Social Media and SMS in the Haiti Earthquake

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ABSTRACT
We describe some first results of an empirical study describing how social media and SMS were used in coordinating humanitarian relief after the Haiti Earthquake in January 2010. Current information systems for crisis management are increasingly incorporating information obtained from citizens transmitted via social media and SMS. This information proves particularly useful at the aggregate level. However it has led to some problems: information overload and processing difficulties, variable speed of information delivery, managing volunteer communities, and the high risk of receiving inaccurate or incorrect information.

Categories and Subject Descriptors
H.4.2 [**Types of Systems**]: Decision Support
H.1.1 [**Systems and Information Theory**]: Value of information

General Terms
Management, Design, Experimentation, Security, Human Factors.

Keywords
Crisis management, humanitarian action, social network, crisis mapping.

1. INTRODUCTION
In crisis situations assessing and responding to the humanitarian needs of the affected population is a huge task. In January 2010 an earthquake of magnitude 7.0 struck Haiti. The capital, Port-au-Prince, and surrounding communities were severely damaged. An estimated 200,000 people died, a similar number were injured, 2.3 million people were displaced, and approximately US$8.1bn of monetary damage was incurred [1][2]. The response effort involved hundreds of agencies covering various activity sectors e.g. emergency shelter, health, telecommunications, and water, sanitation and hygiene [3]. One of the most immediate problems was finding and evacuating victims. Search and rescue teams first perform a local search of the disaster area aided by satellite maps and other information [4]. However notifications of possible locations are increasingly being transmitted via social media (e.g. concerned relatives posting directly to responder agencies sites) or via SMS.

WWW 2012 Companion, April 16–20, 2012, Lyon, France.
ACM 978-1-4503-1230-1/12/04.

The paper describes the first results of an empirical study that included in-depth interviews with crisis managers responsible for information management and who were involved in the relief efforts in Haiti. The study focused on how information was managed and how information technologies were used in coordinating humanitarian response after the Haiti earthquake. One area of interest was how social media and SMS are used in humanitarian actions in crisis situations.

2. INFORMATION SYSTEMS USED IN HAITI FOR HUMANITARIAN RELIEF COORDINATION
The Haiti Earthquake disaster gave rise to an unprecedented use of information systems (IS). In addition humanitarian workers had to cope with a massive amount of information received through web portals, platforms, and social networking media, such as SMS feeds, Facebook, Twitter [5]. The three most prominent IS were the UN inter-agency OneResponse Website, the SAHANA Free and Open Source Disaster Management System, and the crowd-sourcing platform Ushaidi, which focuses largely on social media.

OneResponse is the leading UN collaborative inter-agency website, developed with help from Microsoft. It aims to enhance coordination using the 'cluster approach' to crisis management, which groups response activities into 15 sectors or clusters [6]. Information, such as who is doing what and where may be shared between clusters. However, this website does not explicitly integrate information sent via SMS or networking sites.

SAHANA contains modules that concentrate on common disaster coordination problems, e.g. registering missing persons, and matching aid requests to pledges of help [7][8]. After mapping the staff of all organizations in Haiti, including their locations, assets and resources available, work focused on mapping where relief was most needed. This was done via a module matching requests for assistance to support provision. Interestingly SAHANA was later modified to match requests sent from citizens via SMS. To help process the SMS messages, volunteers located all over the world were solicited to translate them and put them into the required SAHANA format. Moreover, SAHANA enabled the use of geo-referenced data from all kinds of sources.

The Ushahidi Platform is an open source web application for information collection, visualization and interactive mapping [9]. It allows people to collect and share their own stories using various mediums such as SMS, Web Forms, Email or Twitter.

Other social media, e.g. Facebook, Twitter, and wikis, were also used by UN agencies and US aid organizations. The Thomson Reuters Foundation offered a free Emergency IS, providing users with practical and reliable information. This system also makes information available to subscribers via phone text messages [10].

3. ISSUES IN USING SOCIAL MEDIA AND SMS FOR CRISIS MANAGEMENT

Generally, the employed IS proved to be very helpful after the earthquake, mainly because they were easy to use by a diverse group of actors and because of their accessibility. However one aspect that makes the Haiti rescue response unique is the use of social media and SMS by citizens requesting help. As one Search and Rescue Team Leader said *"… one of the things that happened in Haiti and that we had not seen before was that we had a lot of reports come in about people that had been trapped in the rubble through media….. For the first time you could say that a lot of people were sending SMS…."*. Although this provided additional information, the time taken for the rescuers to receive such information varied enormously: *"The path of how those SMS got to us was often very different. Some of them went a long way: someone in Haiti SMS-ed their family in the US, the family in the US talked to the State Senator of the state they live in, the Senator talked to the State department, the State department contacted the US embassy in Haiti, the embassy in Haiti gave it to the SAR people from the US and they shared it with us. It's a long information trip."* Furthermore this additional information also brought the inevitable problem of information overload: *"..how do we deal with this overflow of data that's coming in now through this new media, such as Twitter and Facebook. How do you deal with all of that information?"*. A solution used by some teams was to use a globally dispersed, virtual community of humanitarian volunteers. However, whilst this solved some problems it proved difficult to manage these communities. An additional problem was that the value of the information to the rescuers at the street level was mainly useless, but the aggregation of information from various sources proved very helpful. The following quote shows this and also how the emotional state of the citizens affects texting behavior: *"…when it got down to the street level, the information was not very accurate…up to 90% of the reports of people trapped in the rubble were not correct. The same way, I heard from the Marines that most of the information they were getting about looting, etc. usually was not very correct. When you looked at it from an area perspective, the information became usable. When you aggregated the information about the people being trapped in the rubble and you looked where are the largest number of reports of people came from, that would show you where the concentration of collapsed houses was. …people will report things based on their emotional state. When you have been through a very traumatic experience like an earthquake, to you things may seem devastating even though they may not be. You may be reporting 100% correctly based on your emotional state but it may not give you an accurate view of what the situation is on the ground. I've heard from other places that the social media reports are also not very accurate, because people will also try to use them to try to get help to their areas. But even though 90% may not be correct at the street level, 80% may be correct at the area level, when you aggregate the information. So we shouldn't dismiss them. We should think about what are we using it for."*

4. CONCLUSIONS

The increasing use of social media and SMS in rescue response and crisis management raises interesting issues. Information from citizens via social media and SMS proved useful in Haiti, particularly when it was aggregated at an area level. However there were problems: information overload; questionable speed of information delivery; difficulties of processing information in a non-standard format from different sources and in various languages; the complexity of managing volunteer communities; and the very limited value of using information at the street level. One of the most marked aspects of rescue response in Haiti was the emergence of a global humanitarian volunteer community. In future it is important to harness the potential of this community, to improve collaboration mechanisms and to identify what is the best way to use the provided information.

5. ACKNOWLEDGMENTS

We wish to thank members of the USAR (Urban Search and Rescue) teams, UNDAC (UN Disaster Assessment and Coordination) and OCHA (Office for the Coordination of Humanitarian Affairs) for their participation in the study and whose quotes we have used.

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