**NOTRE DAME COLLEGE, OHIO**

# MASTER'S CAPSTONE

## Social Media: Recommendations to Optimize Social Media for Situational Awareness and Risk Mitigation

**TO: THE NORTHEAST OHIO REGIONAL FUSION CENTER**


Work of Stephanie Barnes, Akif Eren, Brian Lemasters, Izolda Masic,

Amy Poklar, Patrick Thomas, Brandon Vallee

Mentors:

Dr. Kelley Cronin and Dr. John Hatzadony


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**Purpose**

The purpose of this project is to provide recommendations to the Northeast Ohio Regional Fusion Center (NEORFC) on how to optimize social media for risk mitigation and situational awareness. In order to provide relevant and meaningful recommendations, and to provide detailed reference information, this project will complete the following:

1. Review the history of social media to ensure knowledge of the development and identify future trends.
2. Research how social media is utilized before, during, and after disasters, emergencies, and attacks.
3. Document a diverse group of case studies that will cover a variety of events, locations, and social media applications.
4. Identify trends in social media, review volume challenges, aggregation software, and several types of language barriers.
5. Identify best practices related to the dissemination of information for situational awareness during and after an event.
6. Provide recommendations for utilization and application of these identified challenges.
7. Provide recommendations based on identified best practices in homeland security intelligence analysis, collection, and dissemination using social media.

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## 1. Executive Summary

Social media and tools to dissect that information into manageable parts is an essential tool in fighting crime. Police and intelligence organizations across the country are dealing with shrinking quantities of available resources while being demanded to accomplish more. Therefore, any resource which increases the effectiveness of an agency while having a low cost to implement and maintain will prove invaluable. Social media monitoring can be used to solve some of the problems caused by dwindling resources. Social Media allows law enforcement agencies to be more informed and enhance their prevention activities. This technology can be used to track individuals, regardless of geographical location, identify and bring together communities of interest, gather and collate information for an all hazards situation, discuss ideas in a seemingly anonymous manner, and disperse information to the general public.

The purpose of this project is multifaceted. First, we seek to identify trends in social media, document case studies, and challenges facing social media utlization. Second, we are going to explore the contemporary background of social media and associated communications technology. Third, we have identified best practices when utilizing social media, including a statistical analysis. Fourth, we have provided recommendations to NEORFC for utilization and application of these identified best practices in homeland security intelligence collection and dissemination. Finally, we have provided recommendations on how to utilize social media as an information stream before, during, and after any natural or man-made disaster to provide an all-hazards approach.

## 2. History of Social Media/Networking

Social media is a phenomenon that has transformed the interaction and communication of individuals throughout the world. However, social media is not a new concept - it has been evolving since the dawn of human interaction. While the basic form of social interaction has been face-to-face communication, humanity has continually strived to find new mediums to make communication faster and more efficient. The widespread use of the internet, with its global connectivity and insignificant cost, has allowed an explosion of information access. As internet connectivity becomes ubiquitous, its power as a tool of communication is beyond compare, with the platforms and tools utilized in constant evolution.

It is difficult to study social media without encountering the phrase social networking. The Merriam-Webster dictionary defines social media as “forms of electronic communication (as Web sites for social networking and blogging) through which users create online communities to share information, ideas, personal messages, and other content including videos ("Merriam-Webster," 2013). The same source defines networking as “the exchange of information or services among individuals, groups, or institutions; specifically: the cultivation of productive relationships for employment or business.”

The use of social media can have several negative effects for national security, and unfavorable consequences for a state’s strategic interests. For example, during the May 2011 raid on Osama bin Laden’s suspected compound, an insomniac Pakistani IT specialist using the handle @reallyvirtual tweeted about hearing helicopters. The tweets could have compromised the operational security of the mission. While the tweets did not scuttle the mission, they certainly could have. There was little public dialogue in the aftermath of how

social media could have impacted events. Nevertheless, the use of social media can also lead to remarkable opportunities for a country in order to reach its strategically relevant goals, foresee future threats and develop methods to counter their efforts.

Since social media is quickly evolving and is heavily influenced by the interaction with geo-economic and socio-cultural elements, it is important to constantly monitor how networks develop, analyze how they operate, and measure their potentialities. This process aims at removing the element of surprise from homeland security professionals. To prevent exploitation of social media by adversaries an understanding of the current and emerging platforms is imperative. This same understanding allows homeland security professionals time to transform these innovative tools into resources of primary importance, and to be ready to utilize them in counter terrorism operations and emergency response operations.

Throughout much of human history, people developed technologies that made it easier to communicate with each other. The earliest information on social networking refers to 1792; the use of the telegraph to transmit and receive messages over long distances (Adams, 2011). However, even before this seemingly instant flow of information, civilizations had long sought to reduce the spatial and temporal dimensions of communication. The tribes of Mongolia utilized the horse to transmit messages across Asia. Further innovations that reduced the space and time barriers were ocean going vessels, trains, the automobile, and finally the airplane. While these advances allowed information to flow over great distances, the platforms of instant communication did not stop with the telegraph. Technology continued to evolve quickly and by the 1800s networking was possible utilizing the radio and telephone (Rimskii, 2011).

Social networks continued to evolve over the years and now include the modern-day digital variety. During the 1950s the capacity of newer telephone networks allowed multi-party conversations. Ten years later, the public saw the advent of email (Borders, 2009). However, since the internet was not available to the public until 1991, email capabilities were limited. Private networks could facilitate the transfer of email, but such networks were not widespread, and both computers were required to be simultaneously online. Today, email servers will accept and store messages which allow recipients to access email at their convenience.

Social media further progressed during the 1970s. MUD, originally known as Multi-User Dungeon, Multi-User Dimension, or Multi-User Domain, was a real-time virtual world with role-playing games, interactive fiction, and online chat ("NationMaster," 2013). MUD is primarily text based, which requires users to type commands using a natural language. BBS was created in 1978, the same year as MUD. BBS is a synonym for bulletin board system. Users log in to the system to upload and download software, read news, or exchange messages with others (Borders, 2009). In the early years, bulletin boards were accessed via a modem through a telephone line by one person at a time.

With the 1980s came the introduction of The WELL, GEnie, Listserv, and IRC. The WELL, which originally began as a BBS, is short for the Whole Earth 'Lectronic Link. It was developed in Sausalito, California by Stewart Brand and Larry Brilliant and is one of the oldest continuously operating virtual communities ("The Well," 2013). GEnie is the acronym for General Electric Network for Information Exchange. It was an online service using the ASCII programming language. General Electric Information Services (GEIS) ran GEnie on the time-sharing mainframe computers during non-peak hours ("Webdesigner Depot," 2013). Listserv,

launched in 1986, was the first electronic mailing list software application ("L-Soft," 2013). Prior to its creation, email lists had to be managed manually. The software allows the sender to send one email to reach several people. IRC, Internet Relay Chat, is designed for group communication. It is a form of real-time chat, also known as internet text messaging, or synchronous conferencing ("L-Soft," 2013). IRC's main purpose is for group communication, but it allows private messages, chat, and data transfers between two users.

Many social networking sites were created in the 1990s. Some examples include Six Degrees, BlackPlanet, Asian Avenue, and MoveOn (Ellison & Danah, 2007). These are, or have been, online niche social sites where people can interact, including sites for public policy advocacy and a social network based on a web of contacts model.

In 2000 social media received a great boost with the witnessing of many social networking sites being created. This highly boosted and transformed the interaction of individuals and organizations who share common interests in music, education, movies, and friendship, based on social networking. Among those that were launched included LunarStorm, cyworld, ryze, and Wikipedia (Adams, 2011). In 2001, fotolog, sky blog and Friendster were launched, and in 2003, MySpace, LinkedIn, lastFM, tribe.net, Hi5, etc. (Adams, 2011). In 2004, popular names like Facebook Harvard, Dogster and Mixi evolved. During 2005, big names like Yahoo!360, YouTube, cyworld, and Black planet all emerged (Junco, Heibergert & Loken, 2011). In 2006 Twitter launched and as of 2012 it had 500 million registered users, sending 340 million "tweets" (Lunden, 2012).

## 3. Challenges of Social Media

Today, due to the changing nature of homeland security issues, social networks are being used to combat crime and terrorism. The U.S. Department of Homeland Security's command center routinely monitors dozens of popular websites, including Facebook, Twitter, Hulu, WikiLeaks, YouTube, etc. According to the Electronic Privacy Information Center (EPIC), the Department of Homeland Security (DHS) scans tweets and Facebook statuses, and website comment sections on a daily basis. This initiative started in February 2011. The department aimed to use social media to stay in-the-know about breaking news as it is happening. Tweets mentioning "attack" or "shooting" could, for instance, alert officials to disturbances right away (“Mashable,” 2012).

The value of social media is not limited to national security concerns. A heightened awareness of the power of social media can also strengthen consequence management during man-made and natural disasters. Efforts such as Project EPIC (Empowering the Public with Information in Crisis) at the University of Colorado seek to leverage the power of social media in a crisis to increase situational awareness. The goal of the study is to use Twitter hashtags and geo-location to extract more efficient and useful data from tweets during disasters (University of Colorado, 2013). The Federal Emergency Management Agency (FEMA) has realized the power of social media, and offers courses to emergency management officials that provide the participants with best practices including tools, techniques and a basic roadmap to build capabilities in the use of social media technologies in their own emergency management organizations (State, Local, Tribal) in order to further their emergency response missions.

Social media is the emerging tool of communication. An understanding of the most widely used platforms and how information can be utilized is paramount to homeland security professionals and first responders. Through monitoring social media, homeland security professionals can thwart attacks and gain an understanding of potential threats. Likewise, first responders and emergency managers can utilize social media to pinpoint where assets should be deployed in the aftermath of a disaster and to respond quickly to mitigate secondary disasters. By co-opting these new technologies and making their understanding a priority within the organization senior leaders can avoid the embarrassing mistakes caused by slow response and a failure to connect the dots.

Social media has become a staple in the lives of many people. In fact, more than 40 million people use social media web sites multiple times each day (Merchant, Elmer, & Lurie, 2011). These casual users provide unsolicited updates about their personal status and what is going on around them for people they are connected to across various sites. These status updates contain information that can be useful to law enforcement, intelligence agencies, emergency management personnel, and NGO entities in the event of a natural or man-made disaster or other type of mass-casualty event as well as in the investigation of criminal activity. Harnessing this information to create crisis maps of the event will allow for an understanding of what is occurring from assets positioned inside the event in real time. These maps can be used to share information across multiple organizations allowing collaboration, planning, mission execution and forecasting of future trends that can promote effective incident management.

1. January 12, 2010 Earthquake in Haiti: Twitter, Flickr, Facebook, YouTube, and blogs were flooded with pictures and updates about their personal experiences

during the event. This saturation of real time information was one of the catalysts that directed approximately $8 Million dollars to the Red Cross (Gao, Barbier, & Goolsby, 2011).

2. The earthquake and tsunami in Japan: for the duration of the crisis, the communications network in the region was crippled and overwhelmed. The people in and around the affected area used Twitter, Facebook, Skype and local Japanese social networks to communicate and keep in contact with friends and family.
3. 2012: Colorado Wildfires: Facebook and Twitter were lit up by so called 'crisis tweeters' during the event. Just one day after the fires broke out the hashtag #waldocanyonfire had almost 20,000 tweets. A local news station, KKTV in Colorado Springs added 7,000 Facebook friends in two days and added special staffers to control the flow of data going out and the questions coming in. The Jefferson County Sherriff's Office used its blog and Twitter to keep both the public and the press updated about the fire. News media outlets were able to use the specific tweets and updates to create interactive maps of the affected area utilizing Geographic Information System technology (Browning-Blas, 2012).
4. 2007: Southern California Wildfires: Twitter was a useful tool to help gain an understanding of what was happening on the ground in real time. Postings were able to provide information about specific fire locations, status of individual streets, flare-ups / hot spots and the capacity of specific rescue centers. This

> information was helpful with the coordination of relief efforts for the 250,000 affected residents (Veinoitt, Mueller & Cox, 2009).

The use of social networking tools during a crisis event has some key advantages. It allows fresh data to be collected about a particular event. Real time updates can be beneficial for response efforts as it allows them to direct efforts to specific places. Data mining tools can be used to gather information from several sources and aggregated into one place for the utilization of multiple agencies. In the event of a disaster or mass casualty incident, communication networks are often quickly overwhelmed. After the terrorist attacks in September of 2011, communication by phone and internet was sporadic but small bursts of data from SMS text messages were able to make it out (Leiser, 2006). Messages and photographs submitted via social networking platforms can be geo-tagged to provide accurate location data for compilation. This may be useful if a user takes a photograph at one location and then provides an update from another location thus providing the aggregator the ability to differentiate between the location of the incident and the reporting location.

### 3.1. Challenges of Social Media Utilization

There are some shortcomings of using social media as a tool in disaster response. While there are many popular platforms that are in use, aggregation of multiple data sources across a single platform for broad-based consumption takes time and resources for the aggregator. A single source or broad based data aggregation tool is key for ensuring interoperability. While geotagging is beneficial, it may be not be accurate or equal on all devices and could lead to mis-allocation or duplication of response efforts. The human element comes into play as a concern as well. Looting and rioting are real possibilities post disaster as seen in the aftermath of Hurricane Katrina. It is possible that misleading messages or phony distress signals will be sent in order to divert resources to an area where they can be taken by force by those who sent the message. Finally, reliance on technology in a situation where power may be intermittent or disrupted has inherent risks. Efforts must be made to shore up infrastructure (redundancy in power generation and cellular networks) in order for these social networking tools to remain online and viable.

From an intelligence gathering perspective, social media provides a vast amount of data that can be used to understand a threat at its basic level and prevent criminal activity by predicting when and where threats may materialize. Law enforcement and Homeland Security officials have the ability to turn on any electronic device and instantaneously connect to any number of resources that may provide insight to the actions of individual members of a terrorist group or other criminal organization. These open source intelligence (OSINT) sources are a step beyond reading international newspapers and journals. These new media sources allow officials a glimpse into the personalities and activities of individual people that have been identified as members or associates of groups or organizations that may pose a threat to the public. One

particular social media outlet that is available for use in this manner is online forums. These online communities have membership numbers in the millions and are often geared around a specific topic like technology (XDA-Developers), political activism (Democratic Underground) or White Nationalism (Stormfront) (Big Boards, 2005) but sites like 4chan.org are multi-faceted sites with various sub forums dedicated to everything from health and fitness to pornographic images and pirated software (Winkie, 2013). While HUMINT is never going to become obsolete, OSINT is a cost effective way to gather intelligence and can be a useful tool to cast out a wide net, examine the catch, and then focus resources on specific areas of concern.

The main argument against law enforcement monitoring these online forums is the privacy issue associated with the topic. The question of whether law enforcement should monitor the electronic activities of citizens is a double edged sword. On one hand, advocates of personal privacy are against the notion but the backlash would be tremendous if an event occurred that could be tied back to open sources that gave insight or indication of intent or action. Additionally, clandestine participation on these forums by law enforcement officials could be construed as enticement or instigative in nature and could damage the viability of these venues for future use or make the public less likely to offer assistance to officials in the future.

### 3.2. Overcoming the Language Barrier

One of the key challenges facing data collection and distribution is differences in language. Presently, there are 7,105 identified living languages around the world (Lewis, Simons, and Fenning, 2013). This count does not include development in slang and e-speak which have been becoming more prevalent in recent years. Languages are broken down into five categories: Institutional, Developing, Vigorous, In Trouble, and Dying. It is safe to assume that the vast majority of the users utilizing social media platforms and modern pieces of telecommunications will be familiar with some form of an institutional language; therefore we will focus on those. Currently, there are 682 institutional languages around the world (Lewis et al, 2013). Even if we refine our search to just the United States, there are 214 unique living languages, 4 of which are institutional (Lewis, et al. 2013). The figures for the United States do not discuss the languages which are spoken by immigrants as either a primary or secondary language. By any measure, the United States has a substantial amount of language barriers which need to be recognized and taken into account.

New York City is an excellent case study in how numerous languages converge into one location. Between January 2010 and February 2013, all of the language specific tweets sent out of the NYC metropolitan area were tracked and plotted into a map. During this study, 8.5 million tweets were recorded, originating from 34 different languages (Manley, 2013). English and Spanish were the top two contributors while Portuguese, Japanese and Russian round out the top five (Johnston, 2013).

It is important to note that this language map does not match up with the city's own maps of non-English speakers. According to New York City, the top 5 largest immigrant groups in the

city are: Dominican Republic, China, Jamaica, Mexico, and Guyana (NYC, 2008). This difference can be attributed to the age bracket of twitter users in addition to the fact that twitter is a relatively young medium that many non-English speaking users (as well as older populations) in the city may not be utilizing. If we specifically focus on the city of Cleveland, similarities can be drawn to that of New York City. The Cleveland area is home to approximately 100 different ethnic groups (Cleveland People, 2012). Therefore, with the multitude of differences in languages, internationally, nationally, and even locally, collecting accurate information and distributing information which will be understood among all parties will be extremely difficult.

How is this challenge overcome? Some of the problems are fundamentally going to require a significant amount of resources and capital to address which may not be available to a local organization such as hiring translators and publishing materials in multiple languages. However, the international business community has been dealing with the challenge of distributing information to those people in which English is not their first language. Some of the same strategies can be used for information distribution. Recommendations for overcoming this challenge include: 1) Defining the basics of specific words that are commonly used, 2) Be specific, 3) Provide information through multiple means, 4) Do not use jargon, 5) Avoid idioms, 6) Distribute clear information, and 7) Be patient (Berardo, 2007). Other recommendations include, utilizing pictures to convey information, do not utilize overly complex words, and be concise with communications. By adopting these methods of communication, information can be more effectively distributed to non-English speakers and populations with lower levels of English education proficiency.

### 4.1. International: Queensland Police Service

In May of 2010, the Queensland Police Service (QPS) Media and Public Affairs Branch began a trial use of Facebook, Twitter and YouTube accounts to:

- Stake its claim in the digital world;
- Facilitate correspondence with the engaged public;
- Install a framework in the event of a disaster or mass-casualty event.

QPS recognized the need for a social media presence in light of what transpired in the Mumbai Terror attacks where social media was the dominant method of information dissemination but it was disorganized and uncontrolled. Instead of using the valuable resource as a disorganized afterthought, QPS realized its power and understood that establishment of a network before an event would allow for a controlled response. Additionally, the rollout of the program pre-crisis meant that the agency could control the growth and adjust with the learning curve, slowly becoming expert in the practice. This approach is preferable to being thrust into the chaos of response without any experience as a guide.

In November of 2010, a legislative change occurred that designated the QPS as the lead agency in the response phase of a declared disaster. At that point in time, approximately 8 months into its social media project, QPS had accumulated approximately 8000 ‘likes’ on Facebook and more than 1000 Twitter followers.

In mid-December 2010, significant rainfall began in Queensland and on Christmas Day, Tasha, a Category 1 tropical cyclone struck, bringing heavy rains and flooding to central Queensland. QPS began using its existing social media framework to disseminate pertinent information and subsequently observed the doubling of its followers on Facebook and Twitter.

On January 10, 2011, a flash flood best described as an inland tsunami struck Queensland. A disaster was officially declared the second week of January after the massive flooding covered three-quarters of the state impacting more than 200,000 people. In the 24 hour period after the flash flood, QPS observed a significant increase of those seeking information from its social media network. The traffic increased exponentially on its Facebook page with 39 million post impressions which translates into 450 post views per second and its number of 'likes' jumping from 17,000 to 100,000.

January 31 and February 2nd brought two additional tropical cyclones to the region. Anthony (Category 2) and Yasi (Category 5) both caused widespread damage and resulted in another spike in the use of social media. The impact of its social media presence was profound as it only lost about 4000 Facebook followers post disaster.

QPS had established procedures in place dictating policy regarding the 'who, when, and how' of social media interaction. The established framework provided control and continuity in the disaster response. The QPS instinctively gravitated towards social media channels because they were the fastest and best way to distribute important public safety information. It is noteworthy to keep in mind the fact that public appearances of leaders during crisis situations is still necessary to give the public reassurance that someone is at the helm and has control of the situation. If the leaders drop out of sight and hold no press conferences or public events, it may cause more harm than good. The traditional media was integral in the process as it also advertised the fact that instant information could be obtained with the use of the QPS social media network. The media also ran status updates in the crawler at the bottom of news

broadcasts. This cross-over between 'old media' and the 'new media' allowed the QPS team to distribute information at a speed that was previously impossible.

The number of people and types of people receiving information increased exponentially as well. Hearing impaired individuals, people stranded on the side of the road, people trapped in their homes without electricity, residents and family members of residents who were out of the region were able to stay on top of the situation with access to detailed and up to date information. The QPS social media network was the central repository for disaster related information. It was a trusted and authoritative source for factual and timely information that could reach large numbers of people around the clock. This provided the public with reassurance and avoided a vacuum or lapse in coverage. It also allowed the QPS to gain situational awareness about specific issues in the affected regions and differentiate between fact and rumors.

- If you are not utilizing social media, commence the same immediately. If you wait until it's needed, it will be too late;
- Rethink clearance processes. Trust your staff to release information;
- Add a social media expert to your team. While there should be shared responsibility for uploading information and moderating social media sites expert technical advice and trouble-shooting will be necessary from someone with an IT background;
- Do not treat social media as something special or separate from normal work processes. It should be integrated as standard practice;
- Do not use social media solely to push out information. Use it to receive feedback and involve your online community;
- Established social media sites are free and robust which can handle volumes of traffic much larger than agency websites; and
- Ensure that information is accessible. A PDF is not the most accessible way to deliver information. Machine-readable information such as geocoding allows the information to be more accessible and usable for others.

### 4.2. International: Mumbai

The November 26, 2008, terrorist attack in Mumbai, which killed at least 172 people, has been referred to as "India's 9/11." It was not the first significant terrorist attack in India. The July 2006 Mumbai commuter train bombings yielded 209 deaths. Some aspects of this attack were significant, namely, its broad and audacious scope, the complexity of the operation, and the diversity of its targets. The siege lasted nearly 60 hours which grabbed global attention and created a unique situation for law enforcement and government officials. According to Rand, the details and timeline of the attack are as follows:

The Mumbai attackers came by sea, sailing from Karachi on a Pakistani cargo vessel; On November 22 or 23, they hijacked an Indian fishing trawler, murdered its crew; except for the captain, and proceeded to Mumbai; They beheaded the captain as they neared their destination.

The attackers then boarded two small inflatable boats, which they landed at two different points in the southern part of the city. The terrorists divided themselves into four attack teams, one with four men and three with two members each. After landing in Mumbai, one two-man team took a taxi to the Chhatrapati Shivaji Terminus (CRT), Mumbai's main train station, where they took out their weapons and opened fire on commuters. Remarkably, the two were able to roam through the station killing indiscriminately for 90 minutes before better-armed police units arrived, forcing the terrorists to leave the station. The terrorist team then headed to the Cama & Albless Hospital, where they renewed the killing. Escaping again with a police car they had ambushed and hijacked, they headed toward the Trident-Oberoi Hotel, firing along the way. Forced to turn back, they hijacked another vehicle but were finally intercepted by police. In the ensuing gun battle, one terrorist was killed; the second was wounded and captured. This team

alone was responsible for a third of the fatalities. The second team walked to Nariman House, a commercial-residential complex run by the Jewish Chabad Lubavich movement. The team threw grenades at a gas station across the street from the complex, opened fire on the building, and then entered the lobby shooting. Taking 13 hostages, five of whom the team subsequently murdered, the terrorists prepared for the police assault.

This team accounted for eight of the total fatalities. The third two-man team headed from the landing site to the Trident-Oberoi Hotel, where this team began killing people indiscriminately. In a call to the news media, it claimed that seven terrorists were in the building and it demanded that India release all Mujahadeen (Muslim fighters) prisoners in return for the release of the hostages. The siege continued for approximately 17 hours before the terrorists were killed. By the time they died, this team had killed 30 people. The fourth and largest team moved toward the Taj Mahal Palace Hotel. The terrorists briefly entered the Leopold Café, spraying its occupants with automatic weapons fire, killing ten people. Then they moved to the rear entrance of the Taj Hotel only a hundred meters away. They walked through the grounds and ground floor of the hotel, killing along the way, then moved to the upper floors, setting fires and moving constantly in order to confuse and delay government commandos. The siege at the Taj ended 60 hours later, when Indian commandos killed the last of the four terrorists (Rand, 2009).

Mumbai, the fourth largest city in the world with a population of 16 million is India's financial capital. As such, it houses some of the most technologically literate people in the nation. Approximately 75% of Mumbai's residents have mobile phones and because of those numbers, approximately 80 tweets were being posted via SMS every 5 seconds (Busari, 2008).

Many of these tweets contained factual updates and chronologically documented the crisis with pictures of the horror but some of their messages also contained false information. The nature of twitter allows for little real time vetting of the information, which allows false information to spread quickly and be taken as truth. Because of this, some may question the value of the information as 'intelligence'. Some of the tweets that were streaming in were reports from the ground in the immediate areas that were attacked. These bits of information included pictures of the area and descriptions of the attack. Other users were using Twitter as a launching pad to spread emergency response information. Included in these tweets was the information about specific hospitals needing blood donors.

It was later determined that that information was inaccurate but it spread quickly as people wanted to get involved to provide assistance. The pitfalls of this are evident as the misdirection of critical resources in the midst of a crisis has the potential to harm the response effort and delay recovery. "Twitter remains a useful tool for mobilizing efforts and gaining eyewitness accounts during a disaster, the sourcing of most of the news cannot be trusted." (Battle, 2009)

The role of real time situation assessment processes as a factor in the decision making process of terrorists involved in the Mumbai terrorist attack was examined by Onook Oh, Manish Agrawal, and H. Raghav Rao in their piece, Information control and terrorism: Tracking the Mumbai terrorist attack through twitter. They argue that the real-time information available through social media and other forms of technology provided valuable information to the terrorists and helped them along in their decision making process. This result was that these factors acted as force multipliers and it allowed them to have a greater level of success without

the use of advanced weaponry. The uncontrolled and flagrant nature of twitter presented copious amounts of information to the public and was also picked up on by the mainstream media. In turn, when the media reported on the onsite tweets, they inadvertently passed along information that was useful to the terrorists.

The specific tweets related to the Mumbai attacks were examined through a type of content analysis that broke down specific content of communication in a quantitative, objective, and systematic way:

> "*Out of total 934 Mumbai Twitter posts, 17.98 percent of posts contained situational information which can be helpful for Mumbai terrorist group to make an operational decision of achieving their Anti-India political agenda. Also, 11.34% and 4.6% of posts contained operationally sensitive information which may help terrorist group to make an operational decision of achieving their political goals of Anti-Israel/Anti-Jewish and Anti-US/Anti-Nato respectively*" (Onook Oh, 2011).

The nature of social media encourages spontaneous bursts of communication. These live updates posted via Twitter were made in an uncontrolled manner and some of them included sensitive operational intelligence information related to activities by Indian government's officials. Seeing this risk, some Twitter users voiced their concern about seemingly innocent postings and live coverage that could potentially aid terrorists who were monitoring those media reports and online postings through satellite phones and other communication media. Information control mechanisms were recommended to deter the use of social media technology as a tool to be used for enhanced decision making by terrorists. However, aside from bringing

down the cellular network and blocking internet access, controlling the unpredictable nature of Twitter is nearly impossible.

Examples of tweets that support this opinion are as follows:

> *"RT @celebcorps remember when tweeting details that it is CONFIRMED terrorists have satphone (satellite phone—authors added) access to net sources (1:50 AM Nov 27th, 2008 from Ubiquity)"*
> *"Indian government has requested to stop tweeting live updates about Mumbai (8:08 AM Nov 27th, 2008 from web)*
> *"Why is Times Now still revealing the strategy and positions of commandos @ Nariman House? #mumbai (3:58 AM Nov 28th, 2008 from twhirl)"*(Onook Oh, 2011).

The duration of the attack and the fact that it was multi faceted, covering several locations makes the Mumbai case study a bit of an anomaly but still valuable. Most often, acute events (meaning that the duration of the incident is short or abrupt) are the standard. Suicide bombings or drive by shootings are good examples of an acute attack. Fluid situations like the Mumbai attacks, Beslan School Massacre or any event including an active shooter or hostages could be considered more persistent in nature. Technology allowed these terrorists the ability to precisely navigate to their destinations and once inside, they were able to move quickly and purposefully to their objectives. They used satellite phones to stay in contact with their handlers back in Pakistan and were able to obtain real time intelligence information from them:

> *Handler: See, the media is saying that you guys are now in room no. 360 or 361. How did they come to know the room you guys are in? Is there a camera installed there? Switch off all the lights. If you spot a camera, fire on it, see, they should*

> *not know at any cost how many of you are in the hotel, what condition you are in, where you are, things like that these will compromise your security and also our operation.*
> *Terrorist: I don't know how it happened; I can't see a camera anywhere"* (Onook Oh, 2011).

Another intercepted conversation details how the handlers used internet searches to mine for data on specific targets that were being held inside of the hotel. This allowed them to make real-time decisions on target selection.

> *Terrorist: He is saying his full name is K.R. Ramamoorthy.*
> *Handler: K.R. Ramamoorthy. Who is he? A designer, a professor? Yes, yes, I got it [The caller was doing an internet search on the name, and a results showed up a picture of Ramamoorthy]*
> *Okay, is he wearing glasses? [The caller wanted to match the image on his computer with the man before the terrorists.]*
> *Terrorist: He is not wearing glasses. Hey, where are your glasses?*
> *Handler: …Is he bald from the front?*
> *Terrorist: Yes, he is bald from the front he is fat and he says he has got blood pressure problems* (Onook Oh, 2011).

Social media can be a powerful tool or Achilles heel when used in a disaster or mass casualty event. While it has the ability to direct resources to points of need, it also has the ability to work against first responders by acting as an open source of intelligence for the perpetrators of the attack. Control of the information flow is impossible due to the spontaneous and unfiltered nature of citizen journalism. Harnessing the power and using it to your advantage is the primary goal but in the event where it spins out of control, stopping the information flow may be the only

viable option. Shutting down the cellular network or blocking access may be in the best interests of all involved.

### 4.3. International: Arab Spring

One of the most interesting uses of global social media through political influence occurred during the Arab Spring that began on December 18, 2010. Social media venues were used to distribute information quickly related to protests, political information, and recruiting. Through mass media sources, protests and civil unrest has been used to force rulers out of power in Tunisia, Egypt, Libya, and Yemen. Also, there have been uprising and protests in Bahrain, Syria, Algeria, Iraq, Jordan, Kuwait, Morocco and Sudan.

In an article in the Strategic Foresight Initiative (SFI) posted on the Department of Homeland Security (DHS) website, a report from the Homeland Security Institute references that "the Internet plays a vital role in creating social bonds that are necessary for radicalization and recruitment, as well as providing a venue for perpetuating radicalization among groups of recruits (SFI, 2011)." This includes individuals who "self-radicalize" by seeking out terrorist organizations. Experts have raised concerns about the possibility that terrorist attacks perpetrated by radicalized Americans may be more successful and lethal due to terrorist organizations' ability to connect to radicalized Americans remotely and provide resources and suggested tactics (SFI, 2011).

In a 2011 article by Scott Peterson in the Christian Science Monitor, the overthrow of Egypt's President Hosni Mubarak after nearly 30 years in power is discussed. "Everyone is watching this – hundreds of millions of Arabs, Muslims, and who knows who else?" says Shadi Hamid, the director of research at the Brookings Doha Center, speaking from Cairo (Peterson, 2011).

"The Arab world is never going to go back to what it was. We are going to wake up to a new Egypt tomorrow, and we'll also wake up to a new Arab world," says Mr. Hamid. "What has changed is that Arabs know that they can change their own situation without the help of the US, without the help of the international community, they can just go out on the streets and do it on their own – and no one can take that away from them," he says (Peterson, 2011). The use of social media was pivotal in the organization of these efforts and these trends are going to continue into the future.

In 2011, the international media was churning out endless articles about the impact of social media on the political upheaval in the Middle East. Egyptian activists rejected the notion that social media influenced the revolution and they insisted that is was organization in the streets that planned the events. This notion is interesting in that much of the planning was said to be conducted during the internet black-out period. However, it is undeniable that social media influenced new ideas by introducing the world to western perceptions and western culture.

"Young and charismatic, they spoke fluent English and were bursting with self confidence. They tweeted live from Tahrir Square, posting photos to Flickr and videos to YouTube, providing a first-hand, real time account of a popular uprising to an audience of millions. The international media made them into the story, interviewing them for CNN, photographing them for Vanity Fair and inviting them to appear on prominent television programs like The Daily Show with Jon Stewart (Goldman, 2013)."

Goldman continues to explain that while most analysts now acknowledge that the role of social media in fomenting revolution was over exaggerated at first, there can be no doubt that it continues to affect the political discourse. At techPresident we wrote recently about an

extraordinary case in Egypt, where President Morsi issued major policy announcements via his party's Facebook page, abjuring the conventional protocol of calling a press conference and addressing the television cameras (Goldman, 2013).

There are also contradicting options that social media is actually detrimental to the Arab Spring. The inaccessibility of data is a problem for researchers, of course. “But more insidious and damaging are the aggressive, bullying conversations that so many Egyptian activists complain about privately. These are the exchanges that keep once-exuberant revolutionaries awake at night, worrying about the future of their country and wondering if they should stay and fight or look for a more comfortable life abroad (Goldman, 2013).” Some on-line writers claim that the Arab Spring was completely fueled by social media. A study was led by Kate Taylor on TG Daily and states that after analyzing more than three million tweets, gigabytes of YouTube content and thousands of blog posts, it was concluded that the Arab Spring truly was fueled by social media. "Our evidence suggests that social media carried a cascade of messages about freedom and democracy across North Africa and the Middle East, and helped raise expectations for the success of political uprising,” says Philip Howard, an associate professor in communication at the University of Washington (Taylor, 2011).

During the week before Egyptian president Hosni Mubarak’s resignation, for example, the total rate of tweets about political change in Egypt ballooned ten-fold. In Tunisia, twenty percent of blogs were evaluating Ben Ali’s leadership the day he resigned from office, up from just five percent the month before. Subsequently, the primary topic for Tunisian blogs was 'revolution (Taylor, 2011)'. Government efforts to limit use of social media may have incited more public activism, especially in Egypt. People who were isolated by efforts to shut down the

internet, mostly middle-class Egyptians, may have gone to the streets when they could no longer follow the unrest through social media.

Raymond Schillinger states in the Huffington Post that social media absolutely influenced the Arab Spring activity. Platforms like Facebook and Twitter were used to plan the leadership oversthrows in Tunisia and Egypt. The movements throughout the Arab world appeared to have imbued social media with an irrevocable sense of legitimacy as a tool for fomenting change (Schillinger, 2011). Schillinger discusses the significant challenges that we are presented with in scanning, evaluating, and mitigating the use of social media in activist activity (Schillinger, 2011).

- Researchers and policymakers are faced with an overwhelming deluge of data generated by users across social media platforms. Capturing the data is only half the challenge; presenting it in a meaningful, digestible form is critical to understanding its role and influence
- In addition to the sheer size of data sets, how do we cope with the complexity of the data itself? To take one example, how do we effectively interpret reaction-based data such as the Facebook "like," which, despite its moniker, does not always connote approval of an idea or person?
- Social media, through its heavy reliance on memes, is reshaping human language through the unprecedented mixing of idioms, dialects, and alphabets. What long term effects will it have on the way we speak, write and listen?
- Relative anonymity in social media is a double-edged sword: while users can express their ideas more freely, the space is also crowded by false alarms.

Clandestine government influencers who are learning the lexicon of new media. How do we balance anonymity with veracity?

- The dominant social platforms -- i.e. Facebook, Twitter, YouTube -- are powered almost exclusively by U.S.-based private corporations. What happens if business or national interests collide with users' free speech intentions? Would open source alternatives have the bandwith or critical mass to be viable?
- Will social media during peacetime remain a relevant venue for political debate, or is conflict a requisite ingredient for driving meaningful online interaction?

Andy Carvin, from National Public Radio (NPR), has shown the impact of social media by using Twitter to post over 1200 tweets related to Arab Spring activity. He managed to produce superior coverage of the Arab revolutions than any of the mainstream media outlets, aptly noted that social media is more about narratives than isolated content (Schillinger, 2011). He was discussing every detail of the Libyan revolution real-time. At the close of Sunday, Carvin noted he "wouldn't be surprised if this is the most I've tweeted in a single day since Mubarak resigned. Around 900 tweets so far. Oy" (Sonderman, 2011).

These twitter events, wrote Ali Abunimah, offer "a simulacrum of participation while ensuring that millions of eyeballs are diverted away from independent and dissenting analysis and directed toward a strictly official viewpoint (Myers)." With NPR, it's not so easy to separate journalism and politics. In the last six months NPR has been beset with controversy about political bias, starting with the firing of Juan Williams and ending with the resignation of NPR

President Vivian Schiller after an undercover sting video captured a fundraising officer making damaging statements.

### 4.4. National: Hurricane Sandy

In late October, 2012, a hurricane hit the Eastern Seaboard of the United States. Given the moniker Sandy, the storm hit New Jersey first, traveling at 80 mph (LiveScience, 2012). Governor Chris Christie of New Jersey estimated a total of 36.9 billion dollars in damage statewide. Some of the damage caused was over 30,000 businesses and homes were destroyed or experienced structural damage, while 42,000 homes were impacted in some other way. Over $500 million in disaster assistance has been distributed to assist impacted New Jerseyans, while 233,000 people have already registered with FEMA for individual assistance. Power outages affected millions of households in every area of New Jersey (Politickernj, 2012). In New York, the estimated damage is at roughly 20 billion dollars. One of the hardest hit areas was Breezy Point in Queens, where over 100 homes were gutted by a massive fire (Morales, 2012). Hundreds of thousands of people throughout New York and New Jersey lost power for closely 20 days (Choney, 2012). With such a large population without power, many people were unable to receive news updates via the television, internet, or radios. Many people had no idea what type of damage the storm had caused, how long they would be without power, what places were set up to hand out free meals, and where recovery efforts had begun. Without the access to television, internet, and radios, people turned to social media, especially Twitter and Facebook to keep up with the news in their particular state and hometowns, and to find out when power would be restored and what recovery efforts were planned.

In August of 2011, Hurricane Irene hit the East Coast, prompting Governor Chris Christie to take to Twitter and post a simple message “Don’t Be Stupid, Get Out” (Mackey, 2012). When Hurricane Sandy was rapidly approaching, and after it hit the East Coast, governors, mayors, and

even power companies began using social media, particularly Twitter and Facebook, to spread messages to the local populations. Governor Christie, the New York City Mayor's Office, Mayor Michael Bloomberg, Governor Andrew M. Cuomo of New York, Governor Dannel P. Malloy of Connecticut, Governor Martin O'Malley of Maryland, Governor Bob McDonnell of Virginia, Mayor Dawn Zimmer of Hoboken, New Jersey, the New Jersey National Guard, the American Red Cross, Governor Jack Markell of Delaware, Governor Tom Corbett of Pennsylvania, Mayor Matt Doherty of Belmar, New Jersey, Mayor Cory A. Booker of Newark, New Jersey, and Con Edison of New York (Mackey, 2012), all used social media to connect to people and provide updates.

Governor Andrew M. Cuomo of New York, whose twitter account is managed by a team of close aides led by Lisa O'Neill, delivered hundreds of rapid-fire updates, becoming a must-follow for anyone looking for information about the recovery efforts. It was through this account that Twitter users learned when tunnels were closed, bridges opened, and commuter rails were shutting down (Mackey, 2012). Most of the state and local government official's posts were very similar to what Governor Cuomo's post. Governor Dannel Malloy of Connecticut regularly published updates on everything from road openings to power failure statistics (Mackey, 2012). The main reasons for using social media was the fact that it reached hundreds of thousands more individuals than normal television or radio broadcasts. According to the New York City Government, for many who did not have access to a television, or high-speed internet connectivity, mobile access to lightweight social media feeds proved crucial during Hurricane Sandy. Of course, safety and security are always the number one priority, and concerns about health, heat, connectivity and power took precedence during the storm. Research also shown that

constant, responsive communication in an emergency can have enormous positive psychological and emotional benefits to the public, and prevent health concerns caused by stress and anxiety. Thanks to open data measures and social media communication, New Yorkers reported that they felt connected, informed, and saw firsthand that government workers were listening to their needs (Haot, 2013). The New York City Government took it one step further by engaging in two-way communication. The City engaged in two-way communication, responding to questions, clarifying statements, and listening to the public in order to more efficiently allocate resources. The City sent over 2,000 tweets and responded to nearly 300 questions (Haot, 2013).

Twitter, Facebook, and YouTube all proved to be vital sources of information for hundreds of thousands of people who only had limited mobile access to communicate and receive updates on the storm. Many state and local governments realized the power of social media prior to the storm, and effectively used social media to spread critical information regarding the storm. Apart from state and local governments sending frequent updates, social media was used to help with the recovery efforts and provide basic necessities to individuals impacted by the storm. A Facebook page entitled "Rebuild Staten Island," was created by a sole individual, and helped hundreds of individuals impacted by the storm, particularly in the area of Tottenville (Dewey, 2012). Tottenville is a blue-collar neighborhood at the southernmost point of Staten Island. It suffered some of the worst flooding as a result of Hurricane Sandy. So on Nov. 4, scores of volunteers met at the intersection of Hylan and Yetman in the beleaguered area. They split into smaller groups and walked door to door through the damp, debris-filled streets, helping some 125 people pull waterlogged furniture and moldy drywall from their homes (Dewey, 2012). This particular recovery effort, like many others, was organized through the use

of social media. The "Re-build Staten Island" page shared information such as local news articles and donation sites, but perhaps more importantly, rebroadcast calls for volunteers and emergency supplies to an audience of almost 14,000 (Dewey, 2012). Since there was a lack of access to the internet, television, and radios, people used their mobile devices to check social media sites, not only for storm updates, but also for ways to volunteer. Another volunteer effort using social media was used by the Occupy movement. In the week after the storm, an Occupy kitchen in Sunset Park was serving upwards of 10,000 meals a day, its volunteers recruited through social media. The movement signed on more than 15,000 volunteers through the web (Dewey, 2012). While organizations such as the Red Cross and FEMA used social media to alert citizens where they could go to seek medical attention, or shelter, it was the grassroots efforts of citizens taking to social media that really spurred numerous volunteer efforts.

Unlike regular news broadcasts, anybody with access to a social media site can post information, true or false. Hurricane Sandy and the social media frenzy that ensued highlighted this aspect of using this platform during disasters. It also creates issues of credibility for typically trustworthy news agencies. CNN took a story off Twitter as fact, and proceeded to report on air that the New York Stock Exchange was flooded with water, which was inaccurate. In an e-mail, CNN spokeswoman Bridget Leininger said the station's weather correspondent Chad Myers "referenced a National Weather Service report that turned out to be incorrect. We quickly made an on-air correction. We regret the error." The National Weather Service spokesman Chris Vaccaro said the news came from several local New York City media outlets who had posted it on Twitter, though he didn't know which specifically. "We conveyed information we would have deemed credible," but he said as soon they realized the reports were

false, they corrected the report (Bello, 2012). It is very easy for people, including news organizations, to get caught up in the drama of a disaster and forget to use basic reporting skills, such as verifying facts. In the case of the New York Stock Exchange being flooded, one lone Twitter user was held accountable for the misinformation. Not only did the user, with the account name "comfortablysmug", posted inaccurate information about the stock exchange, he also claimed that all subways would be closed for the rest of the week and that major lines were flooded. He posted another tweet that stated Con Edison was shutting off all power to New York City (Bello, 2012). These posts were re-posted by hundreds of people, and even CNN took notice. It did not take long for other Twitter users to correct the misinformation. In fact, Con Edison corrected a tweet, saying it may shut down service in low-lying areas (Bello, 2012). The internet is no longer a place for anonymity, and within hours, "comfortablysmug" was revealed to be Shashank Tripathi, a hedge fund analyst and campaign manager for a candidate for Congress (Gross, 2012). The backlash from his false tweets was so severe that Tripathi resigned from the campaign manager position he held for Christopher Wight, a Republican candidate for Congress in New York's 12th District. Wight said in a written statement, "not only are we reeling from the shock of Hurricane Sandy's destruction to our communities and surrounding areas, but I also remain shocked and disgusted by the actions of my former campaign manager, Shashank Tripathi. Tripathi's actions were all the more distressing, occurring as they did, in the midst of Monday's disastrous weather — during a time when no one was truly safe," (Choney, 2012).

Tripathi did offer an apology via Twitter stating, "I wish to offer the people of New York a sincere, humble and unconditional apology. While some would use the anonymity and instant

feedback of social media as an excuse, I take full responsibility for my actions," he continued. "I deeply regret any distress or harm they may have caused," (Gross, 2012). However, this apology is not enough for New York City Councilman Peter Vallone, who is attempting to have Tripathi criminally charged for the messages he posted on Twitter. Vallone said he asked the Manhattan District Attorney's office to look into the possibility that Tripathi's tweets were the digital equivalent of shouting "Fire!" in a crowded theater (Gross, 2012). While the Manhattan District Attorney has yet to file any charges against Tripathi, the mere fact that said office is looking into the posts as criminal behavior highlights the changes, and importance, of social media. It is easy for anyone, like Tripathi, to log onto a site and post a series of inaccurate claims, which could induce further panic. It is extremely important now that news organizations take the time to fact check what they report on, especially if their source is a series of posts off a social media website.

Social media has drastically changed over the past few years, especially in regards to emergency management. New York and New Jersey state and local agencies really highlighted the shift in use of social media platforms. Hurricane Sandy knocked out power for days in certain areas, and limited mobile coverage was the only way people were able to check Twitter, Facebook, and other sites for critical information regarding the storm and recovery efforts. New York and New Jersey also took a proactive role in advertising their official social media names prior to the storm so that citizens were able to follow them during the hurricane and gain critical knowledge. Foreseeable, social media will be one of the main platforms used during future disasters to inform people what is occurring, where they can go for food and shelter, recovery efforts, and when they can expect for life to return to relative normal. However, the major pitfall

that everyone needs to be aware of is that inaccurate information can easily be posted on a whim. It is imperative that news organizations verify the information that comes off of social media sites prior to reporting it. Inaccurate information can lead to panic, and cause greater confusion during a crisis. Overall, social media used by state and local agencies, FEMA, and the Red Cross can greatly contribute to volunteer efforts, disseminating critical information, and ensuring that citizens understand what is going on and where they can seek help if needed.

## 5. New Trends in Social Networking and Technology

Social media and new technologies are critical in the world today. Much of social media is used for casual communication, but it can also be used for different kinds of terrorism, creating both foreign and domestic threats. Its constant evolution creates a never ending challenge for those protecting our national security. However, with the right knowledge and security precautions the level of threats used through social media and other internet schemes can be bottlenecked.

DHS, FBI, and other groups' information and tactics can be used at the national level and be enforced locally. When it comes to the local level of social networking, also known as the meso-level, many options are available to law enforcement (Homeland Security Wire, 2012). Finding those who are abusing the internet and cyber security is not simply a national problem, but is also a local problem. Only .1 percent of cyber terrorists are world class with 90 percent being ammeters making it key that those world class terrorists are caught with cooperation between city and state governments (Sproles, 1998).

Individuals who use social media typically do not expect anyone besides their friends to look at their pictures and posts. However, anything posted on social media sites, regardless of privacy expectations, is considered open source and available for public consumption (Myers, 2012).

One new social networking application is SnapChat. SnapChat allows users to send pictures/videos to another user for 2-10 seconds (Jain, 2012). The images are not automatically saved to a phone, and therefore can be difficult for law enforcement to trace if they are criminal

in nature. This gives criminals an advantage by communicating through a semi-secure social media application.

Another popular social media site is Instagram. Unlike SnapChat, Instagram images are automatically saved to the site. Furthermore, users are able to hold private conversations via the chat function (Jain, 2012). This function is useful to criminals and terrorists alike because it is difficult for law enforcement to see their conversations.

Roughly 54% of Americans use smart phones (ComScore, 2013). As this figure continues to grow the use of information collection applications, geolocation tracking, and smart phone monitoring become more important to both commercial businesses and law enforcement officials.

The telecommunications revolution, the rapid spread of smart phones, and the prevalence of devices which are able to connect to the internet, have allowed the continued expansion of social media websites. Complied below is a list of various social networking sites along with their respective active users. These sites have been rapidly growing over the past few years and will continue to do so into the future.

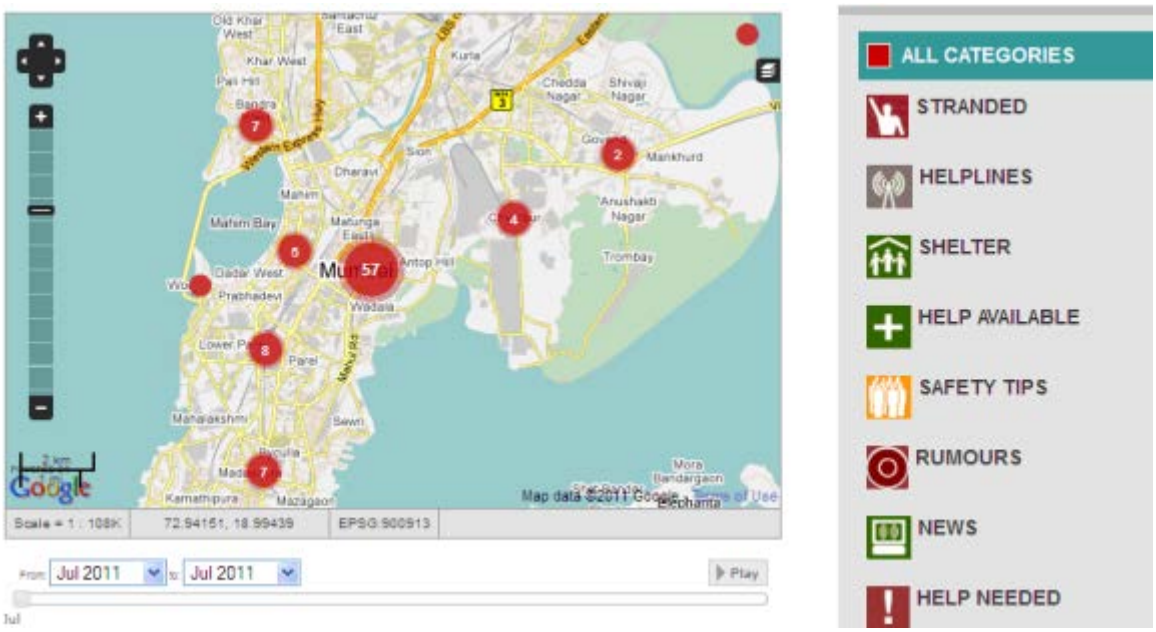
## 6. Possible Emerging Platforms: Ushahidi & Crowdsourcing

Mapping and plotting out crime data has been a standard law enforcement practice for a long time. Pushpin maps provide a visual representation of specific incidents cataloged by law enforcement personnel. A team of crime analysts would have to browse through a limited data set, look for trends, and manually construct these maps. These static representations suffered issues with scalability, density representation, mobility, and replication.


With the dawn of the electronic age the ability to collect, catalog, organize and interpret data has become much easier and convenient. Geographic Information Systems (GIS) took the pushpin map to the next level with detailed electronic representations of hot spots making it easier to detect trends and shift resources. (Dempsey, 2001) As we progress further into the digital age, law enforcement has a new and unique tool at their disposal. Crime mapping in the digital age has moved beyond just what law enforcement can provide to themselves, now the

public has the ability to take a more active role in the process. Crowdsourcing is the newest trend allowing law enforcement to cast a wider net without deploying additional resources. Approximately eighty-eight percent of Americans now own a cellular phone forming a massive, open source intelligence network for law enforcement officials (Homeland Security News Wire, 2012).

New technologies allowing for crowdsourcing are beginning to come online not only for computers but for smartphones. Mobile applications such as Ushahidi, (Swahili for 'testimony' or 'witness') allow its users to submit real time data to a map with classifications. That information is then displayed on an interactive map that can be accessed via mobile application of any device that access to the internet. It has been deployed in Africa to monitor elections, Gaza to report on violence and globally to produce data on the impact of the swine flu (Ushahidi, 2013). It is an open source tool that is offered for free and can be used on any platform. Ushahidi is therefore developing a customized SMS/e-mail service alert option. Users will be able to specify what types of alerts they are interested in receiving and/or the particular location about which they want to receive alerts about (Meier, 2008). This tool was the basis for a more user friendly product called Crowdmap. Crowdmap is a rapidly deployable tool based off of the Ushahidi framework that allows the casual user to create a map and begin to aggregate data from outside sources (Crowdmap, 2013).




There are smart phone apps available to take advantage of this ever-growing resource. Ithinqware develops an iWatch application for individual agencies that allows citizens to respond to police requests for information, submit digital photos or videos from cellular phones directly to officers who are investigating a specific crime (ithinkware, 2012). An active and engaged base of users is a requirement for this method to be successful.

### 6.1. Crowd Soft Control

Crowd Soft Control is a way to manipulate users to provide pieces of data about specific places that may or may not be in their normal area of daily movements.

One of the problems with this methodology is the need for information about a location off the beaten path where not many people go to visit on a regular basis. Researchers at Northwestern University have had positive results with soft controlling of mobile device users by leveraging built in incentives of location based gaming and social applications. Northwestern University created a mobile game called 'Ghost Hunter' that directed users to points of interest,

and directed them to take photographs of certain locations. The users received points for each location visited and for the pictures taken. After analyzing the data from the experiment, they determined that their soft control approach resulted in a 72% improvement in coverage over traditional opportunistic measurements. In other words, they were able to get mobile users to change their routines and provide them with specific and targeted information that would have otherwise been unavailable.

## 7. Existing Tools: Social Media Aggregation Software

Social media aggregation is the process of collecting content from multiple social media services, such as Twitter, Facebook, and LinkedIn (Ecomstor & Interpristor, 2013). The task of compiling information from social media platforms can be done manually by the analyst or through the use of commercially available social media aggregating tools. These applications pull information into one central location, consolidating information from multiple social media platforms. This saves the analyst time, and provides analytical tools to give additional context to conversations, including sentiment, enhanced demographics, and information about the author (Sales Force, 2013).


Social media aggregation tools also enable the analyst to streamline their own presence on different social media platforms. The demographics of social media sites vary between the individual platforms. While Facebook evolved into a ubiquitous social media platform used by individuals of all ages and business, LinkedIn remained a focused social network that provided

online networking for business professionals and job seekers. Social media aggregation tools allow the analyst to tailor messages and disseminate information to the appropriate platform, or to all platforms.

Applications range from free software with limited analytical tools, to full service enterprise suites with marketing tools that enable businesses to monitor and engage customers and perspective clients. Aggregation solutions, like social media platforms themselves, are continuously evolving in a highly competitive niche industry. The following is a brief list and synopsis of several social media aggregators.

**HootSuite**

http://hootsuite.com/

HootSuite is a social media management system for businesses and organizations to collaboratively execute campaigns across multiple social networks from one secure, web-based dashboard (HootSuite Media, 2013). HootSuite offers tiers of service that range from free to enterprise level solutions. Analytics include the ability to gain information on Facebook followers based on demographic, region, language, and post source. Similar analytic tools are available for Twitter and Google. HootSuite allows additional monitoring of social content sites such as YouTube and Blogger. HootSuite also allows historical comparisons allow you to see trends over time.

**Marketing Cloud**

http://www.salesforcemarketingcloud.com/

Marketing Cloud was created when Salesforce.com purchased both Radian6 and BuddyMedia (Williams, 2012). Marketing Cloud collects real-time social data from over 400 million sources, adding approximately five million new sources each week and includes an historical archive that includes more than 55 billion posts, and dates back to May 2008. Marketing Cloud has created a social media monitoring and engagement platform that allows you to view relevant conversations happening around your brand and products in real time.

**Sprout**

http://sproutsocial.com/features/social-media-monitoring

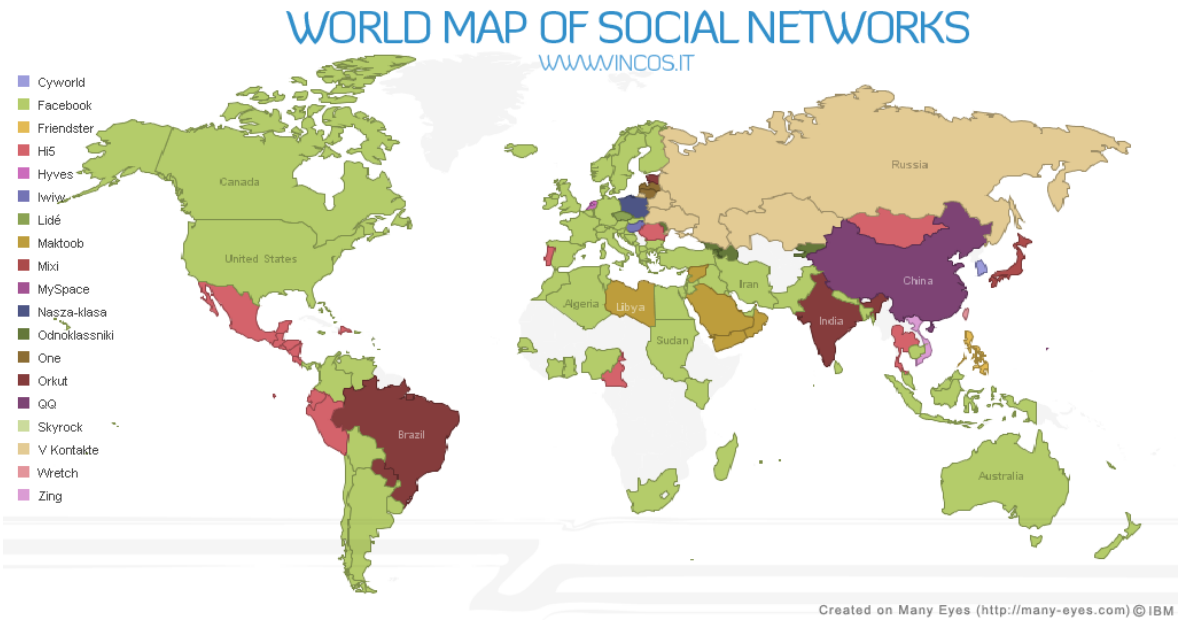
Sprout allows the monitoring of multiple social media streams with its Smart Inbox feature. Smart Inbox combines every message, alert and action from all your profiles into a single, filterable stream. Search for keywords not directly linked to your accounts, find potential followers with similar interests, monitor competitors & stay up to date on industry news.

**Meltwater**

http://www.meltwater.com/

Meltwater's online intelligence platform analyzes billions of digital documents daily to extract insights from social media. Meltwater taps into more than 300 million social media conversations with the Meltwater Buzz Listen social media monitoring module. Search billions of blogs and tweets in real-time to find the social conversations that matter most to your enterprise. IceRocket blog search helps you sift through the social chaos quickly and efficiently to discover relevant discussions, trends and people. Meltwater allows pre-designated clusters for

audience segmentation. This allows the agency to categorize mentions based on your targeted audiences and build a database of resources for future research. Additional filters include new keywords, social media channel, conversation sentiment, language and geography. Daily alerts allow real-time monitoring of developing events. Analytics allow measurement of topic volume, message sentiment, underlying themes, and geographic distribution.




**Sysomos**

http://www.sysomos.com/

Sysomos offers a powerful product suite that provides customers with the tools to measure, monitor, understand and engage with the social media landscape. Sysomos provides instant access to all social media conversations from blogs, social networks and micro-blogging services to forums, video sites and media sources. Sysomos offers two products, Heartbeat and

Sysomos MAP. Heartbeat offers streamline monitoring, measurement, in-depth metrics, key influencers, detailed sentiment for advanced users, and the ability to engage with key influencers. Sysomos MAP is a full-feature analytics service with unlimited access to billions of social media conversations, as well features such as automated sentiment and geo-demographics. MAP is ideal for in-depth research, historical analysis, and the preparation of value-added reports.

## 8. Conclusion – Recommendations

In conclusion, Social Media is a global phenomenon that is going to continue to grow and evolve. It is critically important for Law Enforcment agencies to study Social Media, utilize it for its benefits in situational awareness, optimize analytic scanning for risk mitigation, and understand its challenges to avoid early warning and/or misinformation.
Recommendation Summary:

- To Mitigate Misinformation Challenges
  - Verify, verify, verify:
    - Confirm Source
    - Cross-Reference Source
    - Vet the source
  - Use multiple intelligence mediums
    - HUMINT
    - SIGINT
    - GEOINT
    - Law Enforcement
- To Mitigate Volume Challenges
  - Use Aggregation Software
    - Hoot Suite
    - Maltego
  - Enhance with Geo-location Tools
- To Mitigate "Language" Challenges
  - Use trained analysts
  - Use analysts that are SM SME
  - Optimize trained translators
  - Use local and regional resources
  - Use cultural experts / Gang task forces
  - Research acronyms and symbols
- To Optimize Social Media for Situational Awareness
  - Keep messages brief
  - Post only pertinent items
  - Ensure you can receive info through a private medium
  - Post to the most commonly used mediums
  - Have a back-up plan and/or resource
- To optimize social media for risk mitigation:
  - Identify trends, patterns, codes
  - Scan for:
    - Weapon and materials to build weapons
    - Causes
    - Activist
    - Targets: CIKR
    - Targets: Events

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