Proposal of the project titled “Social Networking Application for Disaster Management” (P6 P7)

1 Introduction

Social networking sites are becoming extremely popular by providing a new way in information sharing and knowledge dissemination. Internet social networking tools are gaining more attention as a possible solution in emergency response during disasters. Also, they are being identified as the popular channels for getting prepared for a disaster. This project aims at creating a social networking application which provides a reliable source of information about an individual during emergency. Also, by preparing an emergency plan, an individual is prepared for any contingencies as well as encouraging others in his/her social network to be prepared for a disaster.

1.1 Goals of our project

The main goal of this project is to build an application [cha()] for facebook [fb()] that identifies and connects friends on facebook who are willing to be ‘Lifelines’. Lifeline is a friend who will agree to check on you in an emergency, provide you with shelter in the case you need it and post updates about your well-being on your Facebook wall. Along with that, a personal preparedness plan should be prepared by the user and shared it with his/her lifelines. Preparedness plan is a plan which is planned in advance to be prepared for different kinds of disasters. It should contain questions like: how you will contact one another; how you will get back together; and what you will do in different situations. A preparedness plan helps families and friends to stay connected in case of emergencies.

1.2 Project Audience

The target audience of this particular project are the individuals who socialize on facebook. It is true that the most vulnerable section of the society who are more affected by the disasters are the ones who have not much access to technology. But we are assuming that all people are able to access the facebook. Also, emergency personnel who are involved in the emergency rescue team can get help through this app by getting information.
1.3 Usefulness

The main aim of this application is to help prepare individuals for any kinds of disasters and also inform their friends or well-wishers their plan if disaster strikes. For example, making a preparedness plan will help trace an individual after an emergency disaster. Since social networking is one of the most-effective way to communicate with friends or well-wishers, the information being shared can be reliable and trust-worthy. For example, usually people share correct information to their close acquaintances. Apart from a personal-level usage, it is also helpful for the society in a way to understand the gravity of the disaster and the well-being of individuals. In this application, each individual has a couple of lifelines who will further add few other friends on facebook as lifelines which grow and educate people to be prepared for disasters.

1.4 Challenges

There are wide variety of challenges for this application. The biggest challenge is whether users of facebook feel comfortable sharing their personal details like family details, etc with their lifelines. Secondly, preparedness plan and maintaining lifelines alone is not sufficient during emergency. We must be prudent in integrating all appropriate technologies, for example twitter feeds to know the current affairs, provide minimal access to health records, including the location maps from google. Also as mentioned earlier in the case of low income families, lack of resources, lack of computer skills will hinder them to access these kinds of applications.

2 Related Work

Different types of technologies are being considered for disaster management [asi(), reg()] which include: Remote sensing, Geographical Information (GIS), Global Positioning System (GPS), Satellite navigation system, Amateur and community radio, TV and Radio broadcasting, Telephone/Cellular phones and Short Messaging Service (SMS) [gui()].

Remote sensing technology is a powerful tool in disaster preparedness, monitoring, relief, and mitigation. Many types of disasters, such as floods, droughts, cyclones, and volcanic eruptions, have certain precursors that satellites can detect. This information is helpful in locating the area of disaster and monitor its growing proportions thereby helping to immediately take-up measures to avoid huge destruction and human loss [spa()].

GIS is a computer–based system capable of integrating, storing, editing, analyzing, sharing, and displaying geographically–referenced information. In the disaster preparedness phase, GIS is used as a tool for the planning of evacuation routes, for the design of centers for emergency operations, and for integration of satellite data with other relevant data in the design of disaster warning systems. In the disaster relief phase, GIS is extremely useful, in combination with GPS, in search- and-rescue operations in devastated areas where such operations are
difficult. In the disaster rehabilitation phase, GIS is used to organize the damage information and the post-disaster census information, and in the evaluation of sites for reconstruction [she()]. The Global Positioning System (GPS) serves as a facilitating technology in addressing these needs by helping the users, at any point on or near the earth's surface, to obtain instantaneous three-dimensional coordinates of their location. Global Positioning Systems are very useful in disaster preparedness, reduction, and mitigation efforts. Few major applications of GPS include: Using the precise position information provided by GPS, scientists can study how pressure slowly builds up over time in an attempt to characterize, and in the future perhaps anticipate, earthquakes; helping stranded motorists find assistance or guiding emergency vehicles; Location information provided by GPS, coupled with automation, reduces delay in the dispatch of emergency services.

Satellites are the only wireless communications infrastructure that are not susceptible to damage from disasters, because the main equipment sending and receiving signals is located outside the earth's atmosphere. Solutions using this system can be applied in both advance disaster mitigation services [sat(), spa()] and in supporting relief and recovery efforts under three general categories:

- hand-held mobile satellite communications;
- portable and transportable mobile satellite communications; and
- fixed satellite communications.

Amateur radio has earned its reputation as an instrument best used to communicate during disasters in areas where other means of communication have failed. Amateur radio is a scientific hobby which can be cultivated by individuals of all age groups and professions. In an emergency such as a natural disaster, two main activities by amateur radio operators can prevent loss of life. The first is to warn people about a possible emergency, enabling them to take appropriate preventive measures for saving lives. And the other is to pass messages, images, and other information to aid agencies to help the survivors and injured as soon as possible in an emergency situation. In the similar way, Community radio stations are usually set up "by the community, for the community". Most community radio stations broadcast on the FM (VHF) waveband, and their coverage varies, depending upon the equipment in use.

Television and radio broadcasting are among the most important traditional electronic media used for disaster warning. The effectiveness of these two media is high because, even in developing countries and rural environments where the tele-density is relatively low, they can be used to quickly send out a warning to a sizeable population. The only possible drawback of these two media is that their effectiveness is significantly reduced at night, when they are normally switched off.

Telephones play an important role in warning communities about an impending disaster. In some countries, mechanisms called telephone trees are used to warn communities of impending danger: an individual represents a "node"
in a telephone tree; when that individual receives a warning message (either by phone or other means), s/he is supposed to make a pre-determined number of phone calls (usually four or five) to others in a pre-prepared list. This arrangement not only ensures the timely delivery of the warning message, but also ensures a minimum duplication of efforts. However, the use of telephones for disaster warning has two drawbacks: telephone penetration in many areas is still unsatisfactory – particularly in rural and coastal areas most at risk; The other drawback is the congestion of phone lines that usually occurs immediately before and during a disaster, hindering the users from contacting the disaster management authorities during the emergency situation. With the rapid advancements of today’s wireless technologies, using cell phones a public warning message in text can be sent to the screens of all mobile devices with such capability in any group of cells of any size, ranging from a single cell (about 8 km across) to the whole country, if necessary. The only possible disadvantage of cell broadcasting is that not every user may be able to read a text message when they receive it.

Short Message Service (SMS) is available on most digital mobile phones that permit the sending of short messages (also known as ‘text messages’, ‘SMSes’, ‘texts’, or ‘txts’) between mobile phones, other hand-held devices, and even landline telephones. SMS works on a different band and can be sent or received even when phone lines are congested. SMS also has another advantage over voice calls in that one message can be sent to a group simultaneously.

There are many apps in disaster management like Boffins’ real-time smartphone disaster management app, University of Maryland’s Save Lives Mobile phone application [ofm()], Sahana [sah()], etc. Apps like Sahana FOSS Disaster Management System, provides a set of modular, web-based disaster management applications. In [Palen and Liu(2007)], Palen et al identifies the importance of human participation in disaster management. There is a huge chance to improve the disaster management techniques [imp()]. Most works in the literature focuses on mass-level human interaction, where credibility of information could be of issue. Also, these provides a overall emergency preparedness plan which may or may not be tailored to the individual’s needs and preferences. Our app is more tuned towards an individual needs at a more personalized level.

3 System Overview

EmergencyApp is a facebook application [dev()], which typically requires users to provide authorizations to access some of the private information like, information about their friends. This is typically done by providing “Allow” button as soon as the user chooses EmergencyApp. Once the authorization is received, user is redirected to EmergencyApps home page, where users are presented with the list of their friends to be chosen as lifelines in the case of emergency. Users are encouraged to send mails to three of their close friends who would be willing to be their lifelines during emergency. Once user chooses their lifeline an invitation will be send to their proposed lifelines to get their confirmation. Once the lifeline prospect accepts their invitation, their facebook id is stored in
EmergencyApps database.

In the case, disaster strikes, twitter feeds related to the location of the facebook user are identified and facebook automatically initiates EmergencyApp to send a notification to the users lifeline to check on the user, to provide any help needed.

4 Procedure (Methodology)

4.1 Tasks

Our methodology (languages, approach using) in building this app:

1. Connecting to facebook: To build an app, we should first have a facebook account. After signing up, we should register our app on developers.facebook.com which provides us with an app id and app secret key. Also, we should be able to provide further details like our domain address, canvas settings, etc for a feasible fit in the facebook framework.

2. Maintaining a preparedness plan: Facebook provides us SDK to access the objects of facebook. We are using PHP to get the plan from the users and using mySql at the backend to store this data.

3. Inviting friends: Using the PHP SDK, we are inviting friends and accessing their information. FBML is the language which we are using to perform this operation.

4. Providing relevant info about disasters using other sources: Also, we are providing relevant information from twitter about place A on the webpage of person X who is acting as a lifeline to person Y from place A.

5 Evaluation

We are planning to test this app by sharing this with 5-10 friends who can give us a valuable feedback.

6 Future Work

While developing this app, we came across few issues which can be extended as future work. They are:

- Developing a recommender system which automatically recommends few friends as potential lifelines based on spatiality, interactions, etc.

- Integrating this app with a government agency which can access health records or any other sensitive information which can be very helpful to detect a person’s medical history in case of emergency.
• Adding important automatically locating the position using GPS and some other features like this.

References


[ofm()] http://bbc.co.uk/news/magazine-15160589/.


[sah()] http://sahanafoundation.org/.


[she()] Gis application in disaster management in bangladesh. http://sheltercentre.org/sites/default/files/HH_GISApplicationInDisasterManagementInBangladesh.pdf.
