

Disaster Management System Using IoT

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Abstract: *The disaster management plays important role in saving the lives at the time of disaster. To protect life report and response in time plays crucial role in any disaster management system. The disaster management system prototype using internet of things used here is capable of sensing the change in environment and uploading the data obtained to the cloud like things speak server. If the disaster occurs alerts will be given via Gmail and telegram. Disaster that may occur by natural or manmade disaster involves widespread human, material, economic or environmental impact. In this system we use wireless sensor network (WSN) and Internet of things (IOT) for centralize data acquisition by sensing and communication technologies like above. We can control and monitor this system from remote location based on information analysis and processing which receive from system without human intervention.*

Keywords: Internet of Things (IoT), Disaster Management System, Wireless Sensor Network (WSN), Sensors

I. INTRODUCTION

The disaster occurs when the slope changes from stable to unstable conditions. There are two type of disaster which can cause change in slope which is manmade and natural. The natural disasters are ground water pressure which causes destabilization, erosion at the bottom of a slope, earthquake caused liquefaction destabilizing slope [1][2]. The manmade causes such as, deforestation, construction which destabilize fragile slopes, vibration is from traffic and heavy traffic, avalanche of rock, flows of debris, flow of mud are various form disaster [3]. The Indian Ocean tsunami (2004), Hurricane Katrina(2005) Kerala flood (2018)Gujarat Earthquake (2001) ,Orissa Super Cyclone (1999) are some of the few of many disaster that had an adverse effect on the Indian geological grounds[4][5]. This major natural disasters that had taken place in India had great impact on us and as well as the other countries around us, But looking back at this disasters we as a group did a immense amount of research and came to an conclusion that this is a need for a disaster management systems, so this lead the idea of this project. The need for disaster management system was not only to build a system for the safety but also bring to the people that even though we have created a system , we need to focus on the educating them regarding the hazards and destruction that are caused by these calamities. And there is also a need for a fund raising community [2][5]. As we know that there are many of them but more the merrier, so taking help of the internet raise the money for the areas which took a greater impact on them. And with the help of the public domains public surveys, internet analysis and websites and looking at the research we did this paper examines these networks, their product and their future potentials. There is also a need for a fund raising community [2][5]. As we know that there are many of them but more the merrier, so taking help of the internet raise the money for the areas which took a greater impact on them. And with the help of the public domains public surveys, internet analysis and websites and looking at the research we did this paper examines these networks, their product and their future potentials.

II. METHODOLOGY

Aim of the system was to develop a disaster management system for natural and manmade calamity which had, has and have been happing and have devastating effects that lead to death and loss of personal properties. Thus disaster

management monitoring is important to catastrophic effect of disaster. Objective of this paper was to detect the condition which lead to occurrence of disaster and notify it well before time and able to save human loss. To establish a mechanism for the effective and reliable technology. In this system we are using various digital sensors such as Rain Sensor, Water Level Sensor, Vibration Sensor, Accelerometer Sensor, LCD display, Atmega 328P. In this system the digital sensors sends all the data which is gathered by sensing all activities which happens in environment to the controller. Atmega328P is our main controller which is been coded with the help of Arduino IDE. This sensor has all the logics which are necessary to perform various activities such as sending data to LCD for displaying. After performing the logics the data is send to the cloud with the help of ESPO1 module which is basically Wi-Fi. The cloud which we have used here is Things Speak cloud. On cloud we have the graphical representation of data where we can do the analysis on data.

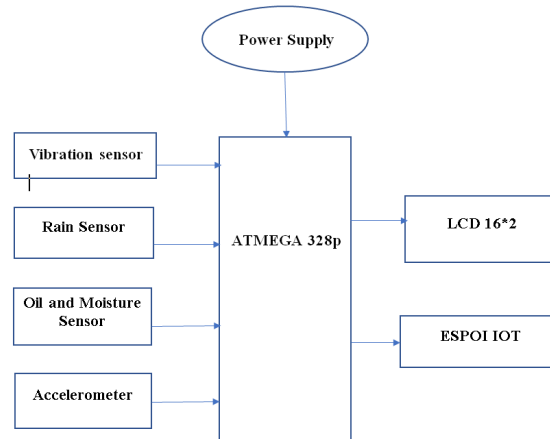


Fig 1 . Block Diagram of Disaster Management System

III. OVERVIEW OF SYSTEM

Aim of the system was to develop a disaster management system for natural and manmade calamity which had, has and have been happening and have devastating effects that lead to death and loss of personal properties.

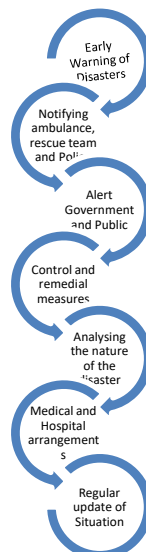


Figure 2: Flow of Instruction.

Thus disaster management monitoring is important to catastrophic effect of disaster. Objective of this paper was To detect the condition which lead to occurrence of disaster and notify it well before time and able to save human loss. To establish a mechanism for the effective and efficient sharing of knowledge, experience and resource about management hazard, risk, disaster.

The figure above explains the working flow of the entire disaster management system. The first step is that we are getting warning of disaster that disaster is going to happen in the particular areas. They send the signals to rescue team, ambulance and police. Warning is given to the government and public commercial area so that citizen should be saved from the disaster.

Some preventive measures are taken to control the disaster and then we have to analyse the nature of the disaster. After the natural calamities the death rate gets increased and for these medical and hospital arrangements are to be done and regular update of situations should be provided to government so that they can fight against the situation in a quite efficient manner.

IV. MANAGEMENT IN IOT

Discussing issue of on top for manage, we have to create the systems which are interlink to each other by technologies for management. IoT is such a technology for connecting departments. This figure shows a two way transmission in the middle of control station and in other departments. To keep control station as a disaster , department also communicate with them. So because of these we can bring some of the division under one tree. And by doing these it provide some ductility to control the events. Mobile application should be developed for monitoring the disaster.



Fig.3. Bi-Directional Communication Model

According to proper arranged structure the disaster is going too happened as shown in diagram. In case of the natural disaster the early notifications are provided to the surrounding regions. Some preventive actions and measures are taken to reduce and minimize the risk of losing life and property. W Looking at the devastation created by the disaster control and remedial measures are taken into consideration accordingly. This natural disaster can be analysed to provide medical facilities and hospitality arrangement. Regular updated are provided to citizens from control room to reduce the risk of life. At the time of crisis we can also provide the escape routes and safe places for the betterment of citizen. Recovery measures are to be planned quickly and can be implemented usefully in a short period of time, In these way we can manage a disaster from the control centre using IoT interlinking.

V. EXPERIMENTAL RESULT

The expected result of the proposed methodology is to create low cost smart disaster early warning system which is also known as LEWS. In which we also have to include development of sensors, the IOT network. The created system must be low cost, easy to access for everyone, it should be robust, accuracy must be high as possible, ready to deploy in any disaster area and tough to bear the disasters. We have to compare the proposed system to the all system which are presents in the open market before delivering for social use.



Fig. 4.1. Experimental Result.

Figure above shows that welcome to disaster management system is displaying on the LCD screen and the interfacing of the circuit is done.

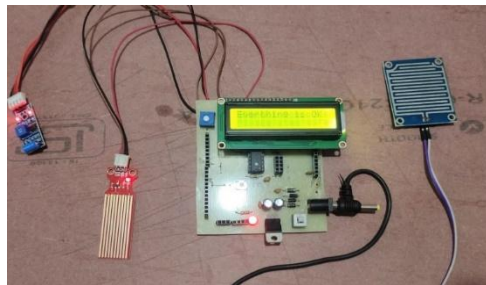


Fig.4.2. Experimental Result.

The above figure shows that all the sensors are working i.e. rain sensor, wind sensor, vibration sensor, accelerometer and they are in ON mode and because of it is displaying that everything is OK.

VI. CONCLUSION

In the field of geophysical research the real time monitoring of disaster management is one of the challenging research areas available nowadays because we know that how nature is unpredictable and we have to give best solution from the limited source. The proposed system uses wireless sensors nodes, for delivering the real time data to the system for monitoring and providing warnings to minimize risk assessment and inhabitants the area. This proposed methodology will be used for understanding the capability of wireless sensor network in the critical and emergency application.

The system have bright future in smart phone in developed or emerging countries for providing disaster detection and warning via mobile phone application. Also we have use wireless system in this system due to which development cost is also less. Due to less cost the system is mass produced distributed and deployed over a relative vast area.

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