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E-Id Card for Disaster Management

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Abstract

India is a country with diverse heritage and it is affluent in pilgrim centers. All the pilgrim centers witness millions of pilgrims each year. But India lacks a system that effectively emphasizes on monitoring the pilgrims. Among the various flaws that incapacitate the management, the most significant vulnerability is the system's inability to keep an accurate track record of the total number of pilgrims in a particular area, at a particular time. The situation worsens when the area is disaster struck. This paper presents an innovative technology for effective disaster management. This new approach incorporated using embedded system emanates from the belief that investments in mitigation are much more cost effective than expenditure on rehabilitation and relief. Successful disaster management planning must encompass the complete realm of activities and situations that occur before, during and after disaster. This paper focuses on attaining its objective through an electronic identity card linked to an administrator via radio frequency to achieve this venture.

Keywords: Electronic identity card (E-Id), embedded system, disaster management,   pilgrimage centers, radio frequency (RF).

Introduction

India with its geo climatic conditions being how they are, is prone to natural disasters. Disasters occur with unfailing regularity and despite of better preparedness to meet all conditions in recent years, the economic and social losses are heavy. Among all disasters afflicting the country, river floods are the most frequent and often the most devastating. A recent catastrophe occurred with the most devastating results in the year 2013 in the northern states of India. In June 2013, the North Indian states of Uttarakhand and Himachal Pradesh, some regions of Western Nepal and their adjoining areas experienced heavy rainfall that triggered devastating floods and landslides as of 29 June 2013, more than 3,000 people have died with many more missing. Entire villages and settlements such as Gaurikund, Ram Bada which are pilgrim centers suffered damage and loss of lives.

As of 29 June 2013, the official death toll in Uttarakhand, based on the collected bodies of the victims, had crossed 850. Rescuers at the Hindu pilgrimage town of Haridwar on the river Ganga have been reported to have recovered bodies of 40 victims washed down by the flooded rivers as of June 21 2013. Bodies of people washed away in Uttarakhand were found in distant places like Bijnor, Allahabad and Bulandshahr in Uttar Pradesh.

This situation triggered the need for developing a system that could manage the crowd at pilgrimage areas and support the purpose of effective disaster management at pilgrimage centers. At 'Kedarnath Shrine Board', there was no such identity (Id) card which could keep track of the number of people entered and crossed a particular gate. At the Rishikesh, the local administration could have issued this set of wrist band & Id card. At different places, there could have been the other teams which would have done the acknowledgement of each & every visitor. Because of lack of management, there was a huge gathering at one time at the temple and many lost their lives

Secondly, after this natural disaster, the military or any other government rescue team was not able to get the information of all the visitors & could not plan the rescue operation accordingly.

Thirdly, the doctor's team was not able to be empowered with very important health information of the patient to start the medication immediately, which could have been possible with the help of the card.

Last but not the least, this concept could have been able to diagnose the dead bodies buried under the debris or recovered by any other way, which was not possible in the absence of the card. Many of the people went missing and many of the dead bodies were unrecognizable.
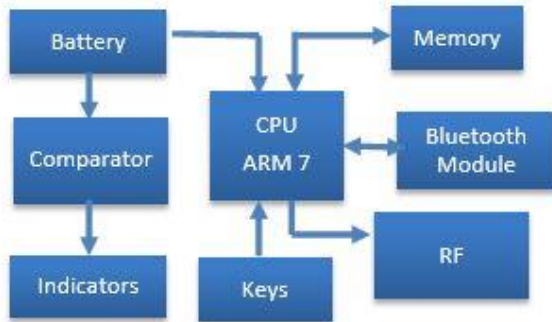
Block Diagrams

Fig. 1.Block diagram of the E-Id (Electronic Identity) card module

In Figure 1 as shown, the ARM7 core CPU will control all the peripherals connected to it. The battery will indicate its capacity to the CPU, also the level of the battery will be compared with a particular threshold level set that is quite above the level at which the battery discharges completely. The indicators will signal the user about this level of the battery. The memory used, serves the purpose of storing all the vital information of the user. This information can be general like name, age, gender etc. or medical like allergies, medications provided etc. The E-id card will communicate via RF (provides large coverage area) with the administrator and with the wrist band via Bluetooth (comparatively lesser area than RF.)
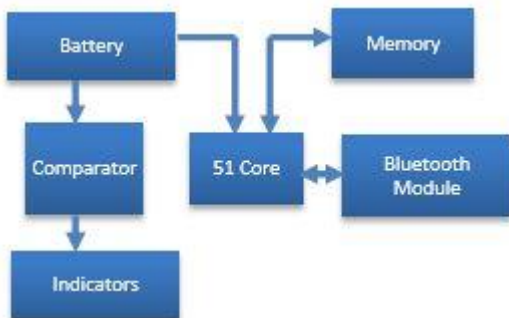

Fig. 2. Block diagram of wrist band module

Figure 2 shows the purpose of the comparator and indicators is the same as that in the E-id card module. The sole purpose of this module is to indicate whether

the E-id card is with the user or not. It communicates with the wrist band via Bluetooth.
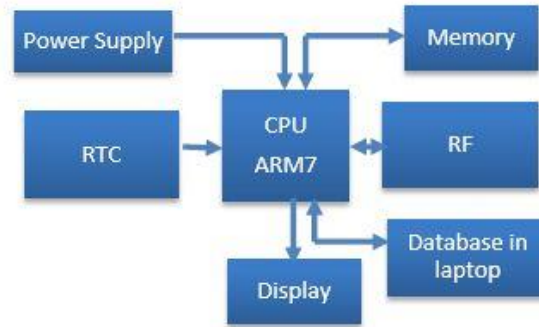

Fig. 3. Block diagram of administrator/ handheld module.

As shown in Figure 3,the entire database of all the users can be stored in the on a single server or laptop (which is portable.) the RTC(Real Time Clock) functions to record the accurate timing of pilgrim(s) entry through the gate where the cards are issued. Data can be displayed with the help of a display.

Materials and Method
Method

The E-Id cards will be fed with all the necessary information like the name, gender, age, medical conditions etc at the issuing centers (entrance of the pilgrimage center), where they will be issued to individual pilgrims. At the same time, wrist bands will be provided, to be fastened on the wrists so that the user doesn't lose track of his card; and if he does, there will be indications on the wrist band signaling the loss of card. This venture is achieved by continuous communication of the card with the wrist band.

The purpose of efficient crowd management can be achieved by allotting check points at regular intervals to address any issues example- tracking the total number of pilgrims passed from (say) check point 1 to check point 2.

If an area is disaster struck, we have the complete information of the total number of people in that particular area, so it is easy to track them. Immediate medical and other help can be deployed to that specific area, which reduces the chaos that might otherwise occur. If dead bodies are retrieved, and the E-id card is not in the vicinity of its particular user, we can gather the information of the deceased through the main database that holds the information of all the users.

But if the card is in the vicinity of the user, the emergency team can retrieve the information by pressing the specialized code allotted for different teams (say) police, paramedics etc.

Materials

The E-Id cards and the wrist bands will be specially designed using the Ingress Protection Rating code to protect them against infiltration of water and dust.

Results

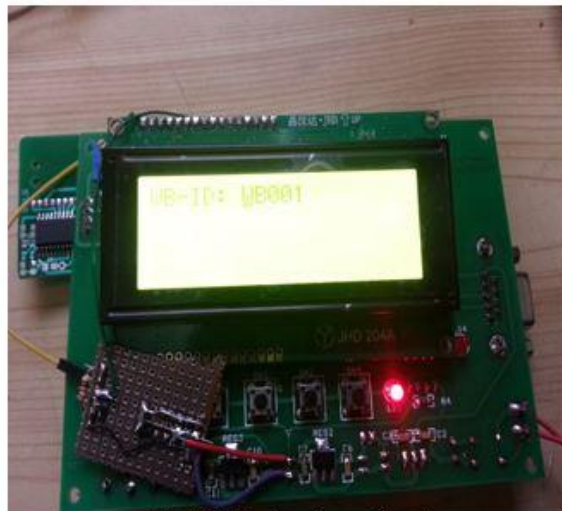**Fig. 4 E-Id card that holds the data of the pilgrim**

Fig. 5 Displaying the card number on administrator module after E-ID card sends it through RF

Conclusion

In this paper we identified challenges and sketched an integrated communication and information system for disaster response, recovery and overall management, by efficient data handling and provision.

Catastrophes and disaster like the recent one which took place in Uttarakhand could be avoided by employing the technological solutions discussed in this paper. The solutions that we have suggested in this paper can also be applied for the management of many other religious events which periodically take place at different places in India. Technology can provide solution to problems associated with lack of information and can prevent many disasters. However technological solutions are most often nullified by ignorance which prevails in almost all religious congregations.

Acknowledgment

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