AN APPLICATION FOR DISASTER MANAGEMENT

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Abstract— The system we proposed is the service oriented system and it is the client server application. At the time of disasters the information should be transmitted in a timely and accurate manner. It will help the people at risk and who are in complicated environment. The system is the service oriented system which provides the real time information about the clients and their surroundings. There is admin who uses user's GPS location and accordingly he can respond to the user's queries if they are stuck in the disaster and the admin can provide the user with escape route. So that user can escape to the safe place from disaster site. The system broadcasts the messages through our application where user gets notified and receives some emergency support from admin.

Keywords-Service oriented system, GPS, rescuers, Admin, Sufferers, Interaction between clients and admin.

I. INTRODUCTION

Mobile government, it is an emergency field where mobile technologies are used in several government institutes to provide services to public through cellular mobile telephones, laptop computers, personal digital assistants (PDA's) and wireless internet infrastructure. Even though natural disasters have an impact on human population, technological disasters or manmade disasters and there outcome are vital as the natural disasters. Thus managing those disasters are difficult. The use of information and communication technology can increase the efficiency of disaster management. Our application is developed for providing emergency support for the sufferers of the disasters. We proposed the system where we are providing the users with certain instructions that can help them during disasters. The users can also post their queries or the help needed for them during disaster and there is an admin who can provide rescue route to the sufferers from the disaster. We make use of the Travelling Salesman Algorithm for determining the shortest route to rescue the sufferers which help them to escape from the devastative situation. We are using Mobile Computing and Cloud Computing to process and store the required information. The proposed system is the service oriented system and it is a client server application. The messages or responses sent by the admin would be broadcasted to all the users.

II. LITERATURE SURVEY

Some methods like graph theoretical model can be used for service oriented networks and quantify the resilience of such networks over node and edge failures. The metrics are based on network of topological structure and how the services are distributed over the network. The algorithms used will basically rely on computing less cuts in graph. Efficient algorithm for allocating optimum services so that the service oriented network can overcome failures of edges or nodes is used [3].

Use of genetic algorithm was applied for optimization for finding the optimum route for the rescuers. The process of disaster management includes several parts: mitigation, preparedness, response and recovery. Each phase is used for reducing the disaster losses. Therefore it helps to overcome the disaster. The mitigation phase is used to decrease the disaster risks. Preparedness phase is the plan to overcome the disaster. Response phase is the mobilization of services and relief when disaster strikes. Recovery phase is the recovery of the disaster state [6].

The related work basically focuses on the application of communication technology in which we can notify others about the danger and the disaster whether it is going to occur or not. Through AppLERT and Facebook public can avoid that place and can take diversion. This can be done through crowd sourcing. The messages can be sent to all the users so that they can be safe and secure. The location of the users can be trapped so that some safety measures can be taken to overcome disaster and loss of life. Therefore the risk can be managed [10].

The disaster management is the technique of dealing with and avoiding both natural and manmade disasters. It basically deals with how we can avoid the disasters and its preparedness, response and recovery so that we can lessen the disaster risk. The types of disasters are many natural disasters, environmental emergencies, complex emergencies, pandemic emergencies and manmade disasters. This deals with what are the risks and how we can overcome it [11].

III. EXISTING SYSTEM

The existing system is a normal web application where the information about the disaster would be broadcasted. There would not be any interaction between the people who are stuck in disaster region. It will not help the public at emergency. The information about the disaster happened and after disaster phases would be updated. It does not provide any emergency support for the users. Therefore there is no real time information exchange. It does not support users to come out of disastrous site.

IV. PROPOSED SYSTEM

We propose a system that consists of two independent systems. Firstly it consists of a web application which provides information and other materials and can be accessed through the PC browsers and mobile browsers of the clients. After registering the client users can upload and maintain their personal information and receive customized information.

A. Travelling Salesman Problem

To decide the most optimum route along different geographical locations Travelling Salesman algorithm is used, where the geographical locations represent the cities and the rescuers represent the travelling salesman.
TSP asks the following question:
"*Given a list of cities and distances between each pair of cities, what is the shortest possible route that visits each city exactly once and returns to the origin city*".

V. SYSTEM IMPLEMENTATION

Fig.1 shows the home screen of our proposed application. This application is based on the Android Operating System. The application of the proposed system contains the useful features such as User side application discussed in Section A and Admin side application explained in Section B.

A. User Side Application

Firstly the user have to register into the application by providing his personal information such as name, email id, home address etc so that the user receives personalized information from the admin. After registering the user is provided with two options:

- *Post Query*: Here the user can send queries to the admin regarding his current situation and he can ask for help if needed. The user can also query his current location if he is lost. After clicking the post query button it navigates to a screen where the user and the admin can send text messages to each other by which the user can escape through hard situations or dangerous situation.

Fig 1   Fig 2

In the Fig 1 and Fig 2 we can see the user login , user register and admin login. The user should register first only then he can interact with the admin. The public who are not in the disaster site also can be the rescuers. Since the messages would be broadcasted.

- *View disaster details*: By clicking on the view disaster status button the user can view various disaster details. As it navigates to a screen where various details such as: Disaster type, precautions to be taken, place and the range of the disaster can be viewed by the user.
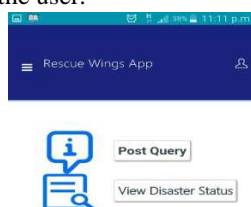
Fig 3

Here in Fig 3 the user can post the query and he can view the disaster details.

B. Admin side application

At first the admin has to be login into the application by using his email id and password. The admin does not have to be verified. The admin side contains following sub-modules.

- *View user query:* Here the admin can check the queries provided by the user. The admin can also post the solutions to the users if any.
- *Post disaster details*: Here the admin can post the details of the occurred disaster and can also provide details and solutions to the users which are very useful during a disaster to escape from the current dangerous area. The details includes Disaster type, Precautions, Escape route, place and disaster range.

The admin checks for the user's location on the earth's surface. By getting the longitude and latitude information about the user the admin provides a safety route and provides an emergency support. Hence he uses the location of the user and according to the geographical location of the user, the admin will respond.

VI.   CONCLUSION

The proposed system will help the sufferers at the disaster site to come out of that location. The sufferer's location can be tracked by the admin and the admin will be in contact with the clients. The admin will make sure if the sufferers are in safe place. The messages exchanged would be broadcasted so that the public who are in the same location can be rescued at a time. Therefore the application is very useful to the public at the time of risk. It provides real time emergency support.

VII.   FUTURE ENHANCEMENT

In future we can use 3D geographic information which gives a clear picture of disaster occurred which is obtained from GIS and the images from the satellite.

A Geographic Information System (GIS) is a computer system for capturing, storing, checking, and displaying data related to positions on Earth's surface. This enables people to more easily see, analyze, and understand the situation on the earth surface. Therefore we can use GIS to predict the disaster and

help the users to be aware of it by sending notifications to all the registered users.

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