

Review on IOT based Natural Disaster Monitoring & Alert System For Earthquake, Fire and Landslides

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Abstract: We know that 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. These new systems focuses on monitoring water level earth vibration room temperature via sensors, 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 used as a primary precaution action to save many lives.

Index Terms – Earthquake, fire, landslides, IoT, Disaster Management.

I. INTRODUCTION

Natural disasters like earthquake, fire and landslide are the great issues towards the mankind. These disasters cannot be prevented but by careful planning of the emergency measures like 'alert' system can often reduce its consequences. Recent technological advances in communication media made new trends in the disaster monitoring system. The system focuses on monitoring water level, room temperature and earth vibrations via sensors, And generates alert signal when it crosses a threshold. Alert message is Text Message And Android app notification Service to the concerned authorities through their mobile phones. It also includes Public address (PA) system to broadcast the messages to the local people, nearby the Forest side. The module can also send status of water elevation to anyone who has the Android App.

A **natural disaster** is a major difficult event resulting from natural processes of the Earth; examples are floods, hurricanes, tornadoes, volcanic eruptions, earthquakes, tsunamis, and other geologic processes. A natural disaster can cause hammering of life or break property, and typically leaves some financial damage in its wake, the severity of which depends on the affected population's flexibility or facility to recover and also on the infrastructure available.

A difficult event will not rise to the level of a disaster if it occurs in an area without helpless population. In a vulnerable area, however, such as Nepal during the 2015 earthquake, an earthquake can have disastrous consequences and leave lasting damage, which can require years to repair.

1.1 Scope

Scope of our system defined as that can be used in real time purposed. It's more usable to disaster management like departments 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.

1.2 Compensating for limited Infrastructure

IoT technologies can't stop disasters from happening, but can be very useful for disaster watchfulness, such as forecast and early warning systems. In this way IoT can pay off for a reduced infrastructure that puts developing and emerging countries in a particularly vulnerable position.

Take for example the monitoring of forest fires: sensors on trees can take dimensions that indicate when a fire has broken out, or there is a strong risk, e.g. temperature, moisture, CO₂ and CO levels. If there is a dangerous combination of these parameters, early on warning systems alert the local population and request help. The firefighters when they arrive have detailed information about the location and spread of the blaze.

Other IoT applications are being developed for different kinds of disaster: microwave sensors that can be used to measure earth movements before and during earthquakes, for example, or infrared sensors that can detect and measure floods and movements of people [5].

II. RELATED WORK

In this paper [1] presents an enhanced architecture for integrating cloud with wireless sensor networks to analyze weather data and notify SaaS users alert during weather disasters at low cost. The occurrence of natural disasters affects lives, damages property and changes our lives completely. Existing system does not support node and network level virtualization for weather sensors. The proposed system overcomes the above limitation by deployment of WSN infrastructure for multiple weather applications using virtual sensor and overlay concept. Monitoring weather data and providing SaaS and social network disaster alerts based on decision ID3 technique and provide cloud authentication using secure shell. These factors improve and provide high quality disaster alters to users and weather analysts at low cost.

In this paper [2] aims to create awareness about the potential uses of IoT in disaster management in India and to cover some of the requirements, issues and challenges related to IoT applications for disaster management.

In this paper [3] Nowadays, every country and human is prone to natural and artificial disasters. Early detection about disasters such as earthquakes, fire, storms, and floods can save thousands of people's life and effective preventive measure can be taken for the public safety. All the crowd-sourced data which are providing the information of a certain geographic region are analyzed in a cloud platform. But, by the time the crowd-sourced data makes its way to the cloud for analysis, the opportunity to act on it might be gone. Moreover, thousands of people's life will be lost. Therefore, fog computing is the new and efficient way to analyze such critical crowd-sourced IoT data of disasters. In this paper, in order to detect and take necessary steps for public safety during a disaster, we propose a crowd-sourcing-based disaster management using fog computing (CDMFC) model in IoT.

In [4] Utilizing Internet of Things (IoT) technology in smart grid is an important approach to speed up the informatization of power grid system, and it is beneficial for effective management of the power grid infrastructure. Disaster prevention and reduction of power transmission line is one of the most important application fields of IoT. Advanced sensing and communication technologies of IoT can effectively avoid or reduce the damage of natural disasters to the transmission lines, improve the reliability of power transmission and reduce economic loss. Focused on the characteristic of the construction and development of smart grid, this paper introduced the application of IoT in online monitoring system of power transmission line.

III. SYSTEM ARCHITECTURE

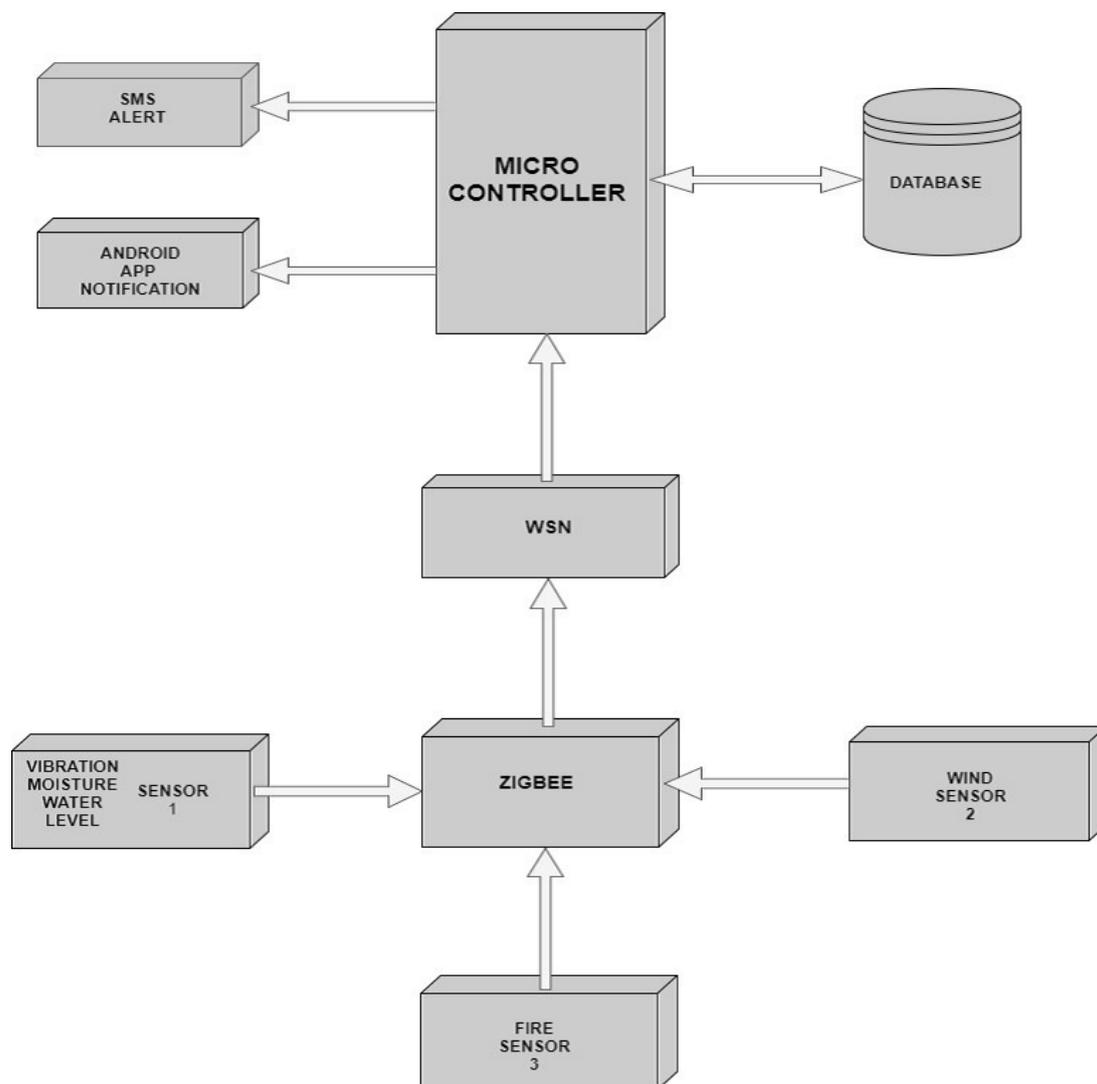


Figure 1 Architecture Diagram

In figure 1 shows the brief idea about the project which is to be implemented for monitoring and sending alert message for registered users the brief ideal description of the project is as follows: The weather observation equipment is used to measure parameters like vibration, moisture, sample temperature etc. These parameters alter depending on the requirement of weather surveillance system. Monitoring system which is the tool used for weather detection is the core part of the work. Draw backs of this particular weather monitoring system is devices are installed in different location, in some situations it is not easy to install weather tools in some areas reasons being lack of access to power source and unable to connect to signal wiring and tools used for measuring are very costly.

The system focuses on monitoring water level, room temperature and earth vibrations via sensors, and generates alert signal when it crosses a threshold. Alert message is Text Message and Android app notification Service to the concerned authorities through their mobile phones. It also includes Public address (PA) system to broadcast the messages to the local people, nearby the Forest side. The module can also send status of water elevation to anyone who has the Android App. 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 this 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. ADVANTAGE AND DISADVANTAGES

Disaster Prediction and Identification using Sensor data

- Monitoring
- Sending Alert message And Notification to register contact which is nearest.

The salient points of the guiding framework can be summarized as under:

- Complete shift from relief and recovery to risk & vulnerability assessment and subsequent management.
- Inculcate a culture of disaster preparedness at all levels.
- Online monitoring system of power transmission line realizes real-time monitoring,
- Build capacity at center and state by strengthening decentralized response capability in the country.

V. CONCLUSION

In this system we are going to proposed a new system which is based on IoT, our approach is to monitor a various values data and compare it with our fixed threshold values and send alert to the peoples who are going to use our system. In case of emergency this will help mankind in taking precautions from natural calamities and can also help in reducing damage caused by natural calamities.

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