

# FHA-Flood Help and Awareness

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**Abstract:** Serious disasters have been annually occurring in Japan. For example, in the Great East Japan Earthquake that occurred on March 11, 2011, communication infrastructure was seriously damaged over a wide area. From such a situation, more resilient network infrastructure that does not stop under challenged communication environment is required. In this paper, we propose a Disaster Information System that can flexibly deal with failures of the server group and respond to rapid load change. We construct the disaster information system based on the cloud computing technology. In addition, we develop a dynamic allocation of server resources in accordance with the load change on the system so that it makes possible to take full advantage of the resources in the disaster areas. A significant role of good user interface design is to enhance user experience. Keywords and icons are heavily used in mobile applications because of the limited screen size and small keypad interface. In creating a mobile based crowd sourcing application to motivate citizens to report disaster events and experiences, use of keywords and icons should be intuitive, have high recall and make reporting accurate. This paper discusses the user validation results of user interface design through user experience measured by intuitiveness, recall, and accuracy. Also, by introducing a mobile cloud and DTN protocol, our system can realize rapidly sharing disaster information even though the communication breakdown area occurred.

**Keywords:** Disaster Information System, Load Change, Disaster Information.

## I. INTRODUCTION

There are many disasters in Japan, such as earth quake, tsunami, typhoon due to its inherit geological condition. In particular, the Great East Japan Earth quake brought huge damages on March 11, 2011. Many Information network infrastructures were destroyed and their traffics were seriously congested. In order to respond to the anticipated large scale disasters, Nankai Trough Quake and Tokai earth quake, Web based disaster prevention systems which can perform disaster information collecting and sharing, resident safety confirmation, decision making to disaster counter are developed. On the other hand, in recent, cloud computing is getting popular for various business fields because of its easy and efficient introduction and elastic expandability. Using cloud computing services, a series of preliminary works including design and maintenance of hardware and software are carried out at a data center. Since the users do not need to newly introduce servers physically for business, the maintenance cost can be largely reduced. Furthermore, by introducing virtual technology, user can construct and run his own private cloud computing system.

Thus, there are many merits to use the cloud computer as Web service. The context of the study revolves in the design and development of a mobile - web crowd sourcing application to enhance citizens to regularly report disaster events in their respective localities. Reports on the ground are sent to a cloud based server where services are created such that cleaning, mining and visualization of data are made possible. On the other hand, so far we have investigated the research of a distributed disaster information sharing system by considering mobile

environment on disaster situation. In this system, network states are monitored at back ground. If network access to Internet is hard, then the disaster information is locally stored on the mobile relay station. After moving to the location where the Internet connection can be established, the stored disaster information can be transmitted to the objective disaster information server. However, this system does not consider the case where the server load change rapidly and the network and server failure.

When the disaster information server is operated during just after the disaster occurrence, the system failure and traffic load concentration have to be considered. In this research, we introduce a mobile cloud computing disaster information system for large scale disasters to be able to keep continuous operation even the network environment is unstable or challenged. The computing resources can be also dynamically provided to different user groups such as local governments as required to maximize the physical resource utilization. Furthermore, this system cannot not only provide information transmission by introducing DTN protocol function on the network but more quick disaster information collection and sharing service by introducing mobile cloud disaster information server can be realized in the areas where the communication networks are unstable or even disconnected.

## II. EXISTING SYSTEM

The system of previous research was developed to respond to the case where large delay and frequent link

disconnection happen as the network environment. In this system, the data can transmit if the disaster server can connect to the network by monitoring the network state. The disaster information can be also smoothly shared with multiple servers of different organization such as different local governments. This system cannot consider the case where rapid network and system traffic change and failure. When the servers of the local government are failed by external factor such as tsunami, those systems cannot be served. In the other previous system, disaster information can be visually shown on the display by combining with GIS system or namely digital map. The user can easily understand what kind of the disaster information is registered in the system by properly using various icons and figures related to disaster properly. Furthermore, by operating 'seek bar' on the window, the registered disaster information can be displayed in temporal order as replay operations on video window.

officials, NGOs who would like to involve in the disaster management.

As soon as, help seeker posts a help message, all other users will get a notification through the newsfeed while posting a help user needs to provide his contact number, name, message type of disaster through GPS the location will be posted. While posting, the user can click the surrounding picture, or can capture audio. Once the user posts all the details will be saved in the cloud server along with the time of post.

### III. PROPOSED SYSTEM DESIGN

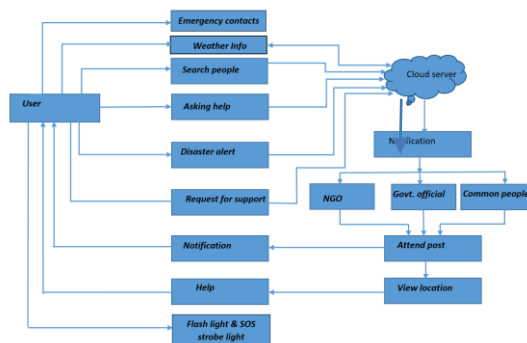


Fig1: System Architecture

#### System Features

- Content various guidelines and instructions to deal with flood and prepare pre-evacuate plans.
- Preloaded content means you have instant access to all safety information at any time, even without reception or an Internet connection.
- Sending messages through social media asking for help and let friends/family know you're safe with customizable "I'm Safe" notification.
- Send current location when asking for help.
- Preloaded with emergency contacts like hospitals, NGO's, blood bank etc.
- Able to add emergency contacts manually.
- User can ask for help using various messages like pictures, audio, various details.
- Various NGOs, various organizations can participate in disaster management whenever the notifications are received.
- SOS buttons with blinking flash light.

#### a. Asking Help

People who are suffering in the disaster area, can use theFHA app through which they can ask for help. The users of the app are common people, any government

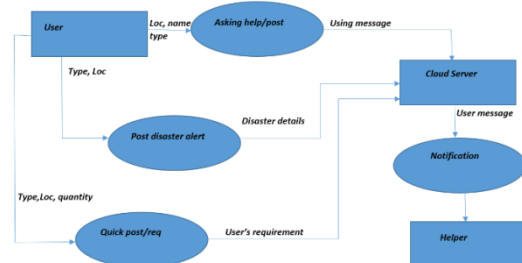


Fig 2: Data flow of help seeker

#### b. Get Involved

All the posts that has been posted by the help seekers will be visible in the Home page of our app. This post will be visible to everyone. Users who are interested to help the help seekers can view the post and check the location in Google Maps. Once the user attends the post the status of the post turns attended and notification sign turns yellow from red. As soon as the user attends the post, the server will calculate the estimated time to reach the place based on the type of disaster, and the post will be updated with the person's name and estimated time to reach. A push notification will be sent to the help seeker with the attendee's name and contact number.

#### c. Quick Post – Alert

Any user can send a quick alert regarding the disaster by clicking on the relevant icon. If GPS is enabled, the location of the disaster will be automatically detected. Otherwise, the user can enter the location manually. The quick post will also be visible to everyone in the news feed.

#### d. Quick Post – Request

Any user can send a quick request for basic exigencies such as food, shelter, transport etc. by clicking on the relevant icon. If GPS is enabled, the location of the disaster will be automatically detected. Otherwise, the user can enter the location manually. The quick post will also be visible to everyone in the news feed.

#### e. Search And Response

When a person is searching for his family, friends, relatives or any acquaintances during the disaster, he can post a request for search and rescue which includes the person's name, location and emergency contact number along with a message and a photo of the victim if possible. When anyone gets any information regarding the search post, they can reply back to the seekers and send the information.

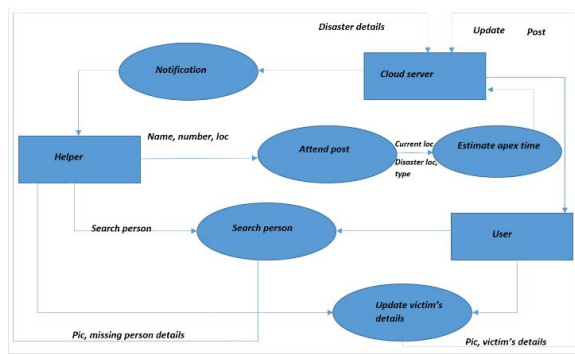


Fig 3: Data flow of helper

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**f. Information Module**

The users can look for emergency contacts, disaster specific first aid and information regarding the preparedness for the disaster.

**IV. ADVANTAGES**

- Preloaded with various guidelines
- SOS message by blinking flash light
- Ask help using messaging system
- Determine victims locations
- Helps the victims by participating in disaster management

**V. DISADVANTAGES**

- Without internet messages cannot be shared

**VI. CONCLUSION**

The FHA is an app that runs on android device with rich preloaded contents sufficient to make people aware of various ways to deal with flood. It provides a platform for people which will enable them to share messages related to various natural disaster. It also provides a way to help the needy people during the disaster event.

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