

Chapter 44

Large-Scale Disaster Response Management: Social Media and Homeland Security

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ABSTRACT

This chapter provides readers with an overview of how social media has enhanced large-scale natural disaster response at the Department of Homeland Security and its partners. The authors of this chapter present the history of the Federal Emergency Management Agency and how its successes and failures have shaped how the Department of Homeland Security has managed trends in increased community participation and information technology. Concepts from Systems Engineering frame the discussion around resilience engineering, network analysis, information systems, and human systems integration as they pertain to how social media can be integrated more effectively in large-scale disaster response. Examples of social media in disaster response are presented including a more in-depth case study on the use of social media during the 2012 Hurricane Sandy response. The chapter concludes with a proposed framework of a decision support system which integrates the benefits of social media while mitigating its risks.

INTRODUCTION

The devastation of Hurricane Katrina and the lack of federal response has been the subject of scholarly research for more than a decade. This tragedy, among others since 2005, has brought immediate attention to the need for an improvement to large-scale disaster response and management. Hurricane Katrina claimed the lives of more than 1,800 people (Zimmermann, 2012) as the nation and the world

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monitored federal response on various media sources, from television to print. Public outrage deepening further after it was apparent that the disaster management resources were grossly underestimated and not timely. Various local and national media sources were reporting that there were hundreds of people in need of rescue and aid, but there was a gap between what was being reported and where disaster response resources were actually deployed. This chapter will provide an in-depth background on large-scale natural disaster response and propose a framework for using social media to bridge the gap between media reporting and adequate resource deployment.

Large-scale disasters undeniably make response very complex. “Every year, disasters put millions of Americans in danger and destroy billions of dollars worth of property” (Department of Homeland Security [DHS], 2013b). Disasters of this scale can be labeled as a catastrophic incident. The National Response Framework (DHS, 2008) defines a catastrophic incident as “any natural or manmade incident, including terrorism that results in extraordinary levels of mass casualties, damage, or disruption.” The sheer magnitude of these disasters typically occurs in multiple jurisdictions and has greater risk to catastrophic loss of life and property. Additionally, with advances in technology and a culture of immediate social media reporting, it is often difficult to coordinate resources at a federal level ahead of public perception of slow response.

To further understand disaster response management, it is also important to understand other commonly used terms, such as, emergency management and crisis management. An emergency can also be considered as an event which has made it unlikely or “impossible for an organization to conduct business as usual” (Turoff, Chumer, Hiltz, & Klashner, 2004b). Typically in crisis situations, it is expected that there will be an element that could not be predicted. The main purpose of an emergency management system is assuring that there are minimum loss of life and property given the investment of resources towards this effort (Nikolic, Savic, & Stankovic, 2007). Similarly, Perry (2003) argues that “emergency management refers to the implementation of plans, and the use of personnel and equipment to achieve the tactical and task requirements of response to address a given threat.” The Federal Emergency Management Agency defines crisis management as the “measures to identify, acquire, and plan the use of resources needed to anticipate, prevent, and/or resolve a threat or act of terrorism” (Federal Emergency Management Agency [FEMA], 2003). Although disasters and crises can be different events, they are certainly highly related. “The disaster is similar to the crisis in terms of the developing phases (pre-event phase, event phase, and recovery phase)” (Shaluf, Ahmadun, & Said, 2003) Therefore, this chapter will apply research from disasters, crises, and emergencies.

Effective disaster response management requires the right resources to be deployed to the right location at the right time. This triangulation is the foundation of precise decision-making. Decision making is a very complex behavior in large-scale disaster management because of the “half-structured or a non-structured problem [and] ... the value of timely information is immense” (Nikolic et al., 2007). One such location of disaster-related information is that found in social networks and media. Bhanot (2012) states that “social media are media for social interaction, using highly accessible and scalable communication techniques... [and] is the use of web-based and mobile technologies to turn communication into interactive dialogue.”

From Web 1.0 in the 1990s to current uses of Web 2.0, social media has evolved over the years. Platforms, such as, Facebook, Twitter, and YouTube have millions of users that are connected to each other over a broad network where their feelings and observations are posted in only a short few moments. Nearly instantly, those that are connected to the same network, linked by common interest, are updated on a new post from a user in their network. There are tremendous advantages to social media. For example, social

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