

# **Crisis Mapping Intelligence Information during the Libyan Civil War: An Exploratory Case Study**

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## Introduction

In late April 2011, the operators of The Voices Feeds website called a source in Tripoli to collect data about the ground situation in the midst of an Internet blackout. The data they collected was then translated into English, and posted as information to the @feb17voices Twitter feed, reading, “LPC #Tripoli: Eyewitness says there are 200-250 cars with mounted guns on standby at tobacco factory. #Libya.” Found by @dovenews, a Twitter user making map overlays depicting the crisis in Libya, this information was then added to a situation map of Tripoli. The map, an amalgamation of information collected from multiple sources, was disseminated on May 14, 2011 through the @LibyaMap Twitter feed, and tagged with “#Tripoli”, making it easy for interested parties, from the news media to NATO, to find with a simple Twitter search.

The situation described above was not an isolated incident. Similar events were common throughout the Libyan Civil War. On many occasions, online social network users took the initiative to collect and process data for use in the rebellion against the Qadhafi regime. Indeed, this data, in some cases, was converted into tactical military intelligence. Holden (2011) argues that to take advantage of open source information available through the Internet, organizations like NATO must first tackle the challenge of “determining how to deal with the huge amount of unstructured data in a useful and/or meaningful way.” On the contrary, this article argues a large amount of relevant data was processed into a usable form by online social network users in 2011, and demonstrates how Twitter users fused crowd-sourced data resulting in the creation of *tactical military intelligence*, likely in an attempt to affect the outcome of the Libyan Civil War.

## Background: Libya & the Arab Spring

Despite apparent gains by pro-democracy protesters in Egypt and Tunisia, “Arab Spring” movements clearly did not find universal success. Anti-government demonstrations were tacitly ignored in Iraq, Yemen, and Algeria. After weeks of large demonstrations in Bahrain, the monarchy effectively silenced all dissent with military support from neighboring Saudi Arabia. In Syria, the Asad regime retained a significant amount of support throughout the country during 2011, and chose to employ a violent crackdown against major demonstrations. In Libya, the Qadhafi regime, though somewhat damaged by a series of early high-profile “defections,” retained a significant amount of support in western Libya, backed-up by the largest military, per capita, in the region. What began as an extraordinary display of dissatisfaction with the traditional ruling elite quickly

degraded into prolonged conflict between the Libyan army and heavily armed Opposition forces.

### **Changing Priorities: Internet in the Libyan Civil War**

The Qadhafi regime was quick to mitigate the proliferation of derogatory information on online social networks concerning the regime's response to the Benghazi-based rebellion. Libya experienced several major cuts in Internet connectivity in the 48 hours following the February 17, 2011 protests, but Internet traffic began to pick up as restrictions were lifted in Opposition-controlled areas, where Oppositionists began pushing information, in the form of videos and blog-postings, onto popular sites such as Twitter, Facebook, and YouTube. Libya's Internet space was completely severed from outside connections on the evening of March 3 ("Libya removes itself" 2011; Beasley 2011). However, as the Opposition quickly gained a stronger foothold in eastern Libya, Libyan voices returned to the web, reporting their firsthand accounts of what had turned into a civil war virtually overnight. Among the many Tweets and Facebook updates, an image of the evolving humanitarian crisis in eastern Libya and along Libya's borders emerged, prompting the creation of the Libya Crisis Map at the request of the United Nations, which was made public on March 6 (@UN 2011).

Crisis mapping was originally conceptualized by the Harvard Humanitarian Institute in their Program on Crisis Dynamics and Crisis Mapping. Launched in 2007, the project "examines how mobile technologies, geospatial data, and citizen based reporting are influencing humanitarian action and disaster response" ("Program on Crisis Management" 2012). Crisis mapping was put to the test in 2008 by *Ushahidi.com*<sup>1</sup> in response to reports of post-election violence following Kenyan elections (Bahree 2008). Activists used *Ushahidi.com*, which allowed users to "send news by e-mail or text and have it attached to a Google map," to crowd source<sup>2</sup> information to help verify eyewitness accounts of violence in the media, and to ensure areas in need of humanitarian assistance were visible to humanitarian organizations and donors (Bahree 2008). This same technology was used to crowd source information for use in humanitarian missions following other recent crises, including the massive 2010 earthquakes in Haiti and Chile, and the 2011 Japanese tsunami.

The Libya Crisis Map was populated with humanitarian information pulled from the media and online social networks; "World Health Organization medical supplies have arrived in Benghazi," "Stranded Somali migrants in Benghazi," "ICRC supports local medical services," "Explosion near Rajma"

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<sup>1</sup> *Ushahidi* is Swahili for "testimony".

<sup>2</sup> Crowd sourcing is "the act of taking a job traditionally performed by a designated agent (usually an employee) and outsourcing it to an undefined, generally large group of people in the form of an open call" (Howe 2011).

(World Health Organization 2011; “Stranded Somali migrants” 2011; “ICRC supports” 2011; “Explosion near Rajma” 2011). However, as the imposition of an internationally-enforced No Fly Zone (NFZ) over Libya became imminent, the Libya Crisis Map became inundated with information that appeared to hold little value *vis-à-vis* humanitarian missions. Rather, this new information was of a tactical military nature; “Government tanks posted at all entrances to Ajdabiyah except one,” “Massive army presence about to enter Ajdabiya,” “Loyalist fighters between Zueitina and Ajdabiya,” “Greek vessel arrives in Tripoli delivering weapons;” sometimes accompanied by specific geographic coordinates (“Government tanks posted” 2011; “Massive army presence” 2011; “Loyalist fighters” 2011; “Greek vessel arrives in Tripoli” 2011). To be sure, many people continued to contribute more conventional pieces of humanitarian information to the Libya Crisis Map, but the sudden shift toward providing information that could aid international military intervention was unmistakable.

Holden appears to have a point regarding the abundance of information available in the Libya Crisis Map: The many hundreds of individual reports were oftentimes posted atop one another, many geographic coordinates were absent or inaccurately reflected on the map, and some of the information lacked adequate sourcing (and possibly adequate vetting). However, alongside the Libya Crisis Map, some social network users began making their own, easily navigable maps containing updated, relevant information. Many of these maps contained limited amounts of sourced information and easily navigable icons, and were made both indirectly and specifically available to NATO through Twitter. These *crisis mappers* took steps to “deal with the huge amount of unstructured data” Holden described and, in some cases, rearranged it in a “meaningful way” in support of NATO NFZ operations.

## **Data, Information and Intelligence**

Each agency in the U.S. Intelligence Community utilizes some form of the Intelligence Process as the doctrinal basis for creating intelligence. Given the scope of international military operations contributing to the enforcement of Libya’s NFZ, this article uses the Intelligence Process outlined in the U.S. military’s joint intelligence manual as its theoretical basis (see Figure 1). The Joint Intelligence Process, through which raw data is converted into finished intelligence, consists of six interrelated categories of intelligence operations: planning and direction, collection, processing and exploitation, analysis and production, dissemination and integration, and evaluation and feedback; all centered around a mission. According to Hedley (2009, 213), “the term ‘finished intelligence’ refers to any intelligence product – whether a one-page bulletin or a lengthy study – which has completed the rigorous, all-source correlation,

integration, evaluation and assessment that enables it to be disseminated.” In this article, we focus on crisis maps as finished intelligence, meaning they meet Hedley’s standards after having been subjected to each category of the intelligence process. Twitter users, though perhaps unaware of the intelligence process, replicated each category during the Libyan Civil War, thus recreating the intelligence process and producing finished intelligence adequate for consumption by NATO commanders and rebel leadership. Each category is discussed in further detail below.

**Figure 1 – The Intelligence Process**



*Source: JP 2-0 2005, I-7.*

### **Mapping Tactical Intelligence: The Case of Libya**

One thing was clear from the beginning of the Libyan Civil War: very few people knew exactly what was happening on the ground. Reporters in the country endured tough scrutiny from government minders in the Western area of Tripolitania, and those who were able to penetrate the Opposition-held areas in

the East witnessed very little front-line fighting. Even NATO, according to one of the organization's spokesmen, lacked the ground-level informants necessary to get a full picture of the situation in Libya (Norton-Taylor & Hopkins 2011).

As Qadhafi's forces easily pushed back against the Opposition march toward Tripoli in March 2011, talk of establishing a NFZ surfaced in the media, and among world leaders. The general rhetorical tone of world leaders, particularly Western leaders, was tantamount to the declaration of a *mission*: the international community, under NATO leadership, was willing to engage in an air campaign against Qadhafi's forces under the auspices of a humanitarian mission to protect Libya's civilians. In this sense, NATO became an ally of traditional humanitarian organizations, and thus ostensibly a consumer of information plotted on Libya crisis maps. As is the case with each source for this study, these maps were discovered simply by searching for two hashtags<sup>3</sup> in Twitter during June 2011, the height of the Libyan Civil War: #NATO and #Libya.

### **Planning & Direction**

During the initial phase of the intelligence process, planning and direction, commanders and policy makers make decisions about how intelligence will be collected, by whom, and what equipment will be required. Intelligence collection requirements are the tools by which commanders and other consumers express their intelligence needs. Such requirements come in a variety of forms, however the two discussed here are Priority Intelligence Requirements (PIR), and Requests for Information (RFI). PIR are simply priorities "for intelligence support that the commander and staff need" (JP 2-0 2007, I-8). For example, the disposition of enemy forces in any theater of operations may be an important intelligence priority for a commander to have, so s/he may issue a PIR to that effect. An RFI, on the other hand, is "a specific time-sensitive ad hoc requirement for information or intelligence products, and is distinct from standing requirements or scheduled intelligence production" (JP 2-0 2007, I-10). For example, an intelligence analyst who knows an event occurred, but does not know the exact location may issue an RFI to fill a gap in his/her knowledge.

It is not outside the realm of possibility to suspect human intelligence (HUMINT) collection efforts were in place on the ground in Libya and in other countries where we see apparently spontaneous requirement generation. However, the pervasiveness of requirement generation combined with the apparent lack of fidelity NATO had in its intelligence coming out of these areas leads us to suspect this is not the case. It is possible, in some cases, the Intelligence Community guided Twitter users to participate in and/or recreate the

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<sup>3</sup> A hashtag (#) "is used to mark keywords or topics in a Tweet. It was created organically by Twitter users as a way to categorize messages" ("What are hashtags" 2011).

intelligence process, but this is speculative and, if true, is likely the exception and not the rule.

While NATO and the Libyan Opposition did not explicitly issue intelligence requirements to the public, they did post stories about social network users trying to help NATO to their Twitter feed, and their online supporters likely drew their own conclusions about what information was necessary to support commanders and policy makers in their mission to protect civilians from military aggression, and enforce the NFZ (@NATO 2011). Since intelligence production was crowd sourced by producers like @dovenews and @k\_thos, it was members of the “crowd” who planned and directed collection efforts, and established operating procedures for each of the six categories of intelligence operations.

Reviewing the Twitter feeds of users who participated in Libya crisis mapping reveals the common usage of requirements that support the creation of intelligence products. The following shows @k\_thos requesting specific information about a specific threat, in order to support maintenance of a crisis map created using Google:

**Figure 2 – @k\_thos Twitter feed, August 22, 2011**



*Source: @k\_thos 2011.*

Such requests are the equivalent of PIR. Other requests that support the creation of intelligence products are more akin to RFI. The following is an example where @k\_thos requests technical information from @libyaproud to support information of which s/he is already aware:

**Figure 3 – @k\_thos Twitter feed, July 21, 2011**



Source: @k\_thos 2011.

## Collection

Collection includes any attempt to procure data that potentially meets intelligence requirements. Collection operations should be managed to coordinate various collection platforms. Such activities must be revised as needed in order to ensure a continuous flow of information from the battlefield.

Data used in products like those posted by @LibyaMap came from a variety of sources, including journalists on the ground, official press releases from various organizations connected to the conflict, and from civilians on the ground updating blogs and/or maintaining telephonic contact with people who posted their comments to blogs.

The Voices Feeds was created in early 2011 as a means of bypassing Internet blockages during the uprising in Egypt. In order to ensure information about the ground situation got out, its operators created the @jan25voices Twitter feed, “and began making cellphone and landline calls, then tweeting what [they] heard” (Scott-Railton 2011). The model was adapted for the Libyan Civil War after the Qadhafi regime shut down Libya’s Internet. The @feb17voices Twitter feed (see Figure 5) included accounts of live phone calls (denoted as “LPC” in the feed) from people on the ground in areas where the Internet was blocked, and where there was little or no media coverage. Recordings of the phone calls were made available to provide consumers with additional context. Throughout the height of the conflict, The Voices Feeds maintained their focus on conflict areas: “when the media showed up in Benghazi, we refocused Westwards (*sic*) on areas where conflict still raged” (Scott-Railton 2011).

Figure 4 – @feb17voices Twitter feed, October 11 – 12, 2011





Source: @feb17voices 2011.

Information from the @feb17voices Twitter feed was later used to support the creation of *The Guardian* and @LibyaMap crisis maps (@Libyamap 2011a; “Twitter network” 2011).

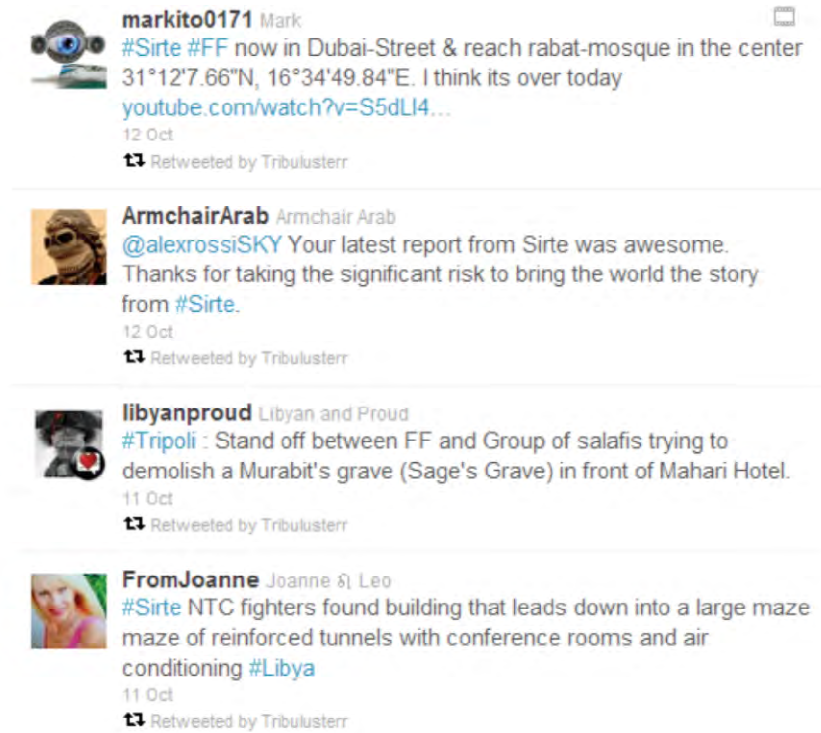
## Processing & Exploitation

Processing and Exploitation is the point at which raw data is converted into “forms that can be readily used by commanders, decision makers at all levels, intelligence analysts and other consumers” (JP 2-0 2007, I-14). Such activities may include initial “imagery exploitation, data conversion and correlation, [and] document translation” (JP 2-0 2007, I-14).

The Voices Feeds also provide a good example of information processing. Most of the @feb17voices Tweets were translated into English from Arabic. Taking a look back at Figure 4, we see that the three Tweets are translations: the first from a live phone call (LPC), and the second two from AJA (al-Jazeera Arabic). This processing of Arabic data into English information helped crisis mappers to exploit data that may not have otherwise been available to them.

Twitter provides both a platform for reporting information, and much of the infrastructure required to convert information into intelligence. Tweets containing information relevant to military missions drew interested users to follow major purveyors of such information, and Retweet<sup>4</sup> the information they found particularly valuable. By virtue of Twitter’s construction, which displays a combination of users’ Tweets and Retweets on their homepage, large repositories of relevant data and information that are easily navigable for exploitation were automatically created (see Figure 5).

<sup>4</sup> Retweet is a Twitter feature that allows users to quickly share tweets from other users (“What is Retweet” 2011).

**Figure 5 – @Tribulusterr Twitter feed, October 11 – 12, 2011**

*Source: @Tribulusterr 2011.*

## Analysis & Production

Information is converted into intelligence during the Analysis & Production phase of the intelligence process. Information is fused together, often by all-source intelligence analysts, into presentable, finished products that satisfy commanders' PIR. Such products can come in many forms; one of the primary means used to communicate a complete picture of the battlefield to relevant commanders and policy makers is the situation map.

Twitter acted as a platform for collaboration on and compilation of intelligence products. Many separate Twitter users began compiling data and information on their own pages. They Tweeted data they collected, information they processed, links to information provided in crisis maps, and Retweeted information provided via private and professional (i.e., media) Twitter users, thus creating a central repository of links to tactical information they deemed valuable.

Some of these users' Twitter feeds could, in and of themselves, be considered intelligence. That most users did not Tweet or Retweet every piece of information they came across about the Libyan Civil War denotes some process of elimination, where only data and information deemed important by the user was retained.

Some Twitter users, along with many media outlets, collaborated to create what resemble finished intelligence products. Some notable examples include detailed, sourced maps of major events that contain information pertinent to military and humanitarian operations. The New York Times created a general map of the conflict, which was updated daily from February 16 to April 29, and which sometimes provided specific information on the location of belligerent forces and violent protests (See Figure 6) (“Map of the Rebellion” 2011).

**Figure 6 – The New York Times Map of the Rebellion in Libya**



Source: “Map of the Rebellion in Libya” 2011.

@LibyaMap began regularly posting situation maps to its Twitter feed beginning in early May 2011. As fighting intensified and information about specific military action became available, @LibyaMap’s updates began providing a general picture of the battlefield. They included specific, sourced intelligence about the progress of fighting, humanitarian and supply needs, and the success of some NATO missions. @LibyaMap used easily recognizable icons, provided by @k\_thos, to represent actors and actions on the battlefield, making the map easily readable by consumers. The June 14, 2011 map from @LibyaMap (see Figure 7) includes many points of interests for NATO commanders, and even includes some hyperlinks to more comprehensive situation reports. One situation report from *ShababLibya.org*, a website established in anticipation of media blackouts during the early uprisings, included specific grid coordinates for reference points in and

around Yefren, and several spot reports (short reports describing actionable information) like this one:

**Almliab forest (VERY IMPORTANT)**

**Position:** 31°58'38.03"N, 12°40'26.62"E

**Site:** on left hand side when going from Gharian to Nalut on motorway.

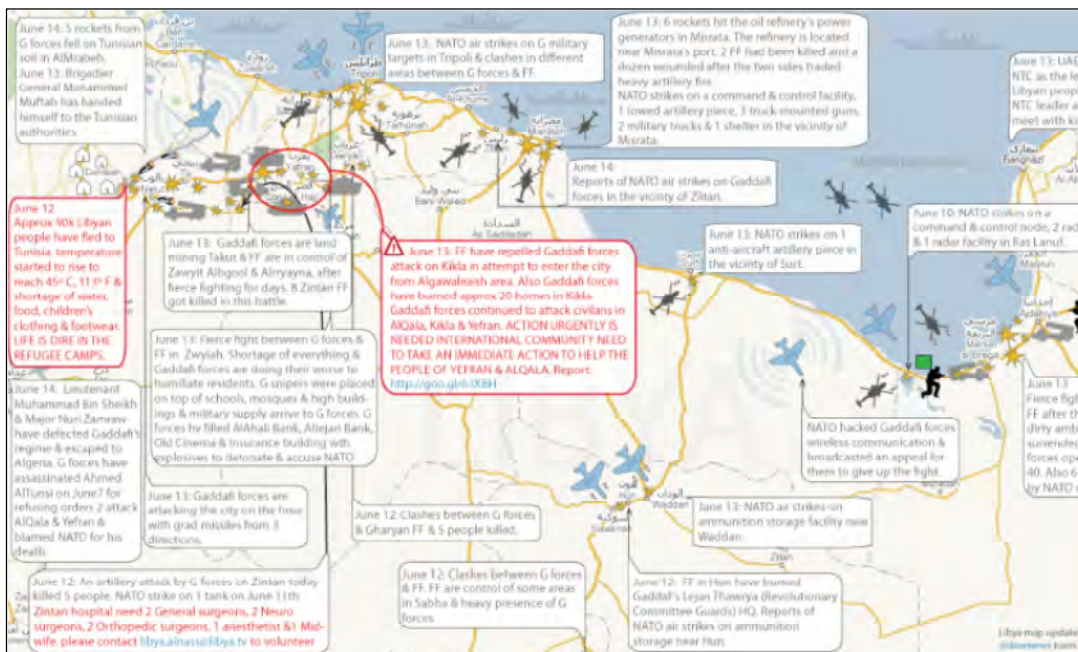
**Force:** Large force including at least 4 tanks, grad, ammunition, personnel, etc. It is the main army supply to the area (substation) for forces heading west.

**Method of observation:** eyewitness

**Time:** Thursday June, 2 [emphasis in original] (“Situation Report” 2011)

Though it was not explicitly stated that these maps were intended to spread intelligence of a tactical nature that could be used to target Qadhafi's forces, the nature of the information renders alternative motivations highly unlikely. They were easily navigable, provided sourcing, and were written in English, the language used by the bulk of the NATO forces who participated in the NFZ enforcement.

**Figure 7 – June 14, 2011 Libya Map posted by @LibyaMap**



Source: @LibyaMap 2011.

**Dissemination and Integration**

Once adequate products are created, they are delivered to consumers during the Dissemination and Integration phase, and may then be used to plan for and conduct future operations. The needs of the user determine the method of intelligence dissemination, which may include briefings, video-teleconferences, telephone calls, electronic messages, and web pages (JP 2-0 2007).

In order to get finished intelligence products to consumers, mappers had to include addresses on their maps, and/or make them easily available and accessible. Many websites, including Twitter, Facebook, and others like ShababLibya.org that were created specifically for the occasion, disseminated relevant intelligence about the Libyan Civil War to a wide audience. On Twitter, maps and messages were addressed directly to intelligence consumers (i.e., @NATO), or included hashtags like #NATO or #libya making them easy to find. In some cases, crisis mappers themselves hashtagged their Tweets in this manner. In others, separate Twitter users Retweeted maps, addressing them directly to @NATO or @NATOPress. In both cases, the deliberate addition of #NATO or @NATO indicates intent to share the information with NATO, even if the information was not initially gathered and processed for that explicit purpose. Creating relevant Tweets in this fashion made Twitter into a searchable intelligence database, where military intelligence analysts could easily search and find finished intelligence.

Furthermore, as open source information, crisis maps available through social network sites like Twitter are already taken into consideration by American and NATO intelligence analysts, and likely integrated into commanders' view of the battlefield. According to a NATO official,

Any military campaign relies on something that we call 'fused information'. So we will take information from every source we can... We'll get information from open source on the internet, we'll get Twitter, you name any source of media and our fusion centre will deliver all of that into useable intelligence (Norton-Taylor, Borger and Stephen 2011).

Public information is unavailable about the extent to which military commanders used information from crisis maps during the Libyan Civil War. Nevertheless, commanders had access to such information, and likely used intelligence products derived, at least in part, from information pulled from social networking websites.

## **Evaluation & Feedback**

Evaluation and Feedback is continuously performed throughout the Intelligence Process. At each point where the various intelligence operations are performed,

collectors, analysts, and consumers provide feedback, which may “serve to refine collection requirements and priorities in phased operations” (JP 2-0 2007, I-20).

In his description of lessons learned through the production of Libya crisis maps, @Arasmus identified 15 particular issues new crisis mappers should consider when constructing their own maps. The underlying theme of these issues was that mappers should spread good information not only to the news media, but to relevant “politicians and policy-makers.” He advises mappers to “Think strategically”:

What is important information? If, for example, protesters are being attacked by air, or by sea, where are the air and navy bases located that are the staging areas for these attacks? This helps the media and *your audience* prioritize and better understand the news reports they hear [emphasis added] (@Arasmus 2011).

@Arasmus provides some basic guidelines for mappers to evaluate the information they intend to disseminate to various consumers, ranging from the Washington Post to NATO.

Indeed, Twitter users expressed their intention to affect military outcomes in Libya early on in the Libyan civil war. An Ontario woman, a man from Birmingham, and another from Tucson were featured in a June 2011 article in the *Guardian*, which noted their attempts to provide NATO forces with geographic coordinates to target as part of their campaign against the Qadhafi regime (Gabbatt 2011). NATO confirmed that its analysts examined such information alongside other sources of intelligence (Bradshaw & Blitz 2011).

At each stage, individual users evaluated data on some level. The collectors did not report everything they heard or read, nor did producers publish every piece of information they came across; each participant in the process examined data and information with some level of scrutiny based on their understanding of the mission.

## Conclusion

This article demonstrates how some crowd-sourced information met the minimum requirements to be considered tactical military intelligence during the Libyan Civil War. Crisis mappers who used Twitter as a means to gather information and disseminate their maps did so, *whether they knew it or not*, as part of a process that ensured that intelligence was produced from data in accordance with U.S. joint military intelligence doctrine. In other words, crisis maps containing information relevant to military commanders may be as reliable as those created by military intelligence professionals for the same purpose.

## Recommendations for further research

Despite the rapid growth of crisis mapping over the past several years, little in-depth research has been conducted to determine the viability of crisis maps as finished tactical military intelligence products. It appears from the advent of similar crisis maps during the 2011/2012 uprisings in Syria that the creation of finished intelligence products by crisis mappers may become a regular occurrence. However, we speculate that the international fervor behind resistance movements in Libya and Syria may have sparked the creation of many maps, and may not necessarily be present during future such conflicts.

Since this study did not take advantage of subject interviews, we cannot precisely extrapolate the motivation of crisis mappers who created finished intelligence products, nor can we determine how responsive crisis mappers would be to official PIR and RFI issued by military commanders. Nor is it clear how receptive military commanders would be to divulging specific intelligence gaps to the public. Future study should focus on subject interviews in order to determine crisis mapper motivations for collecting, processing, and distributing intelligence. Such research could provide insight into whether finished intelligence products, in the form of crisis maps, are likely to be similarly produced during future conflicts. Such research could help to shape future military intelligence policy by informing decision makers on the best direction for research and development related to crowd sourcing intelligence.

Additionally, a better understanding of motivation could inform research on the ethics of crisis mapping. It is reasonable to believe some (possibly many) crisis mappers would be averse to their efforts being used by military commanders to target “enemy” forces and infrastructure. Some are already questioning the direction of crisis mapping development in the absence of professional oversight. Raymond, Howarth and Huntson (2012) assess,

[If] crisis mappers do not develop a set of best practices and shared ethical standards, they will not only lose the trust of the populations that they seek to serve and the policymakers that they seek to influence, but... they could unwittingly increase the number of civilians being hurt, arrested or even killed without knowing that they are in fact doing so.

Researchers should also focus on determining the truthfulness and accuracy of intelligence created by crisis mappers, and the specific methods crisis mappers use to determine the veracity of information they ultimately include in their products. The authors recognize the inherent uncertainty in any intelligence production endeavor that relies on information collected by human sources, or provided by unknown sources—this is an issue with which even the best

intelligence professionals continually struggle. As with the research presented here, future case studies could match emergent patterns in crisis mapper information selection to various methods traditionally employed by the Intelligence Community.

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