System Assessment and Validation for Emergency Responders (SAVER)

Innovative Uses of Social Media in Emergency Management

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System Assessment and Validation for Emergency Responders

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FOREWORD

The U.S. Department of Homeland Security (DHS) established the System Assessment and Validation for Emergency Responders (SAVER) Program to assist emergency responders making procurement decisions. Located within the Science and Technology Directorate (S&T) of DHS, the SAVER Program conducts objective assessments and validations on commercial equipment and systems and provides those results along with other relevant equipment information to the emergency response community in an operationally useful form. SAVER provides information on equipment that falls within the categories listed in the DHS Authorized Equipment List (AEL). The SAVER Program mission includes:

- Conducting impartial, practitioner-relevant, operationally oriented assessments and validations of emergency responder equipment; and
- Providing information, in the form of knowledge products, that enables decision-makers and responders to better select, procure, use, and maintain emergency responder equipment.

Information provided by the SAVER Program will be shared nationally with the responder community, providing a life- and cost-saving asset to DHS, as well as to Federal, state, and local responders.

The SAVER Program is supported by a network of Technical Agents who perform assessment and validation activities. Further, SAVER focuses primarily on two main questions for the emergency responder community: "What equipment is available?" and "How does it perform?"

As a SAVER Program Technical Agent, the Space and Naval Warfare Systems Center (SPAWARSYSCEN) Atlantic has been tasked to provide expertise and analysis on key subject areas, including communications, sensors, security, weapon detection, and surveillance, among others. In support of this tasking, SPAWARSYSCEN Atlantic conducted research on innovative uses of social media in emergency management. Social media falls under AEL reference number 04AP-09-ALRT Systems, Public Notification and Warning.

Visit the SAVER section of the Responder Knowledge Base (RKB) website at https://www.rkb.us/saver for more information on the SAVER Program or to view additional reports on social media or other technologies.

POINTS OF CONTACT

SAVER Program
U.S. Department of Homeland Security
Science and Technology Directorate
OTE Stop 0215
245 Murray Lane
Washington, DC 20528-0215

E-mail: saver@hq.dhs.gov
Website: https://www.rkb.us/saver

Space and Naval Warfare Systems Center Atlantic
Advanced Technology and Assessments Branch
P.O. Box 190022
North Charleston, SC 29419-9022

E-mail: ssc_lant_saver_program.fcm@navy.mil

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1. INTRODUCTION

Information sharing between public safety organizations and communities is critical in emergency situations, especially large-scale events such as floods, earthquakes, and hurricanes. In recent years, according to the U.S. Department of Homeland Security (DHS), "Social media and collaborative technologies have become critical components of emergency preparedness, response, and recovery." [1] Through the use of social media, members of the public who witness incidents can provide public safety organizations with timely, geographic-based information. This information can be used by decision-makers in planning response strategies, deploying resources in the field, and, in turn, providing updated and accurate information to the public.

Social media can provide public safety organizations with improved abilities to:

- Engage in ongoing collaborative communications with community members and better prepare them for emergencies; and
- Gather, analyze, and act on real-time emergency information provided directly by social media users within the community.

Established social media networks are in widespread use and allow for the dissemination of data-rich, contextual multimedia including narrative, photos, and videos. Therefore, by incorporating social media into their communications strategies, public safety organizations can leverage the power of these popular information-sharing technologies to enhance their efforts through all phases of an emergency.

The purpose of this report is to provide an overview of current and innovative social media strategies used by public safety organizations to engage interactively with the public during all phases of emergency situations. The information presented here was obtained from an Internet-based literature review and case study interviews conducted on-site and by telephone.

1.1 Literature Review

A literature review was conducted in order to identify source material describing methods for implementing a social media program (Section 3). Literature sources included:

- Industry, government, and sector-specific reports;
- Online publications and journals; and
- Academic and conference white papers.

The literature on the use of social media presents the following recurring concepts:

- Social media can play a significant role during emergencies;
- Agencies should proactively engage with community members before, during, and after an emergency; and
- Agencies should adopt the use of social media in combination with mobile technology such as smartphones to distribute information quickly.

[1] DHS, Science and Technology Directorate, "Social Media Strategy," First Responder Communities of Practice Program and Virtual Social Media Working Group, January 18, 2012.

1.2 Case Study Criteria and Selection

The information collected from the literature review provided a foundation for the case studies described in Section 4. The case study organizations demonstrated innovative uses of social media and met a number of predefined criteria, which established that they:

- Do not suppress social media sites on internal networks;
- Actively use various social media accounts;
- Use social media to distribute alerts, warnings, and updates;
- Use mobile technology to collect and send information to the public;
- Actively respond to social media content from the public; and
- Use information from social media for situational awareness and to influence decision-making during incidents.

The case studies were generated from literature reviews, site visits and telephonic interviews. The featured organizations include Federal, state, and local government agencies and non-profit organizations.

2. SOCIAL MEDIA OVERVIEW

Social media offers varying capabilities and levels of interactivity. This section provides an overview of social media and is designed to enhance the reader's understanding of the information presented in subsequent sections. Although a comprehensive list of tools and platforms is beyond the scope of this report, the most prevalent categories of these technologies are described below. Additionally, Appendix A contains an alphabetized list of these tools and platforms, including trademark information and vendor details.

Social Networks–Social networks are web platforms that allow users to create an account, establish a profile, and interact with other members. Most social networks permit users to manage their privacy and preferences for sharing content and personal information.

Examples of social networks include Facebook, Google+™, LinkedIn, MySpace, and Twitter.

Media-Sharing Networks–Media-sharing networks provide users the ability to upload photos, videos, or slide presentations and share them in a public forum. Within emergency management, media-sharing networks allow community members to post geographically identified (i.e., geotagged) photos and videos captured on smartphones. This content can then be used to create crisis maps, which display social media content by location.

Examples of media-sharing networks include Flickr™, Instagram, Picasa, Pinterest, SlideShare, and YouTube.

Community Forums–Community forums are online discussion sites that give users the ability to create content, comment on posts by other users, and upload and share files. Within emergency management, they can also serve as a valuable source of information and resources following a disaster. Organizations interested in building and hosting a community forum can use tools and services offered by third-party providers such as IdeaScale and Ning.

Examples of emergency management community forums include Country Fire Authority (CFA), Federal Emergency Management Agency's (FEMA's) National Preparedness Community, Firefighter Nation, First Responders Communities of Practice, and GovLoop.

Blogs–Blogs are a chronological online diary that allow visitors to post responses to a discussion thread on a particular topic. Blogs can support in-depth interactive discussions better than a microblog such as Twitter that limits message length; however, they require creative content to entice the public to participate in the information-sharing process.

Examples of blogging platforms include Blogger™ and WordPress.

Feed Readers–Feed readers are internet browsers or websites, which can be used to subscribe to favorite websites through the use of really simple syndication (RSS) feeds. The desired content is automatically aggregated into one application for easy viewing.

Examples of feed readers include Feedburner™, IceRocket, My Yahoo!, NewsGator®, and Reddit.

Mashups–Mashup technologies display overlays—or a mashing together—of two or more data sets. Within emergency management, mashups are commonly used to map different types of incident-related data (e.g., the location of shelters, evacuation routes, and water mains), generate crisis maps, and improve situational awareness during a disaster. Mashups can also allow citizens to contribute to a response effort by posting photos, videos, or comments on road closures, damages, etc.

Mashup examples include Crisis Map, Esri™, Google Maps, and Ushahidi.

Wikis–Wikis are collaboration websites that allow members to add, remove, and edit content. The Hawaiian term wiki means "fast," and people often use wikis to build knowledge collaboratively on a particular topic and share it with others. Wikis have been set up during disasters such as the 2007 California wildfires and the 2011 Joplin, Missouri, tornado, with community members contributing text, photos, and videos to help others seeking information.

Examples of wikis include Wikipedia® and Intellipedia.

Social Media Management Tools–Social media management tools allow users to monitor and manage their social media networks as well as generate metrics for determining their reach and effectiveness. Some applications are free and may offer upgrades to professional-level services, while others require a licensing fee or paid subscription.

Examples of social media management tools include Crowdbooster, Facebook Insights, Geofeedia, Google Analytics™, HootSuite, Radian6, TweetDeck, and Twitalyzer.

Short Message Service (SMS)–SMS is a communications protocol used for sending text messages on cell phones and other mobile devices. Many public safety organizations allow users to sign up to receive alert messages, which can be especially valuable during an emergency if an agency's existing phone service cannot support the volume of incoming calls from the public. The effectiveness of SMS messaging can be limited because it may rely on community members opting into the service and is generally used by public safety organizations for distributing messages, not sharing information.

3. SOCIAL MEDIA IMPLEMENTATION

Many sources examined during the literature review highlight organizational and industry methods applied to successfully implement a comprehensive social media program. Table 3-1 contains the most commonly mentioned methods.

Table 3-1. Social Media Implementation Methods

Method	Description
Develop a Strategic Plan	• Identify the target audience, objectives, tactics, and staffing requirements including roles and responsibilities • Create a governance structure for approvals • Identify desired social media channels and processes
Establish and Adopt Policies	• Develop overarching documents that provide guidance to emergency managers for the effective use of social media • Implement policies that help foster leadership support and sustainable strategies
Establish a Social Media Presence	• Establish accounts on popular social media platforms and become familiar with the online culture by sustaining an active presence • Establish a complementary mix of social media • Engage with the community in advance through social media and recommend standard hashtags[2]
Manage Expectations	• Engage early and often with the public to help set realistic expectations during emergencies • Disclose the source, type, and frequency of official emergency communications
Establish a Concept of Operations	• Determine how social media will be managed during emergencies • Establish training and staffing plans to allocate more resources to social media monitoring during an incident • Incorporate social media strategies into emergency management exercises
Distribute Timely and Frequent Updates	• Pre-engage the public to increase visibility and credibility by posting regular updates during all phases of emergencies and during times of non-emergencies
Coordinate with Partnering Organizations	• Partner with other organizations to coordinate consistent key messages • Set up a central online source for emergency-related information from a variety of official sources • Coordinate social media efforts regionally
Actively Monitor Social Media Content	• Monitor conversations on popular social networks • Engage with community members by responding to questions and comments and providing clarification

[2] A hashtag, beginning with the pound sign, is a form of metadata tag used in short messages on microblogging social networking services such as Twitter, and allows grouping of social media messages by topic.

Method	Description
Evaluate Public Information	• Monitor social media channels to assess the manner in which official messages are being received • Quickly correct any misperceptions or inaccurate rumors • Use social media management tools to track, analyze, and document messages
Utilize Maps to Increase Visual Context	• Use mashups and location services such as crisis maps to provide visual and spatial viewing of social media content • Include layered map data such as evacuation zones and shelter locations • Allow community members to submit damage reports containing photos, videos, and eyewitness accounts relating to the emergency response
Engage with Digital Volunteer Organizations and Virtual Operations Support Teams (VOST)	• Enlist digital volunteer communities to help satisfy demand for information when in-house resources are taxed • Use a VOST to monitor sites, spot trends, and seek and disseminate information
Improve Community Awareness	• Engage in community discussions and follow relevant hashtags in order to build and maintain better awareness for the Whole Community[3] • Include collaborative dialogue about hardships, consequences, and developing safety concerns
Plan for Loss of Connectivity	• Ensure the network infrastructure is robust and able to handle peak demands during disasters • Establish a contingency plan that can mitigate loss of power and connectivity
Engage with Community Members After an Incident	• Seek feedback from community members to help assess the usefulness and frequency of information shared through social media

4. CASE STUDIES OF INNOVATIVE USES OF SOCIAL MEDIA

The case studies described in this section highlight ways in which government organizations, news outlets, charity organizations, and community members found innovative ways to collaborate and share information through social media. The literature review conducted for this document revealed a number of organizations that used social media heavily during recent natural disasters. Organizations or regions highlighted include:

- City of New Orleans, during Hurricane Isaac 2012;
- Country Fire Authority (CFA) in Victoria, Australia, during the 2009 bushfires;
- Agencies supporting Port-au-Prince, Haiti, during the 2010 earthquake;

[3] FEMA states "The 'Whole Community' includes FEMA and our partners at the Federal level; our state, local, tribal and territorial governmental partners; non-governmental organizations such as faith-based, volunteer and non-profit groups, the private sector and industry; and most importantly, individuals, families, and communities, who continue to be our greatest assets and the key to our success."

- Agencies supporting Christchurch, New Zealand, during the 2011 earthquake;
- Agencies in northern Virginia, during the 2011 earthquake; and
- Queensland Police Service in Victoria, Australia, during the 2010-2011 flooding.

Additionally, several organizations or regions were selected for site visits with special focus on their individual or collaborative regional approaches to social media use in emergency management. These case studies are intended to highlight innovative practices and solutions to common challenges. The case study participants listed below have different missions, resource levels, and collaborative environments. On-site visits were conducted with one or more representatives from each organization.

- State of Colorado (including partnering local, regional, and Federal agencies);
- Fairfax County, Virginia; and
- American Red Cross.

4.1 City of New Orleans, Hurricane Isaac 2012

Innovative Use of Social Media: Extensive Social Media Monitoring and Collaboration

Government agencies actively monitored social media websites and used collaborative communications during Hurricane Isaac, which impacted the Gulf Coast and New Orleans in August 2012. Early on, reports indicated that Florida would be in the storm's path during the same week as the scheduled Republican National Convention. During that time, the hashtag Isaac (#Isaac) was used extensively by government agencies, non-governmental organizations, the public, and the news media to share information on social media networks. As the storm changed its path and headed toward New Orleans, official organizations such as the National Hurricane Center, the National Weather Service, FEMA, and the City of New Orleans used #Isaac and #NOLA consistently on social media networks to clarify alerts and warnings. The willingness of these organizations to use social media tools such as Twitter, YouTube, Facebook, and Flickr demonstrated increased use of social media in emergency management and contributed to the formulation of response efforts.

Social media used during Hurricane Isaac included the following:

- Local and state emergency preparedness offices provided information about their social media accounts and websites to local news outlets so that community members could get up-to-date information on closures, transit changes, flooding, damages, etc.
- The New Orleans mayor's Twitter account was used to respond directly to community members' Twitter messages and to correct misinformation.
- Community members posted eyewitness videos and photos of damages and reported utility outages, flooding locations, and road closures. FEMA and the City of New Orleans used this information to plan their response efforts.
- News outlets encouraged the public to send information on Twitter about damages using specific hashtags and then combined the messages for others to see. This was a coordinated and powerful method of distributing information throughout the community.

- The City of New Orleans used its Twitter account, @NOLAready, to respond directly to inquiries from the public.

4.2 Country Fire Authority in Victoria, Australia, 2009 Bushfires

Innovative Use of Social Media: Interactive Multimedia Website

The 2009 bushfires in Victoria, Australia, revealed a critical need to manage information flow between emergency management agencies and the community in a more dynamic manner. CFA, which provides firefighting and other emergency services to rural areas and regional townships in the state of Victoria, Australia, did extensive work to update their emergency communications strategies as a result of the bushfires. Currently, CFA uses a variety of social media platforms such as Facebook and Twitter, but also encourages the public to engage and upload content to its CFA News & Media website. The website provides news, multimedia content, and a community discussion board called the CFA Forum, which is shown in Figure 4-1.

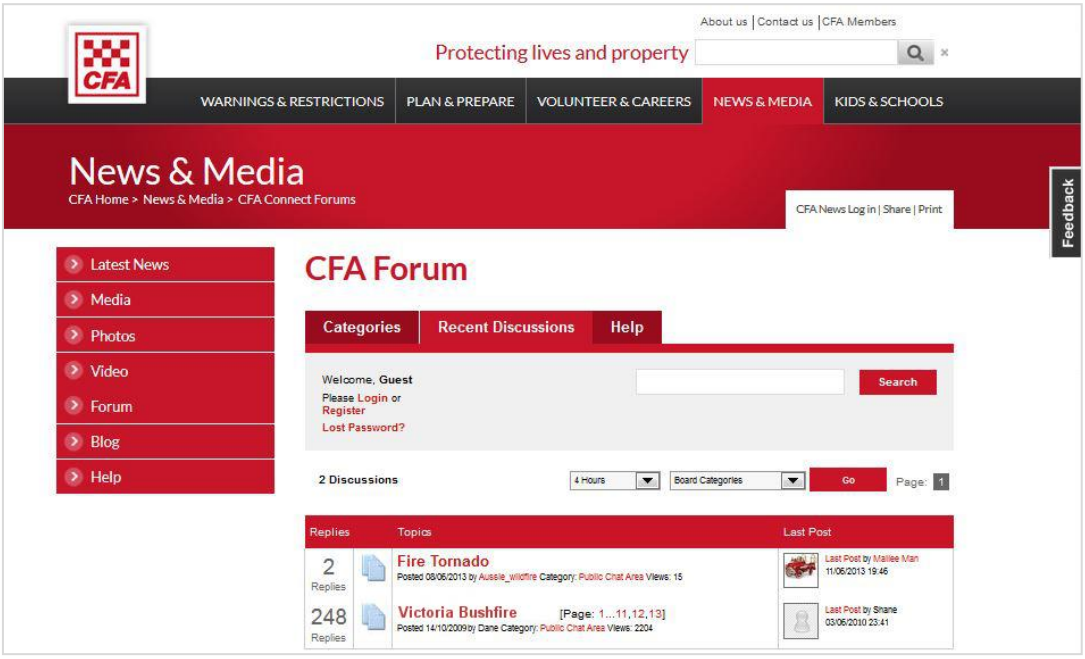

Figure 4-1. CFA News & Media Screenshot

Courtesy of Country Fire Authority

CFA greatly improved its ability to share timely information with the public through its website, which has become the cornerstone of the organization's engagement strategy.
CFA News & Media is an interactive website that combines official and unofficial information related to fires and allows the public to post photos, videos, and discussion board comments.

CFA's guiding principle for online communication is to engage with the public using a collaborative approach to sharing important information. CFA uses Twitter as its primary distribution mechanism during active emergencies and encourages the public to access CFA News & Media for more detailed information and opportunities to engage in collaborative communication. Facebook is used to sustain more detailed dialogue during emergencies. CFA has a robust social media policy and a manual that outlines specific staffing levels as well as defined roles and responsibilities for key social media staff members.

4.3 Port-au-Prince, Haiti, 2010 Earthquake

Innovative Use of Social Media: Crisis Mapping

Emergency personnel engaged in response efforts following the earthquake in Port-au-Prince, Haiti, in 2010 benefited from the implementation of a new collaborative technology known as crisis mapping. After the Haiti earthquake, hundreds of volunteers around the world, dubbed in the media as "digital humanitarians," mobilized to provide technical assistance in the creation of a crisis map. As part of the effort, the volunteers first completed the digital mapping of the country using satellite imagery. An open source interactive mapping solution called Ushahidi Platform was then used to map geotagged Twitter messages and other mappable content from hundreds of other online sources. As shown in Figure 4-2, the numbers on the crisis map represent the number of content items (i.e., Twitter and Facebook posts and photos) within the area. The map allows users to zoom into an area and read the associated content. This tool provided valuable information for the response and recovery efforts by organizations such as the U.S. Coast Guard, the American Red Cross, and the U.S. Marine Corps.

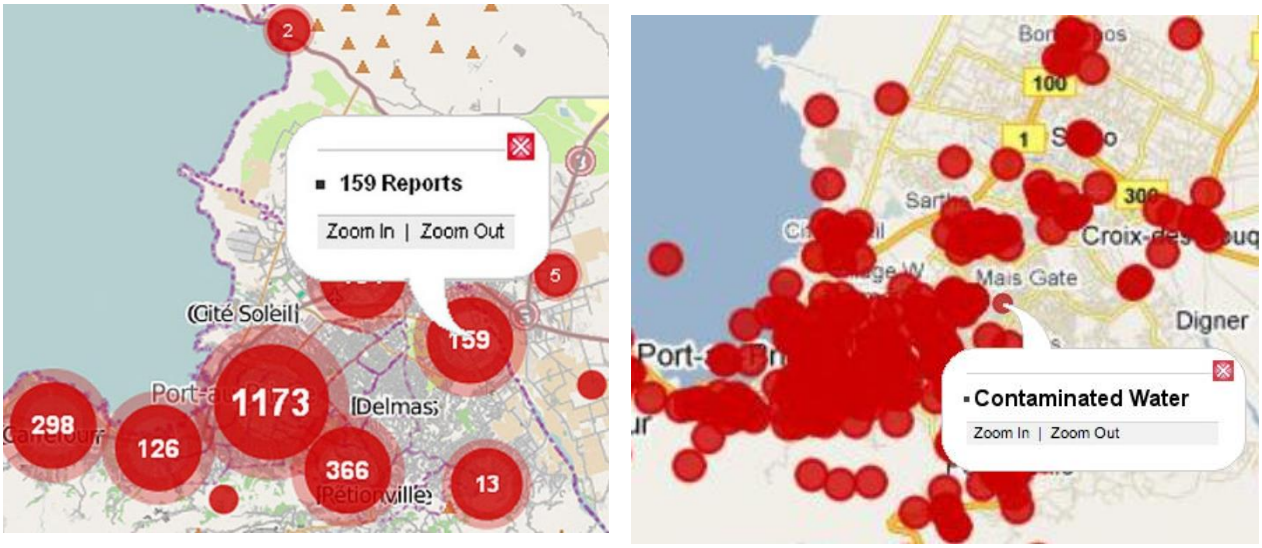

Figure 4-2. Haiti Earthquake Crisis Maps

Courtesy of Ushahidi, Inc.

Another successful venture during the Haiti crisis, the American Red Cross' charity text message campaign, took advantage of smartphone and SMS messaging technology. The campaign raised more than $22 million for Haiti relief within only a few days of the earthquake, thereby demonstrating the power of mobile technology. The charity's previous record for a text-based campaign was $400,000.

4.4 Christchurch, New Zealand, 2011 Earthquake

Innovative Use of Social Media: Crisis Mapping

Community members, official organizations, and volunteers used social media extensively to organize efforts and share information in the aftermath of the earthquake centered in Christchurch, New Zealand. A crisis map, again based on the Ushahidi Platform, was established to aggregate and visually display actionable social media content and official

information. Figure 4-3 shows the Christchurch Recovery Map website with information aggregated from geotagged e-mails, messages, and a locally hosted web forum. Other uses of social media during this crisis included the following:

- A Google Person Finder website was established to collect and share information about missing persons. Within several days of the crisis, the website was tracking thousands of records.
- Government agencies successfully used Twitter to distribute critical information and updates to the public.
- A group of volunteers from the University of Canterbury, totaling an estimated 10,000, organized volunteer efforts through the use of a dedicated Facebook page to meet many of the community's humanitarian aid needs.

Figure 4-3. Christchurch Recovery Map

Courtesy of Ushahidi, Inc.

4.5 Northern Virginia, 2011 Earthquake

Innovative Use of Social Media: Text-Based Alerts and Warnings

Text-based alerts and warnings were used in the northern Virginia area during the 2011 earthquake. This technology provided an additional channel of communication between government agencies and community members and enhanced the responsiveness of emergency management organizations.

In August of 2011, the East Coast experienced a 5.8-magnitude earthquake, which impacted regions from North Carolina to Quebec, Canada. The event reinforced the important role of the collaborative use of social media during emergencies. Twitter reported that within a few minutes of the earthquake, over 5,000 earthquake-related Twitter messages were being sent per second. Government agencies such as DHS, FEMA, and the Virginia Department of Emergency Management urged community members to use social media channels to obtain official information and contact family and friends when cellular networks became inundated with traffic. Additionally, within the week, Fairfax County implemented the Community Emergency Alert Network, which generates important emergency alerts, notifications, and updates during a major crisis or emergency while also encouraging the public to submit reports and comments. With this network, e-mail messages are delivered to any registered e-mail account and text messages are sent to registered devices including cell phones, pagers, and tablets.

4.6 Queensland Police Service, Victoria, Australia, 2010-2011 Flooding

Innovative Use of Social Media: Text-Based Alerts and Warnings

Between September 2010 and February 2011, the State of Victoria in Australia experienced extensive flooding. The Queensland Police Service was complimented in various literature sources on the Internet for its comprehensive and innovative use of social media, which featured the transmission of alerts and warnings through social media outlets as well as traditional channels such as a telephone-based warning system and radio broadcasts. For example, the public's receipt of alerts and warnings on the department's Facebook page was demonstrated by over 39 million "post impressions," (i.e., the number of times each message was seen on Facebook). This equates to 450 views per second over one peak 24-hour period during the flooding. The Queensland Police Service actively used Twitter to share the same up-to-the-minute information with community members that was posted on their official website. The Queensland Police Service also used social media to correct and clarify its messages as new information was received.

In addition to the proactive approaches the Queensland Police Service used during the incident, an interactive crisis map was launched in January 2011. Categories of content such as evacuations, hazards, road closures, property damage, and electricity outages were displayed as layers of data on a map for customized viewing by the community. Posted photos and videos documented the type of damages and recovery efforts taking place in particular neighborhoods.

A report on the response to the 2010-2011 floods, available on the website of the Department of Environment and Primary Industries, lauded the use of social media as a key strategy for alerts and warnings and other communications. The report recommended that the state take the following actions:

- Develop and implement a single web portal as a means of providing emergency information to communities and local government on an all-hazards basis;
- Review its Memoranda of Understanding with official emergency broadcasters to consider increased use of Internet-based capabilities including social media and the ability to broadcast community meetings;
- Actively pursue the use of social media as part of its emergency warning and public information system; and

- Conduct further trials to explore the opportunity for greater use of social media as a credible source of information exchange with the public during an emergency.

The Australian government also funded independent social media research after the floods to evaluate the role social media played in the incident. The research results were incorporated into a YouTube video, which demonstrated the community's use of social media in spreading accurate and helpful alert messages.

4.7 Colorado On-Site Visits

An on-site visit was conducted in Colorado to facilitate discussion in which several organizations participated and provided feedback. Discussions were commonly related to regional management of wildfires during the summer of 2012, although all types of incidents were discussed, including the mass shooting at a movie theater. These events generated large volumes of social media content. Community members sought emerging information and shared their thoughts and concerns, while emergency management agencies used social media channels extensively to keep people informed.

The following are included in this case study and discussed in detail in the sections below:

- Colorado Division of Homeland Security and Emergency Management;
- Jefferson County Sheriff's Office; and
- Colorado National Guard.

4.7.1 Colorado Division of Homeland Security and Emergency Management

The Colorado Division of Homeland Security and Emergency Management serves as the state's emergency management agency. The division is comprised of three offices: Office of Emergency Management; Office of Preparedness; and Office of Prevention and Security.

Social Media Overview

The Colorado Division of Homeland Security and Emergency Management website consolidates all emergency-related information. The website includes links to the division's official social media accounts and provides access to a Google-based map that displays the current status of Colorado fires. The division uses a web feed management provider called FeedBurner to enable RSS feeds providing content. Visitors can easily subscribe to new content on readers available on services such as My Yahoo!, NewsGator, and Google+. The emergency management arm of this division also operates the Emergency Blog with options for visitors to post comments and easily share the content within their own social networks using share buttons and e-mail. Content on the blog includes incident updates, community member concerns, the division's outreach materials, and information from partnering agencies such as the Colorado Department of Public Health and Environment. The agency also offers an opt-in service for community members to receive alerts and updates through SMS or e-mail.

Social Media Presence

The Colorado Division of Homeland Security and Emergency Management maintains dedicated social media accounts on Twitter, Facebook, YouTube, and Flickr for its emergency management functions and amplifies emergency content through Colorado's other official social media accounts. These social media tools are listed below.

- **Emergency Blog**–Used for news stories, videos, photos, podcasts, and updates; also allows comments and postings from the public. The link is located on the division website and the blog is powered by Blogger.
- **Twitter**–Used to follow partnering agencies and organizations to gain situational awareness and to assist with message dissemination by resending Twitter messages and sharing relevant information from trusted (i.e., official) sources.
- **Facebook**–Used to provide updates, collect and respond to questions, and direct people to the division website as the primary online source for official information.
- **YouTube**–Used to share videos of division activities and emergency response. Allows comments from the public.
- **Flickr**–Used to share photos of division activities and emergency response.
- **Paper.li**–Used to automatically create the COEmergency website which displays top news stories related to homeland security and emergency management and shares them on Twitter.

In addition to conducting media interviews with local and national news agencies, the Colorado Division of Homeland Security and Emergency Management used various outreach mechanisms during the peak of the 2012 wildfires. These outreach mechanisms and recorded metrics are listed in Table 4-1.

Table 4-1. Outreach Metrics

Metric	Outreach Mechanism
29,396	COEmergency.com page views
8,858	Views of current Colorado map
11,300	Followers on Twitter
197,403	Total reach on Facebook
3,172	Direct fan reach on Facebook

4.7.2 Jefferson County Sheriff's Office

The Jefferson County Sheriff's Office was included in the on-site visit in Colorado. The Sheriff's office oversees the county's Emergency Management Office. The Sheriff's office works closely with municipalities within the county and was actively involved in the response to the Lower North Fork and Sawmill fires.

Social Media Overview

The Jefferson County Sheriff's Office participated on an incident management team assigned to the Lower North Fork fire in March 2012 and developed a public outreach strategy, which relied

heavily on social media in support of traditional communications methods. The strategy was considered a success due to a high level of community and media support. The Jefferson County Sheriff's Office emergency blog, which consolidates all emergency information in Jefferson County, was visited over 450,000 times during the fires. Twitter and an interactive Google map were key components of the strategy.

Social Media Presence

As part of its comprehensive social media strategy, the Jefferson County Sheriff's Office used a wide variety of social media platforms to share information with the public and provide timely access to critical, potentially life-saving information during the fires. The Sheriff's office also used a number of social media management tools to evaluate the effectiveness and reach of their efforts. These platforms and tools are described below.[4]

- **Blog**–The emergency blog was the central hub of the social media strategy. The blog was used to chronicle ongoing updates in a simple format, enabling Public Information Officers working on the disaster to release information quickly. A photo slideshow was showcased on the blog providing valuable images of the fire and response efforts. More than 100 posts about the incident were published on the blog.
- **Google Applications**–The Sheriff's Office used several applications on the Google platform for information sharing including Blogger (for the emergency blog), Google Maps, Google Docs, and Picasa. Twenty-three documents were shared on Google Docs and an interactive Google Map showing the Lower North Fork wildfire reached 2,716,279 views.
- **Twitter**–The Sheriff's Office used its Twitter account extensively during the fires. The platform directed community members to the emergency blog. During the Lower North Fork fire, more than 450 Twitter messages were sent through @jeffcosheriffco. Many of those messages were resent, with the most important receiving anywhere from 20,000 to 80,000 post impressions.
- **Social Media Management Tools**–The statistics quoted in the referenced strategy report are possible because the Sheriff's office used social media management tools to assist with tracking the volume of activity and streamlining the posting process. The tools used included Crowdbooster, HooteSuite, and TweetDeck.
- **Local Online Communities**–Other online communities rallied support and helped highlight messages originating from efforts of the Jefferson County Sheriff's Office. Many people throughout the nation tuned in to the incident. One popular mechanism was the Social Media and Emergency Management (#SMEM) Twitter community, which revealed positive feedback for the strategy. In addition, the Jefferson County Sheriff's Office used a blog post to manage community members' expectations for information dissemination as the incident began to wind down.

[4] The statistics obtained from these analytical tools are taken from the Jefferson County Sheriff's Office's *Integrated Social Media and Public Information Outreach Strategy* report, which is available on the Jefferson County Sheriff's Office emergency blog.

4.7.3 Colorado National Guard

Colorado National Guard was the third organization included in the on-site visit in Colorado. The Colorado National Guard serves as the State of Colorado's first military responders during state emergencies as directed by the governor.

Social Media Overview

National Guard resources from four states provided relief assistance during the 2012 Colorado wildfires. Organized under the Department of Defense, the National Guard follows the structured social media strategies of the Army.[5] These strategies are implemented by the Colorado National Guard's Public Affairs Office and coordinated with the Colorado Office of the Governor. The Colorado National Guard has its own website and regularly posts news releases. The website also includes links to the Colorado National Guard's official social media accounts.

Social Media Presence

The Colorado National Guard maintains social media accounts on Facebook, Flickr, Twitter, and YouTube. They have developed a synergy between their social media websites and often link photos and videos to their Facebook and Twitter feeds.

- **Facebook**–The Colorado National Guard posted to Facebook several times per day during the wildfires to keep the community apprised of their missions.
- **Flickr**–More than 200 photos of the High Park fire were uploaded to the Colorado National Guard's Flickr account, providing compelling images of the fire and demonstrating the resources being used in the field. This content helped reassure the public that an effort was being made to protect their lives and personal property.
- **Twitter**–The number of actionable Twitter messages sent out during the wildfires increased dramatically, demonstrating the power of collaborative communication in the formulation of an effective response to a large-scale emergency. The Colorado National Guard consistently referenced incident hashtags and the primary @USNationalGuard account.
- **YouTube**–Videos uploaded by the Colorado National Guard provided visual and audio coverage of the support at the High Park fire and subsequent road closures in Larimer County.

4.8 Fairfax County Virginia Office of Emergency Management

The next on-site visit was conducted in Fairfax County, Virginia, a large jurisdiction comprising 395 square miles and a population of approximately 1.1 million. The county is the most populated jurisdiction in Virginia and is part of the Washington, DC, metropolitan area. Fairfax County's Office of Emergency Management is a separate department alongside its fire and police departments.

[5] The United States Army, *The United States Army Social Media Handbook*, Version 3.1, January 2013.

Social Media Overview

In 2007, Fairfax County began experimenting with newer outreach technologies and has since built an active and effective social media presence to complement its comprehensive communications strategy. The Fairfax County Office of Public Affairs maintains social media accounts on Facebook, Twitter, YouTube, Flickr, and SlideShare.

In June 2012, a fast-moving, aggressive thunderstorm system, called a derecho, resulted in downed trees, mass power outages, and boil water advisories. During this incident, Fairfax County used social media as a means to communicate with the public, especially on their mobile devices. Some of the ways in which the county effectively used social media during and after the storm are described below.

Social Media Presence

- **Blog**–Fairfax County uses its Emergency Information Blog to share the organization's alerts, warnings, incident updates, news stories, preparedness information, scheduled events, and newsletters. The blog was used extensively during the June 2012 storm. In the months following the storm, Fairfax County continued to use the blog to post important information. For example, in September 2012, the county posted new preparedness tips on its blog every day for the "30 Ways in 30 Days" campaign and linked back to the blog through its other social media accounts.
- **Flickr**–Flickr is used to display photos of response and preparedness activities within Fairfax County. Some of the uploaded photo albums contain images provided by other agencies such as the Virginia Department of Transportation. A link to the Hurricane Irene album is displayed on the Office of Emergency Management's website. During the derecho, Fairfax County requested that community members upload their damage-related photos to a specific folder on Flickr.
- **Twitter**–Twitter is used to disseminate information quickly and advise community members how to obtain additional information, usually driving them to the Emergency Information Blog. Due to its ability to allow people to resend messages, Twitter was a valuable tool for informing community members about a 9-1-1 outage when phone lines were inundated during the derecho. It was also used to encourage standard hashtags to ensure everyone received consistent and accurate information.
- **Disaster Damage Database**–Following the derecho, Fairfax County launched the online Disaster Damage Database System, a reporting tool for collecting photos, videos, and eyewitness reports of damages due to emergency incidents such as hurricanes, tropical storms, earthquakes, fires, or snow. The tool was built by Fairfax County's Information Technology department and is accessible on their website.
- **National Capital Region Updates**–Fairfax County participates in the information portal called National Capital Region News and Information, which provides a variety of information to community members in Virginia, Maryland, and the District of Columbia. Public Information Officers from participating jurisdictions and organizations collaborate across the region to ensure the website has the most current information available. The portal uses a third party software application called The Public Information Emergency Response (PIER) System, a web-based solution for

crisis communications management that features social media options and geotagging capabilities.

- **Social Media Management Tools**–Fairfax County uses a variety of tools for social media and website management and metrics including Twitalyzer, Google Analytics, and Facebook Insights. These tools help the county measure its influence on Twitter; the effectiveness and attractiveness of the website; and trends relating to user growth, demographics, content creation, and content consumption.
- **SlideShare**–Presentation materials are made available to the public through SlideShare. Fairfax County uploads briefing materials from various departments to its general account. This helps increase openness and transparency with the community.

Other Innovative Uses of Collaborative Technology in Fairfax County

Fairfax County is actively engaged in online practitioner communities to share strategies and tactics and continuously improve its use of new technology. The following are a few examples of innovative initiatives being implemented by Fairfax County.

- **Social Media Summit**–Fairfax County hosted a summit in the Washington, DC, area in July 2012 to engage with partners who are actively using social media. Many of the summit's key discussion points were described in Twitter messages using #NCRsmem and slides of the presentations are available online. Summit topics included community engagement, mobile emergency applications, practical social media uses, and best practices.
- **Incorporating Social Media into Exercises**–Fairfax County participated in an exercise during the week of October 1, 2012, to test the capabilities of social media during a disaster. Other participants included the Commonwealth of Virginia, the National Guard, U.S. Northern Command, the Federal Bureau of Investigation, and FEMA. The exercise used simulated social media platforms and content to demonstrate the important role social media plays during emergencies and emergency operations center decision-making.
- **Member of Virtual Social Media Working Group**–Fairfax County participates in the Virtual Social Media Working Group hosted by DHS's First Responder Communities of Practice. This forum focuses on the ongoing development of social media strategies and tactics.
- **Extensive Training and Resources for Staff**–Fairfax County has developed comprehensive policies, procedures, monthly training sessions, and job aids for those assigned to social media activities.
- **Surveying Community Members About Emergency Information**–Following the derecho, Fairfax County Office of Public Affairs and Office of Emergency Management conducted a survey to evaluate, in part, the devices and tools people used to access information, particularly during the widespread power outages. A few of the statistics collected from the survey are summarized below.
    - 5,795 survey responses were received.

  - 69 percent of respondents lost power. Of those, 37 percent continued to access emergency information.
  - 45 percent of respondents prefer a mobile device to get emergency information versus radio at 17.3 percent, television at 16.8 percent, and desktop computer at 16.1 percent.
- **Geofeedia**–Fairfax County is exploring the potential of Geofeedia. This beta application uses location-based searches to monitor social media and aggregates content from various social media such as Twitter, Instagram, YouTube, and Flickr.

4.9 American Red Cross

The third on-site visit was conducted with The American Red Cross (Red Cross). The Red Cross responds to disasters every day throughout the United States and the world. The Red Cross is not a government agency, but it works closely with government agencies and other organizations to provide response and humanitarian services to disaster survivors.

Social Media Overview

The Red Cross has been at the forefront of implementing social media strategies and has long established accounts with large followings for many years. With accounts on many social media platforms and active training programs conducted for volunteers, the Red Cross continues to advance its capabilities with collaborative technology. In 2010, the Red Cross commissioned a survey on Americans' expectations about social media during emergencies.[6] The survey has been cited throughout the global emergency management community. The Red Cross has also launched a Digital Operations Center, in partnership with Dell, Inc., that drastically changes the way in which they are able to capitalize on social media during disasters.

The Red Cross has a strong culture of trust in its volunteers and the community and encourages collaborative communication through social media in order to carry out its humanitarian mission. The organization has strong policies and procedures for the use of social media as a communications tool, as evidenced by documents published on the Internet such as the *Social Media Handbook* and *Online Communications Guidelines*. The Red Cross' belief that social media is having a substantial impact on disaster communications leads them to seek continuous improvements in this area.

Social Media Presence

The Red Cross' many chapters manage their own social media accounts; however, this section of the document focuses on the Red Cross' national accounts and strategies. The following are some highlights:

- **Blog**–The Red Cross blog covers many topics related to the organization and its mission. During active disasters, the blog is the primary tool for sharing disaster-related information. The blog allows for social media sharing and cross-promotes Facebook pages and Twitter accounts used as information sources for each disaster. The blog's main page contains a disaster news portal and Twitter streams based on accounts, keywords, or hashtags.

[6] American Red Cross, "Social Media in Disasters and Emergencies," July 10, 2012.

- **Facebook**–The Red Cross' Facebook page, which has more than 450,000 followers (i.e., "likes"), serves as a community forum for providing information, sharing and discussing current issues, and learning how to take action and donate funds. Links to other organizations' content are often shared on Facebook, and it is common for posts to accumulate a large volume of comments.
- **Flickr**–The Red Cross' extensive volunteer network operating in many locations provides a substantial database of photos of impacted communities and relief efforts.
- **Pinterest**–The Red Cross uses Pinterest to give visitors the ability to pin Red Cross-related images to their own pinboards and share information through social media platforms.
- **Hurricane Application**–The Red Cross launched a mobile hurricane application for iOS and Android platforms in August 2012. The application provides information on citizen safety and weather conditions and the ability to notify family and friends of status on Facebook, Twitter, e-mail, and text.

Digital Operations Center and Social Media Management

The Digital Operations Center is located in the Red Cross Disaster Operations Center in Washington, DC. The Digital Operations Center uses Salesforce Marketing Cloud's Radian6 software to aggregate and visualize information exchanged through social media channels during emergency incidents. The application allows personnel to group, track, and analyze social media content topics based on keywords such as "first aid," "damage reports," and "shelter."

Radian6's visualization capabilities provide a graphical interface to monitor the frequency and volume of each topic. Other features include a heat map, a conversation dashboard, and an engagement console for volunteers to communicate directly with the public. The Red Cross also uses the system to search social media conversations in order to find actionable information and gauge the effectiveness of its efforts during disasters.

5. SUMMARY

The use of social media has increased dramatically in the emergency management community in recent years, especially during emergencies and disasters. Social media tools are an effective means to disseminate information quickly and to a broad audience. These tools can be used by government and humanitarian agencies to help formulate preparedness, response, and recovery efforts by sending alerts and warnings and other communications to the public while also monitoring public interaction.

This report provides samples of emergency management organizations' implementation of social media, operational uses of social media during recent disasters in the United States and abroad, and innovative social media strategies used to engage interactively with the public through all phases of emergency situations. A summary of innovative approaches identified in this report include:

- Establishing a complementary mix of social media tools that work well together and do not overwhelm resources to sustain (Colorado Division of Homeland Security and Emergency Management, Fairfax County, and Red Cross);

- Engaging with the community in advance using social media and influencing hashtags to improve the interface with digital communities (Colorado Division of Homeland Security and Emergency Management and Fairfax County);
- Incorporating social media strategies into exercises to test and evaluate capabilities (Fairfax County);
- Developing and sharing interactive crisis maps with communities (Jefferson County Sheriff's Office, Country Fire Authority, Port-au-Prince, Haiti, and Christchurch);
- Using social media management tools to track, analyze, and document messages (Jefferson County Sheriff's Office and Red Cross);
- Gauging community responses to use of social media and tailoring practices accordingly (Country Fire Authority, Colorado Division of Homeland Security and Emergency Management, Fairfax County, and Red Cross);
- Empowering the public to submit damage reports containing photos, videos and eyewitness accounts directly to emergency management agencies (Country Fire Authority and Fairfax County);
- Leveraging the power of dynamic images to improve message interest (Country Fire Authority, Port-au-Prince, Haiti, Colorado National Guard, and Red Cross);
- Coordinating social media efforts regionally (Country Fire Authority, Colorado Agencies, Fairfax County, and Red Cross); and
- Influencing and testing new technology (Queensland Police Service, Fairfax County, and Red Cross).

The most effective practices involve a mix of social media tools, strategies, staffing, and support from the organization's leadership. Keeping apprised of new technologies, learning from other organizations' experiences, and periodically testing different strategies will improve the potential for success.

APPENDIX A. PRODUCT INFORMATION

Tool/Product	Vendor	Description
Blogger™	Google, Inc.	A blog publishing service
Crisis Map	Google, Inc.	A tool to create crisis maps providing disaster-related information
Crowdbooster	Conversely, Inc.	A social media marketing analytics and optimization tool
Esri™	Environmental Systems Research Institute, Inc.	Geographic information system mapping software
Facebook	Facebook, Inc.	An online social networking service
Facebook Insights	Facebook, Inc.	A utility that provides analytics capability for Facebook accounts
Feedburner™	Google, Inc.	A management tool to set up web feed through a rich site summary
Flickr™	Yahoo!	An image and video hosting website
Geofeedia	Geofeedia, Inc.	A location-based social media monitoring tool
Google+™	Google, Inc.	A social service network
Google Analytics™	Google, Inc.	A web analytics service
Google Docs	Google, Inc.	An online application to create and share documents from any computer
Google Maps	Google, Inc.	A web mapping service application
Google Person Finder	Google, Inc.	A website that helps people reconnect with friends and loved ones after a disaster
HootSuite	HootSuite Media, Inc.	A social media management system
IceRocket	Meltwater Group	An Internet search engine specializing in real-time search
IdeaScale	IdeaScale	Idea-management and suggestion box software
Instagram	Instagram, LLC	A social network with photo- and video-sharing capability
Intellipedia	Office of the Director of National Intelligence, Intelligence Community Enterprise Services	An online system for collaborative data sharing used by the U.S. Intelligence Community
LinkedIn®	LinkedIn Corporation	A social networking website for professionals
MySpace	Specific Media, LLC	A social networking service
My Yahoo!	Yahoo!, Inc	A tool for customizing web feeds onto a personal homepage
NewsGator®	Newsgator® Technologies, Inc.	A feed reader that runs in Microsoft® Outlook

Tool/Product	Vendor	Description
Picasa	Google, Inc.	Photo organizing software
PIER System	PIER Systems, Inc.	An on-demand, web-based communications software
Pinterest	Cold Brew Labs	A pinboard-style photo-sharing website
Radian6	Salesforce Marketing Cloud	A social media monitoring tool
Reddit	Reddit, Inc.	A social news and entertainment website
SlideShare	LinkedIn Corporation	A slide hosting service
TweetDeck	Twitter, Inc.	A social media dashboard application for management of Twitter accounts
Twitalyzer	Twitalyzer	A Twitter analytics tool
Twitter	Twitter, Inc.	An online social networking and microblogging service
Ushahidi Platform	Ushahidi, Inc.	An open source platform for crowdsourced crisis mapping
Wikipedia®	The Wikipedia Foundation	An online collaborative encyclopedia
WordPress	WordPress.org	A blog publishing application
YouTube™	Google, Inc.	A video-sharing website