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# Information Movement Across Social Media Platforms During Crisis Events

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**Abstract**

We outline a novel research agenda for examining how and why people communicate across multiple social media platforms during crisis events.

**Author Keywords**

Social media; social computing; information dynamics; crisis informatics.

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H.5.3 Information Interfaces & Presentation: Groups & Organization Interfaces: Collaborative computing, Computer-supported cooperative work, Web-based interaction

**Introduction**

We propose a new research agenda that will examine, conceptualize, and assess information movement across multiple platforms during crisis events such as natural disasters, extreme weather events and acts of terrorism. Crisis events are often characterized by large-scale convergence online [6,10] and therefore provide productive opportunities to examine information seeking and sharing behaviors within a high-tempo environment and across platforms. The current dynamics of information movement feature a multitude of social media platforms that connect in numerous and complex ways. Considering the

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pervasive interconnectivity of these platforms, studies that focus on a single platform—as most research in the crisis domain does—provide a problematically limited view of the dynamics of information movement. A cross-platform perspective will offer insight into how variations in platforms’ affordances and user behaviors contribute to the movement of information and the mobilization of audiences.

### **Social Media & Crisis Events**

Though massive convergence and intensive information production/seeking have always been features of crisis events [4], social media have increased the rate and scale at which these behaviors can take place [6,9]. As those affected by a crisis event seek and/or produce information, the information moves across many social media platforms. For example, individuals use a variety of mechanisms to redistribute and rebroadcast information within a single platform (e.g., retweeting for Twitter, sharing for Facebook). Emergency responders and the broadcast media often use tools that automatically post important stories and information to multiple platforms at the same time [7]. Studies have also reported purposeful cross-posting behavior during crisis events—where individuals duplicate information from one platform to another [2,12]. Unfortunately, the vast majority of research studying how information moves on social media during crises tends to focus on one specific platform—typically Twitter [1,3,13]—or a limited set of platforms [7,11].

### **The Research Agenda**

To fully understand how information moves (or is *moved*) through online spaces during crisis events, researchers must adopt a multi-platform approach, integrating digital traces from various sites (e.g.,

Twitter, reddit, Facebook, Wikipedia, YikYak, and others). This approach would enable researchers to account for information propagation dynamics related to the conversational shifts from one platform to another, as well as echo effects and false perceptions of triangulation when information appears to exist independently in multiple sites. Additionally, approaching broad questions of information movement from multiple sites at once provides an opportunity for precise comparison that will reveal how the affordances of different sites shape information sharing practices and the resulting information propagation dynamics. It will also enable researchers to further unpack the roles that specific individuals and applications play by purposefully migrating information from one site to another.

To accomplish this agenda, we envision two main research directions: 1) collecting data across multiple social media platforms and 2) integrating and analyzing the collected data. We discuss the challenges and potential approaches for each of these directions below.

#### *Data Collection*

Collecting cross-platform data is hard, because crises involve uncertainty, improvised decision making, and lack of coordination. Researchers must detect events, identify search parameters, and begin collection quickly to capture “good” data sets. Though some platforms like Wikipedia maintain a perfect edit history, information on many other online sites decays—e.g., tweets are deleted, reddit threads are edited, web pages are updated. This problem becomes further complicated as crisis events emerge and evolve; new keyword terms and geographic areas become relevant and need to be appended to search parameters to

ensure collections adapt to the changing event. We propose to address these challenges through the development of infrastructure that takes advantage of the multi-platform approach and the distributed nature of our collaborative team.

Coordinating collections is also important for assuring comparable, complementary, and comprehensive data. Every search strategy introduces certain biases to the data [5]. For the different data sets (from different sites) to be comparable, search parameters for each collection must be aligned. For example, keyword searches on each site should include similar sets of hashtags and other prominent terms. Integrating data collections across social media platforms adds a powerful new dimension to event detection and the definition of search parameters. Data collected from one platform can inform collection on others—e.g., a burst of public Facebook posts that link to a new reddit thread could be detected and used to initiate a reddit collection on that thread. We propose exploring automated and human-in-the-loop solutions for event detection and curation of event collections (i.e., for helping researchers adjust search parameters as events change and different keywords, geographic areas, etc. become salient).

#### *Data Analysis*

We plan to use a mixed-method approach for analyzing multi-platform social media data around crisis events. We will employ quantitative methods of analysis to describe large-scale patterns, identify anomalies, and determine appropriate samples for follow-up qualitative analysis. The qualitative portion will provide context and deeper understanding of motivations and decision-making related to the phenomena. This integration of

quantitative and qualitative methods will build upon an emerging methodology for doing grounded, interpretive research on “big” social data [8]. Within this process, researchers iterate back and forth between macro and micro analytical perspectives: for example, computationally generating artifacts such as temporal signatures or semantic network graphs; collectively interpreting those artifacts to identify interesting time periods or prominent keywords; and then randomly sampling textual content at those times or with those terms and qualitatively analyzing that content.

#### **Research Implications**

Benefits of this research initially lie directly in the domain of emergency response through improved understanding of how information spreads through and across social media during crisis events. These insights will inform strategies for emergency responders to target, tailor, and monitor messaging across the information ecosystem. This work will also identify practices that those affected can use to bridge platforms and circulate information in effective ways. For platform designers, this research will identify and articulate implications for supporting interoperability, information integration, and situational awareness during crisis events. Our approaches for integrating data collections and analyses across platforms will benefit other researchers in crisis informatics, computational social science, and similar fields.

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