Exercise24: Using Social Media for Crisis Response

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X24 México: Stronger Together

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ABSTRACT

Can populations self-organize a crisis response? This is a work in progress report on Exercise 24, X24, Mexico, a follow up to the first two exercises, X24 and X24 Europe   The X24 exercises used a variety of free and low-cost social media and web 2.0 tools to organize, plan, and manage local and international expertise and organizations in the response to a preset disaster scenario. The first X24 focused on Southern California, while the second X24, X24 Europe, focused on the Balkan area of Eastern Europe. These exercises involved over 12,500 participants for X24 while X24 Europe had over 49,000 participants. This paper presents an overview of the recently completed X24 Mexico exercise, as well as the preliminary results.

Keywords

Social Media, Crisis Response Exercise, Crisis Response Planning

INTRODUCTION

Exercise 24 (X24) is a humanitarian assistance and disaster relief (HADR) virtual research, education, and exercise environment developed by the immersive Visualization Center (VizCenter), at San Diego State University (SDSU). X24 has become a proven-effective, low-cost, and innovative process that leverages the power of social media tools, like Twitter and Facebook, to form and focus strategic partnerships in order to share critical information and coordinate with a unity of effort during a natural or manmade crisis. X24 utilizes the power of the Internet to practice methods to save lives in crisis. The same methods were used successfully to respond to the Haiti Earthquake and Cholera Outbreak; Gulf of Mexico Oil Spill; and Japan Earthquake and Tsunami.

BACKGROUND

San Diego State University's, VizCenter hosted a two-day virtual HADR event called Exercise 24 (X24) simulating multiple natural disasters on the coasts and desert regions of Southern California and Northern Baja California in September 2010. The purpose of this exercise was to prove/demonstrate the use of online resources to foster the building of collaborative partnerships between various U.S., Mexico, California and San Diego County emergency response organizations. Ultimately, the first X24 exercise involved over 12,700 people from 79 nations and 90 U.S. government, non-government organizations, and public/private partners in a collaborative environment using crowd sourcing, social media, and cloud computing applications. This was the first time a collaborative HADR exercise of this scale occurred online and integrated into real events.

X24 Europe was held in April, 2011 and transcended all expectations in its ability to form a collaborative bridge between individuals, communities, and nations with over 49,000 participants from 92 nations, that included two ambassadors, a US major general military officer, as well as representatives from U.S. European Command (EUCOM), U.S. Northern Command, U.S. Transportation Command, Office of Navy Research, STAR-TIDES at the Center for Technology and National Security Policy from National Defense University, and many others. The focus area for the scenario was the Balkans region with a notional seismic event that generated a tsunami in the Adriatic Sea followed by aftershock damage inland. 78% of participants were from the Croatia, Macedonia,

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and Bosnia and Herzegovina. The United States was fourth on the list for number of participants with 3,419 and Serbia was fifth with 1,958. This is significant in consideration of the challenges experienced in this region.

This inclusive environment was facilitated by an open invitation for participation, which was hosted by the SDSU VizCenter. The openness of X24 challenged traditional exercise structures where events in a scenario, or injects, are associated with specific responses by participants with known capabilities. A complete range of skills and experience participated and is similar to actual humanitarian assistance and disaster relief operations. X24 Europe required a considerable degree of leadership agility on the part of the exercise controllers and evaluators. This agility enabled a unity of effort, when a unity of command was not possible.

X24 Europe provided an unprecedented opportunity to test, train, and explore leading-edge humanitarian assistance and disaster relief tools, technologies, and methodology with a global community of experts. This dramatically enhanced the knowledge base for all participants and observers. X24 Europe was as much an educational environment as it was an exercise. Injects were intentionally placed in the scenario to teach the global community the process for U.S. Department of Defense Combatant Command (COCOM) humanitarian assistance and disaster relief capabilities to respond to impacted regions within a COCOM's Area of Responsibility. This unique opportunity to educate through social media would add considerable strategic and operational value to other COCOMs and U.S. interests both within and outside its international borders.

X24 Europe provided a no-fault framework were government agencies, non-government organizations, academia, private industry, and volunteer groups could develop a working familiarity with the evolving tools, technologies, and methodology presently used by the open-source computing community to respond during humanitarian assistance and disaster relief crises. The integration of experienced military officers in the area of operations and logistics identified the improvement need for a time indicator addition to accompany geo-tagging. This will be a part of future analytic mapping for significant events, since the majority of the processing for global disaster mapping occurs at the Immersive Visualization Center.

The purpose of the X24 Europe exercise was to continue to build collaborative partnerships, while testing the use of social media, crowd sourcing and collaboration tools in an HADR scenario on the European Continent. The complex disaster scenario contained simulated seismic events with a resultant tsunami in the Adriatic that caused damage to key resources and critical infrastructure in the five Balkan Countries (Bosnia-Herzegovina, Croatia, Montenegro, Kosovo, and Macedonia). Some of main lessons learned from these exercises are:

- Social media is a valuable and powerful information and dissemination tool, but also has potential as a distractive force if data is not managed, analyzed, and acted upon in a methodical, planned manner.
- A hybrid of formal structure response capabilities combined with crowd sourced and informal self-activating capabilities appear to be the best sense of balance for disaster management and response.
- In the pre-exercise and exercise it was clear that training and practice using the technologies and common operational standards are necessary. When these the new technologies failed to work, participants reverted to more familiar technologies—in this case email, texting and cell phones.
- Sidebar conversations were highly beneficial, but knowledge dissemination was limited to participants located within these private clouds.
- There was confusion and a need for clarification about who the Point of Contact (POC) was for the various social media applications that were used during the exercise.
- There was an inconsistency regarding the number of preferred chat platforms for participants to use as many felt they were redundant and somewhat overwhelming. On the flipside, users acknowledged that while in a crisis, information should be replicated in a variety of locations since people may be using various social media tools to communicate and gather information. Several suggestions included a "one platform" tool that aggregates the relevant discussions together.

X24 MEXICO

The first X24 in 2010 showed the need to develop closer relationships between the United States and Mexico by finding a lack of communication protocols for humanitarian response. Cumbersome border and formal communication protocols made it difficult to impossible for informal or close collaboration. This is particularly interesting and important to the authors as San Diego State University is situated on the border with Mexico and there is already much collaboration between SDSU and various Mexican agencies and organizations.

GOALS

There were five goals for the exercise:

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1. Demonstrate the use of no/low-cost, off-the-shelf social media, crowdsourcing, and collaboration web tools to gather, coordinate, and share actionable real-time information to build situational awareness to help victims of a natural disaster and help save lives;

2. Establish dialogue and build relationships between all partner nations, international organizations, and public/private partners regarding the use of online tools;

3. Test online tools to measure effectiveness, and streamline cyber information sharing in preparation for the next real-world crisis;

4. Address the virtual flow of information and activities of international organizations during a natural disaster and a terror attack utilizing biological weapons of mass destruction/effect; and

5. Encourage all formal and informal groups across the globe to actively participate or observe the exercise.

SCENARIO

The scenario for X24 Mexico was an earthquake and moderate volcanic eruption in southern Mexico. The February 8th pretend quake happened on a real fault called the Middle America Trench and a subsequent eruption occurs at one of Mexico's two most active volcanoes near a populated area. This is not a prediction. It would be rare to have an earthquake and volcanic eruption so closely spaced in time. But in a hypothetical world, if a volcanic system were charged with magma it is possible that the seismic shaking could push it to erupt. In May 1980, an earthquake triggered an unexpected landslide, which started the violent lateral eruption at Mt St Helens. In 1902, an 8.2 Middle America Trench quake was followed by large eruptions at Mount Pele in the Caribbean and at Santa Maria volcano in Guatemala and was also coincided with activity at Volcan de Colima in Mexico. Historic data from Chile show that 4 times as many volcanoes erupt in the year following a very large earthquake than in other years. There is data to support a connection between large earthquakes and eruptions at active volcanoes. The scenario was designed to look at questions such as:

- Impact on air and sea commerce to/from the impacted region;

- Mass exodus from Mexico to the United States;

- Airborne particulates impact response efforts from the east, and commercial air and sea traffic in the Gulf of Mexico;

- Environmental impact concerns in the Gulf of Mexico; and

- Airborne particulates impact populations in the Gulf Coast, Florida, and up to Washington, DC.

Additional questions of interest included:

- Tracking relief supplies to end-users to improve/refine In-Transit Visibility (ITV) data;

- Using social media to estimate the number, type, and transportation mode of mass personnel movement;

- Explore opportunities for sharing information in the maritime domain with the Mexican Navy (SEMAR) for designated vessels of interest (VOI);

- Evaluating potential requests for aid/assistance due to 2nd and 3rd order effects of the disaster; and

- Discussing lead and supporting roles among partners for Foriegn Disaster Relief/Foriegn Consequence Management (FDR/FCM).

SETUP

A dashboard was used for X24 Mexico to accomplish goals 1, 3, and 4. The dashboard, the main screen is shown in figure 1, was a mashup using a variety of tools including mapping, RSS (really simple syndication) feeds, email, Twitter, and a wiki. The dashboard was designed to be Defense Information Systems Agency, DISA, compliant; as well as Rehabilitation Act, Electronic and Information Technology, section 508 compliant. Cost-effectiveness was achieved by using Open source software. Open coding was used to allow the dashboard to accept a variety of social media and multi-media inputs/formats. The dashboard was designed to be modular with an adaptable user interface. Additionally, the dashboard used Twitter and YouTube to broadcast "official" events as well as public service announcements. Finally, the dashboard used Geo-tags to visually represent

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participant locations for those who registered their GPS ids and agreed to be tracked. The X24 Mexico registration page included an advisory, in both English and Spanish that by registering, participants were sharing this information. All dashboard and exercise information was stored in a cloud environment to reduce service interruptions and increase processing ability/storage capacity. Only 2% of available server space was used to host the X24 Mexico environment since it integrated the clouds of Google Maps, Livestream TV, and Twitter. This framework enables an exponential scalability for future X24's.

Additionally, the SDSU VizCenter was used as a neutral and informal meeting location, dubbed "Academic Geneva." This was necessary as the protocols for visiting officials make informal talks between these officials nearly impossible. The collaborative surroundings of the VizCenter along with a large multi-screen display of the X24 Mexico dashboard made these meetings productive and conducive to relationship building.

Figure 1: X24 Mexico Dashboard

RESULTS

X24 and X24 Europe were focused on demonstrating technology and feasibility. X24 Mexico was focused on command and control and relationship building. While X24 and X24 Europe had approximately 12,700 and 49,000 participants representing 79 and 92 countries respectively, X24 Mexico had approximately 1300 participants representing 42 countries. However, what X24 Mexico lacked in numbers was more than compensated for by the level of the participants. Senior policy makers from the United States and Mexico's

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government and military as well as representatives from National Institute of Urban Search and Rescue participated.

Now more than ever, foreign policy and economic policy are inseparable. Prosperity, and incident recovery to a state of prosperity, has to be a core foreign policy goal for all of response organizations, and economic forces, which virtually impact every aspect of how nations engage. The simulated nature of events in the X24 México scenario created a unique opportunity for strategic partners in industry, trade, customs, and military in United States and Mexico to explore the challenges of economic continuity for a just-in-time-service region society. Participants observed the strong connections between traditional response options, the integration of social media communication, environment impact challenges, and continuity of the flow of people and goods to and from the impacted region. In an age when more people in more places can participate in global events through social media, participants had the opportunity to expand the range of partners working to take on our most pressing shared challenges and to work together to take advantage of these new collaborative opportunities.

X24 México was a great opportunity to discuss matters of importance to the bilateral relationship with Mexico, and also to discuss the full range of regional economic and security issues that concern the distinguished group of peers who attended the event. It is clear that Mexico is emerging as a leader in bringing nations together to solve problems that none of us can solve on our own. The Commanding Admiral for Mexico's Second Naval Region requesting a tsunami in the first X24 is an example. The lessons learned between strategic partners were later applied to the Japan Earthquake, Tsunami, and Radiation Leak. The Senator Select for Baja California Norte was supremely focused on the opportunity to use X24 México as an educational vehicle for community preparedness was another example.

All participants agreed that X24 México was an excellent, and all too rare, chance for diverse bilateral partners to connect informally. While this event engaged participants from 42 nations, it was, for many, a great opportunity for participants from the United States and Mexico to discuss breaking deadlocks in the multilateral economic system. The example of challenges to the transport of aid across borders was repeatedly mentioned. Participants unilaterally agreed that future events should incorporate policy analysis from the tactical level to the strategic view. This will make the next collaborative exploration in X24 more equitable for both countries by creating actionable templates for future potential response options.

The success of these lessons learned in their future application is predicated on a commitment to the safe, efficient, and equitable exploitation of transboundary reservoirs for crisis, consequence, and recovery management with the highest degree of safety and environmental standards. This engagement is expected to deepen in the years ahead as the United States, Mexico, and other partner nations work together to exercise, train, and educate together.

CONCLUSIONS

Can populations self organize a crisis response? This is a work in progress report discussing the third X24, X24 Mexico. The first two X24s, termed X24 and X24 Europe, successfully showed that self organization could be accomplished using social media and local expertise. The first X24 focused on Southern California, while the second X24 Europe focused on the Balkan area of Eastern Europe. As described in Howe, et al. (2011), these exercises demonstrated that self- organizing groups can form and respond to a crisis using low- cost social media and other emerging web technologies. Over 10,000 people participated in X24 while X24 Europe had over 490,000 participants. X24 involved people from 79 nations while X24 Europe officially included participants from at least 92 countries. X24 Mexico involved 1300 participants from 42 countries who focused on resolving communication and logistics problems between the United States and Mexico. X24 Mexico demonstrated the value of low cost social media tools through the generation and use of web based dashboard to officials and military officers from both the United States and Mexico. X24 Mexico also allowed a number of high ranking officials and military officers from the United States and Mexico to meet informally to resolve mutual transborder crisis support issues. Finally, X24 Mexico provided logistics managers and planners with a testbed and opportunity to work through multinational crisis response logistics issues.

REFERENCES

1. Howe, A.W., Jennex, M.E., Bressler, G.H., and Frost, E.G., (2011). Exercise 24: Using Social Media for Crisis Response, *International Journal of Information Systems for Crisis Response and Management*, 3(4), pp. 36-54.

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