Proposal for Safety Confirmation System That Launches Bulletin Board Automatically

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I. Introduction

There are many cases where large-scale damage occurs owing to the occurrence of disaster. At the time of the Great East Japan Earthquake in 2011, there was huge damage occurring over a wide area, not only in the Tohoku (North-East) Region with the epicenter, but the damage also extended to the Kanto Region. This earthquake disaster caused extensive damage also to information/telecommunication infrastructure, which is the important lifeline for people's daily life. Information/communication equipment became unable to use due to the line disruption, blackout, etc. [1]. Thus, in order to be prepared for such a situation, it is considered to be quite important to perform safety confirmation at the time of natural disaster [2].

We have been pursuing our study based on the thought that we will be able to realize a useful safety confirmation system by utilizing TLIFES. As GPS is activated only when the user has moved, the power consumption of smartphone are small enough. In the safety confirmation system using TLIFES, the most recent location information about the entire family members can be shared instantly, by using the location information of users stored in the TLIFES server. You can choose whether to make the location information open or not, for the sake of privacy protection. From the aspect of operation, too, the necessity of special operation can be kept to a minimum, in coordination with the usually used chat application.

In this paper, we added a function to launch the bulletin board automatically to the safety confirmation system utilizing TLIFES. If any of your family members happen to be near the disaster area for some reason such as travelling and are consequently involved in the disaster, there is a possibility that no one launches a bulletin board.

II. Safety Confirmation System utilizing TLIFES

We describe in this Chapter a method to Safety Confirmation System utilizing TLIFES.

A. What is TLIFES ?

TLIFES is an integrated life support system where users mutually share information, by utilizing the communication and sensor functions of smartphones. GPS or accelerometer is used to obtain sensor information. In addition, users themselves can utilize the system as their life log to look back their private life or for their own health management, by browsing their own sensor information.

B. Safety Confirmation System utilizing TLIFES

As the Safety Confirmation System utilizing TLIFES makes use of the information from the TLIFES Server, the system is excellent in its immediacy. Privacy is taken into consideration because each user can reject disclosure of the information about the user including location information which the user does not want to be known by others. Meanwhile, the necessity of special operation is kept to a minimum, as the linkage with the chat application regularly used by the user is possible. Thus, the operability of the system is also excellent.

III. Automatic Launching of the Bulletin Board

We describe in this Chapter a method to launch the bulletin board "automatically" by using the data released by the Meteorological Agency.

A. Determination of the Area to Launch the Bulletin Board

In Fig. 1, we indicate the way of determining the area where the bulletin board is to be launched. People who use the bulletin board are the family members registered with the system that includes a person or persons who has/have the possibility of being affected by a disaster. Therefore, the area where the bulletin board is to be automatically launched is limited to the area in the vicinity of the disaster occurring area. The data used to make the marking of "x" and "△" are taken from the data found in the Disaster Information XML File distributed by the Meteorological Agency.

B. Method of Obtaining the Disaster Information XML File of the Meteorological Agency

Atom and XML message are provided by the Publisher, namely the Meteorological Agency. Fig. 2 shows the processing (flow) to the point where we obtain the Disaster Information XML File from the Meteorological Agency. The processing flow for acquiring the XML file is shown below.

1) When an event has occurred, the Meteorological Agency sends renewed information from Atom to Alert Hub.

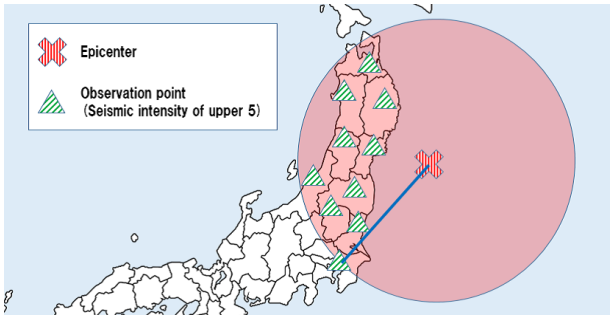

Fig. 1. Determination Method of the Area where the Bulletin Board is to be Launched

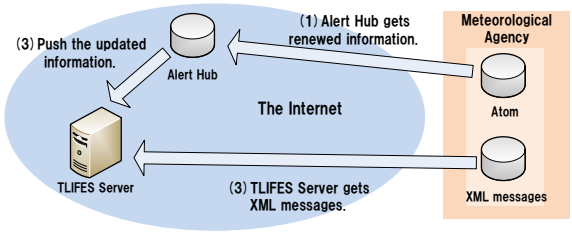

Fig. 2. Flow of the Acquisition of the XML File from the Meteorological Agency

2) Alert Hub sends the feed for the obtained renewed information to Subscriber (TLIFES Server). Then, Subscriber makes a judgment as to whether the relevant renewed information is necessary or not, based on the feed.
3) If and when Subscriber has judged that the update information is necessary, Subscriber gets access to the Meteorological Agency and obtains necessary information.

C. Launching of the Bulletin Board

When a disaster occurred, renewed information is sent from the Meteorological Agency to Alert Hub. Alert Hub, upon receipt of the renewed information, pushes renewed information of various meteorological data to the pre-established Subscriber, that is, TLIFES Server. TLIFES Server in turn analyzes renewed information, and if and when any information about earthquakes is included in the received data, it imports meteorological data provided by the Meteorological Agency. It extracts from the imported XLM File all place names where the seismic intensity of upper 5 is observed. The place names are converted to the coordinates by using Geocoding, and the distance between the place amd epicerter is calculated. A circle whose central point is the epicenter and the radius is the distance between the epicenter and the farthest coordinate is drawn. In this way, the area where the bulletin board is to be launched is determined. Next, by referring to the location information of all users stored in the TLIFES Server, judgment is made if any of the family members is located within the area where the bulletin board is to be launched. If anyone is found within the area, a bulletin board is launched towards all relevant family group members. This processing is pursued for all family groups registered with the TLIFES Server.

IV. Comparison with Existing Systems

We compared our the Safety Confirmation System utilizing TLIFES and our proposed system with another existing systems. Table 1 shows the results of comparison. In this comparison, evaluation was performed from the following viewpoints.

1) Indicates whether the soon be able to check the latest safety information.
2) Indicate if operation can be conducted in a usual manner while safety input is limited to the minimum necessary level.
3) Indicate if private information is protected appropriately.
4) Indicates whether or not there is a need to prepare in order to use the system.
5) Indicate if the system is launched automatically, if and when any of the family members is located near the disaster area.

TABLE I
Comparison between existing systems and our proposed system

	Disaster Message Board	Google Person Finder	TLIFES utilizing system	Our proposed system
1) Immediacy	bad	bad	good	good
2) Operability	fair	fair	good	good
3) Privacy Protection	fair	bad	good	good
4) Preparation in advance	good	good	fair	fair
5) Automatic setting-up	fair	fair	fair	good

V. Conclusion

In this paper, we showed the safety confirmation system utilizing TLIFES. We can use the information stored in the Server, by utilizing TLIFES. Therefore, TLIFES utilizing system can secure immediacy of information. TLIFES utilizing system is equipped with the function of protecting privacy. We also gave consideration in the aspect of operability that required operation is limited to a minimum at the time of emergency. We have examined the function to launch automatically bulletin board to TLIFES utilizing system. By referring to the data of XML File obtained from the Meteorological Agency, it has become possible to launch the bulletin board automatically.

References

[1] Situation of information and communication in the Great East Japan Earthquake, Information and Communications White Paper FY2011 Edition, pp.2-11(2011)
[2] I. Nakamura: Disasters and communication of IP era - Communication situation and its background of communication in Kumamoto earthquake -, Toyo University Faculty of Sociology Bulletin, Vol.54, No.3, pp.33-49(2017)

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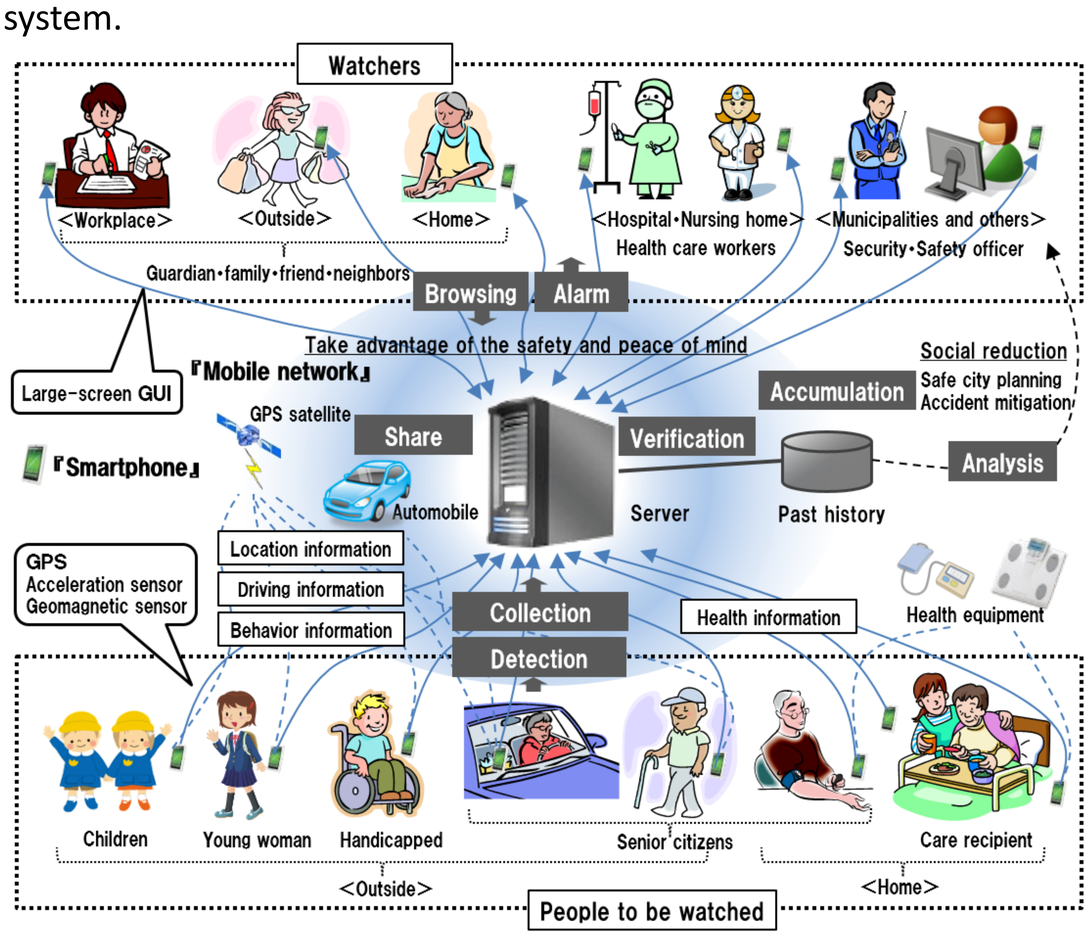
1. Introduction

When a large-scale disaster occurs, people's greatest concern is safety confirmation of the family members.
However, in the event of a disaster, the safety can not be confirmed as the network seems to be congested.
Therefore, we have been proposing the new safety confirmation system using TLIFES(Total LIFE Support system).
When a disaster occurs, a bulletin board is launched, and the location information of the family can be shown instantaneously based on the stored information in the server.
This time, we have examined a system to automatically launch the bulletin board if anyone was near the disaster area.

2. TLIFES

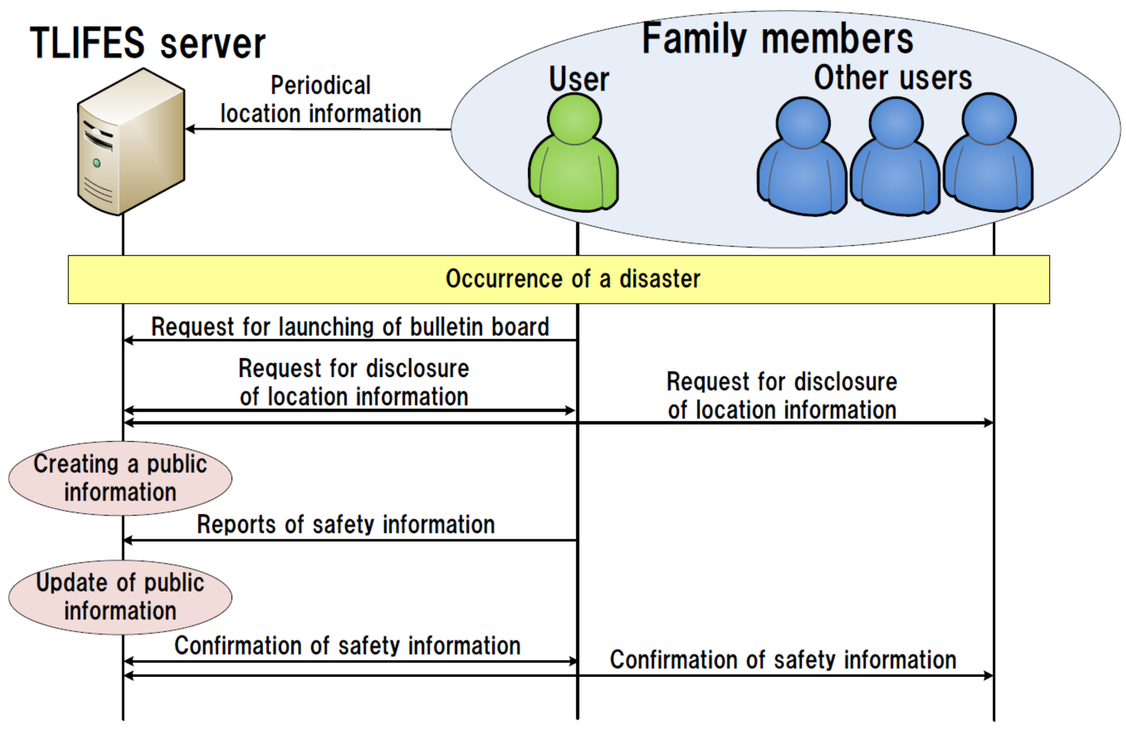
TLIFES is an integrated life support system where users mutually share information, by utilizing the communication and sensor functions of smartphones.
GPS or accelerometer is used to obtain sensor information.
The acquired data is accumulated in the server every 2 minutes.
By viewing sensor information, the user can use it as a watching system.



3. *Safety Confirmation System utilizing TLIFES*

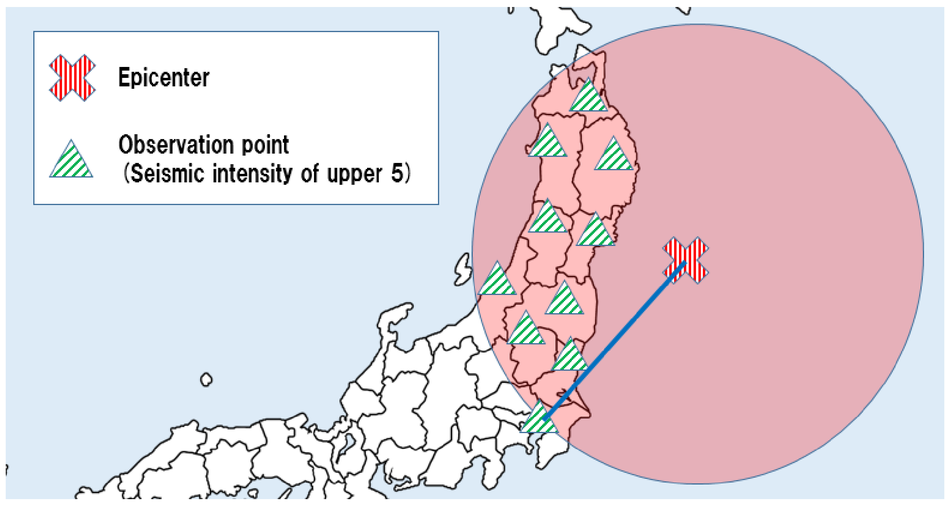
The processing is performed in the following sequence.

- One person within the group activates the disaster bulletin board.
- Request for disclosure of location information is dispatched from the TLIFES Server.
- Disclosed information of individual users of a group is created.
- Each user inputs his or her own safety condition from the safety information input screen.
- Users' disclosed information is renewed.
- Safety information is confirmed.



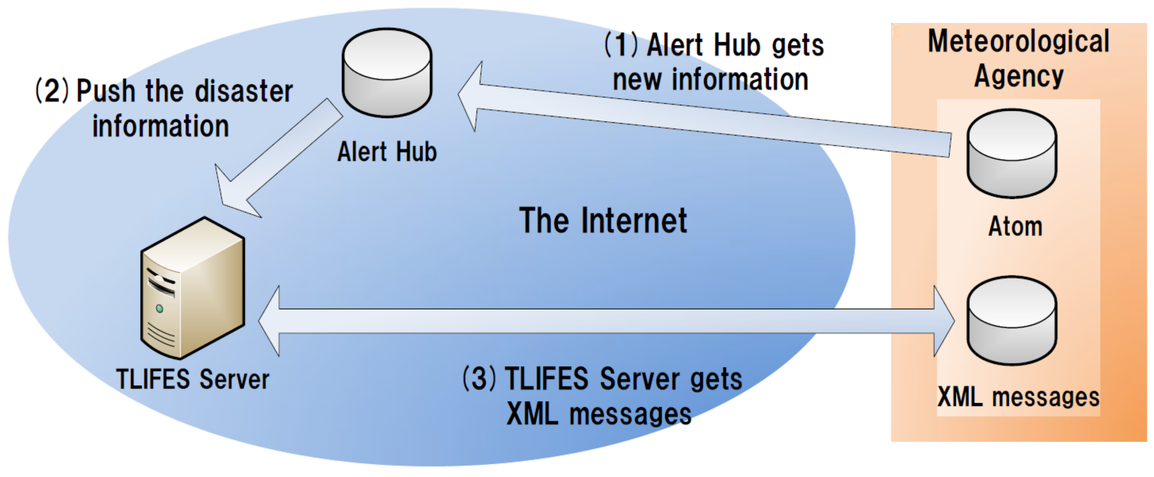
4. Automatic Launching of the Bulletin Board

People who use the bulletin board are the family members registered with the system that includes a person or persons who has/have the possibility of being affected by a disaster.
The area where the bulletin board is to be automatically launched is limited to the area in the vicinity of the disaster occurring area.



5. *Method of Obtaining the Disaster Information XML File of the Meteorological Agency*

Meteorological Agency is distributing disaster information XML files.



6. Comparison with Existing System

	Disaster Message Board	Google Person Finder	Our proposed system
Immediacy	bad	bad	good
Operability	fair	fair	good
Privacy Protection	fair	bad	good
Preparation in advance	good	good	fair
Automatic setting-up	fair	fair	good

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