

IOT BASED REAL TIME ENVIRONMENTAL MONITORING SYSTEM USING BLYNK APPLICATION

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ABSTRACT

Internet of Things (IoT) plays a major role in our lives. Many real time Logistics Environmental Monitoring and Location Tracking changes can be measured using IoT. It uses sensor networks to monitor vital changes in the environment. Here, a real time Logistics environmental android application to monitor Humidity, Temperature, fire and smoke with location is developed. These parameters are sensed and sent to the web server through Wi-Fi. The information can be accessed from anywhere. The android application developed can access the real time data and displays the results. If the value sensed crosses the limit or any critical value, a buzzer is used to send an alert signal to the users. The end user can monitor the sensed data and its graphical analysis using a smart phone where it is deployed with hardware. The project uses the, Im35 sensor, node Mcu board ESP8266 Wi-Fi module. The application accesses the data and the results are observed by the end users.

Keywords: IOT, Real Time Environment, Sensor, Wi-Fi.

I. INTRODUCTION

In day to day life, rapid changes in the logistic environment occur. Due to this, health problems arise. So, it is very essential to monitor the logistic environment where payload and stocks spend more time. Internet of Things is a wide application area [1]. Using this, we can monitor, control and access the information. fire, Temperature and Humidity are the basic parameters for logistic environment monitoring. Here a cost effective application is developed to monitor the parameters with localization. To sense the information, temperature, humidity and smoke are used respectively to sense the information. The open source microcontroller board Node mcu is used in this project. The results from the application show the real - time monitoring of these parameters and its analysis. In future, the system can be extended for remote monitoring.

Objectives:

The objectives of the system are:

1. To monitor the status inside the container .
2. To sense the current temperature, humidity and the fire present in logistic container .
3. To check the risk ranges and provide an alert signal.
4. To detect the hazards present in the logistic environment.

II. LITERATURE REVIEW

Nowadays IoT applications are used in our daily routine life. Researchers are using IoT extensively for their work [1-6]. Deekshath et al.,

[1] developed an IoT Based Environmental Monitoring System using Arduino UNO and Thingspeak. Environmental parameters such as temperature, humidity and moisture were monitored and their changes were noted. The data were sensed and sent to cloud platform for analysis. Zafar et. al.,

[2] designed an IoT based Real time environmental monitoring system using cloud. They sensed temperature and humidity of the surrounding area. The data which is sensed using the developed system is uploaded to the cloud storage. The data are accessed and the results are displayed to the end users. A simple and low cost system was developed by authors in [7].

They monitored and controlled temperature, humidity and CO₂ level using sensors. LPC2148 microcontroller was used and the data sensed was sent to ThingSpeak cloud. A weather monitoring system using Raspberry Pi was developed by S.D. Shewale, S.N.Gaikwad [8]. The system was complex due to Raspbian operating system when compared to Arduino.

III. MODEL DESIGN

The requirements needed for the work are mainly the sensors.

Project Requirements:

The requirements of the project are:

- Node Mcu
- Temperature sensor(lm35)
- Humidity sensor (dht11)
- Smoke sensor (mq8)
- Bread board
- Jumpwires (male to male, female to male, female to female)
- USB cable
- BLYNK application
- Fire Sensor
- Wi-fi connection
- Buzzer, LED

ESP8266

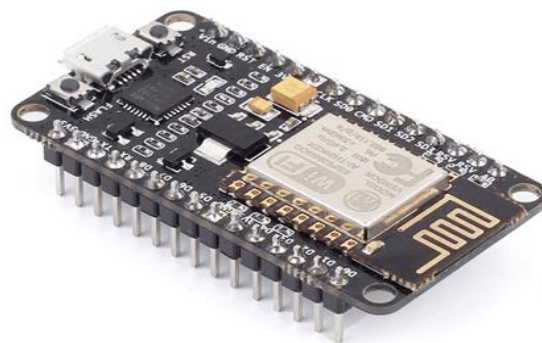


Fig 1: ESP8266

Wifi Module

The esp8266 (Fig 1) is easy to use and ease gadget for web availability. The module can function as an access point (can make hotspot) and as a station (can associate with wi-fi). Hence it could easily bring information and transfer it in the Internet making IoT as simple as possible. Likewise it can also retrieve information from Web using API. So the system, could get any data that is accessible on the web, making it smarter. To make it user friendly, this module can be programmed using the Arduino IDE. But this version of the module has only 2 gpio pins (can hack it to use upto 4). So it must be utilized alongside another microcontroller like Arduino, else independent esp-12 or esp-32 renditions can be utilized.

Features of 8266 wifi module:

- low cost, compact and powerful Wi-Fi 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 @ 80mhz
- 512KB flash memory
- can be used as station or access point or both combined
- Supports deep sleep (<10ua)

- Supports serial communication hence compatible with many development platform like arduino
- can be programmed using Arduino IDE or at-commands or lua script

IV. SOFTWARE IMPLEMENTATION

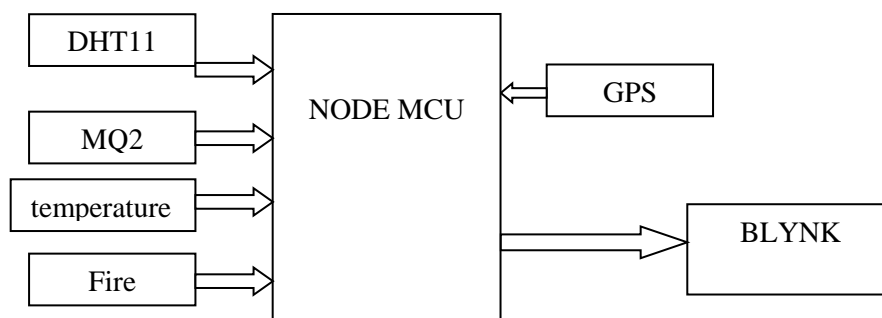


Fig 2: Proposed system

Proposed Methodology:

The proposed system is shown in Fig. 2.

The programs are coded and uploaded in the Arduino software. It is connected with the sensor to sense the different sensor in humidity and the pollution. The Block of the system is shown above:

Modules:

The modules used in this system are:

- Evaluation of sensor value
- Data upload
- Wifi Connection
- Blynk Application
- Alarm sensing system

Evaluation of sensor value:

Node MCU assists in identifying the smoke and fire level, temperature and humidity which is screened on the monitor. The entire system is associated through IoT, which sends the information and compares with the reference values. When the level goes beyond a limit, the system sends an alarm message.

Data upload:

In the proposed system (Fig 2), the parameters sensed by the sensors are organized by the sensor node and they are transmitted to Node MCU. The sensed analog values are transmitted to the live monitoring system.

Wifi Connection:-

After uploading the data it can run on a Serial Monitor of an Arduino IDE and it may give a local host IP address it could become connected on a Wifi of a Mobile or any device. The given IP address can be put on a browser that would also be connected on same wifi. It will display a Static web page That Contains a Result.

Blynk application:

Blynk is a mobile application it can be available on PlayStore which can be downloaded. Login your email to that application. Create a new Project in a blynk application. An Authentication code will be generated and an email is sent. After that import a header

#include<BlynkSimpleEsp8266.h>” to the source code and run it.

V. CONCLUSION

Here a real time logistic environmental monitoring system is developed to monitor temperature, smoke and humidity of logistic environment. The data are recorded and sensed from the system. This data is sent to the Blynk application via Wi-Fi where both real-time data and its graphical analysis are viewed. The end user can monitor the container environment changes using a smart phone. This work can be reached out to implement a home mechanization system where the sensed values can be utilized to trigger some action and control the

gadgets for heating or cooling via the mobile application. This system is a crucial step in understanding the IoT applications development and implementation and serves as a building block for a number of useful innovations in this direction.

VI. REFERENCES

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