open ThingSpeak garçon and observe the covered temperature value on created channel graph.

5.Conclusions

By keeping bedded bias in the open terrain for monitoring enables tone- protection (i.e., smart terrain) to the terrain. To apply this design need to emplace the detector bias in the terrain or in labs for collecting the data via the internet and analysis when requires. By planting this conception, we can bring the terrain, labs old data for assaying with other objects through the network. Also the collected data and analysis results will be available to the end- stoner through the Wi-Fi or Excel distance that's available on one-click download. The smart way to cover hamstrung, low- cost bedded systems is presented with different models in this paper. In the proposed armature functions is different modules were bandied.

The Internet of Effects (IoT) conception is experimentally tested for covering temperature parameters. It also transferred any detector parameters to the pall (Google Spread Wastes). This data will be helpful for unborn analysis and can be fluently participated with other end druggies via an Excel distance. This model can be further expanded to cover the developing smart Labs and artificial zones for pollution monitoring. this model provides an effective and low-cost result for nonstop monitoring of the terrain.

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