Smart Environmental Health Monitoring System

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Abstract

Pollution is a growing issue these days. It is necessary to analyze environment & keep it in check for a for best future as well as healthy living for all. Here we propose an Environment Monitoring System that permit us to watch & check live environment in especially areas through Internet of Things (IOT). IoT supported a real time environmental monitoring system. It plays a crucial role in today's world through a huge and protracted system of sensor networks concerned to the environment & its parameters. This technique deals with monitoring important environmental conditions like temperature, humidity & CO level using the sensor & then this data is shipped to the web page. This information is often access from anyplace over the internet & then the sensor in-formation is presented as graphical statistics during mobile application. This paper explains & present the implementation & outcome of this environmental system uses the sensors for temperature, humidity, air quality & different environmental parameters of the surrounding space. This data is often used to take remote actions to regulate the conditions. Information is pushed to the distributed storage & android app get to the cloud & present the effect to the end users. The system employs a Node MCU, DHT-11 sensor, MQl35 sensor, which transmits data to WEBPAGE. An Android application is made which accesses the cloud data and displays results to the end users. The sensors interact with microcontroller which processes this information & transmit it over internet. This system is best method for any use in monitoring the environment and handling it because everything is controlled automatically through all the time of the process. The results say everything about the application of this system across different field where it was controlled precisely and effectively which further explains that this system easily makes our work easier because of this automatic monitoring system worries about other unexpected climate issues for world.

Keywords

IoT, Android, DHT-11Sensors, Smart Environment, Monitoring System

1. Introduction

Let us go through term word by word by getting what is the actual meaning of the term smart environmental health monitoring system. Internet of Things is predicted to remodel the globe by creating power to observe and control necessary environmental phenomena using the devices/sensors capable of capturing, process and Transfer the details wireless to remote storage just like cloud assistance that stores, analyzed & exposes this information as a meaningful data [1]. This information will be access over web through varied front-end user interfaces like an internet page or a mobile application, looking on the requirement and therefore the supposed goal. Internet plays an essential role during this transformation by creating it a lot of economical and reliable, and making certain a sleek and swift communication of data from these Internet of things devices to the cloud and the cloud to users [2]. The IoT system of interconnected computing devices, mechanical and digital machines, objects, animals, or those who area unit given distinctive identifiers and therefore the ability to transfer information over a network while not requiring human-to- human or human-to-computer interaction. The "things" are capable of sensing, capturing, and causing the information like temperature, pressure, humidity, noise, pollution, object detection, patient vital organ etc. Environmental monitoring is a very important IoT application that involves monitoring and dominant the encompassing atmosphere & presenting this information for effective actions like remotely dominant the heating or cooling devices, sending notifications regarding this status and a protracted term information analysis. This paper presents & describe the implementation feature & therefore the outcome of an environmental system which use the 1oT for temperature, wetness, and different environmental parameter of the surrounding space. The sensors are placed at varied locations to gather the information so as to predict the Behavior of a specific space of interest. the target of this paper to design associated implement an economical monitoring system through that the specified parameters are monitored remotely using web and therefore the knowledge collected from sensors are stored within the cloud and to project the calculable trend on A mobile application. During this research we have a tendency to also present a trending supported the results of collected information with regard To the usual or specified ranges of explicit parameters. Arduino UNO board that interface at i/p with temperature and wetness monitoring detector DHT-11 & at o/p with ESP8266 Wi-Fi module (Node MCU) that transmits the sensed information through internet to a remote cloud storage [3]. Also, once the Node MCU get all the DHT-11 device information it converts this information into a JSON data & send to server. It often a low value system which supplies insight & implementation Of A whole IoT application involving all aspects from sensing & wireless Transmission to cloud storage & information retrieval from cloud via a mobile application. Its depth study & preparation of Arduino development board, its Interfacing with input & output modules like sensors and Wi-Fi module, the usage of API for sending Information To the cloud & development of a mobile application supported the android Operating. The conclusion of research shows the actual time monitoring of wetness levels from Any location within the earth & its applied math analysis. This method will be prolonged to modify remote controlling of varied appliances based on the sensed information. Temperature and wetness values are received from DHT-11 sensor and processed by the ESP8266 Node MCU. Environmental monitoring Presently, society overlooks specific difficulties in environ-mental monitoring, since the aim is to collect & investigate environmental information to evade one possible hazard. at the same time, growing community, urban population, power, transport, and rural enhancements are the first causes of environ-mental infection. Also, natural calamities, like landslides, earthquakes, storms, water floods, and tsunamis are causes of environmental aspects that strength attacks wide. moreover, warming, H2O natural process, and variety harm may drive to a large space effect on the climate. Moreover, air, water, and pollution are supposed to be the most severe environmental intricacies. Incredibly, the additional correlation among air, water, and noise infection and well-being for people are conceded, a lot of hazard is moderated. basically, as someone commonly respires once each three to four seconds, pollution is meant to be ex-ample of the environmental factors that specific sprightly harms personal health. moreover, water is the primary cause of plants however also all living things [9]. The first causes of water infection embrace untreated biodegradable pollution, chemical substance

unharness, oil leakages, and spillages, exhausting from previous mines & farming chemical that are blown off or pour into the public water supply. In really, it is supposed that by 2030 developing countries are hurt from a deficit of water happening from the increasing of a population round the world to four billion [4]. Moreover, noise is an extra severe elaboration in such case that it would be generated from numerous origins, as well as transportations, factories, concerts & several different other causes. IoT sensors & Networking the answer to the control of noise information from open and huge areas over time. Though, specific models of IoT sensors are challenging. sensible IoT for environmental monitoring Current approaches in low PWNT has created the scientific restrictions to develop varied forms of multifunctional miniature IoT sensors, like chemical, visual, thermic, and vital, potential to be mounted to specific wireless sensor arrangements. It uses to look At and respond per the important sensations of the beginning context while not the used for correct direction or interference.

2. Our Implementation

There is two of implementation first one is hardware implementation and another one is software implementation. The hardware design is the fundamental part of the Proposed System is a micro-controller module (Node MCU – ESP8266) which acts as major handling unit for the Entire network. It interfaces with the DHT-ll sensor at the input for receiving temperature and humidity information & with the Wi-Fi module at the output to send the received Information to the cloud & web server over the Web [10]. The Microcontroller polls the sensor to bring the information and sends it over the web for analysis [5]. The software implementation Programming Always play major role in the Integration and working of hardware Design so as in our proposed system. There are second part to our software development: Initialization & configuration of hardware & the initiation of android based smart mobile application as the user Interface.

3. Software for Initialization & Configuration of Hardware

Arduino IDE use to program the Node MCU micro controller for information retrieval for sensor & data transmit the cloud. Once the individual hardware parts were tested, we Integrated them together. Using the Arduino IDE include the libraries from Sketch -> include library -> Manage libraries. Then install the Wi-fi manager libraries. Now Install the DHT sensor library same way we install Wi-fi manager library but chose "DHT sensor library By Adafruit Version" & select our desired version to Install. It is recommended to select latest version of both DHT-ll & Wi-fi manager library.

4. Block Diagram

Block diagram of smart environmental health monitoring system. Pollution is a growing issue these days [6]. it is compulsory to examine environment & keep it controllable for more desirable future & healthy living for all. Here we propose an environment system Allow us to monitor & check Live environment ln particular area through IOT [7]. Internet of Things based on a real time Environmental monitoring system. Internet of Things (IoT) play crucial role in today world through a vast & persistent system of sensor networks concerned to the Environment & its parameters. this system deal with monitoring & con-trolling Important Environmental conditions like temperature, humidity & CO quality then this Data is sent over to internet. This information can approach from anywhere Over the web & then the sensor data is presented as graphical statistics in a mobile application [8]. This paper explains & presents the implementation & outcome of this environmental monitoring system which use the temperature, humidity & other environmental parameter of the surrounding area. This information can use to take distant action to control the situation.
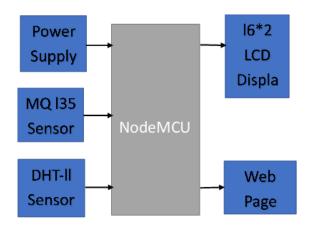
Figure 1. Block Diagram
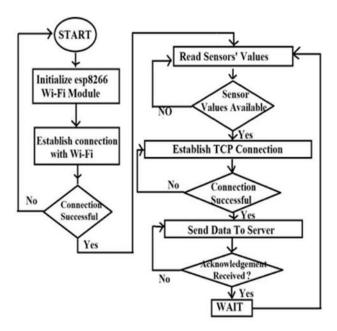
5. Flow Chart of Program

Figure 2. Flow Chart of Program

6. Conclusion

This research give real time IoT build on environmental monitoring system for monitoring of temperature & humidity of sur-rounding environment, and to infer some relevant knowledge based on the climate information. The captured information is sent through WIFI to the n/w where Realtime data & it graphical analyses can Be viewed.an Android application is created for the end client to detect the environment of Area where the hardware is sent using a smartphone. Also, this system can be used to send the notification using the one click IoT device about the Current condition. This system can be elongated to instrument a Home automation System by auto triggering some actions and control other devices based to observe the value of temp and humidity the assistance of the app. The proposed system is a key step in understanding the IOT applications development and

implementation. It also fills in a structure block for several useful innovation's In this direction. The Environmental Sensor Monitoring system enhance a good example of any automation system form on internet Of Things.

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