Disaster Management Using Android Based on Google Map

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Abstract : Natural Disasters have threatened mankind since history started. Due to geographic location and environment change, there are many vulnerable countries to natural disasters. The countries also lack effective disaster preparedness system to confront natural disasters. In addition, a tourist may face difficulties in finding safe area or shelter place prior to the occurrence of natural disasters. For this reason, we have proposed a disaster management system and evacuation system for people using Google Map (GM). The system is implemented on android mobile phone because of the burgeoning growth of smart phones in world. Android device with our application installed on it and user. User can register the multiple receiver or family member or friends to send SMS at a time to send notification for help. By sending the current position obtained by GPS and including shortest path of shelter or safe zone on the map of the application.

Index Terms - **Natural Disaster, Google Map, Disaster Warning, Android**

I. INTRODUCTION

Natural Disasters have threatened mankind since history started. Due to geographic location and environment change, there are many vulnerable countries to natural disasters. The countries also lack effective disaster preparedness system to confront natural disasters. In addition, a tourist may face difficulties in finding safe area or shelter place prior to the occurrence of natural disasters. For this reason, we have proposed a disaster management system and evacuation system for people using Google Map (GM). The system is implemented on android mobile phone because of the burgeoning growth of smart phones in world. Android device with our application installed on it and user. User can register the multiple receiver or family member or friends to send SMS at a time to send notification for help. By sending the current position obtained by GPS and including shortest path of shelter or safe zone on the map of the application. Natural Disaster is the consequence of natural hazards such as cyclone, storm, earthquake, tsunami, flood etc. Since in world there are most of the natural disaster-prone country, so prevention is necessary for shielding lives and properties. Sometimes people may be unaware about the upcoming natural hazards. Lack of awareness of people causes the major damage during disaster. So, sufficient prior disaster warning and effective evacuation system can save Note worthy number of lives in the country prone to frequent disasters. A new comer or a visitor in a particular area may face the problem in finding safe area from his current stay during disaster. Hence, we have projected a location based disaster system on mobile phones using Google Map which is mainly utilized to messages on the map. Google Map (GM) is rapidly growing open sources map of the world because of the availability of map information across the world and the advent of low-cost convenient GPS devices, So the popularity to using Google Map. The demand of location based services is also increasing day by day with the burgeoning growth of smart phones. Our location based system is also an android platform based smart phone application to render location based services showing the warning of upcoming disasters (tsunami, cyclone, and flood etc.) if the user is in the possible disaster affected area or near to that area and demonstrating nearest safe zone or shelters on the map of the application. Our proposed system is developed for the normal people. The usability of Google Map (GM) is ensured for all users as it is free. Users of our application will send text message along the direction on the map to one or more family member which number user register in that application.

(a)Working of GPS (Global Positioning System):
The Global Positioning System (GPS) is a network of about 30 satellites orbiting the Earth at an altitude of 20,000 km. The system was originally developed by the US government for military navigation but now anyone with a GPS device, be a mobile phone or handheld GPS unit, can receive the radio signals that the satellites broadcast.
Wherever you are on the planet, at least four GPS satellites are 'visible' at any time. Each one transmits information about its position and the current time at regular intervals. These signals, travelling at the speed of light, are intercepted by your GPS receiver, which calculates how far away each satellite is based on how long it took for the messages to arrive. Once it has information on how far away at least three satellites are, your GPS receiver can pinpoint your location using a process called trilateration.

(b)Trilateration: Imagine you are standing somewhere on Earth with three satellites in the sky above you. If you know how far away you are from satellite A, then you know you must be located somewhere on the red circle. If you do the same for satellites B and C, you can work out your location by seeing where the three circles intersect. This is just what your GPS receiver does, although it uses overlapping spheres rather than circles .The more satellites there are above the horizon the more accurately your GPS unit can determine where you are.

*(c) GPS and Relativity***:** GPS satellites have atomic clocks on board to keep accurate time. General and Special Relativity however predict that differences will appear between these clocks and an identical clock on Earth. General Relativity predicts that time will

appear to run slower under stronger gravitational pull – the clocks on board the satellites will therefore seem to run faster than a clock on Earth. Furthermore, Special Relativity predicts that because the satellites' clocks are moving relative to a clock on Earth, they will appear to run slower. A Taxonomy of Indoor and Outdoor Positioning Techniques for Mobile Location Services Wireless positioning determination has received increased attention during the past few years. Several wireless applications have been envisaged when mobile terminal location can be determined with sufficient accuracy at any time. In this paper, we attempt to identify the various indoor and outdoor positioning techniques that can be used for the provision of mobile and wireless applications and services. In order to maximize the benefits of this research in the area of positioning technologies, we propose a novel taxonomy with detailed analysis and evaluation of these techniques based on the accuracy that is needed for various mobile location-based services

II. LITERATURE SURVEY

The system is implemented on android mobile phone because of the burgeoning growth of smart phones in world. Android device with our application installed on it and use. User can register the multiple receiver or family member or friends to send SMS at a time to send notification for help. By sending the current position obtained by GPS and including shortest path of shelter or safe zone on the map of the application is discussed in [1]. Natural Disaster is the consequence of natural hazards such as cyclone, storm, earthquake, tsunami, flood etc. Since in world there are most of the natural disaster-prone country, so prevention is necessary for shielding lives and properties [2]. Sometimes people may be unaware about the upcoming natural hazards. Lack of awareness of people causes the major damage during disaster. So, sufficient prior disaster warning and effective evacuation system can save Note worthy number of lives in the country prone to frequent disasters. A new comer or a visitor in a particular area may face [3], the problem in finding safe area from his current stay during disaster. Hence, we have projected a location based disaster system on mobile phones using [4], Google Map which is mainly utilized to messages on the map. GoogleMap (GM) is a rapidly growing open source map of the world because of the availability of map information across the world and the advent of low-cost convenient GPS devices. So, the popularity to using Google map. The [5], demand of location based services is also increasing day by day with the burgeoning growth of smart phones. Our location based system is also an android platform based smart phone [6], application to render location based services showing the warning of upcoming disasters (tsunami, cyclone, and flood etc.) if the user is in the possible disaster affected area or near to that area and demonstrating nearest safe zone or shelters on the map of the application. Our proposed system is developed for the normal people. The usability of google Map (GM) is ensured for all users as it is free. Users of our application will send text message along the direction on the map to one or more family member which number user register in that application.The disaster management consists of four fundamental steps such AS mitigation, preparedness, response, and recovery. Among these steps, the emphasis of our work is the preparedness which is the development of a system for the action plan of disasters. However, our disaster preparedness system protects the people of this country from these disasters and uses Google Map (GM) because the development of GM is very rapid. It is dedicated to encouraging the growth, development and distribution of free geospatial data and to providing geospatial data for anyone to use and share. We analyze 330,000 hours of continuous behavioral data logged by the mobile phones of 94 subjects, and compare these observations with self report relational data. The information from these two data sources is overlapping but distinct, and the accuracy of self-report data is considerably affected by such factors as the recently and salience of particular interactions. We present a new method for precise measurements of large scale human behavior based on contextualized proximity and communication data alone, and identify characteristic behavioral signatures of relationships that allowed us to accurately predict 95% of the reciprocated friendships in the study. Using these behavioral signatures we can predict, in turn, individual-level outcomes such as job satisfaction.

III. PROPOSED METHOD

Determining the most optimum route along different geographical locations is similar to the travelling salesman problem wherein geographic locations represent city coordinates and the rescuers or volunteers represent the travelling salesman.
The travelling salesman problem is formally described as a permutation problem with the objective of finding the path of the shortest length (or the minimum cost) on an undirected graph that represents cities or nodes to be visited. The travelling salesman starts at one node, visits all other nodes successively only one time each, and finally returns to the starting node. Given n cities, named {c1, c2, … cn}, and permutations {σ1, σ2, … σn!}, the objective is to choose σ such that the sum of all Euclidean distances between each node and its successor is minimized. The successor of the last node in the permutation is the first one. The Euclidean distance d, between any two cities with coordinates (x1, y1) and (x2, y2) is calculated by:

$$d = \sqrt{|x1 - y1|^2 + |x2 - y2|^2}$$

The problem with the travelling salesman problem is the rapid increase on the number of possible routes when the number of cities increases. Using the travelling salesman problem as basis and using genetic algorithms to generate a solution, an Android-based disaster management system named MyDisasterDroid(MDD) was implemented. Our proposed location based disaster preparedness system consists of a GPS supported android mobile phones with our proposed application installed on it and users

having national id. The user of our proposed android applicationcan also register the number of family members, relative, friends to send message for help. Using this current position The user of our proposed application message .Our application gets the current position through GPS or network provider from the user mobile phone send the latitude and longitude of user's current position.

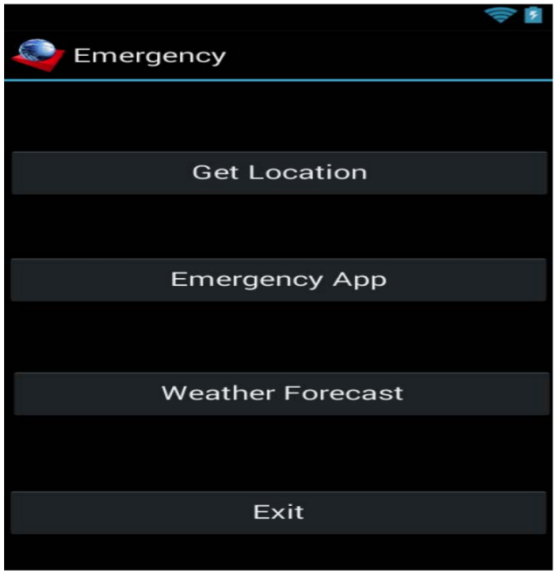

Fig. 1.Emergency selection

IV. RESULTS AND DISCUSSIONS

When the user in a disaster zone, It will send a message notification along with path to the member who can help. In this message user send text message and path to reach for help. The path contain the distance from helper to the user. The distance can be given with the help of Google Map to show the distance by walk, by railway or by bus.

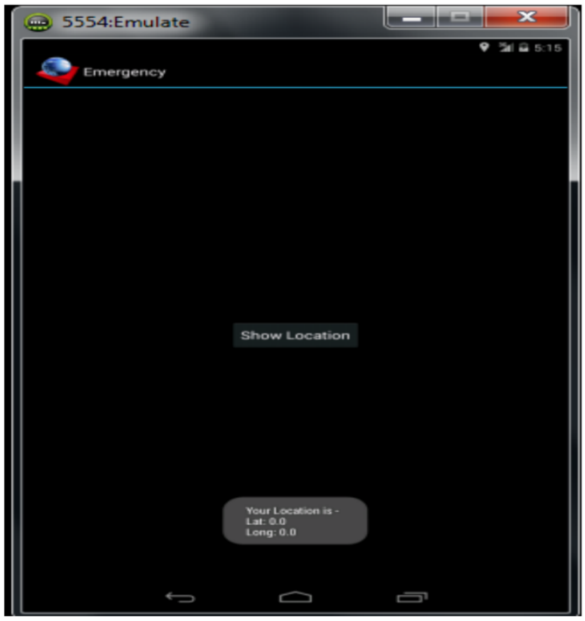

Fig. 2.Showing location

When the user in a disaster zone, it will send a text message

Fig.3.Sending text message

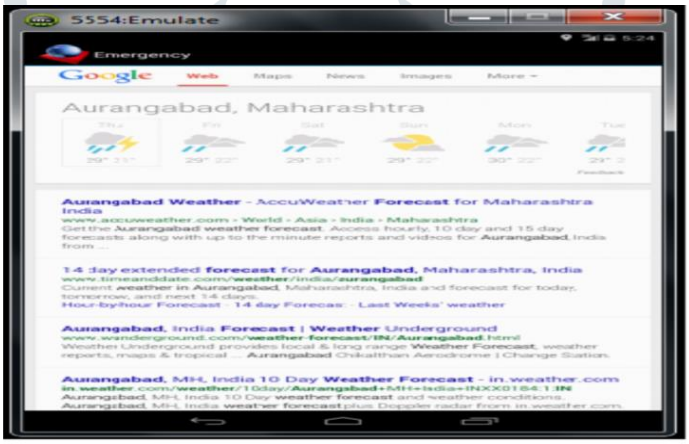

Fig.4.Weather forecasting

Weather forecast detection also there in this application.The application uses GPS to detect the phone's current position and sends this data through the text messages tothe member which user already insert in to the application for help. The mobile phone should have GPS supported location identification facility. The application provides disaster warning in Manual Notification. The application also has a button which send messages to the member from which user can get help.

V. CONCLUSIONS

Our disaster management system is an android mobile application employing Google Map (GM), Our application provides evacuation help on the map of the application to user if the device user is in probable disaster affected area considering the user's current location. This paper helps people to go to the safe area or shelter place prior to the disaster. Our application also facilitates the work of authority to track his evacuation progress ceaselessly so that they can take immediate steps if needed. Moreover, we have a future plan to implement another application to assist in rescue and relief operation after the disaster and a better server side application to totally automate the system of detecting disaster prone area.

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