

Social Media for the Emergency Manager in Disaster Planning and Response

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ABSTRACT

This practitioner paper outlines some of the benefits for the use of social media, from the perspective of a local-level or county-level emergency manager (EM). As compared to state and national level emergency management, because local level EMs have limited manpower and resources, social media can positively or negatively impact the effectiveness of communication before, during and after disaster strikes. Outlined in this paper are six key points where local EMs have specific needs that could be addressed by the effective use of social media and, in the opinion of the authors, represent the top issues that EMs face when considering how to leverage Twitter, Facebook, YouTube, Instagram and other social media platforms. The six needs addressed in this paper include: 1) Best practices for general social media use by EMs, 2) Social media use for internal command and control within the EM group, 3) Developing situation awareness by monitoring social media, especially prior to predictable events, 4) Communicating disaster preparedness messages through social media, 5) Using social media for gathering damage assessment information during, or immediately following a crisis, and 6) Leveraging social media volunteer groups. This short paper picks up where the Federal Emergency Management Agency's social media training leaves off and attempts to represent these six needs as use cases for researchers and developers to address in future publications and products.

Keywords

Social Media, Emergency Management, Disaster Preparedness.

INTRODUCTION

Local level Emergency Managers (EMs) can use social media and new technology more effectively on a regular basis. Waiting for disaster to strike to begin to use social media is a recipe for disaster. This short paper outlines six different areas in which social media can be used in emergency management. Each of these cases provides information from a local EM perspective, rather than a large disaster or national perspective.

The Federal Emergency Management Agency created an online course in use of social media¹, but this course lacks enough detail for a local EM to be able to implement an effective strategy for the use of social media to reach out to the public prior to, during and after disasters occur. In the 2013 version of the course, FEMA Administrator Craig Fugate describes social media being imperative to Emergency Management. While this course is more complete than previous versions, it still falls short of recommending specific implementation steps. The training suggests partnering with social media subject matter experts or leveraging volunteer social media expertise. While the training addresses different types of social media, a non-technical EM at the local level may be unsure of where to start and what objectives to attempt to meet. Almost all of the examples cited were from State or Federal EM users, who generally have staff assistance. The few examples cited below the state level were from large metropolitan areas, leaving out the perspective from the local or county level EM.

This paper seeks to give a little more context and how social media might be useful to a local level EM by describing these six different needs: 1) Best practices for general social media use by EMs, 2) Social media use for internal command and control within the EM/EOC group, 3) Developing situation awareness by monitoring social media, especially prior to predictable events, 4) Communicating disaster preparedness messages through

social media, 5) Using social media for gathering damage assessment information during, or immediately following a crisis and 6) Leveraging social media volunteer groups.

BEST PRACTICES FOR GENERAL SOCIAL MEDIA USE BY EMERGENCY MANAGERS

In terms of best practices, EMs can best benefit from very clear, specific steps to follow to develop an effective social media presence in their community. It is important for the EM to know which social media platforms are in use in their local community, as each community has different adoption rates for each platform. For example, metropolitan communities appear to have a higher rate of adoption of Twitter, while college communities appear to use Facebook. Hargittai and Litt's longitudinal study of social media use in young adults suggest that there may even be different adoption rates based on ethnicity as well as age and technology affinity².

The EM must know their community, but in regards to social media, the EM must know which social media platform is in use by each demographic. A comprehensive survey of social media use in the community would be worthwhile to the EM. Unfortunately, most EMs do not have the time, technical resources or specific social media knowledge to explore each platform and discover how it is used in their community. EMs would benefit from a short and precise procedure for identifying social media use in different demographics in their communities.

The EM may think that the right thing to do is to create a presence in each social media platform and develop a large following of community members on each platform prior to, during and after disaster. However, this is not necessarily the case. It may be more important for the EM to identify key re-broadcasters who are active in each individual social media platform in the local community. If that is the case, then the EM's job could be to network with those re-broadcasters, gain their trust and therefore access to the re-broadcaster's followers. When a crisis occurs, the EM can then reach out to those re-broadcasters and leverage their networks to distribute timely information. As an analogy, the EM does not have to build the TV or radio station and build viewership or listenership. Instead, the EM and public information officer need to know the right process to make press releases to those outlets and build relationships with reporters from those agencies. However, different from the mass-media perspective, in the world of social media, the EM should know how to tweet and post their own content and to manage their following of re-broadcasters to ensure that these folks remain engaged and will be effective outlets during disaster.

Specific best practices should be developed for EMs to develop a social media audience. Some high quality social media marketing material is now available from the U.S. Fire Administration³. While response agencies can use this material and those from other sources as part of outreach and public information campaigns, questions remain about the effective use of these materials to build audience, especially through re-broadcasters. Many response agencies including volunteer fire companies (e.g. <https://www.facebook.com/pages/Luzerne-County-Fire-Companies/292470140792084>) and 911 dispatch agencies (e.g. <https://twitter.com/seattle911>) are communicating their activities through social media, some posting on Facebook and others on Twitter, down to the level of blogging about each of the agency's incidents. Therefore several questions remain. How should an EM develop a list of social media platforms and re-broadcasters that would be effective in their own community? What do effective social media messages look like? How frequently should these messages be published in order build viewership in the EM's local community?

Starting with basic social media platform usage, EMs could benefit from knowing the proper syntax for posting messages, and to understand how different kinds of messages develop audience in different ways. For example, placement of hashtags and URLs in messages to maintain integrity through re-broadcasting could be important (see Figure 1).

<p>A typical Tweet (from Emergency Management Magazine, @EmergencyMgtMag):</p> <p style="padding-left: 40px;">Since 9/11, govts have received more than \$36 billion for equipment, training, preparedness and response. #hsem http://bit.ly/1eJyRXV</p> <p>Once Retweeted may become:</p> <p style="padding-left: 40px;">@EmergencyMgtMag Since 9/11, govts have received more than \$36 billion for equipment, training, preparedness and response. #hsem http://</p>

Figure 1. Data integrity issues in re-tweets

Even professional-level consumer conceptualization of social media is inefficient, as EMs generally build and leverage their audience through re-broadcasters rather than directly. As effective methods for building audience are developed and executed in different communities, those successes should be shared with EMs across the country so that they can be re-utilized. Knowing that many local level EM agencies are one-person shops, it is ineffective for best practices to be individually developed, county-by-county. Successful recipes should be shared between EM Agencies to expand on successes. Those recipes should be motivating and straight-forward to use by the EM, especially those with limited social media experience and staffing.

INTERNAL COMMAND AND CONTROL WITHIN THE EM/EOC GROUP

Just as the job of emergency response scales effectively from small incidents to large, the EMs job also must scale. Use of social media for command and control within the emergency management group and local emergency operations centers that leverage these technologies can become highly effective, even under the constraints of minimal staffing at the local level. EMs from neighboring communities can work effectively together, especially if they leverage modern social media.

Emergency Operations Centers (EOCs) run by local EMs are staffed with employees and volunteers from a variety of local municipal agencies. As incidents start, they may begin small, requiring only a skeleton EOC staff. Coordination of EOC staff could be managed through social media. Tools for mass text notification for small groups (e.g. Groupme.com) may be more effective than traditional audio pager. Online tools like iamresponding.com allows for notification of who has responded to the call and has proven to be extremely effective in volunteer response agencies. These kinds of tools, placed in the hands of the emergency manager could provide for effective cross-agency notification and dispatch to staff an EOC.

Additionally, for small incidents, physical staffing of the EOC might not be necessary if the key members are in communication electronically. Use of video conferencing with tools like Skype, Go To Meeting, shared electronic whiteboards, internal content management systems and other electronic resources could overcome the needs to be in the same physical room as other resource managers. This extended EOC would allow for resource managers to maintain their presence at their own facilities with their own resources rather than re-locating to a physical EOC. This virtual operations center could potentially be more effective in short duration small incidents rather than a full EOC activation.

DEVELOPING SITUATION AWARENESS BY MONITORING SOCIAL MEDIA

Emergency Management can develop an awareness of the actions of people and can make inferences based on community member observations. Monitoring what people are saying publicly by monitoring social media is one way that an EM can keep track of things going on. Some consider the use of Twitter to supplement physical sensors to notify of earthquakes as a possible good use of social media⁴. In fact, the U.S. Geological Survey (USGS) has developed such as system for monitoring of seismic events⁵.

Ahead of predictable weather events such as hurricanes, social media monitoring could be used to determine if people are evacuating as requested. Because social media is a two-way (and multi-way) communication system, EMs can monitor public reaction to messages sent in social media and traditional mass media. If those responses are geo-located, specific focused communication could be more effectively directed. For example, if during a hurricane, residents of one part of the community evacuated effectively, but another area had responded with messages of entrenchment and unwillingness to evacuate, more resources could be dedicated to getting the word out.

Other potential uses might be to monitor for signs of groups of people intending to gather, protest or riot. While social media designers might have intended people to use their tools for things like private parties, some groups have done more with those features than one might expect. For example, in the wake of the Jerry Sandusky crisis, the firing of Joe Paterno and subsequent student riots at Penn State University during November 2011, students created a candle-light vigil for the victims and organized it over Facebook (see Figure 2). The event was “planned” by two undergraduate students who had an idea (hold a vigil), posted a public event on Facebook and invited everyone they knew. Less than 48 hours later, over 11,000 stated (via Facebook) that they were attending this impromptu event. Local level emergency managers identified the event during the announcement phase and monitored its growth. They notified local police and EMS agencies to be prepared with appropriate staffing, since gatherings earlier in the week had resulted in significant rioting. While this event was peaceful, actual crowd size was estimated to be about 25,000 people, which is significant.



Figure 2. Facebook Page for Candle Light Vigil at Penn State, November 11, 2011

COMMUNICATING DISASTER PREPAREDNESS MESSAGES THROUGH SOCIAL MEDIA

In terms of communicating disaster preparedness messages through social media, many EMs are somewhat reticent to step into this domain of public information. There is a question of how much and how often to communicate, as well as the right message. As we have shown above, there is a desire for the EM to build an audience of re-broadcasters to use during crisis. However, there is a mission of Emergency Management to help communicate traditional disaster preparedness messages to the community. The Department of Homeland Security leads the U.S. with their "Get a kit, make a plan" campaign. However, these messages should be tailored to specific communities and timed appropriately. Preparedness messages ahead of disasters must be timely and appropriate. Messages need to be translated from the generic to the specific, giving residents the exact information they need at the right time. Messages are more valuable with local context.

USING SOCIAL MEDIA FOR GATHERING DAMAGE ASSESSMENT INFORMATION

Damage assessment during disaster is critical to the EM. The EM needs to know where damage has occurred, especially in large-scale disasters. One way to do this for an extremely large disaster is to crowdsource the basic evaluation of photographs taken during flyover as was done following SuperStorm Sandy⁶. However, this kind of capability is required at the local level for smaller disasters as well. Whether it is the collapse of a single building or flooding damage across a county-wide area, the EM needs to collect and compare current status to previous status. How large of a building was impacted? How many houses are flooded? How extensive is the damage? It is possible that disaster volunteers could provide real-time photographic information back to the EOC by taking images with smartphones from a safe distance. Especially after a disaster has occurred and the hazards are reduced, even having exterior pictures of damaged areas could provide EMs and response agency directors sufficient information to decide on where to dedicate immediate resources for rescue and recovery. However, local level EMs may be resistant to allowing these photographs to be published on an open-source platform as they may have sensitive information imbedded in them.

LEVERAGING SOCIAL MEDIA VOLUNTEER GROUPS

Local level EMs have often hear about volunteer groups that come to the aid of responders, especially in large disasters. Through training programs like FEMA's IS-42, and other media, they might learn about case studies where technology has been effective in a specific disaster. However, the local EM needs to have some kind of way to activate appropriate resources, assign those resources to missions and conduct follow-on tasking to ensure that these volunteers will be working on something useful to the response effort. Crisis camps might offer well-connected and technical savvy volunteers who are outside of the disaster zone. Highly skilled personnel who can develop multi-layered maps with hard-to-learn geographic information systems (GIS) could also be useful, but without access to GIS data sets, which are sometimes confidential, the volunteers are left integrating open source or outdated data. Tools like Ushahidi and similar products have great potential, but they

require talented technical people to be put in contact with the EM to develop good information to help the incident command staff with their information requirements. Today, there are individual examples of how some organizations have been connected to social media volunteer groups, but there is no common methodology that the local level EM can rely upon to find, activate and task the volunteer group.

CONCLUSION

This short paper provides some context to the use of social media in emergency management. The authors hope that researchers and system designers take some of the information provided in this paper and use it a starting point for the development of new tools to assist local level emergency managers respond to crises in their own jurisdictions. Local level EMs need the capabilities that social media technology provides to more effectively respond to local level disasters and crises.

REFERENCES

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- ¹ IS-42: Social Media in Emergency Management. (2014). Retrieved, January 20, 2014
<http://training.fema.gov/EMIWeb/IS/courseOverview.aspx?code=is-42>
 - ² Hargittai, E., & Litt, E. (2011). The tweet smell of celebrity success: Explaining variation in Twitter adoption among a diverse group of young adults. *New Media & Society*, 13(5), 824-842.
 - ³ Home Fire Prevention and Safety Tips. (2014). Retrieved January 20, 2014,
http://www.usfa.fema.gov/citizens/home_fire_prev/
 - ⁴ Sakaki, T., Okazaki, M., & Matsuo, Y. (2010, April). Earthquake shakes Twitter users: real-time event detection by social sensors. In *Proceedings of the 19th international conference on World wide web* (pp. 851-860). ACM.
 - ⁵ Earle, P. (2010). Earthquake twitter. *Nature Geoscience*, 3(4), 221-222.
 - ⁶ Chan, J., Crowley, J., Elhami, S., Erle, S., Munro, R. Schnobelen, T. (2013) Aerial Damage Assessment Following Hurricane Sandy. Retrieved January 20, 2014,
http://www.giscorps.org/index.php?option=com_content&task=view&id=135&Itemid=63