The Use of Social Media in Disaster Situations: Framework and Cases

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ABSTRACT

Recent disasters highlight the importance of social media supporting critical information gathering and dissemination efforts by members of the public. Given that disasters pose unique challenges and social media are evolving rapidly, how can one compare the effectiveness of social media in different disaster situations? Drawing from prior work on e-participation, this article proposes a novel framework for social media use based on four key modules: selection, facilitation, deliberation, and aggregation. A comparative analysis of social media use following a man-made disaster (the 2007 Virginia Tech tragedy) and during a natural disaster (the 2009 Britain blizzard) exemplifies the value of the proposed framework. Future research can build on and leverage the present work by analyzing and incorporating additional cases on the use of social media in disaster situations.

Keywords: Disaster Management, E-Participation, Social Media

1. INTRODUCTION

The emerging use of information and communication technology (ICT) as social media, including blogging, tagging, and content sharing, facilitates critical information generation and dissemination activities by members of the public during the phases of a disaster (Palen & Liu, 2007). Scholars in the field of crisis informatics (Palen et al., 2007b) recently investigated the public’s elaborate use of social media following various natural and man-made disasters, including the Indian Ocean earthquake and tsunami, London bombings, Avian influenza outbreak, hurricane Katrina, Virginia Tech shootings, Minneapolis bridge collapse, and Southern California wildfires (Hughes et al., 2008; Liu et al., 2008; Palen et al., 2007a; Shkovlevski et al., 2008; Sutton et al., 2008; Vieweg et al., 2008). In essence, findings suggest that “social media support critical information distribution activity among members of the public that (...) needs to be better integrated with official disaster response activities” (Palen, 2008, p. 78). This call for attention to social media in disaster management is in line with the overall objective of emergency response information systems, which consists of “providing relevant
communities collaborative knowledge systems to exchange information” (Turoff, 2002, p. 29, cited in Van de Walle & Turoff, 2007, p. 31).

However, given that disasters pose unique challenges and social media are evolving rapidly, how can one compare the effectiveness of social media in different disaster situations? In addition, the grassroots nature of social media challenges conventional organization processes and structures in typical incident command centers (Turoff et al., 2008), thus further complicating its integration with official disaster response activities. In an effort to overcome these challenges, a combination of policy reform and technology design research has been encouraged (Palen, 2008). Current work seems to focus primarily on technology design, mainly proposing advanced web-based artifacts such as a dynamic voting wiki (White et al., 2007), an emergency domain online social network (Plotnick et al., 2009), and a mega-collaboration tool (Newlon et al., 2009).

In this vein, this article aims to further the understanding of social media use by members of the public in disaster situations. In the absence of a generally accepted body of knowledge on social media use, we draw from prior work on e-participation to propose a novel framework for social media use based on four key modules: (1) selection, (2) facilitation, (3) deliberation, and (4) aggregation. The applicability and utility of the proposed framework is highlighted in a comparative analysis of social media use in two disaster situations: following the Virginia Tech tragedy in 2007, a man-made disaster, and during the Britain blizzard in 2009, a natural disaster.

The remainder of this article is structured as follows. We first provide an overview of prior work on e-participation and present our proposed framework. Next, we describe the methodology of comparative case analysis, followed by a discussion of two different case studies. Finally, we conclude with directions for future research.

2. THEORETICAL BACKGROUND

Due to the lack of an established body of knowledge on the use of social media by members of the public, we draw from prior work that addresses a similar issue: e-participation. In the fields of policy and political science, e-participation generally refers to the use of web applications for public participation in policy making (Macintosh, 2006). E-participation can be seen as a subset of the general mechanisms underlying public participation, which denotes the practice of integrating citizens in the political decision-making activities of organizations (Rowe, 2005). Also in this field, scholars seem to focus now on efforts to design more efficient and effective public participation processes that make use of social media (Abelson et al., 2003).

The intent of the following subsections is to highlight the variety and limitations of the existing concepts in e-participation, which have not yet led to the development of a significant theory of “what works best when” (Rowe & Frewer, 2000). In an effort to overcome these limitations, the last subsection proposes a novel framework for social media use in disaster situations.

2.1. Integration of E-Participation

Arnstein (1969) is one of the first researchers to provide what can be seen as probably the most enduring metaphor of variations in public participation. Her so-called ladder of public participation has eight stages, accounting for the increasing levels of integrating the public in the policy-making process. Wiedemann and Femers (1993) further develop Arnstein’s work by combining the public’s access to information with the public’s rights in the decision-making process. Their conceptualization of public participation ranges from non-participation through sequential stages of increasing integration to the final empowerment of the public, with each stage serving as a requirement to reach the following (Table 1, left column).
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