Microblogging in crisis situations: Mass protests in Iran, Tunisia, Egypt

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Abstract

In this paper we briefly examine the use of Twitter in Iran, Tunisia and Egypt during the mass political demonstrations and protests in June 2009, December 2010 and January 2011 respectively. We compare this usage with methods and findings from other studies on the use of Twitter in emergency situations, such as natural and man-made disasters. We draw on my own experiences and participant-observations as an eyewitness in Iran, and on Twitter data from Tunisia and Egypt. In these three cases, Twitter filled a unique technology and communication gap at least partially. We summarize suggested directions for future research with a view of placing this work in the larger context of social media use in conditions of crisis or social convergence.

Keywords

Twitter, microblogging, social media, crisis informatics

ACM Classification Keywords

H5.m. Information interfaces and presentation

General Terms

Literature review, research directions

Introduction

This paper seeks to build on an area of work known as emergency information management and, more specifically, on a growing research area referred to as 'crisis informatics' -- a term coined by Hagar [1] and extended by Palen, Hughes and colleagues [2, 3], among others. Emergency (or crisis) communication management pertains to the use of communication channels and messages to coordinate activity and convey information among citizens, rescue workers, government agencies and others. The recent literature on crisis communication includes analyses of information seeking behavior following such disasters as 9/11 [4], Hurricane Katrina [5], the Virginia Tech shooting tragedy April 16, 2007 [2, 6, 7], and the Haiti earthquake, to name just a few.

Speaking on the role of information and communication technology (ICT), Palen and colleagues note that 'crisis informatics' includes "empirical study as well as socially

and behaviorally conscious ICT development and deployment. Both research and development of ICT for crisis situations need to work from a united perspective of the information, disaster, and technical sciences." It is the sharing of information in a disaster that is especially crucial, and different types of ICT facilitate sharing to a greater or lesser degree based on a variety of circumstances.

In this paper we consider the use of Twitter in the mass protests in Iran, Tunisia and Egypt and specifically, information sharing among the general public (as opposed to information sharing among rescue personnel and/or government officials). We compare the use of Twitter in prior studies of similar cases of mass post-election protests [8], and types of socially convergent behavior [3]. The goal is to clarify the use of Twitter and the particular gap this technology filled.

Use of Twitter in emergencies

Twitter, a form of micro-blogging using an open-source web framework called Ruby on Rails, is a free, short messaging service established in 2004 by a private company based in San Francisco. The research on the use of Twitter in emergencies, crises or disasters is growing rapidly despite Twitter's short life. The most relevant work has been done by Palen, Hughes and colleagues on the 2008 Hurricanes Gustav and Ike [9] and the 2007 wild fires in Southern California [3], and flooding on the Red River Valley bordering North Dakota in the US [10]. Sakaki and colleagues [11] analyzed the use of Twitter during earthquakes in Japan and developed an algorithm to monitor tweets in order to detect such an event. These studies specifically focus on the use of Twitter in a natural disaster or crisis situation. On the use of Twitter in

situations of social convergence and political crisis, Zuckerman has investigated the Moldovan election protests in Africa [8]. Gaffney [12] collected and analyzed about 760,000 Twitter posts (tweets) from the 2009 post-election protests in Iran to categorize them according to the message content (advocacy, mobilization, or action/reaction). Also highly relevant is a 2009 study by the Web Ecology Project (WEP) [13] that analyzed over 2 million tweets on the Iran elections that WEP collected between June 7 (just before the election) and June 26, 2009. The WEP analyses include tweets both inside and outside Iran, and determined that the vast majority of tweets were posted outside Iran.

The distinction between the analysis by the WEP and my work is that we am focused on the use of Twitter by citizens in the midst of the crisis situation, that is, the streets and alleyways of Iranian cities during the demonstrations. we treat this as a crisis situation because after the first demonstration on June 13 involving millions of people, the protesters were always under threat of attack by uniformed police and plainclothes, volunteer militia members (the 'Basij').

Hughes et al report that Twitter use under duress and in crisis conditions of the two hurricane episodes of Ike and Gustav in 2008 is distinct from routine general Twitter communication behavior in two ways: 1) fewer tweets are sent as replies to other tweets; and 2) fewer URLs are included in the tweet posts. They surmise that this is because in a crisis, people need information broadcast as widely as possible to as many people as possible at once (i.e., no need to reply to a specific individual) and people are less likely to go to a website for additional information during the emergency. In the

case of Iran, it was difficult to consult the Web, because the Internet was extremely slow during the weeks following the elections.

Twitter use in mass protests in Iran
The day after the election results were announced in Iran, i.e., on June 13, a crowd estimated at several million people poured into the streets surrounding Azadi Square in Tehran. Eight people who were among a group of protesters who attacked a barracks were reported killed by militia from inside the barracks. Throughout the next five days, there were additional (although smaller) mass demonstrations in the streets that were relatively peaceful, culminating in a large demonstration in Teheran on Thursday, June 18, to mourn those who had been killed or injured earlier week. On Friday, June 19, one week after the elections, the Supreme Leader Ayatollah Khamenei announced during his Friday prayer sermon that the election results would stand (with the announced winner as incumbent President Ahmadinejad) and that any further protests would be considered illegal.

Throughout the weeks following the disputed election results, the government tightened control over data networks and Internet gateways, such that traffic over them was reduced to a crawl. Various social Internet sites were blocked, including Twitter, Facebook and eventually Youtube. Voice of America Persian, a US funded satellite television network, broadcast proxy IP sites so citizens could connect to blocked sites, and upload or download pictures and videos of recent street protests.

Iranian citizens used a mix of interpersonal and mediated communication to get and compare information, about the election results, the opposition or government's response, what had been happening in the streets, and whether, when and where additional protests were being called.

There are several reasons why the use of Twitter was particularly important in the case of the Iran street protests: 1) the governments had blocked access to the Twitter website, so it was only accessible via a proxy server or a text message on a mobile phone, and 2) protesters often needed information 'on-the-fly' while they were in the streets, to avoid clashes with police and plainclothes militia. So they used their mobile phones not only to take pictures or videos, but also to share information about what was happening at that moment and specific location, such as which street to avoid due to heavy police presence. This was also the case for Tunisia and Egypt.

Twitter Use in Tunisia: December 2010
Twitter as well as Facebook appeared to play a key role in spreading information in Tunisia at the outset of the unrest in response to the suicide by self-immolation of a young street vendor in the town of Sidi Bouzid. According to the Facebook statistical portal (Socialbakers) the penetration rate of Facebook in Tunisia is less than 19%, but in combination with other channels, including face-to-face, TV and phone, it helped to notify others of events and to coordinate initial street demonstrations. The Tunisian government blocked access to the Internet in early December, thereby restricting use of Facebook, Twitter (on the web) and YouTube (until Jan 13, 2011). Subsequently, President Ben Ali tried to calm the population (unsuccessfully) by promising to unblock access to Internet Web sites. Ben Ali fled Tunisia on January 14.

Figures 1 and 2 shows charts (proportion of tweets per tweeting individual/org) and trends (tweet frequency per day) for Tunisia. We collected and analyzed 65,748 tweets (using #SidiBouzid, #tunisia, #tunileaks) from January 1, 2011 to February 1, 2011 and produced visualizations using a tool called Desktop Archivist and web-based Archivist.
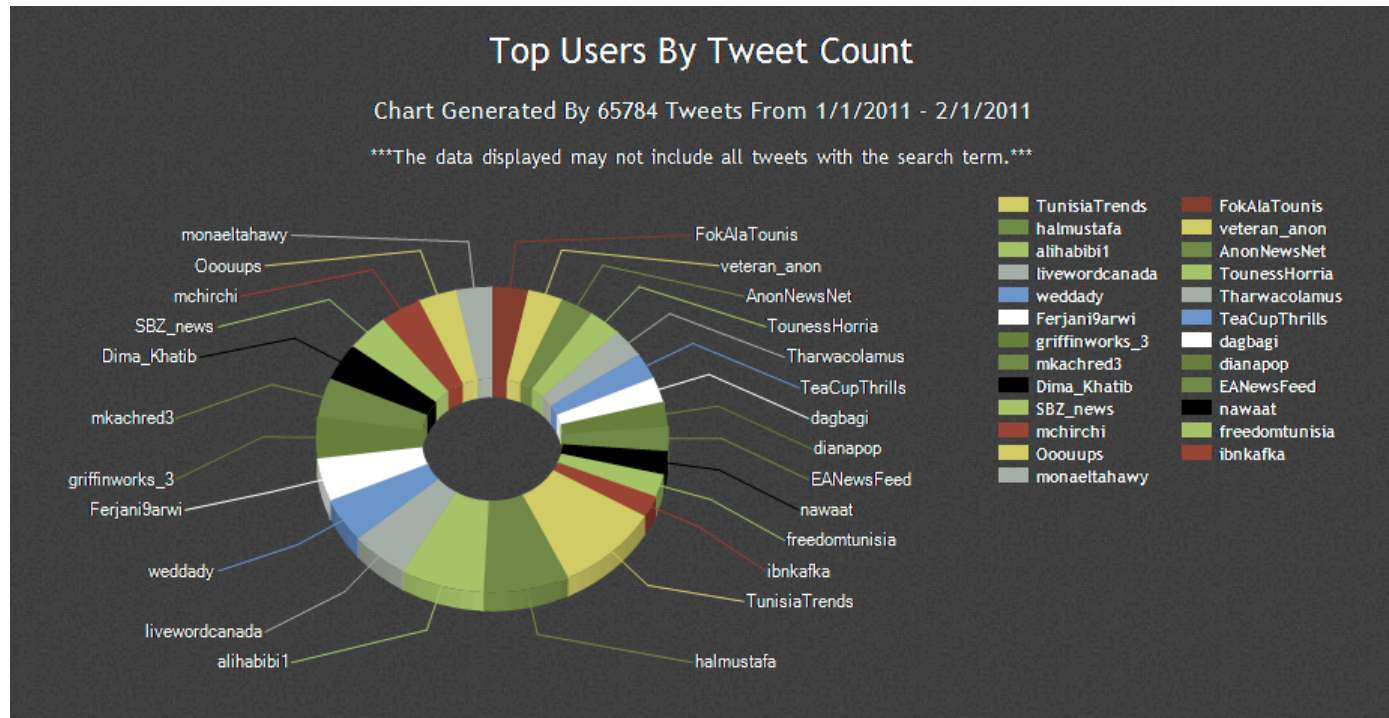

Figure 1. Top Users by Tweet Count (#SidiBouzid)

The most frequent tweeters (Twitter users posting messages or 'tweets') are not necessarily in the country. There is a large majority (almost 63%) of our collected tweets that are retweets (original tweets that are copied by other tweeters and sent out under their Twitter account as 'retweets'). This pattern is a likely indication of users outside Tunisia forwarding on messages from users inside the country.
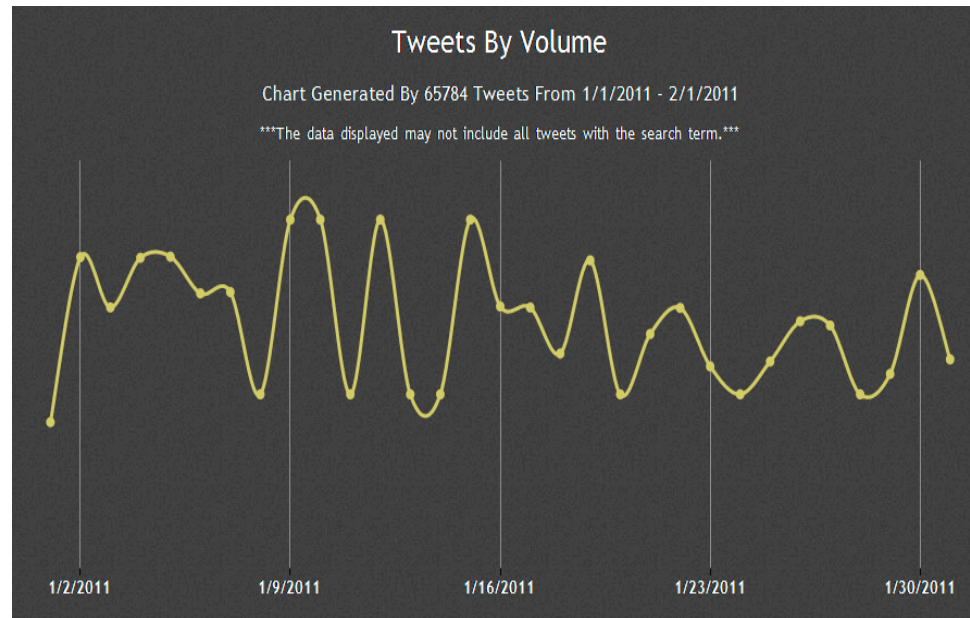

Figure 2. Tunisian Tweets by Volume January 2-30, 2011

Figure 2 shows that the clear peaks in the volume of tweets in January on the 9th, 10th, 12th and 14th (President Ben Ali left the country on the 14th of January). The protests in Tunisia have inspired similar street demonstrations across the Middle East, but the largest of which have been in Egypt.

Twitter Use in Egypt: January 2011

Egypt is the most populous Arab country with almost 85 million inhabitants. Massive protests building throughout January 2011 (primarily in Cairo and Alexandria, the two largest cities) have called for an end to the 30-year reign of President Hosni Mubarak with complaints of corruption, unemployment and lack of democracy. The Pew Research Center's Global Attitudes Survey conducted April 12-May 7, 2010

showed a majority of 59% of Egyptian Muslims reported that they believed democracy was preferable to any other kind of government. The street demonstrations seemed to reflect this kind of sentiment for the most part. As of February 1, several hundred deaths have been reported from the demonstrations.

The Egyptian government quickly cut off access to the Internet and restricted the flow of cell phone network traffic. For example, a ReTweet (RT) on the day of the million man march (February 1) for example says, "RT @Dima_Khatib: Mobiles around Tahrir Square are not working any more. Blocked too. Like internet #egypt #jan25 #cairo". Nonetheless, a stream of communications, including tweets, managed to find their way out of the country. We collected and analyzed 8000 tweets (#cairo, #egypt, #elbaradei) from January 28 to February 1, 2011 and produced visualizations using the Desktop Archivist and web-based Archivist tool. Just a collection of 500 tweets from the day of the million man march shows diverse sources of tweets, half of which are web-based, suggesting they are sent from outside Egypt.

Comparison with Other Cases

The Iranian government appeared to have restricted cell phone use in areas of the Tehran where protests were taking place (around Azadi Square, along Vali Asr street, and Ferdowsi Square) and in Cairo (around Tahrir Square) by limiting bandwidth on cell phone towers that serve those areas. This government control was also reported in the mass street protests in Moldova and in Belarus. By shutting down cell phone service, the government can reduce the possibility of protestors receiving messages via mobile phone while in the streets where protests are underway. This also

eliminates protesters' ability to send and receive Twitter posts, and other SMS messages. The Iranian Ministry of Telecommunications reported that it shut down Internet-based message services during the Iranian elections in 2006 (local elections) because it was not possible to identify users, whereas the content of SMS messages sent via cell phones was not shut down completely because subscribers could be easily identified [8]. This identification of senders and receivers benefits police intelligence.

The use of ICT during the mass demonstrations and street protests in post-election Iran, and in Tunisia and Egypt, as with similar protests, can be considered crisis informatics in social convergence events. It is a crisis in that people are sometimes under attack from police or plainclothes militia, and are always under the threat of attack based on past experience. The street protests are social convergence events, insofar as a large number of people are communicating with each other in proximity and with people in more distant locations (home, other parts of the city, other cities, abroad) who have an interest in what the individual participant is seeing and doing. Given the finding of Hughes and colleagues [9] that people who adopted Twitter during a crisis continued to use the service, and given the ongoing post-election protests, we can expect to see increasing use of Twitter for crisis informatics and social convergence in Iran, Tunisia and Egypt.

Acknowledgements

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