

THE DESIGN AND MANAGEMENT OF AN INTERNATIONAL DISASTER
INFORMATION RESOURCE NETWORK
[BUILDING AN EMERGENCY LANE ON THE INFORMATION SUPERHIGHWAY]

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"In today's new world order, information serves as an empowerment tool that can assist a nation's pursuit of sustainable development by diffusing useful information to citizens, businesses, and research institutions."

ALBERT GORE, U.S. VICE PRESIDENT

Although hazards are unavoidable, the disasters that sometimes accompany natural and technological events may be. While some countries have a remarkably good capacity for coping with hazards, from time to time even the most technologically advanced need help from their neighbors. It is necessary, wise, and efficient for those concerned with emergency management to establish a worldwide network of information systems related to hazard management, so that disasters do not arise as a result of an emergency situation. One thing that can be done is to improve the quality and quantity of hazard related information so that international, national, regional, and local emergency readiness and response can be effectively deployed in real and near-real-time.

Such a network will enable the emergency management community to work together as a "virtual community", drawing on each other's resources as needed. Instead of costing additional resources, it is hoped that this holistic approach to global emergency management will reduce overall resource requirements by encouraging cooperation.

In order for all emergency managers to be empowered with the capabilities this network can yield, the system must be scalable; that is, able to support interactions with users of varying levels of technology. One

important goal of such a network is to simplify an emergency manager's search for information from many sources and its efforts to compare information that is presently given at different scales and uses different terminology. To be successful, information needs to be broken down into manageable units and the units prioritized according to need and utility.

Ongoing improvements in telecommunications and the application of common technical standards along with computer technology are making it possible to generate and/or gather information at an unprecedented rate, distribute it instantly around the world, and through its analysis and application create new products, services and businesses. New and improved communication and information technology opens opportunities for initiating improvements in integrating and coordinating information across disciplines and across national and international jurisdictions.

New forms of networking depart from traditional centralization of information and place greater emphasis on information exchange as the central function. Information on a particular subject is no longer being placed in central depositories, but rather elements are stored in computers all over the world to be assembled into a larger picture through network links. Information exchange, organized through networking, forms the cohesion for this virtual community.

In order for the emergency management community in this new information based virtual community to further hazard management programs, (including all characteristics - hazard and risk assessment, prevention, preparedness, warnings, response, recovery

and rehabilitation) all participants must make information sharing a primary goal. This requires the hazard management community to first recognize the paramount importance of information exchange as a pivotal part of information management and then to acknowledge the supportive role that networks play in such activities.

Beyond this, there is a critical need to raise awareness among information system and network developers that their facilities represent important resources needed in the global exchange to mitigate disasters.

The worldwide network of computers called the Internet would be a reasonable framework upon which to build this emergency management network. Offering such advantages as a well-understood protocol and global coverage, the Internet is a logical choice.

In addition to offering global coverage, the Internet is a valuable asset to the emergency management community because it accesses a wide variety of emergency management information sources. For example, in addition to information providing organizations such as Volunteers In Technical Assistance (VITA), the National Center for Earthquake Engineering Research (NCEER), etc., many of the Governmental and non-governmental organizations involved in emergency management operate on the Internet already.

In order to be of maximum value to the emergency management community, this system must be designed with "scalability" and global access as central themes. Thus we envision that such a system will include Internet based servers with several alternative interfaces in order to support a wide variety of user capabilities. This combination will provide access for users regardless of whether they are using sophisticated computer machinery or simple systems composed of little more than a terminal and a modem.

This system would become a conduit for providing and exchanging critical emergency information between representatives in a stricken area, the U.N., governmental, and non-governmental organizations (NGOs) involved in disaster relief. An Internet based emergency management system including pre-hazard training and warning capabilities, combined with real-time field reporting capability has the potential to save vast amounts of human life and property.

One of the other capabilities a world-wide network provides is the ability to send warnings of potential natural hazards to the population in an affected area, as well as to the media who will use their capabilities to reach even more people.

In summary, the Internet including such systems as HazardNet provide the world-wide emergency management community with unprecedented tools for the mitigation, and response to natural and technological disasters. Efforts are under way to develop systems that will utilize this tool to its fullest potential. Before the end of this decade we will see Internet based emergency management begin to achieve this goal.

There have been several prototypical systems developed in efforts to harness the Internet. The first of which is EPIX, Emergency Preparedness and Information Exchange. EPIX was based on a series of text menus available via an information search and retrieval mechanism called "gopher".

Later, DRIX (Disaster Reduction Information Exchange) was developed to provide access to information on disaster prevention, mitigation, and preparedness. Information provided through DRIX was intended to assist in policy formulation and planning, statistics gathering, research and awareness-raising to increase knowledge about and strengthen capacities for disaster prevention, mitigation and preparedness. DRIX contained links to servers maintained by many government and private organizations, such as those identified above.

FIRRE (Facility for International Readiness and Response to Emergencies). The focus of FIRRE was on providing access to information for use in "monitoring, early warning, and alert of possible, incipient or ongoing emergencies and natural disasters, and for the purpose of preparing, facilitating, conducting and coordinating effective and timely international response." FIRRE contained computer links to databases about "Current Emergency Situations" (including disaster situation reports compiled by Volunteers in Technical Assistance), "Humanitarian assistance" (including a wide range of information about refugees, human rights, emergency relief statistics and supplies, and relief organizations), "Daily News Bulletins and Current Affairs", "Country-Specific Information" (including country profiles from the U.S. State Department and the CIA World

Factbook, maps from the World Map Collection at the University of Texas and the Canadian National Atlas Information Service), "Natural Hazards" (including current weather maps and satellite images), and "Monitoring Programmes" (such as the World Food Programme Food Aid Monitor).

A third prototype which brought all of these capabilities together was developed under the auspices of Project IERRIS (International Emergency Reduction, Readiness/Response Information System).

The IERRIS prototype employed advanced telecommunications and computer technologies to provide a single entry point to databases of public and private disaster mitigation and relief agencies throughout the world. Also, this prototype provided a blueprint of a data structure that ties field reporting, warnings, and relief status reporting into a coherent whole.

As stated in the IERRIS Project Abstract:

The Project [was] to enable the actors concerned to: adopt information management procedures that are of common benefit; to work with common and/or compatible information management standards and technologies; collaborate in the development of new information systems and procedures so, as to meet information needs that are not met by existing systems and procedures, and to share and exchange suitable emergency-related information collected for respective institutional needs. This concerted effort will result in major improvements in the quality, specificity and timeliness of information available internationally for early warning monitoring reporting, resource mobilization, and coordination, evaluation, disaster reduction, and the information exchange, reference and referral services related to all these concerns.

Presently, an operational system is being developed (in cooperation with the U.S. National Weather Service and California Office of Emergency Services) on a test-bed and development platform located at the Centre for Policy, Research on Science and Technology at Simon Fraser University. This operational system is called HazardNet. HazardNet draws together the ideas and design from all of these prototype systems and has synthesized them into a single system.

HazardNet is intended to be a global, all hazards network tying together all elements of emergency management before, during and after an event occurs and providing the nexus for governments and NGOs to interoperate and mitigate disasters arising from natural and technological hazards. This shall include enhancing the timeliness, quality, quantity, specificity and accessibility of information (including real-time warnings of all-hazards) for persons and organizations world-wide concerned with preventing, mitigating, preparing for or responding to large-scale natural and technological emergencies.

Work on this project is on-going. It is hoped that the system will be demonstrated and evaluated widely by the emergency management community. To access HazardNet from the World Wide Web, go to: "<http://hoshi.cic.sfu.ca/~hazard/>"