NEW OPEN SOURCE SOFTWARE
COULD GREATLY IMPROVE FEDERAL AND STATE DISASTER RELIEF OPERATIONS

BY MICHAEL DONAHE

Photo courtesy of the U.S. Navy

Cyclone Sidr, a Category-4 storm that devastated the country of Bangladesh in November, claimed more than 3,300 lives, caused approximately $2 billion in damage and destroyed more than 800,000 tons of the nation's rice crop valued at $290 million.

Groups responding to the disaster say many lessons have been learned. There are also important lessons for US federal and state emergency management agencies.

During the recovery from the storm, an open source disaster management system called "Sahana" was used to address common decision, support and coordination problems countries face during disasters. This was the biggest lesson learned: The need for worldwide implementation of disaster management technologies — before disaster strikes — versus in the midst of a time-critical crisis situation such as a cyclone, an earthquake or a tsunami.

Sahana is currently being utilized in major metropolitan areas within the U.S. and is being reviewed by top emergency management directors across the country. In addition, Sahana's open source platform has allowed many U.S. programmers and developers to contribute to its overall functionality.

On U.S. soil, Sahana could provide many benefits to virtually any area hit by a natural or man-made disaster, including hurricanes, tornadoes, earthquakes, wildfires — even terrorist attacks.

Technology plays a vital role in helping countries, states or cities prepare for, respond to, and recover from disasters by connecting relief groups so

they can coordinate effectively during a disaster. This includes developing a victim/missing person registry, connecting support and relief requests with the donors who fulfill those requests, and identifying and locating victims in shelters and other safe havens. There is also a need to coordinate volunteers and manage food, water and emergency supply distribution.

There are many issues at hand today when it comes to the implementation of technological programs in crisis management situations; first and foremost the awareness that these programs exist at all and next, the implementation and training required to get the appropriate personnel acclimated to their functionalities.

When it comes to worldwide crisis events, technological acceptance isn't the biggest issue. The challenge lies in building awareness around the technologies that are available and then the implementation of those technologies – most often times in the midst of a crisis event.

In early morning hours following Cyclone Sidr, responders scheduled meetings with representatives from various organizations within the region, including the Bangladesh Disaster Management Bureau, the Bangladesh University of Engineering, US AID and the U.S. Embassy. By 10:00 AM, two days later, Sahana was up and running, with full support from the Bangladesh government.

The personnel within the region who were responsible for the operation and customization of the Sahana program lacked Linux skills. Efforts then began to find knowledgeable and willing volunteers to support the program. They were found at a nearby university, whose group members were not only familiar with Sahana but were also contributors to its development.

Within two days of the Sahana implementation by the Disaster Management Bureau (DMB), the Bangladesh Armed Forces Division (AFD) had requested and implemented Sahana on a second server. This second server was relocated to the forward command post in the hardest hit area. Information was shared between the DMB and AFD agencies

with one server being utilized as a full back-up for the other.

Pooling resources within a region is a vital part of what disaster relief initiatives are designed to do, but it's not easy. It takes a tremendous amount of coordination to get all of the agencies involved on-board and up-to-speed with a unified platform upon which recovery efforts are built. Not only is the pooling of human resources a vital

Photo courtesy of the U.S. Navy

on-site process in a disaster situation, but before a crisis event strikes there is a need to work together so that the means for a coordinated relief effort are in place before the event. The creation of Sahana is an example of this…when teams of developers spanning a dozen countries collectively pooled their resources to write, customize, refine, and enhance the program for the past three years, making it available to be downloaded for free, with support for local customization.

For many years, governments, UN agencies, NGO's and private sector responders have faced the challenges of not having a consistent set of disaster management software applications that could be easily implemented in any disaster scenario. The software would need to facilitate the sharing of information while addressing the specific needs of multiple organizations. It had to be easy to implement and easy to use. The benefits had to be clear and it had to be free. Unfortunately, until Sahana, no such system existed.

Deployed by the Sri Lanka government's Center of National Operations and the Center of Humanitarian Agencies (CHA), the Sahana project was originally initiated by volunteers in the Sri Lankan FOSS development community to help their fellow citizens impacted by the Asian Tsunami in December 2004. Based on its initial success in handling broad scale disasters, the Swedish International Development Agency (SIDA) funded phase two through the Lanka Software Foundation. Since its inception, it's been deployed in many other disasters, such as the 2005 Asian quake in Pakistan, the 2006 mudslide disaster in the Philippines and the 2006 Indonesian earthquake. After the Tsunami, Sahana was rebuilt from scratch on the Free and Open Source technology stack, AMP (Apache, MySQL and PHP/Perl).

Sahana's six primary modules consist of a Missing Person Registry, an Organization Registry, a Shelter Registry, a Request/Aid Management System, a Volunteer Coordination System and a Situation Awareness System.

The Missing Person Registry is an online bulletin board of missing and found people that not only features information about the missing, but also about the people who are seeking the missing. The Organization Registry keeps track of each relief organization and civil society group working in the disaster region, including where they are active and the services they're providing.

Sahana is currently being utilized in major metropolitan areas within the U.S.

The Shelter Registry keeps track of all shelter locations in the region, as well as basic data about the shelters, the number of people in them and a geospatial view of shelter camp locations within an affected area. The Request/Aid Management System is a centralized online hub where all organizations involved in relief

efforts can effectively match requests of aid supplies to pledges of support, with full request to fulfillment features.

The Volunteer Coordination System keeps track of all volunteers, contact information, project allocation and availability. The Situation Awareness System provides a snapshot overview of the crisis at hand, including what is happening on the ground and the ability to post notes and photos so everyone, collectively and collaboratively, can know what's going on at any given time.

Sahana's architectural framework was designed specifically for humanitarian efforts.

In addition to its pluggable modules, Sahana's architectural framework was designed specifically for humanitarian efforts. In addition to its plug-in architecture that allows for simplified independent involvement and integration by 3rd party groups, it can also run

standalone without the dependency of the Internet, it can be cloned for mobile field use, and it doesn't require installation from a USB drive. Sahana can be translated into any language, its user interface can be adapted to the device that views it, and it is horizontally scalable, offering accommodation for a greater load by adding more servers in a parallel cluster.

With countries such as the Philippines, Pakistan, India, China, Indonesia, Spain, Portugal, Germany, Poland, United Kingdom, South Africa, Peru, Bolivia, Brazil, Argentina, Sudan and the United States now officially testing or using Sahana, it is becoming one of the fastest growing and most successful disaster management applications in the world. Its benefits, including ease of use, the ability for customization and its proven track record, have contributed to its success. In 2006, Sahana received the highest award available in the open source industry from the Free Software Foundation. Sahana received the 'Award for Social Benefit' in a field of contenders that included OLPC, Project Gutenburg and Wikipedia.

In Bangladesh, the Sahana platform is now supported by members of the Bangladesh open source community,

along with students from the University of Engineering and Technology, who quickly stepped in to attend training sessions, take over local support responsibilities and build a linkage with Sahana experts from the Lanka Foundation.

Those within the crisis management industry understand how technology enables humanitarian efforts to take place on an immediate and mass scale. With applications such as Sahana, both public and private sector organizations can manage many facets of recovery quickly and efficiently, from communications programs to decision support software for government officials. Today, communication technology has significantly advanced, for example. Internet connectivity using Wi-Max units for wide area coverage can be quickly set up to accommodate voice, data, and video transmission. And now Sahana leads the way in a variety of global disaster management initiatives.

The implementation of Sahana as part of a national disaster management strategy promises outstanding results in terms of lives saved, property protected, response coordination, loss reduction and rapid recovery, according to groups responding to the Cyclone Sidr disaster.

There is no doubt a hard-working, hands-on approach to crisis management is by far the most important ingredient of a successful disaster recovery process. But technology can help people work smarter, in addition to working harder. Perhaps this two-pronged approach is vital in facilitating the collaboration between disaster response organizations and governments like Bangladesh to assist in the recovery from all types of natural and man-made disasters.

ABOUT THE AUTHOR

Michael Donahe has worked closely with the developers of Sahana, and has assisted in the implementation of Sahana in several large disasters. He is Chief Operating Officer of I.T. Crisis Services, Inc. (ITC) and he can be reached at Donahe@itcrisis.com.

For those interested in learning more about Sahana, a free and open source disaster management system, visit http://www.sahana.lk/.