American Red Cross, Bay Area Chapter
Disaster Response Web-Based Communications
Project Case Study

Short Summary:

The project utilizes the power of the Internet to solve one of the most difficult disaster response challenges, information management. The goal is to improve service for victims by decreasing confusion and increasing collaboration between response agencies and affected communities.

Long Summary:

The Project is designed to address two separate, but interrelated disaster response problems:

> A. Communicating disaster response information
> B. Engaging the resources of the community in the response and recovery

> ***A. Communications in the midst of a disaster, the ultimate challenge......***

> Disasters are by definition initially confusing and chaotic. At the very time that you need to communicate clearly to a widely disbursed and varied audience, you have the least capacity to support the overwhelming demand for information.

> During the first few days of large disaster responses, emergency management agencies like the Red Cross are struggling to marshall resources, determine the extent and location of damage and provide critically needed services to the affected populations.

> In this environment of fast changing and evolving situations they must also provide a wide variety of information to audiences ranging from disaster victims, the media, local, state and federal government officials to multiple levels of management within their own organization.

> Currently, communications is accomplished by a variety of methods; ranging from broadcast facsimile transmissions to mailing hard copy forms and reports, to telephone calls. The process is labor intensive, fragmented and unreliable. Key information often fails to reach the intended party in a timely fashion; either because of lack of available resources, misdirection of the communications or when over worked personnel forget because of the constant interruptions created by the chaotic quickly evolving situation.

> Further complicating communications during disasters is the reality that most information is very perishable. Reports are a "snapshot in time", often multiple information sources are quoted regarding the same topic, but with information gathered at different times. This leads to significant confusion when information gathered through different channels conflict.

> *Finally, a potential communications solution.........*

The Project is designed to take advantage of the rapid evolution of the Internet as a primary communications medium. Now we can change the distribution from a provider driven to a demand driven system. By establishing an Internet site dedicated to distributing real time response information we can reduce the potential for confusion by narrowing the distribution channels. Switching the system to being demand driven - increases the availability and timeliness of information, and reduces the labor intensity of distribution.

Key features of the system are:

Current response information including press releases, facility maps and operational service delivery statistics, are available on-demand 24 hours/day - 7 days a week to:

- Residents of affected communities know who is responding and where to find help
- Media easily acquire most current information from a single source reducing the confusion created by multiple sources
- Local, state and federal government agencies have ready access to latest service delivery statistics, including shelter service delivery information such as, number, location, number of occupants, meals fed
- Collaborating community agencies have easy access to response information

Interactive area maps provide the location of service delivery facilities, directions, hours of operation and other general information with an easy point and click user interface to:

- Links to the American Red Cross "Family Reunification" web site to help families reunite.
- Community database linking the public to local resources, like where to access sandbags during floods or where FEMA Disaster Application Centers are located.
- Links to other disaster related information (selection tailored to the type of disaster) including:

> Local weather
> Road closures
> Stream and river levels
> Earthquake sensor information
> Collaborating response agencies

Internal Red Cross information distribution in a "point and click" format to support both direct response and agency management (password-controlled) including:

- Disaster response operational reports by day/site or for the entire operation
- GIS mapping support with the ability to extract information including demographics, modeling output from FEMA's HAZUS software, satellite or other digital images or film clips
- Response resource databases (personnel, vendors, equipment and materials)

B. Harnessing the interest and involvement of the community....

When disasters strike a community, the residents routinely rally to support each other. Their support takes many forms. Often they want to volunteer with agencies like the Red Cross. Sometimes the support comes in the form of donating either money or goods or services (what we call "in-kind" donations).

Unfortunately, much like information distribution, the offers of assistance start to arrive at the very beginning of the disaster when emergency response agencies have the least personnel resources to screen and process the offers and when the situation is at its most chaotic. The result is often missed opportunities, lost messages, phone calls that are not returned and hurt feelings.

Offers to volunteer currently come in the form of people stopping by or phoning one of our local offices. All too often the agency personnel handling the contacts are not aware of current personnel requirements and the information they collect is incomplete or the individual's skills or availability do not match our requirements.

Eventually all of the volunteer offers are routed to staffing personnel who sort through hundreds of volunteer offers trying to determine which offers are matched to our needs. Often when a match is identified, the critical contact information (night time or pager numbers or e-mail addresses) is missing.

In-kind offers are currently received and handled in a similar fashion, they come in the form of a phone call to any one of a dozen local offices and end up on a message slip, often lacking basic information on the offer or the call back numbers. The message slips are then routed to In-kind donation personnel at the response headquarters, where the offers are reviewed to identify matches between the offer and our requirements.

Since the personnel who handle the initial contact at our offices are unaware of current In-kind requirements, many of the offers received are inappropriate for our agency requirements, however other collaborating response agencies in the affected communities need the offered goods or service. Currently there is no effective method to redirect the offers or contacts we receive to collaborating agencies.

Finally, in the past decade more and more community-based organizations have begun to get involved in providing support to victims of disasters. Many of the agencies are small, normally providing services to a very specific sub-set of the community and lack the public affairs resources or media exposure to effectively communicate their disaster service delivery information to the public. However, they can be a significant resource to the affected community, if they can effectively link to the public through the traditional emergency response system.

Finally a more effective way to engage the community.....

Utilizing the power of the Internet linked to databases we can finally offer solutions to many of these challenges. By accepting offers from the community via on-line Internet data collection forms we can:

- Screen offers by providing specific information regarding our needs
- Ensure complete, legible information is collected and submitted
- Redirect or refer offers to collaborating response agencies when they are not appropriate or currently required by the Red Cross
- Provide an easy feed back loop to acknowledge and thank potential donors and volunteers
- Significantly reduce personnel requirements for processing community offers of assistance
- Reduce wasted opportunities to channel community support to disaster victims

Key features of the system are:

- Automatic transfer of completed volunteer and in-kind donation offer forms directly from the web page into a database for the appropriate function at the disaster response headquarters.
- Database (or links to their web pages) of collaborating agencies and the types of support they require and the services they are offering to disaster victims.
- Database of other community disaster related resources, such as where to pick up sandbags in their community during floods.
- Interactive mapping of agency offices, disaster facilities and other information that provides disaster victims or volunteers instructions on where to go to either seek or provide assistance.

Project Benefits:

- Improved public access to Red Cross and other community services through availability of facility location maps, 24-hour access to most current information, links to key response agencies and local resource databases.
- Improved coordination with other response and collaborating agencies produced by improved information flow
- Centralized source of timely information for media and local government reduces confusion and misinformation
- Increased ability of community to participate in the response by automating the volunteer and in-kind gift process
- Increased internal Red Cross coordination and communications with wide spread facilities & staff
- Simplified method to distribute information reducing both the labor and the uncertainty of sending broadcast fax or phone messages
- Access to response information for all levels of the State and National Red Cross management team, accessible from anywhere, any time

1. Benefits:

Has your project helped those it was designed to help? In your opinion, how has it affected them? What new advantage or opportunity does your project provide to people? Has your project fundamentally changed how tasks are performed? In your opinion, have you developed a technology that may lead to new ways of communicating or processing information? How might that change unfold?

The project was piloted on a 1998 flood relief operation in Northern California, however the web site is still under construction, with full operational status targeted for Spring of 2000.

The project provides an entirely new method for communicating, coordinating and harnessing existing community resources. The improved communications capability will produce a better-coordinated multi-agency response with increased community involvement. Disaster victim and community outcomes include:

- Faster response(by better utilizing local personnel/agencies we avoid time lags required to bring in outside response personnel)

- Higher quality service to disaster victims with less confusion and frustration

- By more effectively involving the community, the disaster response will be more sensitive to local values and better reflect the culture of the affected communities

- Communities that have the opportunity to work together to help themselves, making them also better prepared for future disasters

The ability to use of on-line Internet data collection for volunteer and donation information that is automatically forwarded to a database at the response headquarters automates a process that has been extremely labor intensive, difficult to coordinate and unreliable.

Converting the distribution of response information to an Internet based on-demand system similarly converts a labor intensive and unreliable system, while improving the over-all quality of the information provided.

Linking agency resource data to the Internet also provided a capability that has not existed previously and opens up further possibilities, such as having field damage assessment teams submit reports remotely by logging into the web page and attaching their files and reports to the mapping system.

When the site becomes fully operational (hopefully next Spring) it will be introduced to the media, local emergency management and collaborating organizations. This will allow both the marketing of the site and user training to begin. One of the most important tasks is to begin the process of populating the databases with information regarding community response resources and to negotiate the links between other organizational web sites.

2. *The Importance of Information Technology:*

How did information technology contribute to this project? Describe any new technologies used and/or cite innovative uses of existing technology. For example, did you find new ways to use existing technology to create new benefits for society? Or, did you define a problem and develop new technology to solve it?

First and foremost the success of the project is due to the development of the Internet. Without the information collection and distribution power of the Internet the project would not be possible.

Inclusion of interactive mapping utilizing AutoDesk's "MapGuide" Internet geographic information system software supports the ability to both provide route and map information, but also to present information in a "spatial" context. The ability to link maps to a wide range of data and display them on the Internet offers options for quickly distributing information that would otherwise be impossible. Information ranging from instructions to disaster victims on what information to bring to a service center all the way to satellite images of the damage.

How quickly has your audience of users embraced your innovation? Or, how rapidly do you predict they will? Does your work define new challenges for society? If so, please describe what you believe they may be.

Emergency management agencies are very excited about the project and have been among the most ardent supporters.

Richard Eisner, *Regional Administrator of the Coastal Region of the California Office of Emergency Services*:

" Effective information distribution during disasters has always been one of the biggest challenges of emergency management. The Internet and projects like this, offer powerful tools to help. I am especially excited about the ability of the project site to collect and distribute information between multiple levels of the community, local, state government, affected residents, and non-governmental organizations."

Dr. Jack Harrald, *Director, Institute for Crisis, Disaster and Risk Management* **from George Washington University**:

" Good, timely, and accessible information is the most valuable commodity during a complex emergency. The use of the Internet to facilitate the exchange of information between relief organizations, affected citizens, and potential volunteers could be one of the most significant steps ever taken in emergency management and disaster relief. The result will be better, faster and more appropriate service by relief agencies. Internet based systems will also decrease the demand for relief services as well as increase the supply by supporting the ability of informed citizens to identify and react to critical needs."

Dr. Frannie Winslow the *Director of Emergency Services for San Jose, California*:

" The ability of city residents to have easy access to response information, like shelter locations, will reduce some of the phone traffic that typically floods our 911 and 311 systems immediately following large disasters. The ability to utilize the Internet to get the latest shelter/service center information when are we preparing reports or briefings for city officials will also be a significant advantage over the current system. "

Mr. Al Frew, *Administrator of the Council for Disaster Preparedness of the Greater Bay Area* " (a Red Cross funded preparedness project):

" One of the most exciting features of the system is the potential for on-line screening and sign up of community volunteers to significantly improve the system used to handle the influx of volunteers that follow each large disaster. Community interest in volunteering and their desire to help is currently underutilized because of the slow and cumbersome system used to identify and match volunteers to roles, this project can help to solve that problem. "

3. Originality

What are the exceptional aspects of your project? Is it original? How? Is it the first, the only, the best or the most effective application of its kind? How did the project evolve? What is its background?

Probably the most exceptional aspect of the project is the way the project applies existing technological solutions to a wide variety of pervasive disaster response challenges.

Many people may ask why such solutions have not been applied before. The answer lays in the fragmented response system and the chronic lack of resource and resistance to change in many government and non-profit agencies.

There are many Internet sites that distribute disaster-related news reports and some that support on-line acceptance of resources, like financial donations. However these sites are national in focus and provide very limited overview of information, such as agency press releases.

A survey performed when the project was initiated did not discover any sites that had the local focus, depth of information, interactive mapping features, response support or community resource databases. In short, we believe this to be the first/only Internet site designed solely to support local disaster responses.

The project evolved from conversations between the American Red Cross, Bay Area Chapter and personnel from Autodesk Software, Inc. (headquartered in the Bay Area). The original intent of the discussions was to explore ways Autodesk might be able to support the establishment of geographic information systems (GIS) at the chapter.

Once we became familiar with Autodesk's Internet based software "MapGuide" and the capabilities of the product to assist in building Internet based information distribution systems, our project vision began to emerge. We expanded our conversations to include RiskINFO, the company which developed and hosts the chapter web site. They enlisted the participation of other organizations, including Sun Microsystems, BEA WebLogic, Stalker Software, and O'Reilly & Associates, all of whom contributed expertise and software. Our project vision quickly expanded, as we learned more about the evolving capabilities of the Internet.

Shortly thereafter, a major flood hit Northern California. The Director of Disaster Services at the chapter, Gregg O'Ryon decided that it was the perfect opportunity to explore our discussions about utilizing the Internet to support the disaster response. A meeting was held on the second day of the disaster and a project team assembled. Within seven days the initial design discussions had taken place and a pilot site established.

Since the initial project discussions began, substantial functionality continues to be added to the site design, significantly expanding the complexity and potential impact of the project.

4. Success

Has your project achieved or exceeded its goals? Is it fully operational? How many people have benefited from it? If possible, include an example of how the project has benefited a specific individual, enterprise or organization. Please include personal quotes from individuals how have directly benefited from your work. Describe future plans for the project.

Because the project is yet to become fully operational, it has not yet achieved the potential effect that it is ultimate designed for. However, we feel confident that it will achieve our goal of improving disaster response information distribution and improving our ability to engage the community in disaster responses.

The project site is currently chapter based, however we intend for it to be utilized for large disasters within Northern California (the extent of our operational jurisdiction). If the project succeeds to the degree we expect, the design could be applied for the entire state or even the nation.

The actual number of people who can/will benefit from the project will vary based on the size of the disasters it is utilized on. Following a major earthquake the site could directly impact service delivery to hundreds of thousands of people and literally millions of friends, family members and residents of the affected communities.

The project has applied for grant funding to complete the site. We will know the outcome of the grant application within the next 15 days, so by the time you read this case study we hope to have the funding secured to make the site fully operational.

5. *Difficulty*

What was the most important obstacle that had to be overcome in order for your work to be successful? Technical problems? Resources? Expertise? Organizational problems?

Limitation of resources has been the most significant challenge. Because this is a chapter-based project, we have had to rely on donated resources (software, hardware, map data, database and web designer time, and web hosting). This has significantly slowed the development of the project causing it to lose momentum several times. The primary members of the project team have had to fit the project into "spare time," given the responsibilities of the participants, it is a tribute to their commitment that the project has survived.

Additionally, like all changes, it is hard to build management support until you can show substantive potential benefit, which in an agency where automation and use of technology are still not the norm, you virtually have to finish the project before you can gain management support and access to resources.

The project continues to be a chapter supported regional project, with the hope that the final success of the project will support expanded use of the concept and full realization of the benefits to disaster victims and the communities we serve.