When Online Is Off: Public Communications Following the February 2011 Christchurch, NZ, Earthquake

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ABSTRACT

This work in progress investigates the communication issues encountered and the strategies used by local government to communicate electronically with disaster affected individuals in the immediate aftermath of the February 2011 earthquake in Christchurch, NZ. It also provides a preliminary examination of the effects of information access on individual perceptions of community resiliency. We draw from a variety of data sources, including field research, interviews, and focus groups with local community members. Ongoing survey research will be integrated into future papers and presentations. This research provides insight into online crisis communications and the effectiveness of strategies to communicate with members of the public in a post-disaster environment when there is limited access to information via electronic channels.

Keywords

Online communications, disaster response, social media

INTRODUCTION

The February 22, 2011, M6.3 earthquake in Christchurch, New Zealand, part of the aftershock sequence of the September, 2010, M7.1 earthquake, caused significant infrastructure and economic damage, and life loss, to a modern city with similar population characteristics as US metropolitan communities. In the days and weeks following the earthquake, local government utilized various risk communication strategies to communicate with individuals affected by the ongoing aftershocks, including a fully integrated social media strategy via online networked communications.

Despite the concentrated effort to relay important information about response and recovery efforts, many disaster-affected individuals experienced significant communication challenges related to failures of critical infrastructure and longstanding power outages in residential areas. Many individuals were physically cut off from key resources, requiring creative strategies to communicate with public officials and to obtain information. In this day and age, when emergency managers are frequently developing their communication strategies by building online information portals and delivering information via web-based and social media communications, disaster affected individuals are at risk of being in a vulnerable vacuum of information just when they need it most.

This *work in progress* addresses these issues and investigates the strategies used by local government to communicate electronically with disaster-affected individuals, individual access to information in the immediate aftermath of the earthquake, and the effects of information access on individual perceptions of community resiliency. We draw from a variety of data sources, including field research conducted two weeks post event, interviews with key informants, and focus groups with local community members. Survey research with a statistically representative sample of Christchurch residents is *ongoing*, and will be integrated into future papers. This research provides insight into the effectiveness of strategies to communicate with members of the public in a post-disaster environment when there is limited access to information and via electronic channels.

BACKGROUND

Online Communication in Extreme Events

Social media is currently being promoted as the next generation communication channel by emergency managers (Crowe, 2010), humanitarian organizations (Harvard Humanitarian Initiative, 2011), and federal agencies (Earle, Guy, Buckmaster, Ostrum, Horvath, and Vaughan, 2010). It is envisioned as a set of tools that can enable crowdsourced information under times of crisis, useful for situational awareness, as well as a channel to distribute information in a timely, networked fashion and to observe social milling in response to risk messages. A small set of empirical studies show varying uses of online communications for large scale, pre-planned events (Sutton, 2009), public safety emergency events (Latonero and Shklovski, 2010; Heverin and Zack 2011), and natural disasters (Sutton, Hansard, and Hewitt, 2011). The February 2010 Christchurch earthquake represents a large scale disaster event with significant numbers of deaths and injuries, resulting in a national state of emergency and the emergence of new communication strategies in the absence of a pre-existing communication plan.

Additional investigations on social media in disaster have focused on technology use by the public to resolve specific problem sets (see for instance Vieweg, Palen, Liu, Hughes, and Sutton, 2008) and to provide information in the absence of timely official communications (Sutton, Palen, and Shklovski, 2008). Research efforts on volunteerism (Starbird and Palen, 2011) and content curation (Liu, 2011) have also become key to understanding the role of distributed publics contributing to the virtual disaster response.

Information and Communication for Resiliency

Access to information during and after a disaster event is one of several key indicators of resiliency (Comfort, 2005; Norris, Stevens, Pfefferbaum, Wyche, and Pfefferbaum, 2008) and is the focus of a current National Science Foundation funded investigation that examines information technology in rural disaster-affected communities (CMMI-1049340; PIs Sutton and Benight). Critical infrastructure to support communications, the existence of and use of local online community networks, and the social interactions that facilitate information sharing in times of crisis are keys to this capacity. The absence of critical infrastructure limits modern communication capacities, requiring those affected by disaster to utilize social networks and implement other strategies to obtain information that is most readily available online. While information proliferates across the web, those without access are left in an information vacuum until communications infrastructures can be restored.

RESEARCH METHODS

Initial field research was conducted in Christchurch in March 2011, where field note observations were recorded and informal interviews were carried out with key informants and public officials (N=8). One group discussion (4 participants) was also held with digital volunteers who assisted in creating an Ushahidi instance and developed the eq.nz.org map online. Follow up research was conducted in Christchurch in November 2011 and included a tour of several "red zone" residential areas and the downtown Central Business District. During this trip, a second round of informal interviews were conducted with key informants (N=2), and three focus groups (9 participants total) were held with local community leaders and public officials. In each of the interviews and focus groups, discussions centered on communications strategies in the absence of infrastructure and public access to information online. Similar questions were also incorporated into four focus groups conducted by research collaborators from the Joint Centre for Disaster Research at Massey University in Wellington, NZ.

Notes from all interviews and focus groups were analyzed to identify common themes on disaster communication, access to information, and key resiliency related items. Context specific information was then incorporated into a survey questionnaire that has been distributed by New Zealand collaborators.

In December 2011, a survey was sent to a statistically representative sample of 600 households in Christchurch with a current response rate of 12%. An additional wave of surveys was sent post-holiday in an attempt to increase the response. Survey items included questions about failure of residential power sources and communications

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*L. Rothkrantz, J. Ristvej and Z. Franco, eds.*

2

infrastructure, value of information sources, access to online information, and perceptions of collective coping and resiliency. Survey results will be statistically analyzed and included in future papers.

PRELIMINARY FINDINGS

These preliminary findings draw from field research, interviews, and focus groups conducted during the initial reconnaissance trip (March 2011) and follow up visit (November 2011) to Christchurch, NZ. Findings are organized around the official response, members of the public, both in the local community and distributed online, and individual perceptions of resiliency in the aftermath of the disaster.

Officials Online

The February EQ event was the first time for the Christchurch City Council to develop an integrated online media communications strategy. The September 2010 earthquake was an early alert to the CCC that a plan might need to be created to reach populations that use popular social networking services such as Facebook and Twitter. In the days following the February 2011 earthquake, CCC stood up a fully integrated social media strategy that included the use of a wordpress site (in lieu of a static web page), a Twitter account and a Facebook page. These became online channels to push information out to subscribers and followers and an alternative resource for monitoring public responses to official warning information online. CCC media monitors followed social media to assess local needs and resources and to communicate directly with those who posted questions online. These regular assessments were fed to intelligence managers as a set of daily trends and were used to inform situational awareness. Urgent requests for assistance were immediately forwarded to incident commanders for a quick evaluation and response.
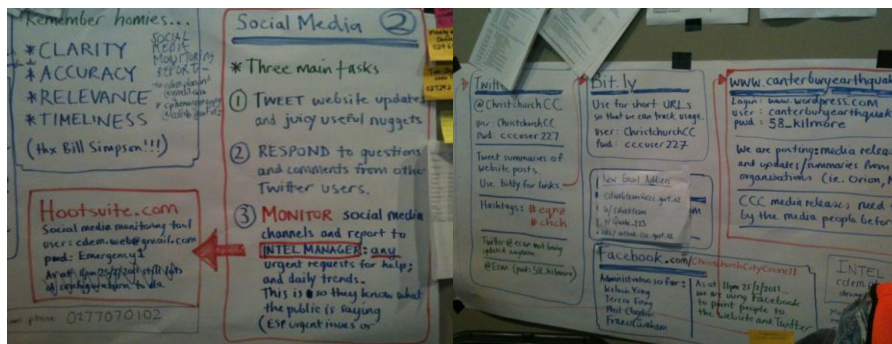
Figures 1 and 2. Pictures taken inside the Emergency Operations Center at the social media monitoring section, demonstrating the emergent strategies, tasks, and goals for their wordpress site (www.canterburyearthquake.org.nz), Twitter feed (@ChristchurchCC), and Facebook page (facebook.com/christchurchcitycouncil).

GNS science also had an online presence via their website, (www.geonet.org.nz) and interacted with the public via Facebook, both of which garnered a considerable number of followers in the aftermath of the February earthquake event. Geonet also utilized Twitter as a mechanism to alert geonet followers about recent earthquake activity at varying magnitudes (including @geonet_above5, for earthquakes above magnitude 5.0, and @geonet_above4, for earthquakes above magnitude 4.0).

Public Online

Interviewees and focus group participants alike reported difficulty accessing information online post earthquake, primarily from the lack of power and a weakened communications infrastructure. Those who were most able to access official information did so through contacts with those outside of the disaster area who had internet access or awareness of the broader disaster context. Those who were within residential zones that had been cut off from electronic communications (such as the heavily damaged eastern suburbs) remained without direct access to viable information from public officials for weeks following the earthquake.

Proceedings of the 9th International ISCRAM Conference – Vancouver, Canada, April 2012
L. Rothkrantz, J. Ristvej and Z. Franco, eds.

3

Some individuals actively sought out information or took the lead in creating their own information resources for others in their community. Many, for instance, powered up their smart phones using chargers in their cars and drove to areas that had cell phone connectivity in order to access information online. Others collated this information, printed it out, and posted it to bulletin boards in central community areas. Some, such as local volunteer leaders in heavily damaged communities, created websites that integrated information about national response efforts with locally relevant information.

Across the nation and internationally, online volunteers took active roles in collecting and curating information from open sources, including Tweets, SMS, email, web reports, and Ushahidi applications on Android and iPhones, making it available via publicly accessible web pages. Within hours of the earthquake, an Ushahidi instance was established and populated with locally relevant information. This open source map (eq.nz.org) was posted to local print and online media, (*Stuff* and *NZ Herald*) until an authoritative CCC map was posted online days later (canterburyearthquake.org.nz) showing official information about bridges and road closures. Early competition existed between the two maps as conflicting information, as well as concerns about information privacy, became chief concerns of CCC officials. However, it was information about the local context, such as available ATMs, petrol stations, and grocery stores, which was mentioned as the most important resource for those who were directly affected by the earthquake impacts. Digital volunteers working on the eq.nz.org map had no easy access to data on vulnerable populations and they stopped maintaining the site within a month of the earthquake event.

Information Access and Resiliency

Individual perceptions of community resiliency were linked to information access, community networking and organizing, and community leadership. Key informants described local activities to garner and share information and resources with those who were unable to do so for themselves. Individuals who had technology access were able to report their needs; those without access appeared to be ignored or forgotten. Locals with experience and expertise on community organizing and online communications developed strategies to aid neighbors, demonstrating community self-reliance in the absence of governmental assistance. This internal information sharing was relevant to the needs of the locals and was not monitored by authorities, allowing a timely free flow of information to those who needed it most.

Trust in information was identified as a key issue for community members who were most directly affected by the earthquake and were without lifelines to authoritative information for weeks. Without direct communication, a demonstrated response from CCC, or evidence that national and local government was invested in the plight of those who lost their homes in the suburban neighborhoods, individuals expressed significant concern that information coming from officials would be irrelevant, too politically biased, or simply untrustworthy. Individuals who remain in an information vacuum months post-event expressed the greatest concern about trustworthiness of public officials, indicating that communication in the recovery phase may be just as vital as communication in the earlier stages of a disaster response.

DISCUSSION AND NEXT STEPS

When online communications are cut off due to power failures or critical infrastructure disruptions following a disaster event, there is evidence that web based communications remain an important resource for those directly affected by the disaster and those far away. Access to information is a key resource in times of crisis and individuals will go out of their way to find accurate information from reputable sources. Public officials that develop mechanisms to integrate online communications into their media strategy are likely to reach those who actively seek information via networked media when other sources are inaccessible. Demonstrated here and in many previous disaster events, volunteers online will actively search for and post information that is relevant to local needs, and complementary to official sites. Without easy access to data and strategies to coordinate activities between volunteers and officials, long term efforts will be limited.

Public information seeking activities following the Christchurch earthquake signifies that future large scale earthquake events may have similar outcomes, requiring official preparedness efforts that integrate a variety of

Proceedings of the 9th International ISCRAM Conference – Vancouver, Canada, April 2012
L. Rothkrantz, J. Ristvej and Z. Franco, eds.

4

mechanisms for communications, even when infrastructure is heavily disrupted or damaged. A diversity of channels, accessible through a variety of formats, containing consistent information, will be necessary for individuals seeking information in the post-disaster context. Early coordination and information sharing between volunteers and officials may provide an early solution to the overwhelming information seeking needs of disaster-affected individuals, especially when officials are tasked to other life-safety efforts and human resources are thin. Ongoing engagement with disaster-affected individuals via online mechanisms may open doors of communication, facilitating the flow of resources, increasing trust in public officials, and fostering a greater sense of collective efficacy.

These preliminary results provide a brief examination of a work in progress. Next steps include the integration of survey results that will provide greater knowledge of the resources accessed by disaster-affected individuals in the absence of communications infrastructure. Survey data analysis will also demonstrate the linkages between perceptions of individual and community resiliency and access to information online. These findings will have bearing on future preparedness efforts for public communications in disaster response and recovery.

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Proceedings of the 9th International ISCRAM Conference – Vancouver, Canada, April 2012
L. Rothkrantz, J. Ristvej and Z. Franco, eds.

5

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Proceedings of the 9th International ISCRAM Conference – Vancouver, Canada, April 2012
L. Rothkrantz, J. Ristvej and Z. Franco, eds.

6