Disaster Management System using Internet of Thing

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Abstract: *Now in recent years the natural disasters is a very important issue and this issue is occur in many more region like Kerala, Bhopal, and Malian. This issue is occur due to the global warming, Deforestation, Heavy use of unwanted chemicals. Natural Disasters leads the vast loss of life and property damages in many countries. Hence we decided to implement one system that will help to our society from the losses. So the objectives of this project is to monitor the floods, fire, spark, landslides and send the alert in case of danger in the form of text message and call to take appropriate action. In this proposed system the detection section will consist of microcontroller and different sensors to detect the different situations like fire, floods, sparks, and landslides. The system deal with monitoring and controlling the conditions with sensors and send the information to people using SMS and call.*

I. Introduction

In the recent days, Many countries are facing of several social issues in aged population, healthcare, disaster reduction/prevention, safety, security, etc. the natural disasters occur in many areas and many people loss their life progress of India towards smart cities and digitalization is noticeable. India's historic vulnerability cannot be overstated. Around 57% land is vulnerable to earthquakes. Of these, 12% is vulnerable to severe earthquakes, 68% land is vulnerable to drought, 12% land is vulnerable to floods, 8% land is vulnerable to cyclones, and many cities in India are also vulnerable to chemical, industrial and man-made disasters.

In the recent years, on 30 July 2014 many people lost their lives because of Malin landslides disaster due to the heavy rain in Malin village of pune district in Maharashtra, India. Malin village receiving the heavy rain on 29th July 2014 and the date of 30th July landslide will occurred due to heavy rainfall. This issue will observed because of deforestation and many other several reasons. There are many more disasters will occurred but the solution is to be implemented the internet of things techniques to reduce the losses and makes an early warning system. This system utilizes the Internet-of-Things (IoT) technologies to helps in social infrastructures to opens a new door for innovative solutions to prevent the losses from natural disasters like floods, forest fire, earthquake, spark etc. and the most important thing is to we save our life and also saves the animals life.

Internet based sensor networks have recently gaining the attention Sensors are connected to the Internet and the information from the sensors is gathered at a server. When Particular region is equipped with sensor devices, microcontroller, and various application become a self-protecting and self-monitoring that environment is the smart environment. Sensors sensor information transmission and monitor the data which will be collected from various sensors and give alert message to people using SMS and using Calls.

II. Literature Survey

In the proposed system based on IOT technology gives a real warning system using IOT is a new technology to implement the time analysis of flood and earthquake and so that can efficient flood and earthquake observatory and warning system with monitor the flood and earthquake affected areas. In the existing paper proposed and implemented such cloud based IOT system. This implemented on the IOT kit and Developed and android application, and a cloud based middleware platform is not only able to exchange data between publisher and subscriber but also perform the load balancing.

In the paper of early warning system of flood detection build the approach allows the sensors to be deployed at any desired location, the system developed in this project has low power requirements, is more maintainable, and is extremely low cost. Our system does not follow the multi-tiered approach which should lead to lower latency, and requires lesser resources. Research work aims at developing a system which facilitates aids in the collection of data with the help of interconnected modules consisting of multiple sensors useful for smart city monitoring as well as disaster management. This will consist of multiple Wi-Fi module

that together share in the distributed resources and data, capabilities provided by physical objects such as sensors, microcontrollers, actuator etc.

The paper reviews different for disasters monitoring system, after reviewing the different paper or methods and that paper no any single technic to give alert messages through calls. And this altering system help to villages to prevent the different losses like social and economic.

III. System Overview

The proposed system of disaster management system using IOT is playing important role in real life because onwards the different natural disasters affected on human lives and environment so this system will help to society. We identified a suitable implementation model that consist different sensor and other modules and their functionality.
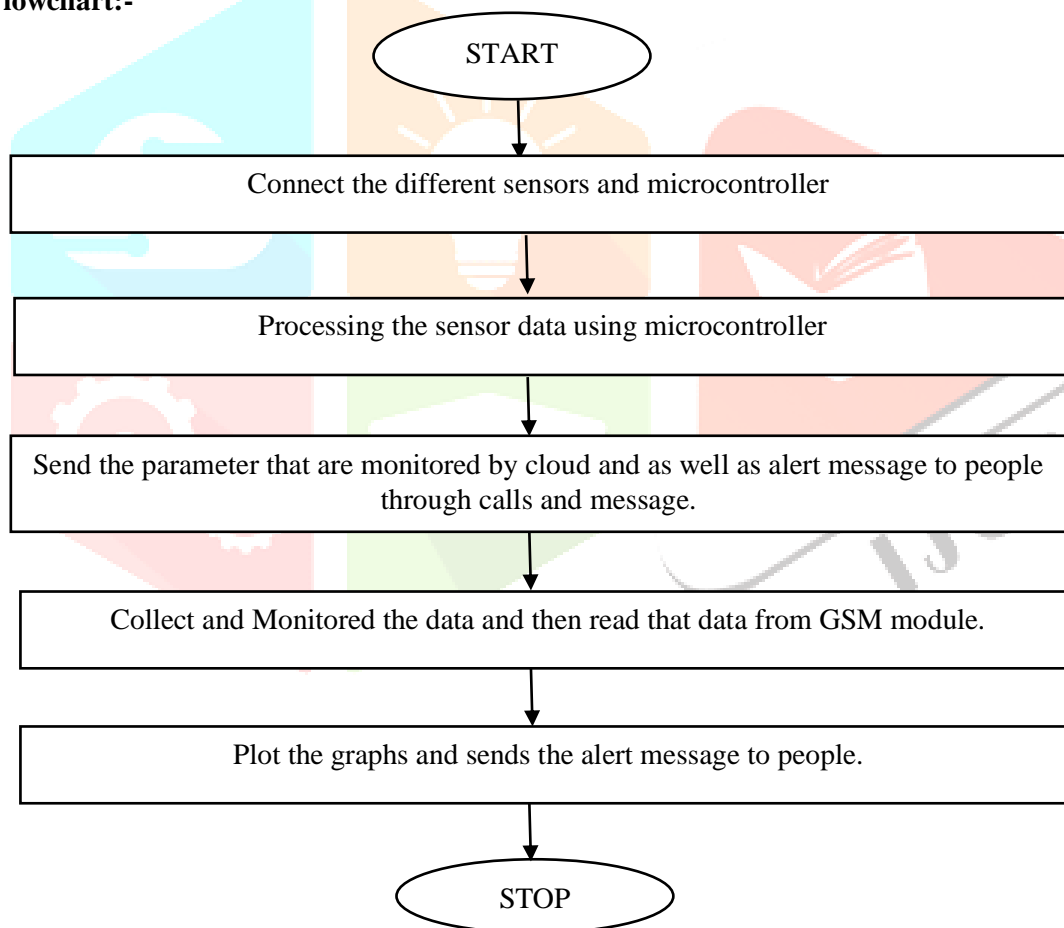
i. Flowchart:-

Fig 1 :- Flowchart for Disasters management system

In our Disaster management system, we are going use different sensors like LDR sensor, MQ2 sensor, Magnetic float sensor, IR sensor, and multifunction Detection feature. The entire system detect the changes in particular area or region and this sensor will detect the different changes and record them. For the detection of landslide accelerometer is used. LDR sensor can detect the spark present in area. MQ2 sensor use to detect fire or combustible gas present in substation. Magnetic Float sensor detect the heavy rain and monitor the water level. Through this sensor continuously counting the water level and admin will store and monitor those record of increasing and decreasing the water level, if the water level is low and normal then no any action will be taken. If the water level is high then that means the flash flood is occurred and there will be action is taken. Admin will collect the contact from database and Send SMS and call to people for taking early precautions from losses.

And alarming system will inform to rescue team. GSM as well as Connection will be established to transfer collected to end user to store on cloud for future use.
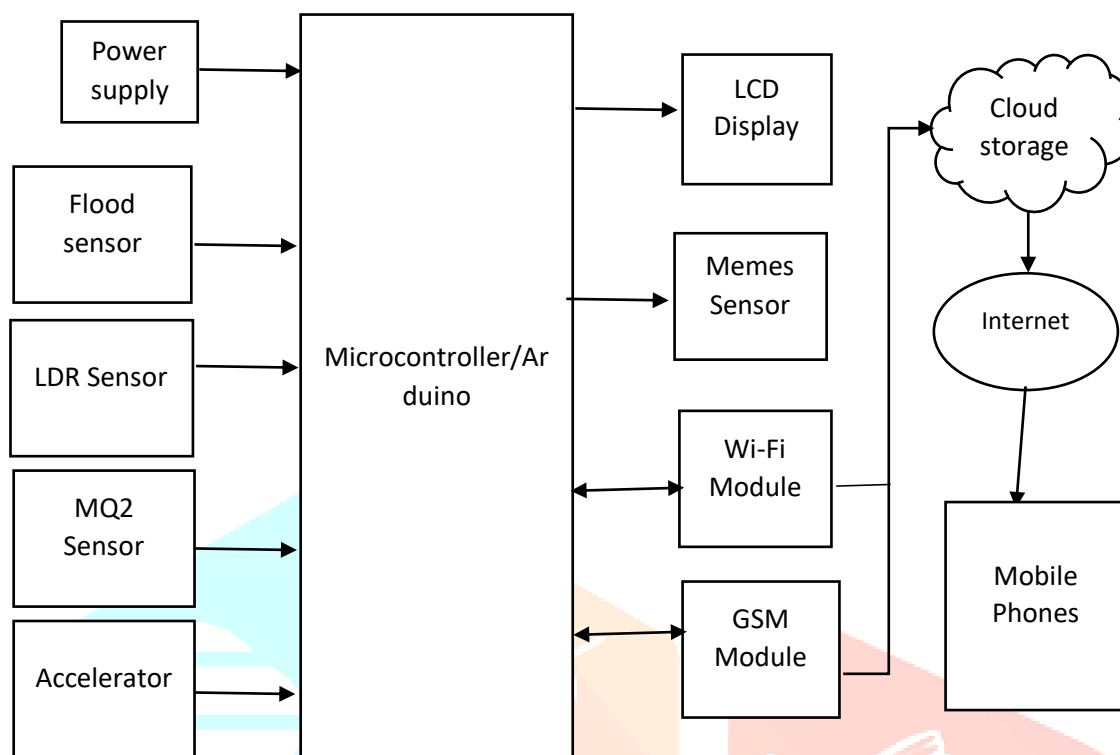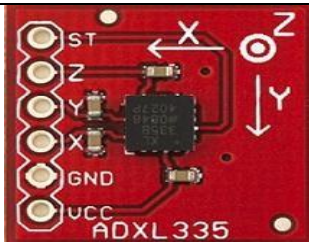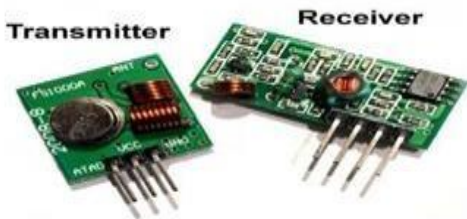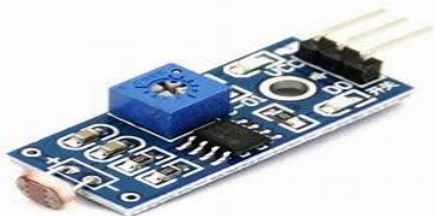

Fig 2 :- Block diagram of Disaster management system

IV. Sensors and their Information

In the proposed disaster management system using different sensors and modules to collect and monitored from sensors. The block diagram consist of different sensors and module now see that information detail-

Sr. No	Sensor Image	Description
1		It is an Arduino. Arduino is an open source tool for making computer that can sense and control more of the physical world than your desktop computer. Using this we can create standalone projects and can be communicate with software running on your computer.it is an open source physical computing platform based on a simple microcontroller board.
2		It is an GSM Module. It is used for SMS, Voice along with Data Transfer application in M2M interface. The On-board regulated power supply allows to connect wide range unregulated Power supply. With help of this modem, one can make audio calls, SMS, answer the incoming calls and internet through simple AT commands.

3		It is an flood sensor, which can be designed for water level detection and sensing the rainfall and even liquid leakage.
4		It is an accelerometer ADXL335 which is integrated circuit sensor that can be used to measure the coordination of the earth with electrical output.it the coordination exceeds threshold then an alert will send vice versa.
5		It is an Buzzer or alarm. It is an mechanical, electrochemical or piezoelectric audio signalling device. It can be driven by oscillating electric circuit or other audio signal source.
6		It is an RF Transmitter and Receiver. The RF module operates at radio frequency (30 KHz and 300GHz). The TX and RX has frequency about 434 MHz and it will consist of encoder and decoder.
7		It is an LDR Sensor which detect the any spark present in substation.
8		It is an MQ2 sensor, which detect the presence of gases in air such as LPG, Methane, and Butane. this sensor and it can detect the Fire.
9		It is an Wi-Fi Module. ESP8826 Wi-Fi module which is having TCP/IP protocol stack integrated on chip.so that it can provide any microcontroller to connected with Wi-Fi Network.

V. Advantages

1. The GSM module is installed in this system will message and calls on to the mobile phones whenever water level has increased to the maximum.

2. IOT Will help to reducing the Loss of property damage. Provide the early warning system using calling functionality.

VI. Conclusion

An IOT based disaster management system has been proposed adapt new techniques, could reduce the chances of losses of human lives as well as damage to large-scale infrastructures due to both natural and human-made disasters. According to this project we can implement inexpensive wireless sensor network components to detect floods, spark, forest fire, landslides and send alert to the people residing across the coastal line of a country. In summary, the aim of this study is to supply fundamentals about IoT-based disaster management systems that help us to know past research contributions and future research direction to solve different challenges disaster management systems.

VII. Acknowledgements

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