

# **Communication Transformed: Social Media and Disaster Communication in the Modern Age**

---

**Kyle Clayton**

*Emergency Management and Homeland Security Program, Florida State University, USA*

**Kristin Samulkewitsch**

*Emergency Management and Homeland Security Program, Florida State University, USA*

## **Keywords**

Web2.0, Social Media Integration, Crowdsourcing, Open Source Technologies, Volunteered Geographic Information, Geographic Information Systems, Emergency Management

## **Abstract**

Crisis communication is immeasurably important to a community during a disaster. The ability to communicate both to responders and the public is critical for emergency management agencies. In recent years, the rapid growth of social media has spawned a new generation of open source, multilateral platforms that have changed the way people communicate. Advancements in media technology now allow individuals to connect wirelessly to the internet, take videos and pictures, view and create maps, and share information nearly instantaneously. During disasters the ability to communicate is essential for maintaining situational awareness. Traditionally, the public was primarily a consumer of information, but these advancements have amplified the ability of the public to gather and relay information.

This report examines the benefits and limitations of social media integration into the broader crisis communication process, relying on case analyses and research. Results indicate that the field of emergency management is apprehensive to pursue the integration of social media dissuaded by the presence of pre-existing processes, as well as negative connotation accompanying social media.

Data collected shows potential advantages of social media integration, and challenges the negative stigma of the burgeoning technology. This report presents three policy options for the integration of social media into disaster communication. The policy outcomes are termed Proactive Integration, Reactive Integration, and Inactive Integration. Each option is evaluated against three criteria: Ease of Implementation, Economic Feasibility, and Benefits to Pre-existing Crisis Communication Processes.

## **Introduction**

Mobile web-based technology is rapidly changing the communication landscape of emergency management. Technological determinism, a reductionist theory that predicates a society's technology drives the development of its social organization and cultural values, has initiated the spawn of using social media in emergency management notification systems. The use of analog assessment methods have

produced accurate evaluations, but with the communicative potential of real-time hyper-connectivity, analog assessment methods are quickly becoming antiquated. State sponsored assessment teams are no longer the only entities gathering data during or after an incident. The individual has the capability to both gather and disseminate data in near real-time. As the public realizes the potential of their capabilities, their role in a disaster will evolve from a consumer to a producer of information.

Mobile technology enables the public to contribute to disaster management. With information readily available through other mediums, authoritative data delivered through traditional methods will fall on deaf ears. In order to continue playing the role of a reliable information provider, administrations must harness the capabilities of social media and adapt for the coming age of hyper-connectivity.

## **Thesis**

To better incorporate the eyes and ears of the public, governmental authorities have begun to perform conscious social media monitoring during natural disasters, often to great benefit. The City of New Orleans has successfully implemented an active social media campaign to both gather information from the public and relay additional information back to them. The performance of NOLA Ready, the active social media profile used by the city of New Orleans as observed by the Florida State University VOST, is the premier example of how local or state government can tap the communicative potential of the public. By implementing NOLA Ready the city of New Orleans created channels of communication between the public and the city that had been previously non-existent, allowing valuable information to flow freely and in real-time. By following the example of New Orleans and realizing the potential of Web 2.0 technologies, governments can begin to identify online volunteers and the public as valuable assets and resources, improving communicative capabilities and increasing the effectiveness of emergency response.

## **Sources of information**

When the speed of information delivery becomes paramount, as is often the case during a disaster, established platforms and methods used to communicate to the public (such as television, radio, and cellular communication) begin to waver. Although some of these platforms enable increased delivery speed, they are not without insufficiencies. Filtration from various stakeholders and vendors often leads to dilution of messages. “This type of message adjustment can be positive or negative, but inherently happens for a variety of reasons ranging from media bias due to time (or space) limitations based on the format utilization for distribution” (Crowe, 2010). When the message being communicated is relevant to the protection of the general population, we cannot afford to hamper or dilute messages based solely on the conditions of consumerism or media limitations.

Equally important as speed of delivery, accuracy of information plays a vital role in effectively communicating information in a crisis. To garner optimum emergency response, reliable data and intelligence are preeminent. “Agencies that are responsible for managing information are often underfunded and under-resourced, and compelled to wait while information can be verified, whereas volunteers are today equipped with digital cameras, GPS, digital maps, and numerous other resources. Multiply the resources of the average empowered citizen by the population of the city and the result is an astounding ability to create and share information” (Goodchild and Glennon, 2010). Armed with a new role in crisis communication, the addition of an information-producing public forms what Kodrich and Laituri call an Online Disaster Response Community, or ODRC. Kodrich and Laituri agree “An important addition to this group of responders are the ad hoc citizen groups, local victims of the event and their families, and computer-based disaster response volunteers that collect and disseminate data in the form of text, blogs, video, pictures, and maps” (Kodrich and Laituri, 2008). The emergence of the “computer-based disaster response volunteers” proves to lend a great deal of strength to the ODRC. The use of social media in disaster response has largely been successful. These volunteers possess a technical knowledge of mapping

technologies and use other open-source platforms to create and populate live maps that are free, widely available, and informative.

One of the more valuable capabilities brandished by the public is their newfound ability to wield mapping technologies on a whim. The creation of geolocation has significantly benefited responding agencies. The concept of VGI, volunteered geographic information, as coined by Goodchild (2011), coupled with a crowdsourcing or open-source process could result in an unimaginably large sample size of potential sensors. “This network of human sensors has over six billion components, each an intelligent synthesizer and interpreter of local information. One can see VGI as an effective use of this network, enabled by Web 2.0 and the technology of broadband communication” (Goodchild, 2011). This concept of volunteered geographic information, combined with Web 2.0 capabilities allows information to be shared visually like never before in a disaster in the form of crisis maps.

GIS (Geographical Information System) or “crisis maps,” are created online, often by volunteers, to illustrate multiple types of information in a geospatial manner. The combination of web applications used to form these maps, or “mashups” “combine satellite imagery with maps and geospatial data providing local information using the open Application Programming Interfaces (APIs), for example, of Google Map and Google Earth” (Kodrich and Laituri, 2008), provide a seamless, user-friendly end-product that can be viewed by the public. These maps can be created to show all types of relevant information including, but not limited to, medical stations, evacuation routes, shelter locations, road blockages, food distribution points, etc.

Possessing the knowledge to create and manipulate open-source GIS maps, volunteers have proven to be invaluable in coordinating response and recovery efforts. When volunteers attempted to create crisis maps after the Haiti earthquake in 2010, they found existing maps in Google Maps to be largely incomplete and unsatisfactory. “The OSM (Open Source Mapping) community came to the rescue by crowd-sourcing the most detailed and comprehensive map of downtown Port-au-Prince. They did this by tracing satellite imagery and making their map open and freely available. Some 600 volunteers from several dozen countries contributed over one million edits to the Haiti OSM map during this period” (Meier, 2012). Some volunteers have even self-initiated into volunteer networks like the Standby Volunteer Task Force for Live Mapping (SBTF) who boast over 700 volunteers, spanning 70 countries, all of whom are trained in live crisis mapping (Meier, 2012).

These open-source mapping platforms have ushered a new level of situational awareness previously unseen in the disaster response community. As these maps are generated through open-source techniques they are often updated in real time as information is received and, most importantly, are viewable by everyone with an internet connection. The use of open-source maps are “almost as good as having your own helicopter. They provide a bird’s-eye view of an unfolding event and thereby create more situational awareness. Indeed, live crisis maps can synchronize shared awareness in new and powerful ways” (Meier, 2012).

Platforms, especially Ushahidi, were used to such a degree during the Haiti earthquakes that they were being utilized by the “U.S. Federal Emergency Management Agency (FEMA), UNOCHA, the U.S. Agency for International Development, Marine Corps, and the U.S. military and Coast Guard to direct assistance” (Heinzelman and Waters, 2010). Craig Fugate of the FEMA Task Force described this type of open-source mapping as “the most comprehensive and up-to-date map available to the humanitarian community” (Heinzelman and Waters, 2010). Beyond the scope of geospatial applications providing user-friendly visual aids, the use of open-sourced applications and third-party volunteer organizations can provide assistance in many of the different missions performed by emergency management entities and responders.

## **Verification and Malicious Information**

Information gathered through social media and other crowdsourcing mediums lack the accountability and verification techniques prevalent in authoritative information gathering processes. Consequently, many emergency management and response personnel believe that information gathered without training and expertise is inaccurate and unreliable. Due to this lack of professional accountability, emergency managers are reluctant to consider social media when making decision. While the bits of data gathered through the mere monitoring of social media may seem unreliable initially, active participation of governing authorities can create channels of communication that can lead to the verification of such data and the creation of intelligence. Due to technological advances made in the realm of mobile connectivity, mapping, and mobile devices, a breakdown between expertise and novelty similar to the notion of neogeography has occurred. Use of these capabilities was widely observed during the Florida State University VOST activation during the Hurricane Isaac landfall as shown in figures (1) and (2). Information produced by untrained individuals can now be verified much in the same manner as information produced by professionals, using visible picture data and geographic referencing.

Figure 1



Figure 2



In the realm of social media the presence of malicious information generated during a crisis is the most substantial fear associated with the use of crowdsourced information. Malicious information differs from incorrect information in that it is purposely falsified, usually motivated by extraneous variables. Although falsified reports are a common concern for many emergency managers, few cases have actually been reported. Examples of these cases were observed during the activation of the FSU VOST following the landfall of Hurricane Sandy in New Jersey.

Tweets using the hashtag #SANDYLOOTCREW began appearing shortly after the storm dissipated. These Tweets warned individuals in affected areas of looters targeting evacuated homes, similar to the Tweet displayed in Figure (3). In reality, the participants of the #SANDYLOOTCREW were merely conducting a (highly criticized) social experiment. Shortly after, a local online news company began reporting on the self-reported acts of looting. The participants swiftly ceased the reports and revealed the true nature of their experiment as shown in Figure (4). Although this incident was indeed an act of introducing malicious information, it did demonstrate the weaknesses inherent in the use of information gathered over social media.

Figure 3



Figure 4



Eventually, self-enforcement properties of crowdsourcing would have corrected the information as individuals returned to their homes only to realize they had not in fact been looted. But more importantly, the introduction of malicious information can clearly be classified as a false positive. In accordance with the definition of a false positive it could be assumed that the risk taken to act on this malicious information would be less than the risk generated by a false negative.

### Findings: Criteria Evaluation

Proactive social media integration, includes “the active usage of social media systems like Facebook, Twitter and others previously discussed to both disseminate information and monitor public comments regarding their agency and/or community event” (Crowe, 2010). Proactive integration represents the upper-most tier of the utilization of social media and opensource platforms. Within proactive integration, all communication techniques are utilized and emergency managers and responders are in active dialog with the community. Through the presence dialog between the community and authorities, disaster resistant communities may develop, strengthening the bond between ODRC’s and responders and increasing the flow of information between communities and their governing agencies.

Proactive integration may represent the highest degree of implementation present. It also represents the highest value of difficulty of implementation. Increased levels of monitoring of social media and routine communication with the public inherent to proactive integration, additional personnel would be required. Also, due to these heightened levels of integration, these additional personnel may require enhanced training to be able to perform the duties required. “Proactive utilisation is the most complicated use of social media and requires the most time and resources to master” (Crowe, 2010). As many emergency management agencies do not possess an overabundance of time or resources, proactive implementation is classified as the most difficult level of integration to achieve.

It is worth noting, however, that although proactive integration receives the highest value of difficulty of implementation it does not necessarily mean it is beyond the scope of local emergency management to achieve. As discussed earlier, the use of volunteers in emergency management is widely observed, even more so at the local levels. If smaller jurisdictions could employ volunteers from their respective populations, or even through cooperating ODRC’s, a majority of the fiscal implications accompanying the need for additional personnel may be avoided, allowing the difficulty of implementation to diminish.

Reactive social media integration represents the “utilisation of social media only (to) disseminate and/or monitors public comments, but not both” (Crowe, 2010). Reactive integration represents a scaled-down utilization of social media as compared to proactive integration, characterized by limited scope of

use. Inactive integration describes the absolute lack of social media interfacing, resulting in the exclusion from information transmitted over social media mediums. Crowe identifies this risk, suggesting “This inactive status is probably the most dangerous to emergency managers because it ignores the significant impact of social media on emergencies and disasters” (Crowe, 2010). Agencies deciding which category of implementation to pursue must be consider the ratings of each level of integration in all criteria, avoiding the dangers posed by choosing based solely on ease of implementation.

## **Recommendations**

Recent events have proven the budding social benefits that could potentially be acquired through the integration of social media and opensource platforms; however the field of emergency management is reluctant to adapt. Conceivably, the integration of social media could potentially provide an achievable level of social benefit to emergency managers and the public.

Through examination of integration criteria, individual emergency management agencies can conduct their own organizational analysis and identify which level of integration can be realistically adopted. As emergency management agencies all face differing limitations regarding personnel, funding, and resources, the criteria of ease of implementation and economic feasibility may vary between agencies. The potential benefits to pre-existing crisis communication processes through the integration of social media are available to all emergency management and response agencies. Due to this potential social benefit, emergency managers must recognize the need for the integration of social media and opensource platforms into crisis communication operations.

## References

Crowe, A, (), "The social media manifesto: A comprehensive review of the impact of social media on emergency management", *Journal of Business Continuity & Emergency Planning*, vol. 5. 1, pp.409-420.

Goodchild, M. Glennon, J. , 1st Initial, (2010), "Crowdsourcing geographic information for disaster response: A research frontier", *International Journal of Digital Earth*, vol. 3. 3, pp.231-241.

Goodchild, M, (2011), *Citizens as sensors: The world of volunteered geography*, Edition of book, John Wiley & Sons, Ltd,Chichester.

Heinzelman, J. Waters, C., (2010), "Crowdsourcing crisis information in disaster-affected haiti", *United State Institute of Peace, Special Report 252*, vol. . , pp.1-16.

Laituri, M. Kodrich, K., (2008), "Online disaster response community: People as sensors of high magnitude disasters using internet gis", *Sensors*, vol. 8. 5, pp.3037-3055.

Meier, P, (), "Crisis mapping in action: How open source software and global volunteer networks are changing the world, one map at a time", *Journal of Map and Geography Libraries: Advances in Geospatial Information, Collections & Archives*, vol. 8. 2, pp.89-100.

## Author Biography

**Kyle Clayton** is a graduate from the Florida State University, receiving both a Bachelors of Science as well as a Masters in Public Administration. Kyle has been with the Center for Disaster Risk Policy since August of 2011 and was originally hired on as a student researcher. Kyle's primary research focus is the link between the use of social media and communication during a disaster or incident to gather and disseminate data.

Since then Kyle has participated as an active member of the FSU VOST, or Virtual Operations Support Team, as well as a FSU DIRT, or Disaster Incident Research Team, member. During blue skies Kyle also performs the duties of a Teaching Assistant, providing various administrative supporting activities to assist professors in their respective classes.

**Kristin Samulkewitsch** earned her Bachelor of Science in Economics and is currently pursuing her Masters of International Affairs at Florida State University. She is a student researcher for the Center for Disaster Risk Policy at Florida State University. As a Student Researcher, Kristin assists with classes in the Emergency Management and Homeland Security program, supports and staffs the Disaster Incident Research Team and the Virtual Operations Support Team, and concentrates in plans and conducting exercises.

Ms. Samulkewitsch's experience includes interning at the Capital Area Chapter of the American Red Cross as the Emergency Services Student Coordinator. She also was a part of Florida State University's Independent Study program and worked under the state's Planning Section Chief (ESF #5) for the Division of Emergency Management. Before landing at the Center for Disaster Risk Policy, Kristin assisted the Emergency Coordinating Officer for Business, Industry, and Economic Stabilization (ESF #18) in the development of Continuity of Operations Plan (COOP). Kristin has also assisted the state's Emergency Operations Center during activation and worked at the Joint Field Office in the months following Tropical Storm Debby.