Interoperability for Extreme Events Research Group

THE UNIVERSITY OF SYDNEY
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Characterization of the Use of Social Media in Natural Disasters

Social media sites are playing a significant role in rapid propagation of information when disasters occur. This effective communication platform is a useful tool for emergency (disaster) management agencies during all phases of the disaster management life cycle: prevention (mitigation), preparedness, response, and recovery. This study has conducted a systematic review of social media use in disaster management literature. This has been done to identify how social media sites have been used during these four critical phases of the disaster management life cycle in order to recommend strategies for government officials. The findings of this study discovered six main themes: situational awareness, data collection methods, distributed sensor systems, news and rumors, sentiment analysis, and digital volunteerism.

Social Media in Natural Disasters

Information exchange is pivotal during the disaster management processes (i.e., prevention, preparedness, response, and recovery) and specially in the response phase. During a disaster, people are able to share their information in a variety of forms (e.g., text, photo, video) or their concerns about the situation on social networking sites. This provides a good source of information for disaster managers to find out the source and severity of the event and create (a better) situational awareness appropriate to the affected communities. Disaster managers can monitor content provided by communities to identify emerging trends and potential hotspots, which can be flashpoints for disaster.

Early Findings

Key findings from our early research have shown that there are six areas of implications, when social media have been used in previous natural disaster incidents:

A. Demand for real-time data

The rise of social media and other forms of user-generated content have created the demand amongst people hit by natural disasters for real-time information. Social media offers various methods for the effective dissemination, collection, and analysis of disaster related posts. Examples of such tools are Bloom Filter Chains for real-time tweet search and twitter APIs – 'crawl' and 'timeline'.

B. Developing Situational Awareness

Social media platforms are overwhelmingly useful to create situational awareness among affected communities in natural disasters. For many social media researchers a situational awareness view is helpful for anticipating how individuals, groups and communities can use information contributed by others on social media platforms.

C. Classifying News and Rumours

Research shows that if Twitter, as a social media platform, is effective in broadcasting valid information, it is also effective in spreading baseless rumours which can contribute to the general chaos in affected areas. Therefore, appropriate mechanisms must be in place to help both citizens and disaster management authorities to ensure reliability and accuracy of information posted on social media.

> ***While time that social media is very effective in disseminating real-time information during a natural disasters, appropriate mechanisms must be in place to help both citizens and disaster management authorities to ensure about reliability and accuracy of information posted on social media***

D. Distributed sensor system

Proliferation of social media feeds and geographic information content fosters the emergence of microblogging as a new type of a distributed system, with bloggers acting as sensors, and their comments in the form of messages, conveying relevant information often with a corresponding geographic footprint. Many studies highlight that social media websites such as twitter present an effective distributed sensor system for event detection and impact assessment.

E. Digital volunterism

Experts recognize the importance of processing real-time and first-hand information from disaster-affected-communities for better decision making and strategy design. Individuals and groups involved in monitoring incoming feeds to find new, relevant, and actionable information are called digital volunteers, who often work to change the social media data into useable resources. Studies postulate that with the knowledge of existing self organizing mechanisms, digital volunteers will become a common and likely influential feature of social life.

F. Sentiment analysis

Experts argue that minorities differ in their risk perception and in their response to emergency warnings, with some having fatalistic sentiments leading to greater fear and less preparedness. These sentiments need to be understood by the emergency authorities to better tailor emergency warnings, preparedness and responses. Public sentiments towards unfolding natural disasters are measured in various ways by the social media platforms. For example, Facebook measures the level of public concern through 'likes' and 'dislikes'.

Takeaway

A systematic review of the literature on the role of social media in natural disasters characterises social media into six aspects. This can be insightful for the development of a strategic view of social media use during a natural disaster by authorities during their decision making.

References

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