

BLYNK APPLICATION FOR DISASTER MANAGEMENT BASED ON IOT

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Abstract – Natural disasters such as earth quake and flood etc have very harmful effects lively hood and even loss of life. There are lot of incident took place in past decades one of such incident which as took place in recent time in India Up flood due over flow of Ganga river which has effected severely and many people lost their life the incident of Jharkhand earth quake also took place in recent times so to avoid such situation we implemented a system where the location is displayed on Google map and data is recorded in blynk app and alerting is done through buzzer here we can see demonstration of both earth quake and flood when the sensor observes or senses the vibrations the earth quake is detected notification is sent to blynk app and water level rises from the dam the sensor senses up to the level the water level has been increased which is recorded in graph form in blynk app which we can demonstrate using glass by pouring water level at different level hence the alerting is done prior to the event so there is less chances of risk to the life and whole system works on Wi-Fi model. The proposed system which we have implemented in this course of time consist of the two sensors MEMS and ultrasonic sensors most commonly called as flood sensors, GPS, Wi-Fi module, LCD display and Arduino

Key Words: Arduino, Blynk, MEMS, Flood sensor, GPS

1. INTRODUCTION

Disaster management is a support system. Disaster is unexpected event which is threatening and managing it works as a setback system to handle the dangerous situation. There are four types of disaster we can see service oriented natural, post and manmade disaster. Natural disasters such as volcanic, flood, forest fire, land slide and earth quake among which earth quake and flood are most common natural disaster which we can see today and they are recurrent among all the natural disaster in our day to day life and effects on the people life and their live hood hence extra care has to be taken to became more safer earlier to the disaster taking place here we are using Arduino mega 2560 which is very useful in programming the whole prototype. Earth quake occurs due to shaking of the earth crust that is due to seismic waves that creates vibration from the core of the earth if the vibration is stronger and greater then equal to 10 it causes major destruction and huge loss even death rate id high at this

magnitude and earth quake of magnitude less or equal to 4 which is consider has minor earth quake and causes low destruction death rate is low even negligible flood occurs due to over flow of water that may due to the waste at river side we can see five type of flooding urban flooding , river flooding, coastal flooding, flash flooding and pounding

1.1 RELATED WORK

Ancona et al proposed flood monitoring system which is better in terms of efficiency, scalability and reliability and it is based on IOT which is accumulated it further investigates that M2M and ultra low power processing architecture can be used for better understanding of flood monitoring system and the system uses RFID sensors , actuators and security system which is interoperable and works in three step process that is identifying, communicating and then interacting along with the RFID sensor it uses wireless sensor network [1].Lo et al proposed a novel mechanism for understanding the flood status by using the CCTV and IOT here the whole process is based on image capturing several images of the water levels are taken from the water reservoir and then the decision made by seeing the different levels of water in the reservoir if water level is rising then action taken by altering[2].A.Alphonsa and G.Ravi have proposed earlier detection of the earthquake using ZIG BEE AND wireless sensor network technology where they have used three accerolometer to sense three different axes of the earth hence the alter message is given to smart phone and LABVIEW software is used for altering purpose[3].M.Inoue, Y.Owada, K.Hamaguti and R.Miura have proposed earthquake altering system aimed on improving the communication system via nerve net because there were lot of connection loss during the earthquake and there was issue of the communication problem so by using the nerve net the communication problem was solved[4].L.Spalazzi, G.Taccari and A.Bernardini have proposed the system were they have categorized system into sensor, actuator and domain were the sensing and actuating is done simultaneously for altering crowd and taking action as soon as possible to move to the safer place. Sensing object senses the earthquake prior to the disaster happening and the information is sent to the actuator to act upon the disaster happening [5].

EXISTING SYSTEM:

“In case of flooding monitoring system CCTV camera is used to view the live image of the water level and algorithm is used to check the availability of the water” [2]. “And in case of the earthquake monitoring system nerve net is used for better communication because there where lot of problem regarding communication and communication loss was the big issue when earthquake occurred” [4]. In both case recording does not exists and even location only several images of the water levels can be seen and then action can be taken if the water level is increased.

PROPOSED SYSTEM:

Whereas the system we are going to propose consist detection of both earthquake and flood prior to the event that is going to take place and the message of the flood and the earthquake occurring is displayed on LCD display if it is above the threshold value then notification is sent to blynk app and the data is recorded in blynk app and even the location is shown on the blynk app and buzzer is used for altering purpose and hence it aims to help people move to the safer area and helps in rescuing themselves from the disaster.

SYSTEM DESCRIPTION

BLOCK DIAGRAM:

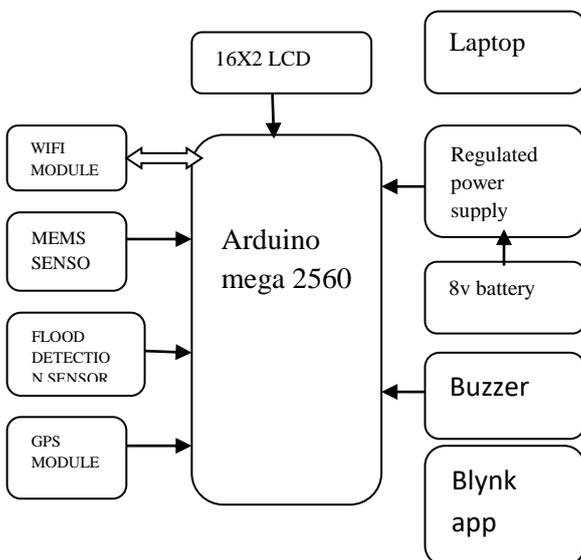


Figure 1: Proposed system block diagram.

The above proposed system implementation needs both hardware and software .Hardware which we have used are as follows]:

HARDWARE DESCRIPTION:

ARDUINO mega 2560:

In this project the Arduino mega 2560 plays the major role in dumping of the program in it and is done via USB cable after program compiling and execution is done in laptop. It consists of the 54 digital input\ output pins and hence it runs on the 8v battery.

MEMS SENSOR (ADXL335):

There are four types of the sensors we can see among which the one we are using is MEMS accelerometer which senses the vibration and sends alter to the blynk app.

Ultrasonic sensor (HC-SR04) :

This sensor is also known as flood sensor which works on the principle of echo sound or wave sent to the targeted object and through this the sensing is done faster than any kind of sensor.

POWER:

Regulating the power is necessary to avoid damage to the overall circuitry.

BATTERY:

The battery we are using is of the 8v total each of 4v combining and whole circuit works on 8v which is sealed of lead acid and it is rechargeable and even solar panel can be used for recharging the battery.

WIFI MODULE:

The whole circuitry works on the WI-FI module which helps the microcontroller to access the Wi-Fi network here the Wi-Fi module works as host application for uploading or off loading applicaton.

GPS MODULE:

It is used for tracking the location of the area where the implemented system is set.

LCD DISPLAY:

LCD Display of 16x2 is used for displaying the message of earthquake and flood occurred. When the sensor of the earthquake senses the vibration of the waves the message is displayed and same happens in case of the flood that is when the water level is high is message is displayed on the LCD display and as we know LCD is better than the LED display.

BUZZER:

A buzzer is audio signaling device used for altering purpose during the disaster.

SOFTWARE DESCRIPTION:

ARDUINO IDE:

Arduino IDE is one of the libraries used for programming to link with the blynk app. Embedded c programming used for the interface of the hardware to the software hence it is needed to know the result on the blynk app.

BLYNK APP:

It is cloud based software where we are going to observe our output data through internet.

CONCLUSION

The above proposed system is effective in detecting earthquake and flood prior to the event through the blynk app and even alerting is done through buzzer.

FUTURE SCOPE

The implemented system can be improved by using live video streaming for better monitoring of effected area and also improved in terms of the accuracy in recording.

RESULT

The following image shows.

1. Implementation of the proposed system.
2. LCD display displaying the earthquake occurrence.
3. LCD display displaying the water level rising.
4. Alert message showing on blynk app that earthquake as occurred
5. Alert message showing on blynk app that that water level is high.
6. Recording of the earthquake and flood occurred.
7. Location of the earthquake occurred.

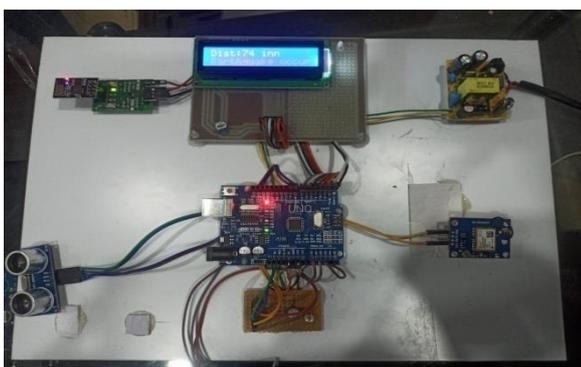


Figure 2: Implementation of the proposed system.



Figure 3: LCD Display displaying the earthquake occurrence.



Figure 4: LCD display displaying the water level rising.

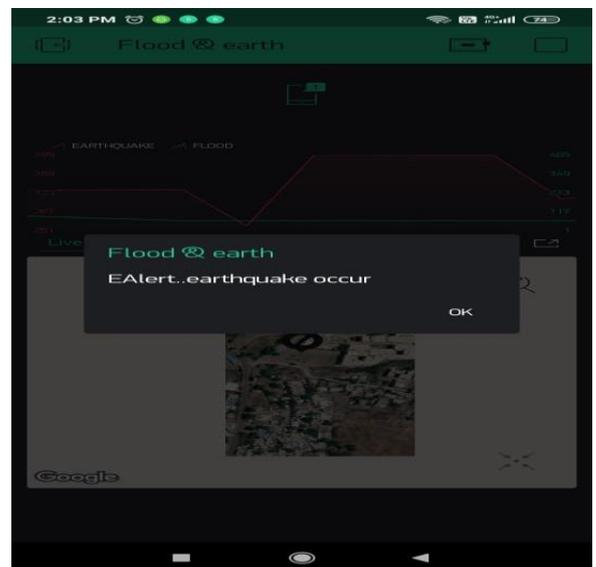


Figure 5: Alert message showing on blynk app that earthquake as occurred.

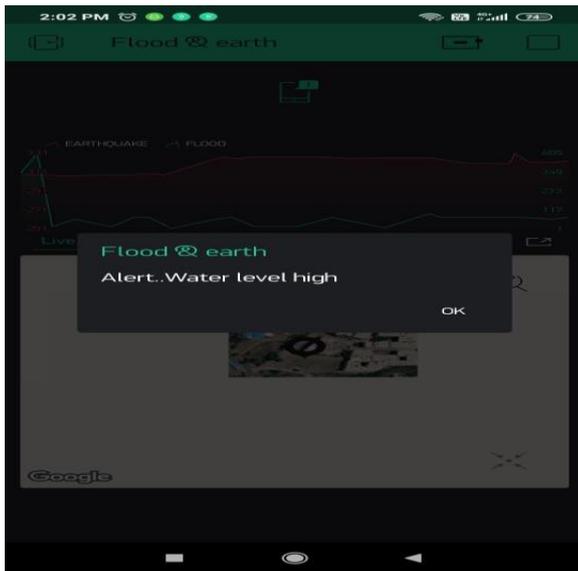


Figure 6: Alert message showing on blynk app that water level is high.

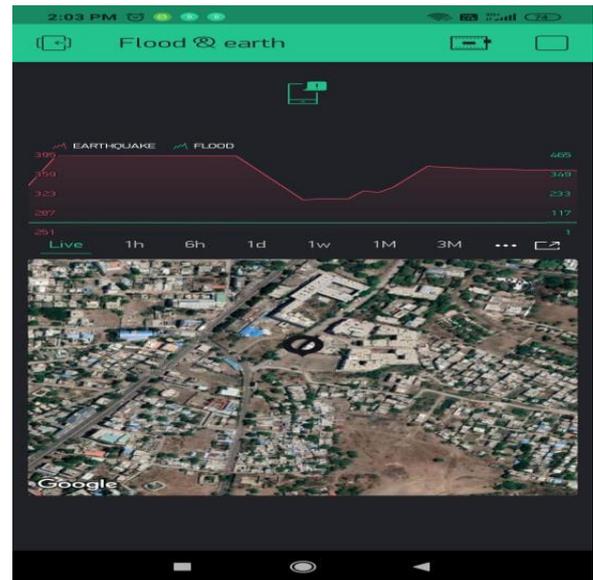


Figure 8: location of the earthquake occurred where the system is implemented.



Figure 7: Recording of the earthquake and flood occurred.

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