

Natural Disaster Monitoring and Alert System using IOT for Earthquake, Fire and Landslides

Amit Kadam, Lokesh Mate, Chaitanya Chiddarwar, Akash Bhoite, Saif Momin, Amol Shelar
Anantrao Pawar College of Engineering and Research, Parvati Pune-411009

Abstract:- Natural disasters like Earthquake fire and landslides can be proved to be great harm to man-kind. This harm cannot be prevented but by careful planning and emergency steps of spreading alert we can often reduce the consequences of these disasters. Recent technological advances in communication medium made new trend in monitoring system. This new system focuses on monitoring water level earth vibration room temperature via a sensor's, and generate alert signals when the values cross the threshold values provided to sensors. Alert message is a Text Message and Android application notification services to the concerned authorities through their mobile phones. It also includes public address (PA) system to broadcast the message to local peoples nearby the place. The module can also send the water level to the android user. This app will be very useful to the community and can be used as a primary precaution action to save many lives.

I. INTRODUCTION

Natural disaster like earthquake, landslide, and fire are included in this system. This system are to prediction to disaster are occurred and then safe to people. In this system are used to made embedded and software part using android phone for monitoring. This system includes the web-based portal used in to change and update the threshold value. In recent technology advance communication media make a new technology in the disaster monitoring system. All sensors are working then applications are generate alert signal when it crosses a threshold. Alert message is text message or android app notification service to authorized people to mobile phone. Alert system text message are send which disaster are occurred and which are place are safe to people. It also include public address (PA) system to broadcast the message local people and nearby all place.

Landslide also known as a landslip, landslide are day to day are increases in rainy season because rain are highly in the ground that time are landslide are possible. Natural disaster monitoring system is more application in the But correct prediction are not giving any application because disaster are natural. In this system are make in multiple space like as society, IT companies, factory, etc. Natural disaster monitoring system are mainly used in government because disaster prediction are important to country people are safe. Developin an early warning system for the monitoing all landslide, earthquake, and fire require application. Most of the landslides in India are caused due to heavy rainfall. Rainfall events can cause slope failures in areas of limited extent or in large regions. This application are advantegas of many people are own sefty. At the current year weather department are are not correct prediction to people.

Natural disaster like landslide, avalanches, floods, and debries flows can result in enormous property damage and human casualties in mountainous regions, Landslide are gravitational movement of soil or rock down slopes that can cause serious damage to civile infrastructure. Numrious facility and structural failure caused by landslide have been reported over year. Therfor effort to measure and monitor potential landslide are essential to ensure human safety and to protect xivil infrastructure.

To Observe the behavior of slope, monitoring system have been install and manual inspection by human expert have been conducted. Land slide monitoring is based on geotechnical instrumantion using, for examples accelerometer sensor, water level sensor, Vibration sensor, accelerometer, inclinometer, or. However, cable based monitoring system are costly, require continuous maintenance and are limited in there are communication flexibility.

To overcome the limitation. Wireless sensor network or internet of thinks. Are viable internet technology. State of the art wireless landslide monitoring system collect environmental data from the slope and transfer it to connected computer system for persistent storage. It monitors and detect the landslide and alert people from land slide hazards.

A. Advantages

Disaster Prediction and Identification using Sensor data

- Monitoring
- Sending Alert message And Notification to register contact which is nearest.
- Complete shift from relief and recovery to risk & vulnerability assessment and subsequent management.
- All sensor data show in android mobile phone application.
- Online monitoring system areworking on totally wireless sensor network.
- In this application are used to all country and people are safe.

B. SCOPE

Natural disaster monitoring system can be used in real time purposed. It's more usable to environmental department who keeps monitoring on natural disaster. This system can be very use in keeping track of all the disastrous activities and will help as taking primary step in saving people's lives.

II. LITERATURE SURVEY

In this author Arjun D. S [1] presents an enhanced architecture for Croud Sourcing using the Weather Disaster Monitoring using the Wireless sensor network. The weather

forecasting department prediction about to weather atmosphere. Weather department to prediction about rain, tuanami, Earthquake, wind etc. Weather department is not correct the prediction about to disaster. His only safety for the human to display wireless sensor through display message.

In this author Ashish rauniyar [2] Nowadays, every country and human is prone to natural and artificial disasters. Early disaster detection about Earthquake, Fire, Stroms, and Floods detect prediction for many people sefty are easily safe. All the croud sourced data are providing information of certain geographics region are analyzed in cloud platform. Croud of source data make its way to analysis and more than thousand people life are lost. The fog computing is new and efficient way to croud sourcing using IOT. In this paper public safty are most important concept of croud sourcing based disaster management to avoid the any disaster. Croud-sourced data can be shown in the peace of data should bedetect and alert about the disaster show.

In this author Rajesh singh[3] Utilization of Internet Of Things technology is automation system. In this system all about working on machine automatically. IOT technology important approach to speed up of the information about the power system and efficient management of power system infrastructure. Disaster prediction and reduction of power transmission line is important application of Internet Of Things. Disaster management information transmission are easily to Embedded software. Transmission are very reliable. Internet Of Things technology are improve the the reliability of power transmission and reduce the disaster loss. The paper introduce the application of IOT in online monitoring system of Power transmission line.

In this author yiying zhang [4] Aims to create awareness about the uses of IOT in disaster management system in the world and to cover the all geographics area requirement. It handle the all the issues and challenges of IOT application of disaster management.

In this author Garcia A. [5] Ground-based techniques are mostly used in landslide monitoring system. The landslide disasters are occurred using ground-based techniques using measure the all slope of landslide easily. All the surface and subsurface surveying real time data availability. Commonly the adopted sensors include inclinometers, accelerometers, strain gaiges, wire extensometers, pressure transducer, gps. This impotent concept they are important to battery, data storage and transmission technology. This system are based on cable connection between sensors, data loggers and GPRS modems. This system are installation and operation are running to take more time. The transmission of data are transmitted without preprocessing. Ground-based techniques are handle all working about the land like as vibration of land, slope of land, moisture level of land, distance are measure are easily. This ground-based techniques are more used to weather department.

III. ARCHITECTURE OF SYSTEM DIAGRAM

The above figure1 shows the brief idea about the project which is to be implemented for monitoring and sending alert message for registered users.

Weather department is measure the vibration, moisture, temperature, fire etc. The parameters alert depending on the weather surveillance system. Monitoring system is used to detection of either is core part of the work. Fig 1. This are monitoring system these are include multiple sensors and this system three disaster are include earthquake, landslide, fire. First of all moisture sensore are measure the water level and vibration sensor measure the richter scale earthquake and fire sensor measure the temperature. All the sensor are important to the weather department.

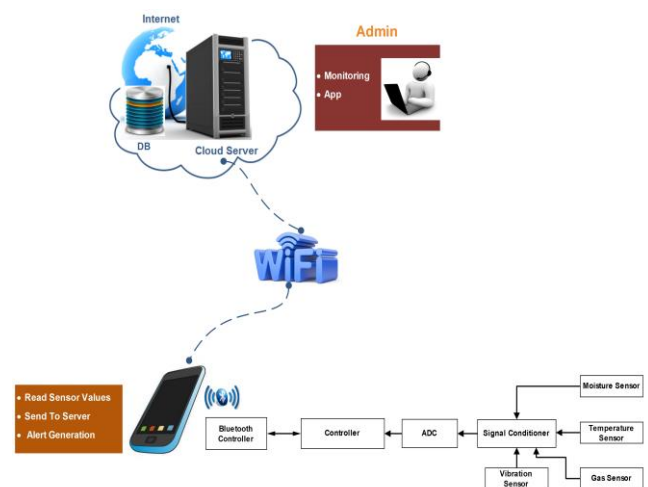


Fig 1:- Architecture Diagram

Disaster monitoring systems are monitor to all sensor like as water level, moisture, earthquake, landslide etc. All the systems are running in geographic area then duster are occurred. Sensor data are high upon fixed threshold value or cross the threshold value before disaster are occurred then monitoring system are Alert to the authorized person through the text message. These places are disaster are detect this place people are send the notification about the disaster. This module would be beneficial to the community and act as a precautionary action to save lives in the case of Land sliding, Forest Fires, and earthquake disaster.

In project we are going to deal with the natural disasters and the damage caused by it, in project we are going to track various values which includes moisture from soil, vibrations in earth, smoke in room and temperature of room .from this information we are going to create a database and in which we are going to compare values continuously if the value cross the fixed threshold we are going to generate alert message for registered user and show safe directions for them.

IV. PROPOSED SYSYTEM

In this proposes system the project which consist of software components.

A. Registration Module

This module is responsible for adding or managing users. Suppose new user download the app and creating a new

account. The user can registration are successful then used for this app advantegas.

In this figure 2 user register module is provided to user to add new user it consist of user name , password , contact no. ,email id , address . like features which provide security to user module so that only user can access the app and same security is given to Admin application so that only authorized person can change the threshold value

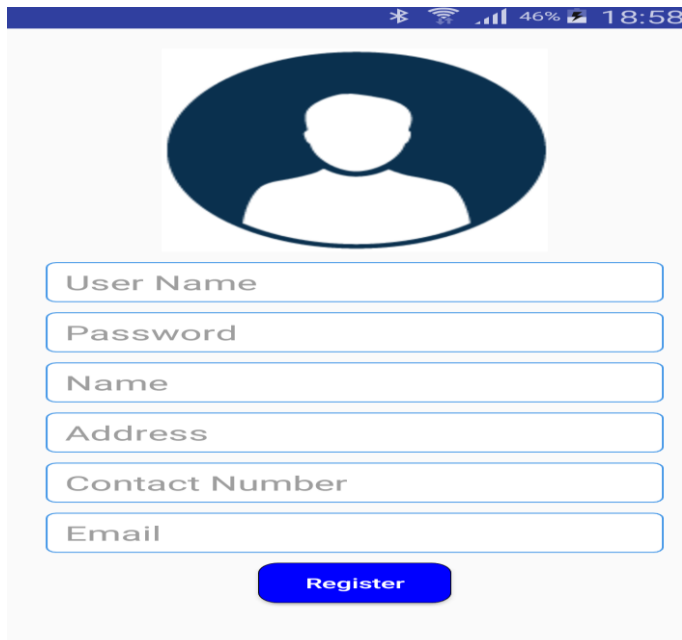


Fig 2:- User Registration

B. Landslide detection Module

This module is responsible for a getting threshold value and checking the current value getting by sesors and managing the buzzer according to reading values. The disaster are occered then sensor are sence the disaster then threshold value are compare with sensor value . The sensor values are crossed the threeshold values then admin alert to the user through buzzer or text message.

As soon as possible about the same as the all sensor are work on same procedure like as Earthquake,landslide and fire detection.

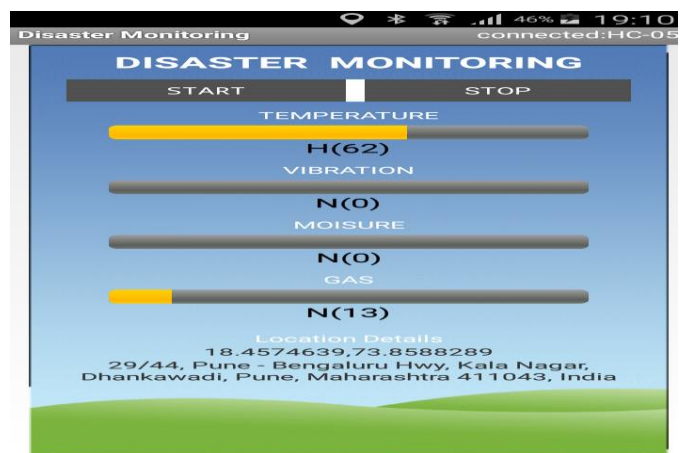


Fig 3:- (a) . Before detection of disaster

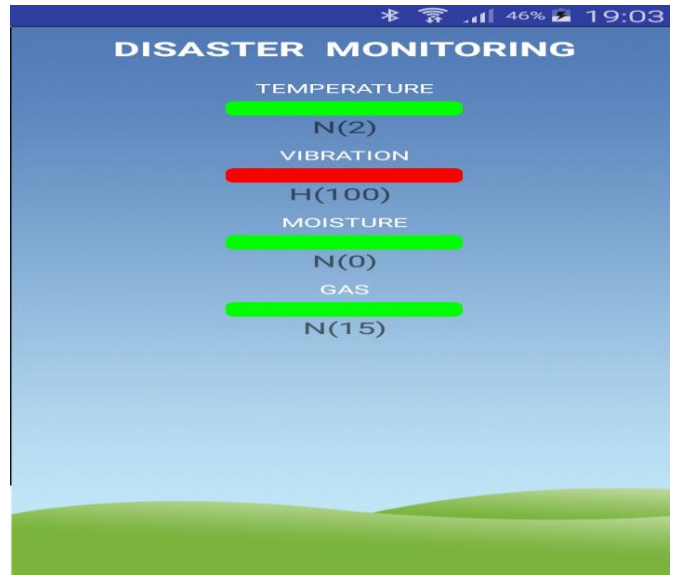


Fig 3:- (b) . After Detection of disaster

In this image disaster are occerd to display in red colors.

C. Device test Module

This module is responsible for a only chechking the device is properly working or not. Device test module are controlled on all devices like as ckt device include all sensors,controller,PCB,Ic etc. To handle all device. The running system anyone device can not run to detect the user is not working.

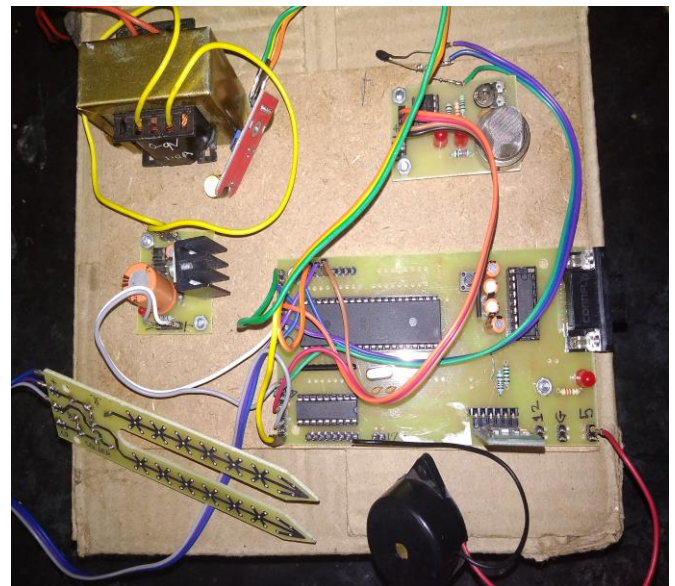


Fig 4:- Curcuit Diagram

D. Manage Sensor/Device Module

This module is responsible for aManaging the sesor and device(ON/OFF).

E. SMS Module

This module is responsible for a sending a SMS to the governing body when landslide, Earthquake and fire happening or crossing the threshold value. All value are

crossed the disaster are detect are detect then Sms module are send the message on registered user.

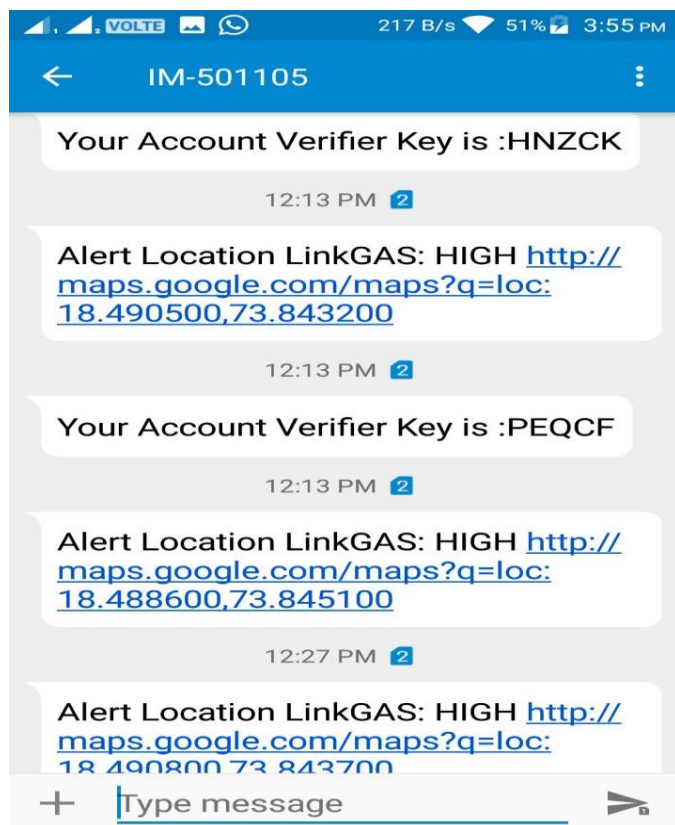


Fig 5:- Alert Text Notification

In this proposed system all the modules are running succesfull.

V. CONCLUSION

In this propose system all working sensors are handle mobile phone application using wireless sensor network. four commercial sensor are used in system water level, moisture level, vibration sensor, gas sensor. All sensor are monitor to admin and generate Alert signal to water, moisture, temperature, vibration and gas sensor cross the threshold value. The system can also send the status of all sensor value to android phone using Bluetooth. This system helps out people to reach to the nearest safe place prior to disaster. In the mobile application value are cross then send text message to authorized people. That message is send a map link to user to show the safe place in disaster. . Lack of details on Google Map of developing countries is the main challenge of our work. More then people are working on Google map because people are challenge in work of countries. These applications are developing more counties. We have future plan to made this application to safe people and need not any risk to any disaster are occurred. These applications are more used in people in the countries.

REFERENCES

[1]. Arjun D. S ,” Integrating cloud-WSN to analyze weather data and notify SaaS user alerts during weather disasters” Published By 2015 IEEE International.

- [2]. Ashish rauniyar,”cloudsourcing-Based Disaster Management Using fog computing in Internet of Things Paradigm” Published By 2016 IEEE 2nd International Conference.
- [3]. Rajesh singh ,” Land sliding and monitoring using WSN” Published By 2014 IEEE International.
- [4]. yiying zhang ,”Internet of Things(IoT) foe Effective Disaster Management ” Published By 2012 conference Publication.
- [5]. Garcia, A., Hördt, A. and Fabian, M. (2010). “Landslide monitoring with high resolution tilt measurements at the Dollendorfer Hardt landslide, Germany”,*Geomorphology*.
- [6]. S. S. Vishnu “Disaster Alert and Notification System via android mobile phone by using google map,published by 2014.
- [7]. Sagar D. Kharade,”Natural Disasters Alert System using Wireless Sensor Network” Published By 2015 conference Publication.
- [8]. The next frontier for innovation, compition and productivity ,McKinsey.
- [9]. ”Digital compition://www.mckinsey.com/insights.”
- [10]. ”Governmentwebsitetosupportentreprenours://msme.gov.in/mob/home.aspx.”