Emergency Help Alert Mobile Cloud

Mohammad Aazam¹, Aymen Abdullah Alsaffar², Al Amin Hossain³, Md. Motaharul Islam⁴, Pham Phuoc Hung⁵, Mauricio Alejandro Gomez Morales⁶, Huh Eui−Nam⁷
Department of Computer Engineering, Kyung Hee University

Abstract

Emergency situations are unfortunately part of our lives. Today’s smart computing allow us handle such situations and fulfill our requirements more efficiently and effectively. This paper presents architecture to handle various kinds of emergency situations more efficiently by allowing the user (victim or witness) easy and quick way to alert the concerned department(s) with just a single button press. The emergency related information is then uploaded automatically to the mobile cloud, allowing further analysis and improvement in safety of people.

1. Introduction

A situation that poses an immediate risk to health, life, property or environment, is known as emergency situation. Emergency situations are part of our lives. They happen at any moment, any place, to anybody. May it be an accident, a fire breaking out, building being collapsed, murder, robbery or kidnapping, stealing or damaging something; any kind of such situation can arise. With the increasing number of such situations, in today’s age of smart phones, it has become necessary to have a solution for quick and easy way of alerting the right people for help and inform family members in an efficient and easy way. With the advent of cloud computing, mobile cloud computing, and smart phones, it has become very important to use these paradigms for such purpose more effectively [1, 2, 3, 5, and 6].

Currently, the way emergency situations are tackled at the user’s end, is not efficient at all [2, 3]. If any emergency situation occurs, the victim or witness has to first decide the type of emergency and then find out which appropriate departments have to be contacted. For example, in case of an accident, the victim or a witness has to call ambulance, as well as the police. So manually finding out the contact numbers and departments is not efficient. After that, the victim or witness will inform his/her family members, may it be one, two, three or even more. All this is time taking and in case of emergency, very frustrating and can cost life as well. All this traditional process is shown through a flowchart in figure 1.

Fig 1. Traditional processes and actions in emergency tackling

2. Proposed Architecture
The objective is to contact the appropriate emergency tackling department as well as send message to the family members (to alert them to avoid any further
problems or ask for help) upon occurrence of such event and then upload the data on cloud. Proposed architecture is named as Emergency–Help Alert Mobile Cloud (E–HAMC).

Many applications have been developed to tackle emergency situations, but all of them lack some basic functionality that is very vital in critical situations [3, 4]. No application is available through which appropriate emergency tackling department (e.g. fire-brigade) is directly contacted by the application, upon user’s single action or click of a button, instead, the user or victim has to decide which departments have to be contacted and then find out their contact numbers. At the same time, a message is sent to the close family members of the user. In our case, proposed E–HAMC maintains a list of those family members. With this, user does not need to find out which organization to be contacted and search for contact numbers of family members at the time of emergency. User will only click on the type of event: rest of the things will be done by the application. The exact location of that even can be sent through GPS or through base-station’s location, avoiding further hassle. Figure 2 shows the basic interface.

As discussed, the data may be uploaded on the cloud, which helps related departments for better planning and future betterment [7]. All concerned organizations/departments will be able to access all type of incidents’ information over the cloud and analyze it. For example, if some area faces more accidents in night, due to bad light, or sharp turns, then that issue can be tackled in future. Similarly, hospitals and ambulance service providers can see which location is more suitable to have their office, for quick response and have reachability to the place of event, keeping in view the frequency and types of events that occur in a particular area. In case of emergency situation, instead of thinking about whom to contact and how to contact and then inform the family members as well, one by one, the user only has to select the type of event occurred through a simple, user–friendly menu. Upon doing that, the application sends message to the control center of appropriate emergency dealing organization/department, by sending a short message, including the place of that event, which can be taken from the BTS the cell phone is being connected or through GPS. Other than this, the application automatically sends message to the already stored close family members, whose list is maintained by the application. This has another benefit that if the victim is not in a situation to inform his/her family members, then any witness or passerby can do it with a single button–press using E–HAMC, on victim’s mobile phone. After that, the data is to be uploaded on the cloud by the application, so that concerned authorities can gather the data from the cloud, when needed, to analyze which kind of emergency situations have been rising with what frequency, in any particular area and what are the reasons. This will allow preventing and avoiding such situations in future and ensure better public life.

Communication pattern of proposed E–HAMC is shown in figure 3.

Fig. 2. Basic interface of proposed E–HAMC

Fig. 3. Communication pattern of E–HAMC

2. Conclusion and Future Work

This research activity was focused on handling emergency situations more efficiently and minimum amount of effort at the user’s end and also utilizing
mobile cloud computing paradigm for data and facts storage for future care, analysis, and improvements for the purpose of safety and care.

3. Acknowledgement
This research was supported by Next-Generation Information Computing Development Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education, Science and Technology (2012–0006418). The corresponding author is Prof. Eui–Nam Huh.

References


