



Best Practices for Incorporating Social Media into Exercises

Social Media Working Group for Emergency Services and Disaster Management and DHS S&T First Responders Group

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**Homeland
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EXECUTIVE SUMMARY

To institutionalize social media into all aspects of an agency's emergency preparedness, response and recovery operations, social media should be incorporated into exercises. Using social media in exercises helps prepare first responders for real-life events where the public increasingly uses social media to share and gather information. Exercises provide an opportunity for first responder and public safety agencies to integrate unconventional information channels into an operational environment without burdening time-crunched responders.

This report discusses how agencies and organizations can integrate social media into exercises, provides suggestions for the planning processes and methods for conducting the exercise and evaluation, and lists challenges associated with using social media in exercises, areas of future research and case study examples for agencies.

INTRODUCTION

Social media and collaborative technologies have become critical components of emergency preparedness, response and recovery. From international response efforts after large-scale disasters to domestic response and recovery after events affecting the United States, many government officials now turn to social media technologies to share information and connect with citizens during all phases of a crisis. Implementing these new technologies, however, requires that responding agencies adopt new communication strategies, policies and engagement methods.

Recognizing the need to address these challenges, the U.S. Department of Homeland Security's (DHS) Science and Technology Directorate (S&T) established a Virtual Social Media Working Group (VSMWG) in 2010. After [Public Law 114-80](#) was passed, the VSMWG was re-named as the Social Media Working Group for Emergency Services and Disaster Management (SMWGESDM). The mission of the SMWGESDM is to provide recommendations to the emergency preparedness and response community on the safe and sustainable use of social media technologies before, during and after emergencies. The SMWGESDM is a subcommittee of the Homeland Security Science and Technology Advisory Committee (HSSTAC). The HSSTAC approved the recommendations contained in the report by consensus vote on January 6, 2017.

Drawn from a cross-section of subject matter experts from federal, tribal, territorial, state and local responders from across the United States, SMWGESDM members establish and collect best practices and solutions that can be leveraged by public safety officials and responders throughout the nation's emergency response community. Below is a list of agencies and organizations to which the SMWGESDM members belong.

SMWGESDM Member Agencies and Organizations as of March 2017

- American Red Cross
- Colorado Department of Transportation, Office of Emergency Management
- City of Evanston [Illinois]
- Federal Emergency Management Agency (FEMA)
- George Mason University
- George Washington University
- Humanity Road
- Indianapolis [Indiana] Fire Department
- National Institutes of Health (NIH)
- New York City [New York] Department of Health and Mental Hygiene
- New York City [New York] Emergency Management Department
- United States Northern Command (NORTHCOM)
- Oregon Voluntary Organizations Active in Disaster (VOAD)
- City of Palo Alto [CA] Police Department
- Sacramento County [California] Office of Emergency Services
- King County [Washington] Office of Emergency Management
- San Francisco [California] Department of Emergency Management
- City of St. Louis [MO] Emergency Management Agency (CEMA)
- Southern Marin [California] Fire District
- United States Geological Survey (USGS)
- University of Washington Office of Global Affairs
- Virginia Department of Emergency Management (VDEM)
- Washington County [Arkansas] Regional Ambulance Authority

PURPOSE

This report follows the SMWGESDM's last publication, *From Concept to Reality: Operationalizing Social Media for Preparedness, Response and Recovery*, which introduced and discussed how and why social media should be operationalized by public safety, including:

- The need to integrate social media into all aspects of preparedness, response and recovery, to ensure its longevity;
- Social media's role in decision-making and information sharing in emergency response;
- How to operationalize social media and for what purposes;
- Associated challenges and barriers; and
- Areas requiring further consideration, research and development.¹

The purpose of this document is to:

- Discuss best practices for consideration when integrating social media into exercises, including objectives for doing so (e.g., using social media for communications or leveraging information from social media to support operational decision-making);
- Discuss social media's role in exercise design;

¹ DHS SMWGESDM. "[From Concept to Reality: Operationalizing Social Media for Preparedness, Response and Recovery.](#)" April 2016. 4.

- Identify social media exercise planning elements in the Homeland Security Exercise and Evaluation Program (HSEEP) practices;
- Address the need for the integration of social media into all aspects of preparedness, response and recovery, including exercises and training, to ensure operational implementation and longevity; and
- Discuss challenges associated with integrating social media into exercises and training, including policy, technical and procedural challenges.

The SMWGESDM developed this document with input from the public safety community through monthly group meetings and discussions via a variety of communications channels. It is intended for use by all public safety disciplines and all types of agencies to better understand and utilize social media and other web-based tools without having to duplicate effort or spend undue resources searching for examples, policy templates or guidance.

Examples included in this document are not intended to serve as an all-inclusive list but rather to provide a brief listing of agencies that use social media for public safety purposes. For more information on these topics and additional resources, please visit [DHS First Responder Communities of Practice](#).

DEFINITIONS

The terminology used to describe various aspects of web-related technologies varies in definition, depending on perspective, domain and discipline. The following key terms are defined for the purposes of their use within this document. For a comprehensive description for commonly-used terms in exercise and evaluations, please consult [HSEEP](#).

Closed Environment: A closed environment is a controlled, private setting online for exercise participants that cannot be seen or accessed by the public.

Core Capabilities: Core capabilities are the 32 distinct critical elements necessary to achieve the [National Preparedness Goal](#), which defines what it means for the whole community to be prepared for all types of disasters and emergencies

Exercise: An exercise is an instrument to train for, assess, practice and improve performance in prevention, protection, mitigation, response and recovery capabilities in a risk-free environment. Exercises can be used for testing and validating policies, plans, procedures, training, equipment and interagency agreements; clarifying and training personnel in roles and responsibilities; improving interagency coordination and communications; improving individual performance; identifying gaps in resources; and identifying opportunities for improvement.

Geoform: Geoform is a tool for entering “Social Media for Emergency Management” (SMEM) information into a form that captures the geographic location associated with that information and is connected to a map feature service. The form is based on a data model that tracks information requirements established by emergency managers.

Homeland Security Exercise and Evaluation Program (HSEEP): HSEEP is a program that provides a set of guiding principles for exercise programs, as well as a common approach to exercise program management, design and development, conduct, evaluation, and improvement planning.

Meme: A meme is a humorous image, video, piece of text, activity, concept, catchphrase or piece of media that is copied (often with slight variations) and spread rapidly by Internet users; for example, photos of

people lying down in public places (also known as planking) or a short video of people dancing to a specific song or dance.²

National Preparedness Goal (Goal): The Goal defines the core capabilities necessary to prepare for the specific types of incidents that pose the greatest risk to the security of the nation. The Goal emphasizes actions aimed at achieving an integrated, layered and all-of-Nation preparedness approach that optimizes the use of available resources. Specifically, the Goal defines success as “a secure and resilient nation with the capabilities required across the whole community to prevent, protect against, mitigate, respond to and recover from the threats and hazards that pose the greatest risk.”

Open Environment: An open environment allows the use of online and publicly posted social media platforms such as Facebook and Twitter in an exercise.

Passive Data Collection: Passive data collection is the gathering of user data through interaction without actively notifying or asking the user's permission. For example, cookies on a user's computer capture Internet browsing history.

Social Media: Social media includes any online or digital medium that is provided and/or collected through a channel that enables the two-way sharing of information, involving multiple parties. This includes social networking sites, texting, blogs, etc.³

SOCIAL MEDIA AND EXERCISES

SMWGESDM's previous publication, *From Concept to Reality: Operationalizing Social Media for Preparedness, Response and Recovery*, discussed social media and its role in the disaster lifecycle. It also addressed general points for consideration when integrating social media into an agency or organization's emergency preparedness, response and recovery efforts.⁴ This report focuses specifically on integrating social media into exercises as part of the larger effort and discusses various points requiring further consideration when planning to do so. Following the steps outlined in this report to integrate social media into exercises will help ensure a sustainable and scalable process for adding, assessing and building upon lessons learned.

Social media may be integrated into HSEEP modeled activities. Social media has its place in both discussion-based and operations-based exercises and may often be used as an inciting incident to trigger cold-start play in the latter. (This report makes references to HSEEP throughout, visit to learn more about additional [HSEEP policy and guidance](#).

For example, if designing an exercise around a wildland-urban interface fire, initial reports for exercise play may come simultaneously from dispatch as well as social media injects. In the case of real incidents such as active shooters, exercise play triggers may be developed around social media messaging describing the scene. In these instances, recognizing social media as an important social phenomenon should not be ignored or muted when working through higher-level operations-based exercises.

² https://en.wikipedia.org/wiki/Internet_meme

³ DHS First Responders Group VSMWG. “[Using Social Media for Enhanced Situational Awareness and Decision Making](#).” June 2014. 8.

⁴ DHS SMWGESDM. “[From Concept to Reality: Operationalizing Social Media for Preparedness, Response and Recovery](#).” April 2016.

The complexity of exercises will be determined by the scenario, the type of social media skill being tested and the availability of data or environments in which to test play. Exercises may be as simple as a workshop involving members of a Joint Information System identifying a variety of disasters that could impact an area and writing or pre-scripting messages that could be saved and used during real-world events. It may also be as complicated as designing an entire artificial environment complete with thousands of messages, both relevant and irrelevant to the disaster that must be filtered and analyzed to extract pertinent messages beneficial to the exercise. Testing in these more complex designs may also include evaluating how that information is shared with other positions and if it impacts operational decision making.

Primary Motivations and Objectives

The primary motivation for using social media will drive objectives and activities in support of exercise development. Objectives for using social media include enhanced communications and engagement, enhanced situational awareness, and decision-making. Ultimately, incorporating social media into exercises allows an agency to replicate real-world actions in a safe, no-consequence environment to test responses to difficult situations (sometimes known as “train like you play”). Some specific motivations and objectives are:

- Enhanced Communications and Engagement
- Better Intelligence and Decision Making
 - Dynamic Decision Making
 - Strategic and Tactical
- Sustainability of Social Media Capabilities
 - Procedural
 - Technical
 - Informational

Suggested Approach

This report offers an HSEEP-based building block approach and a layered decision-making tool to help determine the complexity of the exercise needed to achieve exercise objectives. The decision-making tool resides within the building block approach and was written for the purposes of this report. Exercise planners may choose from the least complex to the most complex exercise design. Incorporating social media into exercises is challenging even in the best circumstances, and this report suggests agencies begin with more basic skills before moving up to more advanced skills, as suggested in the decision-making tool.

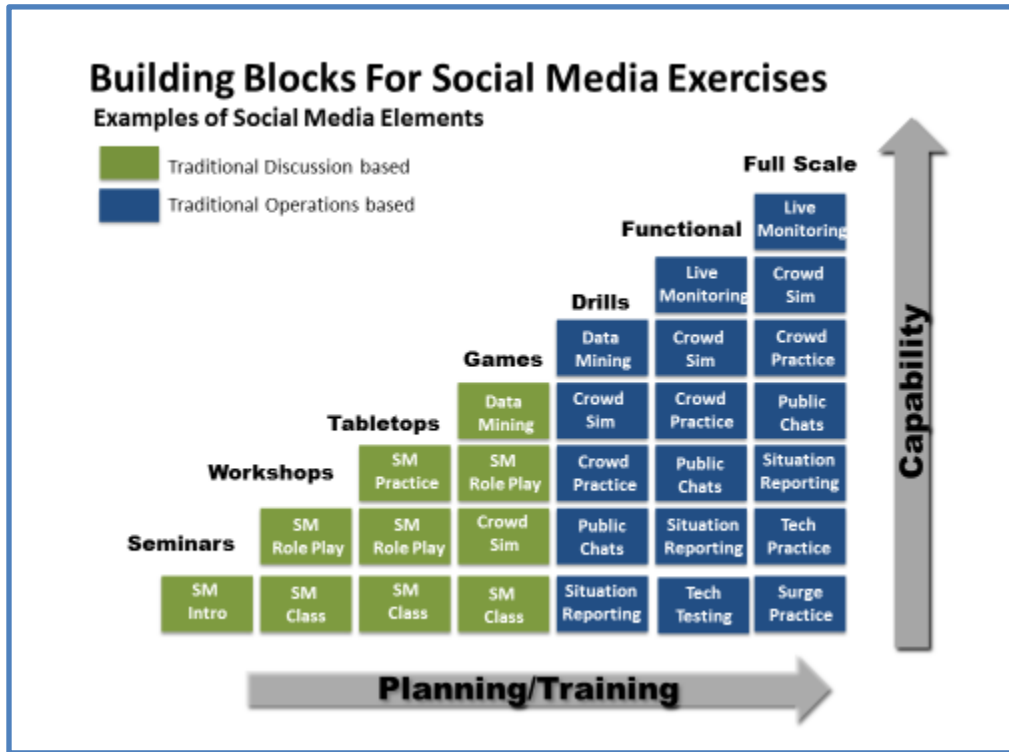
HSEEP provides a set of guiding principles for exercise programs, as well as a common approach to exercise program management, design and development, conduct, evaluation, and improvement planning.⁵ HSEEP exercise and evaluation doctrine is flexible, adaptable, for use by stakeholders across the whole community and applicable for exercises across all mission areas – prevention, protection, mitigation, response and recovery. Humanity Road’s “Social Media Exercise Planning Guide”⁶ is a training guide for exercise development that uses the HSEEP building block approach (*Figure 1*) beginning with seminars and workshops, and building in intensity and capability to full scale exercises. The guide provides examples of social media elements that can be included in seminars, workshops, games, drills, and functional and full

⁵ <https://www.fema.gov/media-library/assets/documents/32326>

⁶ <http://humanityroad.org/smx/>

scale exercises. When developing an exercise plan, an agency may consider using a building block approach to incorporate social media elements.

Figure 1: Building Blocks for Social Media Exercises



Building the elements from Figure 1 into opportunities and venues reinforces communications skills and will help improve knowledge management and expertise. Table 1 offers potential exercise types and options.

Table 1: Exercise Types and Options

Seminars, Workshops, Tabletops and Games	
Discussion Based	Seminar review of agency social media policies; review of procedures for circulating social media data within an Emergency Operations Center (EOC) or the field
	Workshop discussing the social media message “lanes” for dissemination of messaging to the public
	Tabletop scenarios involving message, photo and video creation
	Games for honing skills such as data mining or situation reporting
	Tabletops, workshops and games that include roleplaying elements
	Tabletop scenarios on applying 508 compliance to messaging, photos and videos
	Public chats on who to follow for what type of disasters
Drills, Functional and Full Scale Exercises	
Operations Based	Scene setters that simulate the crowd
	Master Scenario Event Lists (MSELs) that include simulated social media messages
	Include beta testing of technology into functional and full scale drills
	Data mining practice for response teams
	Drills to practice situation reporting
	Drills for Virtual Operation Support Teams to practice skills
	Drills for the public to practice their mobile tech skills
	Functional exercises with SMEM partners, such as Humanity Road

Depending upon the mission types, skill level and resources within an agency, it must determine the desired exercise complexity and match it with the desired core capability outcomes. Recommendations are to start small and move to more complex, advanced exercise designs. Agencies may opt to begin with information dissemination and test select core capabilities before moving on to analyzing and operationalizing information. Aligning exercise activities to one or more of the 31 core capabilities is a best practice, as exercise grant funding is often contingent on holding an HSEEP-compliant exercise in line with the National Preparedness Goal. Furthermore, corrective action plans, new policies, after action reports or other documentation can inform the desired outcome and complexity of an exercise. Depending on the desired complexity of the exercise and the capabilities of the parties involved, the exercise may demonstrate social media as a means to:

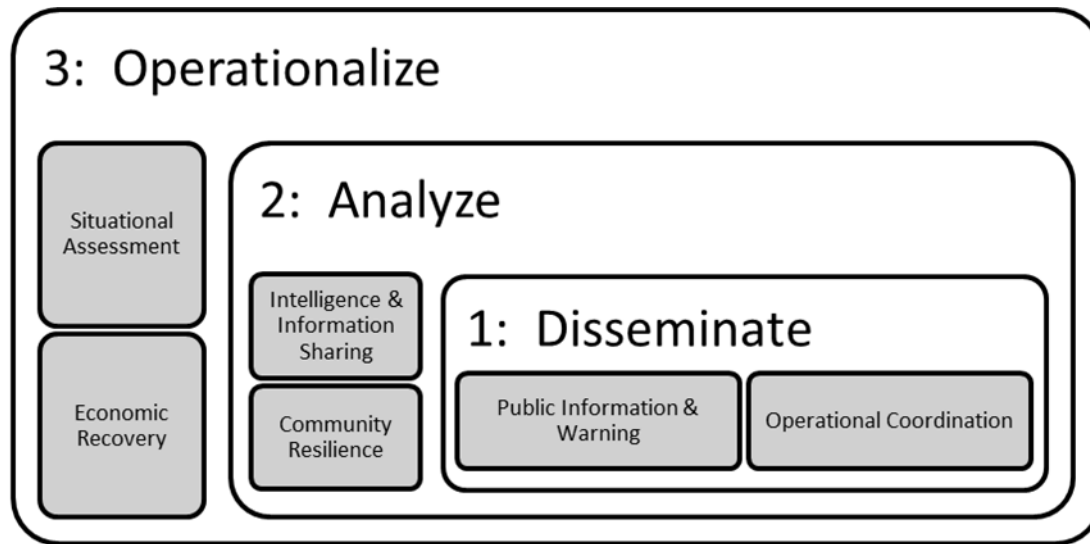
- Disseminate information;
- Call upon assistance from the public;
- Passively or reactively monitor the public’s reaction to the scenario at hand;
- Rumor control; or
- All of the above.

Figure 2 suggests six core capabilities (taken from the National Preparedness Goal), organized around three layers of complexity: disseminate, analyze and operationalize.⁷ This model shows the complexity in design of social media exercises. The three areas cross reference selected core capabilities to make building exercises easier for the designer. The SMWGESDM’s previous report, From Concept to Reality:

⁷ <https://www.fema.gov/core-capabilities>

Operationalizing Social Media, identifies these three layers of complexity as part of social media roles/missions within the Incident Command System (ICS) as the basis for the model below. The report also includes a capability maturity model for social media, which can help guide agencies from early social media usage to full-scale adoption.⁸ Figure 2 is one way for agencies to exercise their social media capabilities and move from beginner level to advanced.

Figure 2: Core capabilities Organized by Exercise Design Complexity



Public Information Officers (PIOs) often have the highest comfort of use with social media as they are responsible for information dissemination in an agency’s day-to-day operations. Early integration of social media into exercise design should include information dissemination, which can be exercised by the PIO. Agencies can and do coordinate via social media (which is not limited to applications such as Facebook and Twitter). Coordination may include a variety of aggregation tools with social applications. Core capabilities within the **Disseminate** layer include: **public information and warning** and **operational coordination**. These elements can be tested easily through a variety of discussion and operations based exercise designs.

Including the analysis of social media data increases the complexity of an exercise because it requires that individuals have the knowledge, skills and abilities to perform complex searches on social media without the assistance of third-party data analysis tools. Within the **Analyze** layer of social media exercise complexity, the core capabilities often evaluated include: **intelligence and information sharing** and **community resilience**. Extracting and mining the data is one level of skill; converting that data into useful situational awareness, intelligence and common operational picture tools is necessary as well. An exercise task might be to assess available data, extract pertinent data and disseminate it appropriately throughout an EOC or field command. Often, social media-focused team members may be paired with Technical Specialists – GIS (if available) to map data and to share data spatially for other members of the response to incorporate that data quickly into their operational decisions or planning. Exercise Evaluation Guides (EEGs) would be written to correspond to accurately retrieve data providing analysis and context, route that data to the appropriate sections, and measure the time in which that data was identified and transferred. Although Community Resilience may not be an obvious core capability related to social media, a complex

⁸ DHS SMWGESDM. “[From Concept to Reality: Operationalizing Social Media for Preparedness, Response and Recovery.](#)” April 2016. 9, 11.

incident with cascading effects can have mitigation needs. For example, weather events such as hurricanes have longer term preparedness and mitigation elements prior to the landfall response. These elements may take place utilizing social media and can be informed by social media.

Within this exercise design complexity, the most complex integration of social media into exercise design in the **Operationalize** layer include the core capabilities of **situational assessment** and **economic recovery**. Social media can support situational assessment by providing first responders additional relevant information, such as cascading effects from a disaster or incident for use in decision-making. Additional core capabilities to the ones noted above may be identified and included in an agency's exercise design. These capabilities will be dependent upon the organization's mission and goals.

Getting Started

Agencies should select the type of exercise (discussion based or operations based) and decide whether the exercise will focus solely on social media usage or whether social media will be a component of a larger exercise. The next step is to conduct an assessment of the existing emergency response environment — identify risks, select stakeholders to engage, define exercise roles and responsibilities, and develop content and supporting materials.

Although identifying key goals and objectives of the exercise is imperative, it is equally important and recommended that agencies use the initial planning meeting to gauge the level of interest and expertise of exercise participants as well as their social media competencies. The planning meetings will aid in the development of goals and objectives, guide MSEL development, and assist in determining size, length and complexity of the exercise. Additionally, the planning meetings help determine how the exercise will be evaluated (e.g., using quantitative and/or qualitative measures). For example, if an agency has an assigned team for social media monitoring and analysis as part of the Joint Information System/Joint Information Center structure, the evaluation form could include a question asking how long it took the agency to acknowledge and communicate on social media regarding the exercise event.

Whether social media is a backdrop to an already planned larger exercise or the primary focus of the exercise will affect the primary goals and objectives of the exercise. There may be limited objectives for social media in an already planned exercise versus tailored objectives for an exercise focusing on social media capabilities and competencies of agencies. For example, if the exercise is a tabletop exercise, then developing a replica social media environment with scripts that feed fictitious social media posts to a social media monitor (as would be the case during an operations based exercise) would not be necessary. For the purpose of this report, the recommendations center on the exercise having social media as an integral part.

During the after action review, a comparison of target capabilities or objectives to the evaluator's findings and feedback will identify gaps in plans, policies or procedures that were tested.

Stakeholder Engagement

As stated in HSEEP, it is important to gain support for an exercise. Prior to any design and/or development, agencies should consult elected and/or appointed officials, not necessarily to gain approval, but to make them aware of the agency's intention of performing an exercise where social media will be incorporated and to gauge the capabilities and policies of the stakeholders. With elected and/or appointed officials' support, the exercise has overcome an important hurdle, in case any challenges surface in later stages of the design/development phase.

Planning Team and Simulation Cell

Engage elected and/or appointed officials early to obtain buy-in and ensure the success of the exercise

Roles and responsibilities of all exercise participants should be clearly defined and shared prior to exercise planning and execution. HSEEP Table 4.1 describes participant roles and responsibilities for exercises.⁹ For the purposes of incorporating social media into exercises, the most important stakeholder groups are the planning team and the simulation cell (SimCell).

The exercise planning team is responsible for the exercise design, development, conduct and evaluation. The planning team assists in the development of appropriate training, guidance, content and exercise materials. For a successful exercise with social media, planning teams should include a social media subject matter expert (SME) to assist with deciding key questions, such as whether the exercise will take place in an open or closed environment, the data captured, the process of integrating data into the response analytics programs, situational awareness applications and other incident management tools. An agency's PIO or employee whose has responsibility for communications should be included in the planning team (as a SME or otherwise).

During the exercise itself, the social media SimCell is used to generate and/or respond to injects and provide information for the exercise players that would typically occur in a real-life incident. The SimCell should be made up of individuals who are familiar with social media, platforms and the types of responses to disasters. External partners and/or digital volunteers can assist agencies in fulfilling this role. Depending on resources available, external partners such as Humanity Road might oversee or participate in information sharing. They also might be groups that benefit from information identified in social media, or inform or act upon information provided via and/or because of social media. External partners can also assist in social media monitoring or information sharing. Additionally, digital volunteers, whether internal, external or ad-hoc, can help identify and disseminate critical information in a restrained resource environment. Involving a digital team in exercise play will help to establish a robust, sustainable and repeatable capability for future events.

When planning an exercise, planning teams should consider the following:

- Coordinate public information strategies with partner agencies and neighboring municipalities as needed ahead of time;
- Determine which social media platforms they intend to use, taking into consideration the need to remain flexible and adapt to a new platform;
- Determine whether the exercise will use off-the-shelf technology or actual platforms;
- Provide staff training on general social media usage, to include several of the popular platforms;
- Develop a policy on when and how to use social media as well as the expected writing style when representing the agency in communications with the public;
- Identify personnel who will be dedicated to social media analysis, monitoring and communications;
- Ensure automatic cross-posting on social media sites is turned off during incidents/exercises; and
- Determine anticipated level of engagement with the public prior to the exercises (passive, active, engaged).

⁹ DHS FEMA. "[Homeland Security Exercise and Evaluation Program \(HSEEP\)](#)." April 2013. 4-3-4-4.

Data Management¹⁰

When planning an exercise, agencies should consider data storage and management policies. Agencies will need to consider questions such as: *how will social media data be aggregated, reported and shared within the emergency operation center?* Effective data management is a critical component of exercise planning. Planners need to consider how they will manage and store the data generated during an exercise. Humanity Road’s guide to social media emergency management analytics¹¹ is a resource that includes tips on data management, data extraction and other implications of social media data mining. The guide also contains questions for trainers, managers and planners to consider when developing their program. These considerations will help define the operational approach:

Keep data management and storage policies in mind when designing and planning an exercise

- What tools will be used to collect the data?
- What is the period of collection – ongoing, limited to the length of the emergency, or somewhere in-between?
- Who will own the data?
- How will the data be protected?
- How long will the data be stored?
- Who is responsible for managing losses of data or data breaches?
- Who determines data accuracy and integrity?

Conducting an Assessment

In conjunction with planning meetings, agencies should assess their current state as it relates to social media and the extent to which it is leveraged across the agency, and how it supports an agency’s mission, objectives, activities and requirements.¹² Agencies should assess current technologies and technology gaps (e.g., ArcGIS, WebEOC, social media, etc.), processes (information management, social media, mission requests, etc.), roles and responsibilities (Operations, PIO, volunteers, etc.), information requirements and resources, and existing infrastructure (both technical and procedural).¹³

Conducting an assessment is good homework for an agency to do prior to an exercise and will make it easier to evaluate the exercise based on the previous state. The SMWGESDM’s previous report introduces a Social Media Integration Maturity Model¹⁴ to assist agencies in adopting, implementing and integrating social media successfully in planning, training and exercise activities. Successful integration is not dependent upon the degree to which social media is leveraged across the agency, but the degree to which it supports an agency’s mission, objectives, activities and requirements. A mature social media program addresses people, process, governance (policies and documentation) and technology concerns. The model suggests a phased approach to full integration that is adaptable to the requirements of an agency. For more information on conducting an assessment, see the report referenced in this section.

¹⁰ Flynn, Mary Jo. Incorporating Social Media Into Exercise Design.

<http://www.slideshare.net/mjflynn001/incorporating-social-media-into-exercise-design>

¹¹ Humanity Road. “[A Guide to Social Media Emergency Management Analytics](#).” November 2014.

¹² DHS SMWGESDM. “[From Concept to Reality: Operationalizing Social Media for Preparedness, Response and Recovery](#).” April 2016.

¹³ ArcGIS and WebEOC are common technology platforms used by public safety agencies for operational and emergency management support.

¹⁴ DHS Virtual Social Media Working Group. “[From Concept to Reality: Operationalizing Social Media for Preparedness, Response and Recovery](#).” April 2016. 11.

Developing a Process

During the planning stages of an exercise, agencies should determine answers to the following:

1. What is the agency testing?
 - a. Information dissemination
 - b. Analysis capability, finding information such as:
 - i. Damage assessment
 - ii. Community needs
 - iii. Behavioral response to directives such as heeding evacuation orders
 - c. Rumor identification and response processing
2. How will the agency measure results?
 - a. Quantity of messages produced and the timeframe in which they were generated and posted
 - b. Correct identification of message criteria. For example, within 100 messages, 13 use language identifying a damage assessment concern; the outcome should identify all 13 messages or rely upon a percentage of accuracy (e.g., identifying 9 of 13 messages for a 69 percent accuracy rating).
 - c. Achieving 100 percent accuracy in a multi-step process to share information identified from social media and captured in analytical reports (see Joint Information Center Decision Matrix from Operationalizing Social Media report¹⁵)
3. How will the agency determine public exposure and privacy?
 - a. Will this be an open environment on the live web?
 - b. Will it be a closed environment, using either proprietary technology or linked private accounts and groups? Or, will this be conducted as a tabletop exercise without the use of technology, e.g., writing messages?
4. What policies and actions will the agency use for accidental leaks into real-world?
 - a. What will stop exercise play?
 - b. Are real-world media involved to prevent panic or spread of inaccurate information in order to avoid a “War of the Worlds” scenario?
 - c. Is information shared sensitive or for official use only?
 - d. What rules and behaviors need adoption to prevent leaks to real-world social media?
 - e. Are accounts branded in such a way so that the public can easily identify that the content is not a real-world issue? (see *Figure 3*)

¹⁵ Ibid. 22.

Figure 3: Sample Branding of a Twitter Account for CAUSE IV



Developing Content and Supporting Materials

Developing content and supporting materials may vary depending on if the exercise is discussion based or operations based. HSEEP offers more information about developing supporting materials, such as the Exercise Plan, Situation Manual and other documentation. This section focuses primarily on developing social media content and materials for use during the exercise.

MSEL and Inject Development

The purpose of developing a MSEL is to allow exercise participants to pre-configure the injects and release times to generate or prompt player activity.¹⁶ The MSEL can be tailored to create a more or less intense exercise. The exercise planning team should identify a system or process for injecting social media messages

into the exercise. During the development phase of the exercise, the exercise planning team may decide to collectively develop social media posts and/or injects that are collected and saved for reuse in future exercises as well. Agencies that are just beginning to use social media will likely choose a different level of play than agencies that are more mature. This report suggests agencies develop challenging injects including scripted social media posts.

Resources for Developing Social Media Injects:

- [Google Tags 6.0](#)
- [Social Media Message Library](#)

The following are examples of challenging social media scenarios to consider when developing injects:

- Create social media messages that reflect the percentage of useable and un-useable messaging (more on this below).
- Create a sufficient quantity of social media messages to replicate the speed and pace of message delivery, thereby increasing the pressure on players.
- Insert ambiguous messaging from outside sources to impede operational decisions.
- Develop information overload scenarios in these broad categories:
 - Eyewitness postings that may include text, photo or video descriptors of the exercise scenario;
 - Retweets received from unofficial and official sources and traditional media; and
 - Emergency management professionals or established influencers in either official or unofficial capacities that post information pertaining to affected communities or the public at large.

¹⁶ DHS FEMA. "[Homeland Security Exercise and Evaluation Program \(HSEEP\)](#)." April 2013. 3-8.

- Include emotional and tonal messages (e.g., panic, confusion, sarcasm, humor, anger, empathy, etc.).
- Develop negative social media content that places the agency in crisis control mode or instigates the need for a public relations and/or crisis management response. Responses are measured qualitatively against the agencies policies or exercise goals. Examples include acceptance and/or transparency, blame and/or defer ownership of problem, ignore and/or head in the sand, and quantitative measures of the timeliness of response – i.e., slow, reasonable, quick.
- Develop a scenario where content on several social media platforms (e.g., Twitter and/or Facebook) begins broadcasting and/or linking viewers to an entirely different platform (e.g., Periscope, Snapchat or YouTube).
- Develop decision-making uncertainty with social media content that forces the decision-maker to choose between decisions that would have differing consequences.
- Insert cascading events into the scenario scripts (i.e., create another crisis).
- Block access to social media data until a ransom has been paid to hackers (a.k.a. ransomware).

MSEL and inject development should be as realistic as possible to mimic real-life behavior and activities. To achieve a realistic playing environment, both pertinent and “filler” material should be included. This will encourage participants to filter through content as they would in a real-life event by manually processing content to identify applicable and useful information.

Table 2, developed by Patrick Meier of the Qatar Computing Research Institute, presents the results of his research on messaging type and volume in social media. Following these guidelines when developing content and MSELs can help to achieve realism.¹⁷

Table 2: Message Type for Content Shared via Social Media¹⁸

Message Type	Percentage
Other Useful Info (minimum 7%, maximum 59%)	33
Sympathy and Emotional Support	20
Affected Individuals/Survivors	20
Donations and Volunteering	10
Caution and Advice	10
Infrastructure and Utilities	7

¹⁷ Percentages are presented as examples and are not an exhaustive list. As an example of 100 scripted messages, 20 messages would indicate sympathy and emotional support while another 20 should represent affected individuals or survivors.

¹⁸ Meier, Patrick. <http://irevolution.net/2015/02/16/comprehensive-crisis-tweets-study/>

Sender Type	Percentage
Eyewitness	9
Government	5
Non-governmental organizations	4
Business	2
Media	42
Outsiders	38

Conducting the Exercise

One of the primary concerns of using social media during an exercise is avoiding accidental messaging to the public because it could be mistaken for a real-world incident. Agencies and localities are reluctant to even use private groups (available on Facebook and Twitter) for exercises. Conversely, proprietary systems such as Simulation Deck only test message dissemination and cannot adequately construct the volume of messages to simulate real-world overload. For any exercise, there are some artificialities involved. Fortunately, precautions that are used when conducting any emergency management or first-responder exercise can also be applied to an exercise involving social media.

Here are two suggested approaches:

1. Transparent disclosure on all electronic media systems that outlines the exercise being conducted, and includes the date, time and platforms being used. This is the virtual equivalent of caution-tape. Participating agencies should note “***This is an exercise***” at the beginning and end of every electronic transmission.
2. Passive collection and simulated participation. This method utilizes trending media items and could be anything that allows for searching across platforms. Examples would be a high-visibility sports event or weather incidents from areas beyond the exercising jurisdiction.

One or both approaches can be used, depending on the core capabilities and objectives being tested. Neither method necessitates expensive or proprietary systems, and both can be used relatively inexpensively with most of the cost attributed to paid staff time.

Messages broadcast in an open environment visible to the public are subject to misinterpretation, and to bad actors re-circulating the information to make it appear as if it is a real incident. For example, an individual can screen capture and alter a post, making it appear as if the agency is reporting a serious incident.

Passive collection can be additionally beneficial if the event or meme being monitored is local to the jurisdiction conducting the exercise. For example, successfully monitoring social media during a sporting event requires knowledge of specific cultural references related to the teams, which are often historical in nature. Nicknames for locations or the naming of neighborhoods and cultural centers are also difficult for outside observers but very necessary when working a real-world incident.

Open Environment

Conducting an exercise in an open environment may require participants to use social media platforms in real time (whether for monitoring, evaluating or message dissemination). This could either be done for public consumption or be designed so that the social media accounts used for the exercise are private accounts in a public forum. One of the benefits of using an open environment allows participants to leverage

metadata, which refers to various attributes available in addition to the text of a social media post (e.g. geo-location, post time, follower count).¹⁹ Another benefit is participants are able to experience an event as it happens, with the information flow being more unpredictable yet realistic. Tools that could be used for an open environment could include social media platforms such as Twitter, Facebook, Instagram and YouTube, as well as social media management and monitoring platforms such as HootSuite.

Using an open environment can pose a challenge when conducting an exercise. Depending on the degree to which social media messages will be disseminated (if at all), the exercise developers will need to consider if the public could access the information and misinterpret that the data being shared/used are part of an exercise, especially if verified accounts are leveraged during the exercise. This would require additional staff involvement before the exercise occurs to educate the public, in addition to actively monitoring the exercise from start to finish. Exercise planners may want to consider using closed or hidden groups (available on social media platforms) to keep information from leaking to the public. Using such groups may mean additional work to bring exercise participants into the groups and ensure they know how to operate within the groups without letting the information become public.

Agencies may consider using fictitious social media account(s) unavailable to the public. For example, the creation of a fictitious Twitter and Facebook platform for MSEL content would eliminate the risk often described as similar to the Orson Welles' "War of the Worlds" 1938 radio broadcast scenario that incited real-world panic.

Closed Environment

Similar to an open environment, a closed environment would require accounts to be set up to monitor, evaluate and disseminate messaging. Conducting an exercise in a closed environment, however, offers exercise participants a controlled, private setting that cannot be accessed by the public. Although not leveraging social media tools in real time, closed environments typically mimic the core functionalities of these platforms to make it as realistic as possible. Additionally, the closed environment allows exercise evaluators to control the number of injects and challenges given to participants at any point during the exercise, and can be scaled based on the size and scope of the exercise. Examples of closed environment tools are Social Simulator and Simulation Deck.

Unlike with an open environment, the closed environment typically does not leverage or allow access to metadata that might be present in an open environment. In a closed environment, the metadata must be simulated. Archived data may be useful in a closed environment; however, agencies may want to change the metadata, hashtags or other components. When re-using archived data, the metadata is often lost, which agencies should take into consideration. Additionally, using a closed environment for an exercise may be beneficial for security purposes. In many cases, closed environments are custom-made tools that require additional funds and training to be used effectively and may require additional staff to ensure the technology is used correctly.

¹⁹ DHS First Responders Group VSMWG. "[Using Social Media for Enhanced Situational Awareness and Decision Making.](#)" June 2014. 7.

Risks Associated with Using Social Media in Exercises

Task an exercise participant with monitoring real world conversations for information leaks

When real-world social media platforms such as Twitter and Facebook are used during an exercise, there is the possibility that the general public and other response entities could mistake the exercise for a real-world emergency.²⁰ Whether the exercise takes place openly for non-participants to see (with the preceding word “EXERCISE”), or if the exercise takes place in a private or hidden group, there is always the chance that information can be accidentally shared and, thus, misinform. Tasking an exercise participant(s) with monitoring real-world conversations for any leaks of information, including accidental social media messages, can lessen this possibility. These participants should be trained in searching for hashtags and keywords used during the exercise. These participants also need a predetermined script or method to address the leak to reassure the general public that the conversations are related to an exercise of social media during emergencies.

The following can help to mitigate confusion should exercise content leak into the public domain without proper disclaimer:

- Notify the public, applicable stakeholders and the media in standard outreach and exercise-specific outreach in the days approaching the exercise and after as follow-up;
- Involve the public, applicable stakeholders and the media in the exercise by encouraging targeted and facilitated participation;
- Publish information about the exercise on agency websites and in other online content; and
- Provide updates on the status of the drill or exercise throughout the course of the event and clearly announce its end.

Evaluating the Exercise

Exercise evaluations must address intended outcomes and will vary depending on exercise objectives, stakeholders and other variables. The objectives will also drive the type of evaluation, dictating a preference for quantitative or qualitative measures, or a combination of the two. Some activities may be measured using quantitative data, for example the number of social media messages disseminated to the public. Alternatively, measurements may include qualitative data such as assessing public sentiment to an incident or response. Tying the exercise objectives to the evaluation will assist reviewers in examining the success of social media use within the exercise.

Some general ideas for exercise evaluation are:

- Evaluate the exercise based on training objectives (which should be measurable and detailed so that there are useful takeaways).
- Include qualitative measures, i.e., was the information actionable, useful, reliable? If the information was actionable, what were the decision points achieved?
- Include quantitative measures, e.g., if there were 20 rumor injects, what percentage were caught and acted upon?
- Define and specify what “faster” means. Participants suggested a controlled experiment with A and B groups, and timing from inject to action. This could be repeated over several exercises.

²⁰ Kaniewski, Daniel. “Why VA Police Thought an Active Shooter Drill was Real.” The Daily Signal. 10/15/2015. <http://dailysignal.com/2015/10/15/why-va-police-thought-an-active-shooter-drill-was-real/>

- Ask whether participants were able to assess enough information to make a decision.
- Consider uses and applications of information made available. How would the information be used? What decisions or actions would be made from this information?
- What didn't the information provide that would have helped?
- Was verification sufficient? Why or why not?
- Was information integrated well within the larger information sharing environment? (e.g., other data).

This report provides two examples or models for exercise evaluation forms: Yes/No and a five-level Likert scale. Appendix A is a dichotomous, or Yes/No, example that requires responses to be in the form of a simple yes or no answer. Appendix B is an example of a five-level Likert scale that grades responses on a scale of strongly disagree, disagree, neither agree nor disagree, agree, or strongly agree.

Resource for Likert Scale Responses: [Clemson University's Likert Scale Response Anchors](#)

Between the Yes/No models and the five-level Likert scale, an evaluator will have several ways to approach evaluating the exercise. The evaluation should be determined in advance of the actual exercise, in consultation with the exercise planning team and social media SME. It is important to point out that for an operations-based exercise, both the five-level Likert scale and the Yes/No model are unable to measure reach or exposure of the participants' messaging because the exercise is taking place in a simulated environment where those statistics do not exist.

Social media adds the potential of a many-to-many channel of communication to the traditional one-to-many channel. The evaluator may desire to see whether or not the agency leverages this opportunity, thus producing a quantifiable measure.

Quantitative Measures

The following quantitative measures are based upon the assumption that a fictitious, non-live social media platform was leveraged. These social media platforms are not in the public domain. The following are some quantitative measures to consider in evaluating an exercise:

- Measures of Time:
 - The difference between the time of initial message and the ending time following a specified process.
 - The time to process messaging and inclusion in a situational status report.
 - The difference between the time of a posted question and the agency response post.
- Measures of Accuracy:
 - In a pre-determined quantity of MSEL injects, what percentage were accurately identified, handled or otherwise managed?
 - What was the percentage of typographical errors, omissions or incorrect data in messages?
 - Assessment of the accuracy of translated messages.
- Measure of Adherence to Policy:
 - Scoring against a rubric or EEG, what is the percentage of time a policy was or was not adhered to?
 - Scoring against a rubric or EEG, what is the percentage of time accessible tools were utilized for messages? For example, using the Twitter text description for posted [photos](#).

Other Measures

Additional evaluation measures include:

- Total number of tweets per shift;
- Length of tweet;
- Number of likes, shares and comments;
- Hashtags used (or omitted); and
- Cross-referencing to websites/other sources (whether or not on social media platforms).

After-Action Assessments

While designing the exercise, the exercise planning team should develop an after action survey to distribute to participants at the conclusion of the exercise. This survey should assess performance against exercise objectives and identify and document strengths and areas for improvement relative to core capabilities, goals and objectives for the exercise.

When developing a survey, an agency should think about the intended result of the completed forms. For example, if an agency has established objectives seeking to promote the usage of social media within their environment, then questions should favor this strategy as the answers will gauge how effectively, or ineffectively, the exercise achieved the objectives. If the survey seeks to identify issues and gaps, however, questions should be tailored so that corrective actions can be taken. Below are some suggested survey questions:

- Name
- Position/Title
- Agency Name
- Exercise Role
- Overall Impression of the Quality of the Exercise: (5 – Excellent; 4 – Very Good; 3 – Good; 2 – Fair; 1 - Poor). For ratings 2 or below please provide reasons for your rating.
- How frequently do you use social media within your agency during emergencies? (1 – Never; 2 – Rarely, in less than 10 percent of the chances when I could have; 3 – Occasionally, in about 30 percent of the chances when I could have; 4 – Sometimes, in about 50 percent of the chances when I could have; 5 – Frequently, in about 70 percent of the chances when I could have; 6– Usually, in about 90 of the chances I could have; 7 – Every time)
- Which positions within the EOC have social media responsibility? (e.g., Social Media Technical Specialist, PIO, Situation Status)
- What barriers were present that may have restricted the integration of social media?
- What training is necessary for future application of social media in your EOC? (e.g., platform tools, analysis techniques, accessibility techniques)
- Were the social media policies and procedures followed? Are revisions or training necessary based on the performance during the exercise?
- Did you feel overwhelmed by the quantity of information on social media: 1 – Strongly disagree; 2 – Disagree; 3 – Neither agree nor disagree; 4 – Agree; 5 – Strongly agree.
- Privacy issues

If gaps or risks are identified in the returned survey results, the information should be consolidated and incorporated into the agency's corrective action plan with an owner assigned the responsibility of resolving the gap/risk and a reasonable due date. If the owner cannot address the gap/risk in a reasonable amount of time, or if costs or other factors obstruct the resolution, then it would be necessary to escalate the matter to senior leadership for them to either accept the risk or to address it through whatever means necessary (e.g., funding).

CHALLENGES ASSOCIATED WITH INTEGRATING SOCIAL MEDIA INTO EXERCISES

Although the use of social media in exercises has become more commonplace, challenges to its incorporation exist. If social media is part of an agency's planning and operations, it should be exercised the same as other plans and policies. These challenges include process and personnel considerations, deciding which platforms or tools to use, technical limitations, and additional legal and privacy considerations. The following section provides guidance and examples for how to address these challenges, as well as considerations when utilizing social media during an exercise.

Processes and People

Many exercises do not have the right processes in place or individuals involved. This may be due to gaps in the level of competency or expertise of individuals, or the lack of training as a team. Failing to identify team tasks, assignments and processes may lead to communications breakdowns and overwork as individuals try to accomplish all social media goals in an exercise, rather than breaking apart the goals into manageable pieces. Establishing processes prior to an exercise can help mitigate the possibility of overwork and allow individuals the opportunity to complete their goals. Agencies that choose to exercise social media may find it difficult to identify exercise participants to work with social media during an exercise due to fear of using social media platforms and accidentally messaging outside the exercise environment. This report recommends agencies engage stakeholders early in the exercise design process and provide training on social media platforms and dry runs in preparation for an actual exercise. Suggested training resources are indicated in the Additional Considerations section.

Technical Challenges

In addition to challenges in processes and people, there are also technology challenges to consider when including social media in exercises, both in the technology design and its usage.

For technology design challenges, an exercise team must consider involvement of SMEs to ensure the selected technology meets the goals and objective needs of the exercise. Often an oversight and not appropriately prioritized during exercise design is process flow of information exchange and information fidelity.

Agency firewall restrictions on access to social websites and analytic tools are often cited as one of the major technology access roadblocks. Furthermore, simulation technology must often be scheduled for installation or access and involves a training component as the utilization of such technology is different enough from open social media platforms that users must practice prior to the exercise. Not providing for practice time prevents an accurate analysis of social media use as the evaluators will not know if it as a social media skills issue or a lack of understanding of how to use the simulation tool. Breakdowns in access occur when agencies adopt evolving attitudes toward the use of social media, but do not adequately update their policies and instruction to Information Technology managers to remove restrictions. Finally, EOCs must be evaluated for Internet bandwidth capacity. As multiple users access social sites to inform their decision

making within the EOC, Internet bandwidth may be constricted preventing other necessary service operations from being completed in a timely manner.

To summarize the key questions to address for better management of technical challenges, the following list provides some pointers and considerations:

- Assess firewall issues to ensure access to social media in the exercise environment and for the technology interface to be used for the simulation.
- Assess Internet bandwidth within the EOC facility and with any redundant systems.
- Identify social media search, display and reporting criteria, and adopt technology interfaces that meet this criteria requirement.
- Identify the multiple social media platforms in use and resolve access issues.
- Identify mapping technologies (e.g., ArcGIS) that may incorporate social media data into an operations dashboard to present aggregated social media data.
- Data issues:
 - Access to multiple platform data;
 - Managing data (input types, structure);
 - Processing data (information type flows, analysis, sharing); and
 - Storing and systematic archiving of data (process based retention, historical data).

Additional Considerations

In addition to the challenges provided above, each exercise will provide additional considerations dependent upon the scenario and exercise environment. These additional considerations may include:

- The quality and type of information accessible through social media as limited by: socio-economic impacts, demographics of users, whether a user is experiencing the incident or commenting on it, and access to technologies such as mobile devices or computers;
- Identifying various data needs inclusive of Essential Elements of Information and Critical Information Requirements and the format in which that social data is shared throughout the EOC and other agencies;
- Documentation of decisions made with this data (e.g., information products produced) and utilization of a decision matrix;
- Leveraging data from exercises in future response (e.g., collecting written messaging to draft templates for use in future incidents or exercises); and
- Phasing exercises so as to test each phase of the Social Media Maturity Model.

Finally, emergency management agencies may not always have a budget to fund employees specifically for enhancing social media efforts, but there are ways to incorporate this into semi-regular activities for practice. For example, FEMA offers free courses specifically tailored for social media use through the Emergency Management Institute²¹ to help build capability in an emergency management organization. Additionally, the [National Disaster Preparedness Training Center](#) offers two classes – PER-304 Social Media for Natural Disaster Response and Recovery and PER-344 Social Media Tools and Techniques. As referenced in this report, tools available online can be used as an environment to practice the collection of information requirements and the process for doing so.

²¹ <http://training.fema.gov/is/courseoverview.aspx?code=IS-42>

AREAS OF FUTURE RESEARCH

Potential research needs for the efficient incorporation of social media and other new, unconventional information sources in exercises for the academic community and future inquiries into social media are highlighted below.

Research Area	Description
<p>Achieving Realism in Exercise Simulations</p>	<p>Given that real-world emergencies can be rapidly changing events, information shared on social media is evolving in nature and its usage has an expiry date. Beyond a certain timestamp, information no longer aids situational awareness. Therefore, during exercises, creation of streaming content using MSEL-driven and other real-world (past) event-driven information flow of social media requires an interdisciplinary team of computing and organizational behavior researchers, as well as first responders, to identify information requirements. Information types in the simulated content needs to accurately reflect and model the evolution of event-related multimodal data (e.g., caution/advice to resource requests²²). Such an event evolution model needs to continuously update information and knowledge organization for situational awareness of different operational unit needs.</p> <p>Further research needs to focus on identifying types of information categories²³ (e.g., warning templates) that can be generic and adaptable across events, exercises, and different regions. Research and development of human-in-the-loop computational models²⁴ for contextualization of information types and content from other events could help automate the creation of incident-related information for an exercise scenario. In the past, such content has been transformed by replacing the exercise hashtags and appropriately mapped geo-tags used by exercise-related social media accounts.</p>

²² Purohit, H., Castillo, C., Diaz, F., Sheth, A., & Meier, P. (2013). Emergency-relief coordination on social media: Automatically matching resource requests and offers. *First Monday*, 19(1).

²³ Imran, M., Castillo, C., Diaz, F., & Vieweg, S. (2015). Processing social media messages in mass emergency: a survey. *ACM Computing Surveys (CSUR)*, 47(4), 67.

²⁴ That is, computational models that require human feedback and interaction

Research Area	Description
<p>Focusing on Information Processing from Different Platforms for Specialized Operational Services</p>	<p>In the existing research on practices during real-world response and simulation exercises, information accessibility for people with disabilities and others with access and functional needs have been undermined by data-driven approaches. As the types of multimodal data access expands, additional research is needed on information processing to support the integration of groups such as the autism community. There are wider issues with integrating people with disabilities and others with access and function needs in preparedness efforts. Exercises that incorporate issues with 508 compliance in exercise design and testing will assist agencies and organizations in real incidents.</p> <p>Therefore, a key research avenue is to investigate the role of different modes of communication used by such communities. It is likely that a specific social media platform may not be appropriate for the purpose of serving these communities. Further investigation on which modes of communication can be utilized to engage these citizens and how information sourced from those medium can be incorporated into the simulation technology interface for the exercise planners is necessary.</p>

Research Area	Description
<p>Exercise Resource Replicability and Multiple Data Platform Integration in Exercises</p>	<p>One major challenge within the exercise environment is that exercise operations can remain static (i.e., they do not change much). The content of communication and resources employed often changes, however, given that they are highly dependent on the context of the exercise scenario. This creates a replicability challenge.</p> <p>When creating exercise content and MSELs, the exercise planning team should identify specific information sharing platforms suitable for the exercise and identify the types of information most appropriate for situational awareness given the data disparities between platforms. Development of databases of disaster messaging separated by types of disaster (e.g., wildfire, hurricane, flood) and types of data sourcing platforms (e.g., news, social media) that can be used by stakeholders in the public safety community for future exercises would be of use.</p> <p>There is also a need for processing data from multiple platforms to integrate into a common operating picture. Situational data sources for exercise location and event type can be used to answer questions about what data sources to use, how much of a content stream is needed, how to develop such data sources for specific exercise scenarios, and how to train the exercise stakeholders to be adaptive (e.g., Humanity Road created datasets for the Canada-U.S. Enhanced Resiliency Experiment (CAUSE)– EM Deck, and the National Science Foundation’s Social-Computational System program research team at Kno.e.sis for the Dayton Regional Functional Exercise).^{25,26} There are at least three kinds of factors to incorporate while researching this type of content creation and adaption into the exercise workflow: first is new-scripted posts specific to the scenario; second is contextualization of generalized pre-scripted posts from other events including ways of scripting simulated metadata for advanced analysis; and third is creating enough volume of message activity to replicate open platforms. It is important to have volume containing unrelated messages, or noise, mixed with the signals to efficiently train practitioners.</p> <p>Creating a library of reusable, testable data for a variety of incidents with content that is grounded in real-world past event information category distribution (see referenced study from Patrick Meier in the report) will be a first step towards making ‘re-purposable’ exercises. After content creation, creating information interfaces of simulation technology that integrates multiple data sources is a key to successfully integrating social media into functional exercises. For example, a map serves as a base layer for any common operating picture, and therefore, can be a starting point for information presentation with multiple data sources. For data integration purposes, one future research direction of a socio-technical system of people, process and new technologies is the mapping between actions of the end users and the information provided via different types of data sources, with different modality (images vs. text).</p>

²⁵ Hampton, A., Bhatt, S., Smith, A., Brunn, J., Purohit, H., Shalin, V. L., Flach, J. M., & Sheth, A. P. (2015). On Using Synthetic Social Media Stimuli in an Emergency Preparedness Functional Exercise. *arXiv preprint arXiv:1503.00760*.

²⁶ Hughes, A. L. (2014). Participatory design for the social media needs of emergency public information officers. *Proc. of ISCRAM*.

Research Area	Description
<p>Credibility of Sources and Information Assurance</p>	<p>Given the increasing use of new technologies (e.g., citizens sharing affected region’s situation and drones capturing images/videos) during emergency response, a critical research challenge for information integration from multiple sources is the credibility of sources and the modality of data (e.g., visually evidential content via images/videos vs. text data).</p> <p>Such researched components need to fundamentally integrate the aspect of information assurance and trust measure with the content for who provides information, when and how crowd sources/citizens have vetted that content. An automated process to assess credibility of information and sources will increase the efficiency of the decision-making process for exercise participants.</p>
<p>Metrics and Evaluation for Exercise and Technologies for Integrating Multimodal Data Sources</p>	<p>Measuring effectiveness of the processes and technologies and providing a means to highlight deficiencies is critical for success of an exercise. Therefore, future research needs to better integrate mechanisms for technology interface to log activities of exercise stakeholder interaction with information, as well as post-exercise analyses to identify the pockets where technology integration into the exercises works versus areas that need attention for further improvements.</p> <p>A suggested direction for research into exercise tool development is the creation of a self-scoring mechanism of sophistication that identifies what exercise “play” level is available and how it can meet the exercise planning requirements. One example is the Canadian social media maturity model.²⁷ Furthermore, research on metrics that can help post-exercise briefs identify the utility and value of integrated information, as opposed to simply facilitating streams of multiple information sources.</p>
<p>Games, SimCell and Virtual Reality for Future Preparedness Exercises</p>	<p>Gaming principles and new wearable technologies are increasingly receiving attention from human computer interaction research areas. Research is anticipated on developing incentive-based gaming mechanisms as well as virtual reality based and augmented reality interface development in the simulation technology environment of exercises.</p> <p>Future research on 3-D games, microworld simulations, virtual reality and augmented reality will provide a means to create customized collaborative environments for the exercise stakeholders. For example, a mapping solution that provides live updated instructions for evacuees or a map that shows where resource caches might be located may provide additional and better preparedness opportunities. Further research on collaborative information system design and development will show new ways toward multimodal data integration and information flow facilitation for exercise participants. Such research also needs to factor in the design of new simulation technology environments with unconventional data sources, as well as the exercise level sophistication in the tools, which can help ease the adoption of such tools for exercise stakeholders.</p>

²⁷ Defence Research and Development Canada. “[Social Media in Emergency Management](#).” May 2014. 14.

CONCLUSION

This report discussed proposed processes and best practices for incorporating social media into exercises, beginning with exercise design and development and ending with exercise evaluation. The report complements HSEEP guidance and practices to include social media considerations, recognizing that social media is increasingly used by the public to share information before, during and after a disaster or incident. Agencies should decide on objectives for integrating social media in their exercises, which will help inform the rest of the process. Incorporating social media into exercises allows agencies and organizations the opportunity to “train like you play”, testing technologies, policies and procedures that can be used in a real-life event. The report also presents various challenges associated with integrating social media into exercises and offers ideas on how to resolve those challenges. Finally, the report presents future areas of research for academia to support future exercises.

Appendix A: Social Media Exercise Evaluation Guide – Dichotomous (Yes/No) Example

This is an example of a social media exercise evaluation guide that would produce only one of two possible responses from the evaluator.

Question	Yes	No
MESSAGE CLARITY AND QUALITY		
Were messages clear and understandable (e.g., brief, concise, plain language)?		
Were messages accessible?		
Were messages limited to 1 or 2 main points?		
Were acronyms and abbreviations used judiciously?		
Were critical action words used?		
Were hashtags used in messages?		
Were hashtags placed at the end of the message?		
Were more than three hashtags used per message?		
Were a consistent number of messages distributed throughout the event?		
RESPONSIVENESS		
Were externally-generated messages acknowledged through a direct response?		
Were messages generated quickly after response agencies were aware of the event?		
Were updates posted in a reasonable timeframe throughout the event?		
Was an “all clear” message posted at the conclusion of the event?		
Were messages written and disseminated within the expected agency timeframes?		
Were there any delays in creating messages?		
Were there any inconsistencies or irregularities in messages (e.g., empty promises, actions unfulfilled, or latency in communicating)?		
REFERENCES		
Were other official agency social media posts shared/retweeted?		
Were links to press releases made within a message?		

Question	Yes	No
Were links to websites made within a message?		
Were links to additional sources for information made within a message?		
ONLINE CREDIBILITY AND LIABILITY		
Was information for social media dissemination accurate before releasing?		
Were any erroneous decisions made based on information from social media?		
MONITORING AND ANALYSIS		
Were the injects' pertinent cues extracted?		
Were the social media influencers discovered?		
Were any of the data from other sources used?		
Were keyword searches performed?		
Was a list of referenced hashtags generated?		
Were data aggregation or social media management tools used (e.g., Hootsuite, etc.)?		
RESOURCE ALLOCATION		
Were digital volunteers used?		
Was mutual aid requested for social media efforts?		
MISCELLANEOUS		
Was an Incident Command System structure used?		
Was approval sought from the Incident Commander prior to releasing public information via social media?		
Does the agency have a disclaimer on its social media sites detailing how they intend on using that platform during an event?		

Appendix B: Social Media Exercise Evaluation Guide - Five-level Likert Scale Example

This is an example of an exercise evaluation guide that uses the five-level Likert scale.

Question	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
MESSAGE CLARITY AND QUALITY					
Messages were clear and understandable (e.g., brief, concise, plain language)					
Messages were limited to 1 or 2 main points					
Acronyms & abbreviations were used with care					
Critical action words were used in messages					
The interval between messages was appropriate for the type of event (scope, magnitude, complexity, type)					
Passive communications were performed ²⁸					
Active communications were performed ²⁹					
Engaged communications were performed ³⁰					
Hashtags were effectively used in messages (e.g., at end of message and limited to 3 max per message)					
A consistent number of messages were distributed throughout the event					
RESPONSIVENESS					
Externally-generated messages were acknowledged through a direct response					
Messages were generated quickly after awareness of event					
Updates were posted in a reasonable timeframe throughout the event					
An "all clear"-type message was posted at the conclusion of the event					
Messages created quickly following receipt of inject					

²⁸ Passive is defined as involving monitoring social media traffic and obtaining information.

²⁹ Active involves responding to inaccuracies or answering questions on other social media sites.

³⁰ Engaged involves full interaction with the public, responding to all questions, inquiries, etc.

Question	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
REFERENCES					
Other official agency social media posts were shared/retweeted					
Links to press releases were made within a message					
Links to websites were made within a message					
Links to additional sources for information were made within a message					
ONLINE CREDIBILITY AND LIABILITY					
Information for social media dissemination was confirmed accurate before its release					
MONITORING AND ANALYSIS					
Pertinent cues were extracted from the injects					
Social media influencers were discovered					
Data from other sources was used					
Keyword searches were performed					
A list of referenced hashtags was captured					
Data aggregation tools were used (e.g., Hootsuite, etc.)?					
RESOURCE ALLOCATION					
Digital volunteers were used effectively					
Mutual aid was utilized effectively					
MISCELLANEOUS					
An Incident Command System structure was used for social media efforts					
The Incident Commander approved all information prior to its release on social media					
Other tools (live video, photos, GIFs) were leveraged					

Appendix C: Case Study: District of Columbia Homeland Security and Emergency Management Agency (DC HSEMA)

[DC HSEMA](#) held a Hurricane Preparedness Exercise in 2014 that serves as an option for public safety agencies to integrate social media into their exercises using real social media accounts that were protected from public view and provided participants with a sense of reality.

Considered as leaders in applying social media to emergency management practices, [Kim Stephens and Cheryl Bledsoe](#) were subcontracted by Readiness Consulting Services, LLC, the prime contractor for the exercise series. Stephens and Bledsoe assembled a social media team to plan for the incorporation of social media into all aspects of the tabletop (TTX) and functional exercises to enhance the experience of all participants, including those who were not directly involved in communications. In consultation with DC HSEMA, the social media team decided to use real social media accounts across seven platforms for this exercise. The reasons for this choice were:

- Using social media during exercises was difficult even in the easiest circumstances;
- Using current social media platforms required less training as participants were already familiar with platforms such as Facebook and Twitter;
- Public safety agencies involved did not want to use their usual social media accounts in case something was leaked, became public and caused a panic; and
- Mock social media platforms often lack realism and did not adequately mimic real-world social media platforms.³¹

One of the first tasks for the social media team was to create content, or injects, for the exercise. All social media posts tied back to the exercise objectives, Master Scenario Events List (MSEL) and the event timeline. The team used a Google spreadsheet to collaborate on content creation. The spreadsheet was divided into subject areas (shelter, road closures, flooding, etc.) and by platforms (Facebook, Twitter, etc.). The team relied on real disaster social media posts as a foundation for their simulated entries. This ensured the content had the same urgency and tone as real posts.

WordPress

The team created a [WordPress](#)-based blog site to serve as the “newsfeed” for the event; it was updated regularly to provide situational awareness to participants. It also served as a repository for the situation manual and other documents including the exercise objectives, maps and more. The site was de-indexed to avoid the content from being discovered via a search engine and potentially mistaken by the public or media as real-world information. Blog sites can be password protected, but de-indexing effectively made it private since knowing the exact URL was necessary to gain access.

Throughout the exercise, the social media team updated the site with press releases, road closure information and other materials generated by participants. The newsfeed function of the blog was meant to help exercise participants see the bigger picture beyond their own functional areas.

Twitter

The team opted to use [protected Twitter accounts](#) after studying other options, including the use of an

³¹ Stephens, Kim. “Incorporating Social Media Into Your Exercises #SMEM.” *iDisaster 2.0 Blog*, June 4, 2015. June 21, 2015. <https://idisaster.wordpress.com/2015/06/04/incorporating-social-media-into-your-exercises-smem/>

exercise-specific hashtag, which was determined to be an insufficient solution. Even if all posts were labeled with the exercise hashtag, the content would still be visible to the public and would include an opportunity for mischaracterization or interpretation. In addition, nothing would have prohibited someone from removing the hashtag and re-Tweeting an exercise post.

By using protected [Twitter](#) accounts, the Tweets were *only* visible to people who had been manually approved by the account holder to view their Tweets.³² Furthermore, protected Tweets are not re-Tweetable and are not crawled, meaning they will not show up in a Web search.³³ To create the protected Twitter accounts, the team started with new Gmail accounts (since an email is required to sign up) and then created Twitter accounts for each of the simulation cell (SimCell) participants for the exercise. The SimCell portrayed the part of outside organizations, agencies and individuals who would likely participate in an actual disaster.³⁴ The exercise participants used their protected accounts to post content as they normally would during any event (e.g., the location of shelters, road closures, evacuations) and to respond to the SimCell's requests for information.

To view the Twitter stream from these accounts, all of the protected Twitter account holders simply followed each other. This helped create a more realistic stream of Tweets throughout the exercise. Using the protected Twitter accounts offered other advantages as well. Participants were already familiar with Twitter, so re-training was not needed; the simulated Tweets appeared beside participants' normal streams of Tweets, adding to the sense of reality; and since the Tweets were protected, there were minimal security issues.³⁵ On the downside, protected Tweets cannot not be re-Tweeted, so participants had to copy the Tweet and repost it. This added a little additional time to the task and made it somewhat less realistic, however, this concern was minor.

Flickr

[Flickr](#), a photo sharing application, was used for two main purposes: to find images (with re-use licensing agreement) that could be repurposed into YouTube and Facebook content and to create a "newsfeed" in the Emergency Operations Center (EOC) during the exercise. The team searched for photos from past hurricanes at varying stages – prior to landfall, during landfall and in recovery. The photos were placed in Flickr albums which were streamed into the EOC for participants to view in the exercise. Ms. Stephens and her team uploaded the albums in concert with the timeline of the exercise and they appeared in the EOC accordingly, allowing participants to view them and further give the exercise reality.³⁶

YouTube

Stephens used [YouTube](#) to further make the exercise more realistic. She found video material and images that matched the exercise location to create seven "News Updates/Alerts" videos depicting the hurricane's path and destruction. These news alerts were displayed in the EOC much like a news channel would show

³² "About Public and Protected Tweets." *Twitter.com*, 2014. June 22, 2015.

<https://support.twitter.com/articles/14016-about-public-and-protected-tweets#>

³³ Ibid

³⁴ FEMA, "Control Structure and Simulation Cell." *Homeland Security Exercise and Evaluation Program*. April 2013. June 21, 2015. https://www.fema.gov/media-library-data/20130726-1914-25045-8890/hseep_apr13_.pdf

³⁵ Stephens, Kim. "Incorporating Social Media Into Your Exercises #SMEM." *iDisaster 2.0 Blog*, June 4, 2015. June 21, 2015. <https://idisaster.wordpress.com/2015/06/04/incorporating-social-media-into-your-exercises-smem/>

³⁶ Ibid

videos of an actual hurricane. As they were posted to YouTube, they were easily embedded on the exercise WordPress site.³⁷

Facebook

A [closed group](#) on [Facebook](#) was used throughout the exercise for the same reasons Stephens and her team decided to use protected accounts on Twitter: exercise participants were already familiar with the Facebook platform. As mock Facebook accounts are comparatively difficult to create than mock Twitter accounts, however, exercise participants had to use their personal accounts for access to the closed group. Closed groups on Facebook are easy to set up. The content in a closed Facebook group does not appear on a user's newsfeed, which helped preserve security of the exercise. Exercise participants were added to the Facebook group prior to the exercise, and the SimCell wrote and populated the Facebook group page with content.

During the exercise, the participants responded to requests for information and help on the Facebook group and also posted updates as they normally would. The inability to create false identities was a drawback. This meant the SimCell members interacted with participants on multiple injects (e.g., asking for information or help). In a real event, many different people would have been asking those questions.³⁸

Google Forms

Stephens and her team used [Google forms](#) to create questionnaires and collect information and feedback from all exercise participants (more than 400 during the TTX). Google forms were easy to create and distribute. The feedback received during the exercise was aggregated and placed on monitors for participants to view.³⁹

Short Message Service (SMS) Text Messaging

SMS text messages provided exercise participants a further sense of reality and urgency during both the TTX and functional exercise. The team used an online SMS texting service for this capability. Text messages distributed Google form questionnaire links, provided fictional weather updates each hour, and provided a general sense of situational awareness. During an actual disaster, responders might receive texts and alerts from worried family members, weather watches and warnings, and other similar information. One difficulty encountered was obtaining accurate phone numbers from a few participants who were concerned about how their phone number could be used. After seeing other participants receive the messages, however, anyone who was initially hesitant inquired about being added to the system. Text messages are extremely effective and worthwhile because they are read, on average, in the first five seconds of receipt.⁴⁰

Outcomes

Overall, the exercise with DC HSEMA was a success. Social media by nature is dynamic and quick-moving, which can create complications. Using already-familiar platforms, maintaining the WordPress blog and giving participants a sense of reality whenever possible helped the exercise accomplish its goals.

³⁷ Ibid.

³⁸ Ibid.

³⁹ Ibid.

⁴⁰ Gigi. "45 Texting Statistics That Prove Businesses Need to Take SMS Seriously." *OneReach Blog*, September 10, 2015. <https://onereach.com/blog/45-texting-statistics-that-prove-businesses-need-to-start-taking-sms-seriously/>

Appendix D: Case Study: Canada – United States Enhanced Resiliency Experiment (CAUSE) Series

On December 7, 2011, then-President Obama and Prime Minister Harper released the Beyond the Border (BTB) Action Plan. Specifically, the BTB Action Plan states that Canada and the United States (U.S.) will: “promote the harmonization of the Canadian Multi-Agency Situational Awareness System with the U.S. Integrated Public Alert and Warning System to enable sharing of alert, warning and incident information to improve response coordination during binational disasters.” The Canada-U.S. Enhanced Resiliency Experiment (CAUSE) works to improve information-sharing and situational awareness between the two neighbors and is the latest move to build bilateral partnerships for emergency preparedness.

The Canada–U.S. Enhanced Resiliency III Experiment (CAUSE III) addressed this common goal in addition to several other initiatives. It was jointly sponsored by the U.S. Department of Homeland Security Science and Technology Directorate First Responders Group, Defense Research and Development Canada’s Centre for Security Science, and Public Safety Canada. This cross-border initiative consisted of experiments held throughout November 2014. Emergency management agencies in Nova Scotia and New Hampshire, supported by digital volunteers, tested the capability of officials to leverage social media. Virtual USA contributed to enhanced situational awareness (SA) across borders. The results demonstrated improvements to shared SA and interoperable communications, which positively impacted enhancing community resilience.

A simulated environment was created for the Northeastern CAUSE III experiment, which was designed around a large hurricane scenario. Social media and SA tools supported the exchange of alerts, warnings and notifications and the coordination of mutual aid between Canada and the U.S. The results demonstrated that the cooperation and collaboration between traditional emergency management organizations and digital volunteers, including Virtual Operation Support Teams and humanitarian organizations, had the potential to improve recovery operations by using interoperable SA tools and social media tools.⁴¹

CAUSE IV took place between Port Huron, Michigan, and Sarnia, Ontario in April 2016. The Blue Water Bridge, the second busiest crossing between the U.S. and Canada, served as the primary site of the emergency scenario. Local alerting systems triggered targeted public notifications via a variety of channels, including outdoor warning sirens, telephone, Short Message Service (SMS)-text message and social media. The SMS alert messages included public safety information to expand SA for the public and local, state, provincial, non-governmental and federal partners. Building on this effort, digital volunteers and 211 dispatch centers assisted in developing an automated damage assessment triage model to help emergency managers prioritize where to send teams into the field.

For CAUSE IV, social media was simulated in a closed environment using real-world platforms (Facebook and Twitter). The experiment planners used an open source archiving solution (Google Tags 6.0) to identify similar disasters and collect relevant messages to be re-used during the experiment. The social media messages were changed from their original format with an exercise hash tag, personally identifiable information and latitude/longitude for use as scripted messages and exercise injects. The experiment planners used the PHP scripting language along with the Twitter application program interface to create an automated protected Twitter feed of exercise injects and content. Since each Tweet had to come from a

⁴¹ DHS S&T and Canada DRDC CSS. “[Canada- U.S. Enhanced Resiliency Experiment \(CAUSE III\) Northeastern Scenario After-Action Report](#).” June 2015.

user, the experiment planners manually created each user, requiring additional time and an email address. The Twitter feed posted Tweets from simulated agencies and the public in time sequence during the experiment. The experiment planners experienced an issue during CAUSE IV because Twitter imposes limits on the number of automated Tweets in a given amount of time; therefore the Tweets were more limited than originally planned. The Twitter feed was created to have a similar signal-to-noise ratio as seen in real-life disasters or incidents. For Facebook, a closed group was created for digital volunteers to interact with a simulation cell that posted simulated content. During CAUSE IV, a digital volunteer team used mapping software and a Geoform to curate and display the categorized messages from Facebook and Twitter that required follow-up action. From the approximately 500 social media injects that were monitored, the digital volunteer team identified 40 reports that contained valuable information and shared these with the through a Social Media Operations Dashboard for follow-up.⁴²

⁴² DHS S&T and Canada DRDC CSS, "[Canada U.S. Enhanced Resiliency Experiment \(CAUSE IV\) Binational After Action Report.](#)" June 2016.

Appendix E: Case Study: Anchorage, Alaska Social Media Exercise

The 211 Call Center in Anchorage, Alaska serves as the public call center during activations of the Emergency Operations Center (EOC), as requested and authorized by either the Director of the Office of Emergency Management (OEM) or the City Administrator. The Anchorage 211 Call Center is housed in the lower level of the EOC and has the capability to rapidly expand the number of on-site call takers or to divert calls to other U.S. call centers. Anchorage OEM's Emergency Programs Manager and EOC Lead Public Information Officer (PIO) worked with the Director of the Anchorage 211 Call Center to develop a paper-based system for reporting calls to the Public Information Center (PIC) and for tracking follow up within the PIC. A paper-based system was created because there was no software available to link the 211 systems with the PIC. This new process needed to be tested, so it was incorporated into Alaska Shield 2012.

Anchorage PIC's PIOs also needed to test their ability to use, monitor and respond to public information via social media with very limited staffing. During an activation of the EOC for a real-world event, the PIC will have one to four PIOs on site, if available. Frequently these PIOs will need to participate virtually due to the obligations they have to their own agencies. No funding for software was available. The Anchorage OEM's Emergency Programs Manager and EOC Lead PIO selected Hootsuite as the tool to be used to monitor and update social media. Training and job aids were created and provided to the PIOs. A blog for public dissemination of situation updates and messages was also created, trained and incorporated into PIC processes. All of these new tools also needed to be exercised and were incorporated into Alaska Shield 2012.

The 211 Call Center paper-based system and the Hootsuite tool for monitoring and updating social media needed to be tested. As such, they were incorporated into Alaska Shield 2012 with the following purpose:

- To test the Anchorage EOC PIC's ability to use, monitor and respond to social media during an event;
- To test the 211 Call Center's ability to process incoming requests for information; and
- To test the coordination between the 211 Call Center and the EOC PIC.

The exercise consisted of a controller, an evaluator, players and role players and utilized both Hootsuite and WordPress. The Anchorage EOC exercise scenario was a natural gas shortage during a cold weather event. The PIC participated for the first two of four days. Master Scenario Events List injects were created in advance and volunteers were briefed on how to role play the exercise. Volunteer recruitment was targeted to individuals within the community who were active participants with the Anchorage OEM's volunteer programs and community education programs. Volunteers were selected based upon availability for the entirety of the PIC exercise, knowledge of general emergency management and response concepts, knowledge of emergency public information concepts, and ability to be a trusted source for the exercise.

A critical component of any exercise is the ability to ensure injects and responses are not interpreted as real-world events or activities. To avoid open, public messages, the Anchorage OEM created a private Facebook group and kept the blog Web address unlisted until after the exercise. All posts to the Facebook group and blog included "This post is part of an exercise and is not a real world event or activity." Twitter was not utilized.

When exercise play began, role players would either call injects in to the 211 Call Center or present injects via social media at the designated time. The role players also spontaneously created new injects based upon their monitoring of press releases, blogs and social media posts. Because social media allows for two-way conversations and enables public information officials to quickly understand how their messages are being

interpreted and applied, live responses from the simulation cell to the players and vice-versa was an important exercise criterion. As posts were added to Facebook or the blog, role players were encouraged to reply on Facebook, call 211 with additional questions or concerns, or create their own posts within the private group about the information provided by the PIC.

The role players were also asked to provide input to the after action report from the perspective of the public users of social media. Some of the after action items identified through the exercise included:

- An identified need for additional staff assigned to social media. At the time, a single PIO was tasked with creating posts and monitoring social media. The PIO found it nearly impossible to do both.
- An identified need to revise policy on message approval. It took too long to receive approvals for every individual social media post.
- Even with 211 receiving public inquiry calls, the PIC was incredibly busy with all of the PIOs staffing their shifts in the PIC. During an event, if PIOs are operating virtually or are unavailable (thereby reducing staff), monitoring social media will be the first activity to be eliminated. All other activities (media releases, posting to social media, participating in EOC meetings) are more pressing. To ensure that social media can be monitored effectively, adequate staffing must be addressed.
- Hootsuite worked exceptionally well as a dashboard and allowed any of the PIOs to take over the social media position quickly and easily.

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