Smart Disaster Management using Stress Monitoring System

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***Abstract*-Disaster management essentially deals with management of resources and information towards a disastrous event and is measured by how efficiently, effectively and seamlessly one coordinates these resources. The ability to effectively deal with disasters has become a challenge to modern technology. Disaster impact is often expressed in terms of the numbers of dead and injured and loss of property and resources. Disaster management at the individual and organizational level deals with issues of planning, coordination, communication and risk assessment. Therefore, the purpose of this project will be served if in the end it helps to minimize the economic losses and reduce injuries and death priorly to the affected population.**

In this case, the environmental Disaster are identified priorly using piezo electric sensor ,where it is embedded with MCU board and we can get the alert message to the owner or authorizer and the location is tracked using GPS and GSM module.

Keywords-Embedded c; Piezo electric sensor; SMS; Environment Surveillance and Alert.

I. INTRODUCTION

A disaster is a consequence of a sudden disastrous event which seriously disrupts the normal function of the society or the community to the extent that it cannot subsist without outside help. A disaster is not just the Occurrence of an event such as an earthquake, flood, conflict, health epidemic or an industrial accident; a disaster occurs if that event/process negatively impacts human populations. Disasters combine two elements: hazard, and the vulnerability of affected people. A disaster occurs when a hazard exposes the vulnerability of individuals and communities in such a way that their lives are directly threatened or sufficient harm has been done to their community's economic and social structure to undermine their ability to survive.

A disaster can be defined as any tragic event stemming from events such as earthquakes, floods, catastrophic accidents, fires, or explosions. It is a phenomenon that disasters can cause damage to life, property and destroy the economic, Social and cultural life of people. A disaster is a calamitous, distressing, or ruinous effect of a disastrous event which seriously affects or disrupts (or threaten to disrupt) the critical functions of a community, society or System, for a period long enough to significantly harm it or cause its failure. It is beyond the capability of the local community to overcome it. The stricken community needs extraordinary efforts to cope with it, often with outside help or international aid.

Figure 1 Disaster occur [1]

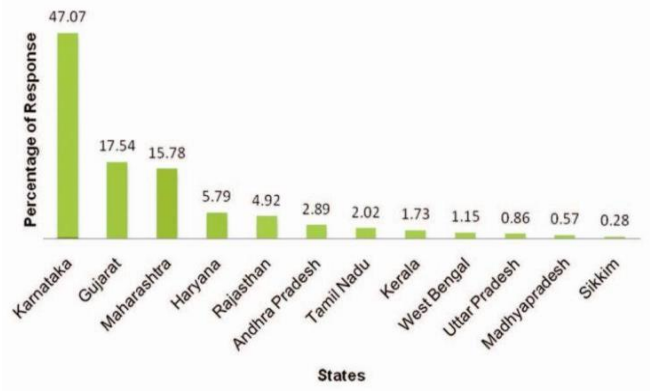


Figure 2 Survey of Disaster [2]

The Internet of Things (IOT) is a recent communication paradigm that envisions a near future, in which the objects of everyday life will be equipped with microcontrollers, transceivers for digital communication, and suitable protocol stacks that will make them able to

communicate with one another and with the users, becoming an integral part of the Internet. The IOT concept, hence, aims at making the Internet even more immersive and pervasive. In order to properly manage the catastrophic events, information needs to be collaborated, for example by sharing resources and/or data and coordinating actions,

decisions, and activities. Furthermore, during an emergency, such resources and data have to be merged in order to accomplish complex tasks, such as evacuate a geographical area and perform operations by means of actuators. The lack of integrated platforms and infrastructures which assist in data acquisition results in a bad management of the emergency.

The main concept of Internet of things is machine to machine communication. Internet based sensor networks Internet-based sensor networks have recently been gaining attention. Sensors are connected to the Internet and the information from the sensors is gathered at a server through the Internet. Security and manageability of sensor information transmission and deploy ability of sensors connecting to the Internet wirelessly are the major issues though low cost and high scalability are expected. This 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.

II. LITERATURE REVIEW

This work is carried out by referring the following from the literature. Prabodh Sakhardande, et. al [1] have proposed a system of interconnected smart modules is developed as a way to enable centralized data acquisition as well as provide an interlinked network for transmission of data in absence of any existing infrastructure. Emphasis is given on how sensing and communication technologies of IOT can effectively be used in smart city monitoring as well as in case of disaster management. The hardware of the module used for this purpose is studied and elaborated in a detailed manner.

T.-Y. Chen, H.-W Wei, et.al [2], have proposed a solution for porting uIP library to the wireless sensor network devices and presents the integration of speaker module and IPv6 ready sensor device. They also proposed a safe building application based on the integrated system to help people escaping from disaster environment. Andrea Zanella, et. al [3], have proposed a project based on Internet of Things (IOT) shall be able to incorporate transparently and seamlessly a large number of different and heterogeneous end systems, while providing open access to selected subsets of data for the development of a plethora of digital services. Building a general architecture for the IOT, this paper focus specifically to an urban IOT system that, while still being quite a broad category, are characterized by their specific application domain. Urban IoT's, in fact, are designed to support the Smart City vision, which aims at exploiting the most advanced communication technologies to support added-value services for the administration of the city and for the citizens.

Aziyati Yusoff et. al [4], have proposed project discusses one of the common disasters that occurred in both urban or rural housing areas and neighborhood i.e. the flood. This article is proposing that the flood management and early warning detection can be resolved with cloud computing facility. Through

the progressive appearance of cloud computing, it is also expected that this facility is complemented with the Green Cloud technology to promote the green environment towards a better living in the smart cities.

Asta Zelenkauskaite et. al [5], have proposed a project main focus is on the area of complex social networks and the dynamic social network construction within the context of IOT. This is by highlighting and addressing the tagging issues of the objects to the real world domain such as in disaster management; these are in relation to their hierarchies and interrelation within the context of social network analysis. Specifically, suggest to investigate and deepen the understanding of the IOT paradigm through the application of social network analysis as a method for interlinking objects – and thus, propose ways in which IOT could be subsequently interlinked and analyzed through social network analysis approach - which provides possibilities for linking of the objects, while extends it into real-world domain. They present few applications and key characteristics of disaster management and the social networking analysis approach, as well as, foreseen benefits of its application in the IOT domain.

Luca Filipponi et.al [6], have proposed system based on the ARTEMIS JU SP3 SOFIA project. It is an Event Driven Architecture that allows the management and cooperation of heterogeneous sensors for monitoring public spaces. The main components of the architecture are implemented in a tested on a subway scenario with the objective to demonstrate that our proposed solution, can enhance the detection of anomalous events and simplify both the operators tasks and the communications to passengers in case of emergency

III EXISTING SYSTEM

The occurrence of disasters cannot be stopped by humans. The only option mankind can choose is to develop authentic prediction mechanisms to limit the damage and to streamline the disaster management operations by adequate planning, using up- to-date developments in the field of information technology. The minimum the human population could aim for is to mitigate the post-disaster effects as far as possible by appropriate estimation of the scale of damage, the area affected, causalities, and immediate and long term relief requirements. However, one of the major obstacles faced by the organizations involved in managing the post-disaster relief operations is the improper resource allocation (Anparasan and Lejeune 2017).

Resources may refer to any kind of equipment, medicines, edible items or even the personnel deployed onsite for carrying out the relief work. As already discussed in Sect. 3, the disaster management scenario in India is still naive and quite complex as compared to the other developed

countries. The uneven resource allocation can directly be attributed to the delay and inconsistency in obtaining the information that can outline the post disaster situation . This research proposes a technical infrastructure that will help the disaster management organizations in gaining a

comprehensive visibility of the post disaster scenario. This can be achieved by integrating information obtained from the multiple sources, such as sensors, satellites. Environmental data obtained from the sensors alone are not enough for planning the disaster management activities.

Appropriate knowledge about the geographical conditions of the disaster site is also significant. This information will be utilized in planning the route of the relief effort, which is another vital activity for the disaster management planning. The integration of RFID technology in the proposed IoT based infrastructure can facilitate better monitoring of the dispatched resources. This information is crucial and is required for and effective management of rescue operations and efficient coordination with the deployed personnel. Real-time communication of this information to the disaster management unit shell help them in dispatching timely response to the disaster site.

IV. PROPOSED SYSTEM

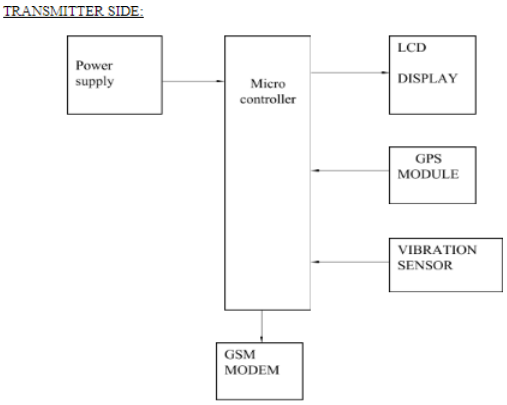
(A).MICRO CONTROLLER

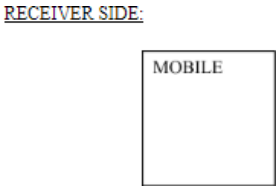
The microcontroller that has been used for this project is from PIC series.PIC Microcontroller is the first RISC based microcontroller created in CMOS(complementary metal oxide semiconductor) that uses separate transport for instruction and data allowing synchronous access of program and data memory.
Technology that is used in pic16F877 is flash technology, so that information is kept even when the power is off. Easy Programming and Erasing are different of PIC 16F877.

(B).VIBRATION SENSOR

The piezo speaker is associated to the input of an op amp operated as a comparator. In task, subtle vibrations cause the piezo element to generate a little voltage. when the voltage exceeds that applied to pin 8 of the amp analog output is created. A peizo electric sensor is utilized as the vibration sensor which has to mounted on the anywhere which you have to secured.

(C).BLOCK DIAGRAM





(D).LCD

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide scope of applications. A 16x2 LCD display is very fundamental module and is very regularly used in various devices and circuits.

Pin Diagram:

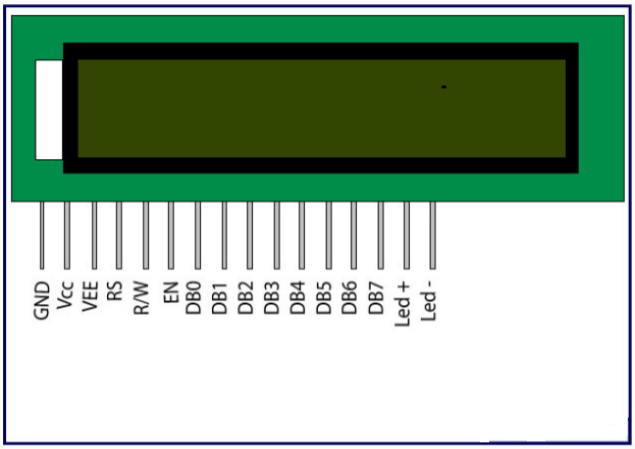


Figure 3 16X2 LCD Display

(E).MAX232

In this circuit the MAX 232 IC used as level logic converter. The MAX232 is a dual driver/receiver that includes a capacitive voltage generator to supply EIA 232 voltage levels from a single 5v supply. Each receiver converts EIA-232 to 5v TTL/CMOS levels.

(F).GPS

The Global Positioning System (GPS) is the only fully functional Global Navigation Satellite System (GNSS). Utilizing a constellation of at least 24 Medium Earth Orbit satellites that transmit precise microwave signals, the system enables a GPS receiver to determine its location, speed, direction, and time

Figure 4 GPS Module

G).GSM

Figure 5 GSM Module

V. CONCLUSION

An IOT based disaster management system has been proposed in this work to endorse the concept of smart cities. The proposed system involves Node MCU and four sensors. The parameters monitoring is done using four sensors. The readings of sensors are successfully uploaded to Thing Speak. Hence, before the occurrence of disaster, alert is sent to rescue team or users via SMS in the group of Telegram app. The proposed work proves to be a breakthrough in disaster management as it can be deployed in the smart cities with less budget requirements. Future work includes improving dynamic adaptation of modules to changing conditions, development of a dedicated protocol for disaster management. These results could be used for the prediction of occurrence of disastrous events.

VI. REFERENCES

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