

Development of Corresponding Management System for Disaster

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Summary

There are many damages caused by natural and article disasters. In October 2004 earthquakes hit Niigata-Chuetu in the mid north part of Japan. Under discussion came the terms preparedness, response, recovery and mitigation. Especially during an emergency, it is very important to make correct and quick decisions. Recently, the number of Web-based GISs is increasing and everyone can access GIS data through a Web browser. But, it is difficult to carry out advanced and complex functions because of security problems, for example, editing real-time telecommunication data. We proposed the CMS (Crisis Management System) decision support system for disaster. It is called "Geo-CMS" (Geographic Crisis Management System). It is useful for decision making and disaster mitigation planning such as response, recovery, and correspondence. The Emergency Management Office will share real-time information with other organizations such as the fire department and police office via that system.

Background

Natural disaster gives the lesson in the cost whose life and property. But if those lessons do not lead to learning and knowledge generation then it is a very heavy cost to bear. This lack of a thing to learn from the past gives it pain most with the recurrence of the disaster. For example as for these it can see as The Great Hanshin earthquake (January 17, 1995 an earthquake of 7.2 magnitude on less than 20 km below Awaji-shima, an island in the Japan Inland Sea and The earthquake caused 5100 deaths, mainly in Kobe.). We experience a shortly in the Niigata-tyuetu Earthquake (October 23, 2004 at 17:56:00 an earthquake of 6.8 magnitude on Mid Niigata prefecture). It caused Dead 35, Injured >2200, Collapsed 263, partially Destroyed 6394 as of October 28 08:00). But the relief work The Great Hanshin earthquake similarly suffered immensely due to lack of information and proper planning. This pointed to the urgent necessity of building a system for disaster mitigation and for documenting experiences of individuals and organizations, which might act as a knowledge resource and help in better coordination in case of future disasters.

We were developed the "Corresponding Management System for Disaster" As for us on the basis of the teaching which is obtained from these disasters. The most important thing is that the system can be used upon disaster having following several features. ; 1) The continuity in which system can be used in both of daily and_emergency time. 2) The simple characteristic in which everybody can do operation. 3) The wide area characteristic

in which the system utilizes Webservice. 4) The integrity of the disaster-related information.

To satisfy those elements we have developed the GIS (Geographic Information System) for Risk Management System.

In making an emergency decision, people are categorized into several types by behavior. Representatives of those types are as follows.

1) People who react with intelligence, 2) People who plan the activity through conversation, 3) People who decide the reaction individually and etc...

The system we propose assists to make the emergency decision precise and this paper introduces an intelligent decision support system integrated with an alert database for Risk Management.

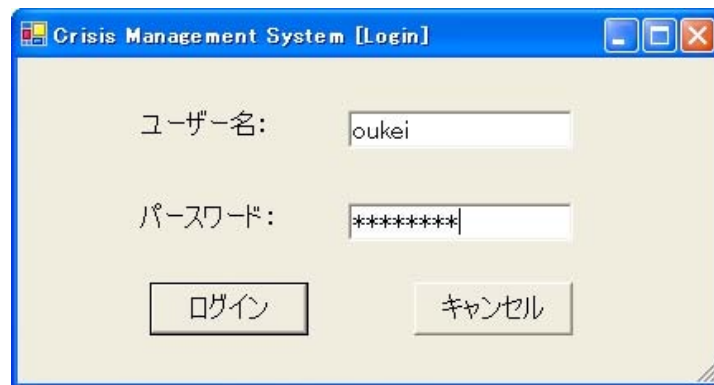
Explanation of demonstration of Emergency correspondence GIS

We kept designating four point elements as development goal in the design of the system. Several elements are listed below.

(A) Reliability of information

Here can guarantee the information presently in the system person in charge here by inputting login information. (Figre01) and with this is possible, can use even in postmortem of decision making after the disaster to seek the reliability of information.

In addition, the analysis becomes possible whether proper emergency correspondence was done immediately after the disaster by leaving the information of login. (Figre02)



Figre01. Interface of Login

(B) Disaster information gathering

Information requirements vary depending on the level in the organization and the type of decision being made. In every case, it is vital that appropriate information be directed to the proper decision maker. And lack of enough understanding of disaster management and tendency to be reactive on the local government level were the main problems.

Sufficient information is very important for decision making in Emergency. So, we had decided to adopt the following kind of element in this system. Several elements are listed below. (Figre02-A)

- The disaster information of the Meteorological Agency: Immediately after the disaster quick precise information is reported from Meteorological Agency.
- The actual proof information of the media: Immediately after the disaster broadcast media is done Quick data gathering
- Real-time information gathering: Even after the disaster occurring, procuring of real time information is important.

(C) Support of spatial information

Geographic information system (GIS) technology can be used for scientific investigations, resource management, and development planning. For example, a GIS might allow emergency planners to easily calculate emergency response times in the event of a natural disaster, or a GIS might be used to find wetlands that need protection from pollution. Also GIS makes it possible to link, or integrate, information that is difficult to associate through any other means. Thus, a GIS can use combinations of mapped variables to build and analyze new variables.

Especially, we proposed the systems such as inking works very freely and feel as though you're drawing with a pen. It can be same API as with other products such as Windows Journal is used so when you write on a map it feels and looks the same as when you write in text. (Figre02-B) You don't do what you would do with a mouse-go to menu, pull down a drop down and click on something. It means that be able to make Emergency Correspondence smoothly when disaster occurs.

(D) Transmission of information

The Internet is a highly disaster-resistant computer network that straddles the entire globe. With the capacity to transmit information anywhere in the world, the Internet functions to disseminate information and forge partnerships and interactions between user and computer without regard to geographical location. So, Here systems was adopted the Instant messaging function which can do information communication making use of Internet. It is the ability to exchange messages in real time with other Decision maker over the Internet. (Figre02-C)

In disaster response, it is of the utmost importance to share all disaster information among the central and local governments, fire departments, polices, armed forces, hospitals, volunteers, and other organizations.

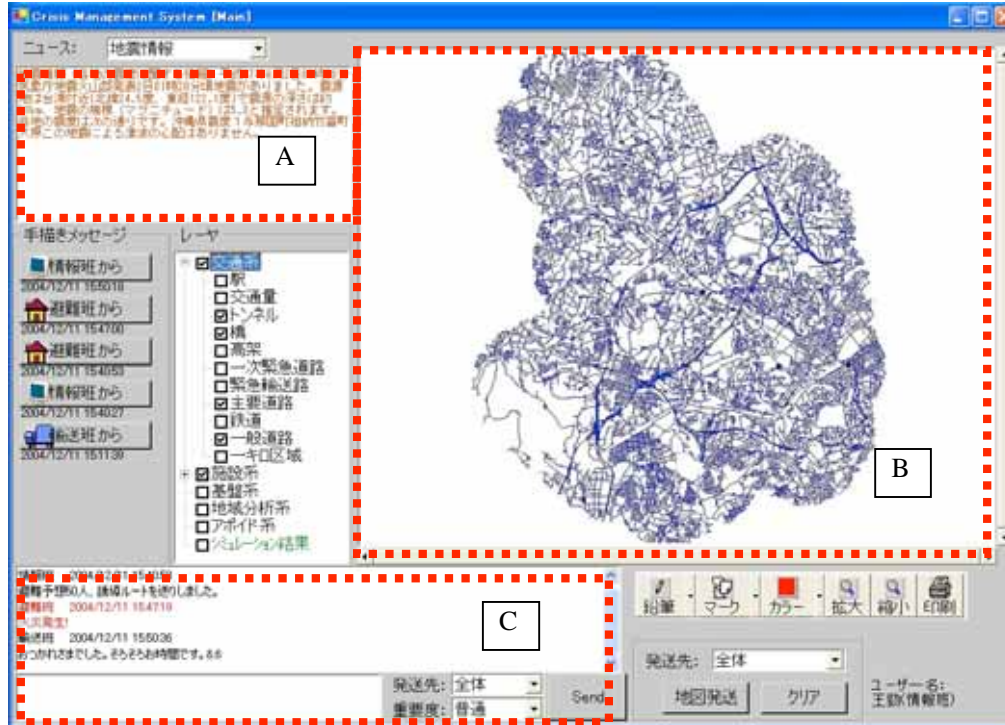


Figure02. Main Interface of Emergency correspondence GIS

Conclusion

The GIS for risk management system (Corresponding Management System for Disaster) prototype offers a mechanism for the development of a social and technical system for managing risks in complex emergency environments. By adapting and integrating appropriate information technologies to support inter-organizational decision making and providing real time information to practicing managers, GIS for risk management system will contribute to advanced technical and organizational functions at several levels of performance: 1) Decision making of specialist level, it will enable Meteorological Agency, Broadcast media, and another organizations to adapt their resources, intelligence and energy constructively to reduce risk and respond effectively when disaster occurs. 2) Information joint ownership level, it will enable ordinary citizens to gain timely access to relevant information. The use of this prototype of system for both professional and public communication of information regarding risk will contribute to that community's capacity to adapt and respond to demands from its environment in a more timely, appropriate, and efficient manner.

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