

**MPC Major Research Paper**

**Social Capital in Online Hashtag Communities:  
Analyzing #RubyPH**

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The Major Research Paper is submitted in  
Partial fulfilment of the requirements for the degree of  
Master of Professional Communication.

Ryerson University  
Toronto, Ontario, Canada

July 31, 2015

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**Abstract:**

This Major Research Paper uses theories of online community and social capital to explore how hashtag communities are formed, and whether or not social capital can be created in hashtag communities during a natural disaster. The focus is on #RubyPH, a hashtag created during Typhoon Ruby, which landed in the Philippines on December 6, 2014 (Malm, 2014). First, this Major Research Paper demonstrates the presence of social capital within hashtag communities emerging during Typhoon Ruby. Furthermore, demonstrating whether or not information shared by different parties can have an affect on the social capital present. This was done with a deductive content analysis of a sample of 2,000 tweets containing the hashtag #RubyPH. The findings of this study demonstrate that there is evidence of social capital within #RubyPH and that non-governmental organizations, news media, and governments contribute to social capital online.

*Keywords:* online community, hashtag community, social capital, networked collectivism, natural disasters, twitter, typhoon ruby, typhoon hagupit

## **Acknowledgments:**

Throughout the process of writing this Major Research Project, I have had the guidance of some very respected individuals, who I am very grateful to. I would like to thank faculty of the School of Professional Communication at Ryerson University who, through a variety of assignments and course material, taught me various communication theories and have further enhanced the foundational skill sets and knowledge I needed to complete this Major Research Project.

In moving this Major Research Project from an idea to a completed work, I would like to extend my highest thank you to my supervisor, Professor Jaigris Hodson. Her guidance, as well as her passion and knowledge in Digital Communication and Social Media, have had an enduring effect on the completion of this project as well as my personal knowledge and continuing passion within this area of study.

Furthermore, I would like to convey my gratitude to Professor Frauke Zeller who provided much insight and guidance, especially in teaching me much about various methods of analyzing online communities and conducting research and data analysis online. Finally, my classmates, friends, and family have all provided me with valuable inspiration, feedback, and insight on this Major Research Project.

I want to thank each of these individuals for their help – both direct and indirect – in completing my project, providing their knowledge, valuable advice, and for supporting me in my endeavours.

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## **Introduction:**

As defined by the United Nations Office for Disaster Risk Reduction, a disaster is a “serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts”, where the community in question is unable to recover without external aid and resources. (“United Nations Office for Disaster Risk Reduction Terminology,” 2007). A disaster can leave a significant negative impact, such as an extensive loss of life, disruption of property and even large-scale damage to economic infrastructure (Shaluf, 2007). Without the aid of external resources and better disaster planning, some communities and environments would never recover. Fortunately, many developed nations and international organizations put great effort and resources into helping communities prepare for and recover from disasters. A recent example of a natural disaster, and the focus of this Major Research Project, is Typhoon Hagupit (Also known as Typhoon Ruby), which landed in the Philippines on Dec 6, 2014 (Malm, 2014).

Due to the vast number of lives that could be influenced by a disaster, appropriate disaster preparedness, response, and recovery plans become a vital aspect of confronting such events. In order to create a disaster management plan and execute it nearly flawlessly, a considerable amount of communication with the public is needed throughout a disaster, as well as data and research in order to support recovery efforts. In fact, over the past few years, social media platforms – in particular Twitter – have played an important role in communication and data collection during a disaster (Bruns & Liang, 2012). Social media platforms are online platforms that allow users to create an online identity and exchange information with other users, connecting with each other via the digital sphere, and most importantly allowing users to

create and manage their own online content (boyd & Ellison, 2008). Some social media platforms include: Twitter, Facebook, YouTube, LinkedIn, and Reddit. Right before and during a disaster, there is a marked increase in social media activity (Sweetser & Metzgar, 2007). This increase can be attributed to better mobile technology, as 39% of global mobile connections are considered to be broadband connections, meaning that they allow a larger number of messages to be broadcast at the same time (Kemp, 2015). Therefore, during a disaster individuals are able to go online and communicate at the same time without causing a disturbance to the network. The increased activity on these platforms means that more data can be collected and processed as it is generated. This data can be used to predict events, such as detecting the outbreak of an illness through monitoring influential users (Christakis & Fowler, 2010), to obtaining geographical information from mobile users to determine and track events such as a wildfire (Bahir & Peled, 2014). Social media data collected from disasters has also been used to construct an earthquake reporting system (Sakaki et al., 2010), as well as to rapidly assess damages (Guan & Chen, 2014). Not only can the increasing use of the digital sphere serve those looking to help individuals affected by disasters, it can also be used to collect information useful to those directly affected. An example would be Google's People Finder, which was launched to help individuals find their loved ones during an earthquake in Japan in 2011 (Smith, 2011).

Social media platforms and the data collected from them during a disaster are only useful due to the collective power of the individuals using the platforms. In other words, individuals on social media are able to contribute when they connect with one another online to collectively share valuable information and ideas, which can then empower them or lead researchers to discover valuable trends in data. The collective power of individuals coming together on social

media is a result of the social capital that is created when these users come together to share information (For-mukwai, 2010). As defined by Robert Putnam, social capital is the value that individuals gain from the connections they make – which are part of their social networks – and the desires to give value back to those within their networks in order to, in some way, reciprocate the benefits that the individual has received (Putnam, 2000). Fundamental to social capital are trust and reciprocity (Putnam, 2000), which during a disaster would allow individuals to depend on one another in order to gain something of value. One example is individuals receiving accurate information that allows them to participate in evacuations. Another would be a user participating in the online community, who is removed from the disaster, and volunteering or donating to the cause because the community has shared information demonstrating the impact. The trust within the community allows the user to contribute something of value (e.g. volunteer hours) without directly expecting something in return.

The foremost intention of this Major Research Project is to examine a disaster related hashtag community - #RubyPH. As previously stated, social capital is essential to the power held within social media platforms during a disaster (For-mukwai, 2010). Therefore, #RubyPH will be examined to determine whether or not it is a community, and if any social capital is present within the hashtag. Due to the diverse amount of Twitter users, and the difficulty associated with collecting a representative sample of data from all Twitter users, it is necessary to narrow the analysis of connections formed by individuals to a specific keyword or topic (Bruns & Steiglitz, 2013). For this reason, this Major Research Project will focus on the connections between individuals utilizing the hashtag #RubyPH during Typhoon Ruby. If this hashtag were to represent a community that contains social capital, it would mean that

individuals who are a part of the community are able to gain something of value. Furthermore, those affected by a disaster are not the only group of individuals who are utilizing Twitter and various hashtag communities as a forum of communication during a disaster; other key players are: non-government organizations (NGOs), news media, governments and their agencies, individuals not affected, and even corporations (Muraldiharan et al., 2011; Takahashi et al., 2015; Vieweg et al., 2010).

First, this Major Research Project will begin with a thorough literature review in order to set the backdrop for the analysis and findings. Discernibly, the sharing of information and creation of connections in a Twitter hashtag can lead to underlying positive effects, such as the creation of an online community of individuals who have a common goal. For example: political hashtag communities that serve to compile and supplement information so that viewers may have a central informational hub (Small, 2010). The second section of this paper will discuss the methodology behind the collection of data, the subsample, and the methods of analysis. Nearly 50,000 tweets containing the hashtag #RubyPH were collected. Drawing from Small (2011), a content analysis of a smaller sample – 2,000 tweets – from the data collected will provide a useful analysis in regards to the questions asked. Random sampling was used to find the smaller sample. After a smaller sample of the data was created, a qualitative and quantitative content analysis along with the presented methods and tools was used to analyze the sample. Briefly, the findings of this Mayor Research Project demonstrate that similar interests and deliberate engagement within the hashtag #RubyPH are present. Meaning that the hashtag represents a participatory community of individuals, where the majority of tweets contain information relevant to Typhoon Ruby. Findings also demonstrate the presence of reciprocity and trust,

alongside bridging and bonding capital, meaning that social capital exists within #RubyPH. Furthermore, it is found that while NGOs and news media do play a big role in the online activity during Typhoon Ruby, government related accounts played a bigger role during this event. In short, it is found that NGO, news media, and government accounts are able to contribute to the presence of social capital within the hashtag community.

## **How Connections Created in a Hashtag Community Can Foster Social Capital: A Literature Review**

Due to the increasing use of social media platforms over the past decade (Swartz, 2011), organizations working in the area of disaster relief have been able to garner further support in their relief efforts by using social media to generate awareness of disasters and crowd-source information available to aid in disaster relief (Gao et al., 2011). Additionally, the use of these platforms can motivate those receiving and viewing any information to take action during a disaster by creating a real-time understanding of the event, providing important updates, and even with the creation of online communities (Bahir & Peled, 2013). Information gathered from these social media platforms could aid in an understanding of how individuals are able to connect online, creating online communities that provide value. The following literature review aims to first provide a thorough overview of Twitter and its role during natural disasters through a discussion of the prevalence of Twitter. Then the literature on online communities and social capital will be presented, using key concepts of online communities, networked collectivism, and social capital. Finally, the role that various parties play during a disaster will be discussed. This thorough overview will provide a clear insight into how the research questions, presented at the end of this section, have emerged.

### **The Prevalence of Twitter:**

Over the past decade, with the introduction and intensifying use of social media, communication – in particular the distribution of information – as well as the collection of data during natural disasters has radically changed (Lindsay, 2011). Today, instead of anticipating

information from traditional news sources, the masses are able to access information online, as it happens, anywhere around the world (Haythornthwaite, 2005). The past decade has seen the birth of many different social media platforms. These are applications built within the digital sphere allowing individuals to connect with each other based on shared interests, as well as giving them the necessary tools to exchange information and create their own content (boyd & Ellison, 2008). These platforms range anywhere from more personal platforms, such as Facebook, where individuals must have a reciprocated relationship in order to connect online, to more public platforms, such as Twitter, where individuals do not need to have a mutual relationship in order to be connected on the platform (Huberman et al., 2008).

Twitter is a social media platform that allows users to communicate with one another using short messages – tweets – limited to 140 characters (Jansen et al., 2009), forcing users to condense what they are sharing, or to tweet more often if they have more to share. Each user is able to customize their feed to the information they want to see by following specific accounts (Deller, 2011), whether it is daily updates from close friends or updates from their favorite celebrities. Additionally, users can use hashtags (keywords with ‘#’ placed in front of them) and keywords to track certain topics and see tweets from individuals they do not follow (Deller, 2011). Algorithms developed by Twitter allow the keywords and hashtags that are most widespread and relevant to an individual to be recognized as trending topics (“Twitter Support,” n.d.). If there is enough maintained activity in many different locations around the world, the hashtag or keyword becomes a worldwide trend. This function allows individuals to gain awareness of what is occurring in their surrounding area and perhaps all around the world.

Furthermore, users are also able to interact with one-another and engage in two-way public conversation (Schmidt, 2014), through tagging each other in tweets called ‘mentions’ by using the following format: @username. Users can either directly engage with one another by responding to each other’s tweets, or they can tag a user when talking about them in a tweet (boyd. et al., 2010; Deller, 2011; Honeycutt & Herring, 2009). On top of that, users are able to engage each other by ‘retweeting’ any tweets they deem valuable: this function takes the tweet that is being retweeted and shares it with a users follower base (Deller, 2011). Retweeting has permitted users to play an active role in the dissemination of information (Lascia, 2003). In fact, in some cases, due to its quick nature, Twitter has actually been found to raise initial awareness of a disaster faster than agencies responsible for keeping the public informed (Sakaki et al., 2010). Some of the most important rationales for why individuals use Twitter are to broadcast information, gather information and news quickly, to gain awareness as to what is happening around the world or within ones community, and to feel connected to other users (Acar and Muraki, 2011; Marwick and boyd, 2010).

Unless a user has explicitly created a private account, all posts on Twitter are public, which allows all individuals to view more information than they would on other more restricted platforms. This fundamental need of Twitter users to share information publicly can contribute to an abundance of data that can be used to help individuals and communities who could be impacted by disasters (Guan & Chen, 2014). Other platforms that require a relationship in order to share information with other individuals, such as Facebook, foster an inherent private nature, which is not as beneficial when acquiring up-to-date data and information becomes essential (Huberman et al., 2008). During a natural disaster Twitter allows individuals, organizations, and

news media to provide continuous updates and information to the general public (Rogers, 2014). Furthermore, when technical difficulties of traditional methods of communication occur due to a disaster, individuals turn to mobile technology. This has been found to be true during the 2011 tsunami that hit Japan, where wire line infrastructure was not operating but mobile phones were still able to connect to the web, thus allowing individuals to use social media and various other digital methods of communication to connect with others (Gao et al., 2011). The prevalence of more powerful technology, in combination with an increasing use of social media means that platforms such as Twitter could become a powerful tool of communication and disaster management. Additionally, due to its allowance of two-way communication through @mentions and retweets, communication on Twitter uniquely allows the emergence of personal publics. As defined by Jan-Hinrik Schmidt, these are “a new kind of publicness which consists of information selected and presented according to personal relevance, shared with an (intended) audience of articulated social ties in a conversational mode” (2014, p.11). Therefore, Twitter can be a very valuable resource to help us gain insight into how individuals connect with each other on the platform and form networks and relationships of value.

#### Twitter and Typhoons in the Philippines:

Typhoon Haiyan – a category 5 super typhoon - is one of the most powerful storms to have made landfall in recent years. The tropical storm swept through the Philippine’s on November 8th, 2013 bringing 300km per hour winds and heavy rainfall that led to flooding and rushing waters similar in effect to a tsunami (“Typhoon Haiyan – One Year On,” n.d.).

Approximately 14 million people were affected, and more than 6,000 were killed (OCHA,

2013a, 2013b). Due to its devastating impact, Typhoon Haiyan received international attention and aid. A year later, even with the aid of external organizations, 500,000 people were still living in transitional homes or makeshift shelters (OCHA, 2014). Since the nation was still in recovery, the news of another typhoon in 2014 made communities and the local Philippine government anxious. In early December of 2014, Typhoon Ruby was first recorded as a tropical storm, but was quickly upgraded to a super typhoon, when its winds rapidly increased from 185 km per hour to 300 km per hour over a 6-hour period (Erdman & Wiltgen, 2014). Being the same strength as Typhoon Haiyan, and heading along the same trajectory, communities were preparing for the worst. Luckily enough, on its approach to land, Typhoon Ruby was downgraded to a category 3 storm and then further downgraded to a tropical storm (Erdman & Wiltgen, 2014). Typhoon Ruby landed on December 6, 2014, and, compared to Typhoon Haiyan, was much less severe in impact with sources estimating the death of 27 individuals (Malm, 2014). Both of these disasters stand out because they garnered international attention due to their size; meaning that even individuals not directly affected by the disaster were attempting to share information about them through different mediums - Twitter in particular. Data found from simply tracking keywords related to both of these disasters has demonstrated that Twitter users all over the world were highly active on the platform during these events (Appendix 1). For this reason, it is clear that there is much to be discovered about how Twitter is used during a disaster, what happens when individuals connect, and how Twitter can be used to create a positive impact.

### How Individuals Connect Online:

As the world has become smaller due to an increased ability for individuals to connect with one another, the definition of community has been altered to include various and emerging forms of communities. A community is no longer solely defined as concrete social relations between individuals whose real lives intersect on a daily basis, and who live in close proximity to one another (Wellman, 1979). Now, with an increased ability for people to connect with each other regardless of space and time, the creation of a community is no longer based on proximity, but communities can also be hubs that allow different people from entirely different walks of life to form connections (Baym, 2010; Gruzd et al., 2011; Rainie & Wellman, 2012). For example, the communities that are formed on online forums and various social media platforms. When individuals are connected to each other via a virtual platform, they become part of a social network, meaning that they are now involved in the exchange of information and value between each other (Garton et al., 1997; Rainie & Wellman, 2012; Wellman & Wortley, 1990). This exchange of information and fostering of virtual connections can lead to the creation of relationships that can form a virtual community. Now “community is based on sociable and supportive social relations, and not on physical locality” (Gruzd et al., 2011, p.1298). Therefore, a virtual community is created because individuals communicating via online platforms are able to cut across the barriers of time and distance to create new and meaningful social relations (Baym, 2010; Gruzd et al., 2011; Wellman, 1999).

According to Jones (1977), and McMillan and Chavis (1986), two ideas are necessary for the creation of a virtual community. Jones emphasizes the importance of having a “virtual settlement”, where more than two people are purposefully participating within the community,

interacting with one another, in a common space, over an extended period of time (1977).

McMillan and Chavis add to this idea by emphasizing the importance of those within the community to feel as if they belong, have some level of influence, are able to gain and provide support, and share their thoughts and experiences (1989).

Even with this advanced ability to connect with other individuals, some scholars state that most social network platforms only allow the further development and support of already pre-existing social relations between individuals (boyd, 2007; boyd & Ellison, 2007; Ellison et al., 2007; Lenhart & Madden, 2007). As previously stated, Twitter is a unique platform with a public nature and an allowance for connections without a previous relationship, allowing individuals who have never met to connect with one another (Huberman et al., 2008). However, the communities, especially one's personal community and network, formed on Twitter are not similar to the conventional communities that individuals form offline; online communities are based on a combination of both online and personal ties between individuals (Castells, 2000; Rheingold, 1993; van Dijk, 2005).

It is the ability to foster an increased amount of weak ties that makes online communities so valuable (Granovetter, 1973), due to the fact that weak ties lead to networked collectivism. Networked collectivism comes from the concept of networked individualism, which is the idea that groups are no longer the sole focus of system; instead, individuals are (Baym, 2010). An individual participating in social media networks is now at the center of a community catering to their own interests, while allowing them to interact with other users, and undertake a number of various engagements simultaneously (Rainie & Wellman, 2012). An example of this on Twitter is the fact that each user is able to follow anybody, creating a timeline of tweets from accounts

that only interest the user, resulting in each user having a customized timeline. On a platform such as Twitter, ones network would be comprised of both strong and weak ties (Granovetter, 1973), where “the strength of a tie is a (probably linear) combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterize the tie (Granovetter, 1973, p.1361).” Strong ties would be direct relationships such as friends, co-workers, and family members, and weak ties would be more indirect relationships, such as a friend of a friend (Granovetter, 1973).

Weak ties allow an individual and their network to be connected to a variety of other individuals and their unique networks (Granovetter, 1973). In early history, an individual’s network consisted of social groups containing family members and close friends, groups that had structure and hierarchy, where individuals interact with and receive support from others within the group (Wellman, 2001). Now, networks are not only equal to small groups, but are the broader personal networks of an individual (Rainie & Wellman, 2012). One example is two roommates living together, while the roommates might still have a common network; each individual also has their own personal network. They each have their own family members, college friends they go to movies with, classmates they study with, and teams they volunteer or play sports with. Each roommate has the ability to move between groups of people in order to satisfy different needs, this ability is the basic notion of networked individualism (Wellman, 2001). It is our weak ties that allow the variety of groups we operate within to connect with one another (Granovetter, 1973), and this is what creates networked individualism where each individual has loosely-bound networks (Wellman et al., 2001). With the introduction of

technology that allows a wider variety of individuals to form weak ties, networked collectivism has emerged.

Networked collectivism is simply when individuals who have weak ties bind their individual networks together (Baym, 2010). While their shared interest creates a shared identity and some of their relationships may be offline, their relationships are mostly based on online connections and weak ties between their networks (Baym, 2007). The communities that are formed online today are flexible and continuously evolving based on the individuals they are created by, but provide more support to the individuals or groups that are at the heart of the community (Rainie & Wellman, 2012). While online communities are mostly made up of weak ties between individuals (Granovetter, 1973), they are able to provide access to information, support for individuals, and even acceptance and friendship (Wellman, 1999).

Just as networked individuals are connected to one another through technology, enabling weak ties (Granovetter, 1973; Rainie & Wellman, 2012), significant hashtag communities that form on Twitter allow each participating individual to connect with others within the hashtag through the creation of weak ties. On Twitter, a hashtag is the usage of a pound (#) symbol before a keyword or a phrase (E.g. #Sochi2014 was used during the 2014 Summer Olympics), allowing individuals using the hashtag to insert their tweet into a broader context or conversation, further allowing both Twitter users and non-users to track a specific topic or theme of interest that lies outside of their network (Bruns & Burgess, 2012; Bruns & Moe, 2014; Scott, 2015; Small, 2011; Zangerle et al., 2013). Using a hashtag, such as #RubyPH, on Twitter already satisfies some requirements of a “virtual settlement” as previously defined by Jones (1977). When an individual uses a hashtag, they are purposefully inserting their tweet into a broader

context in the common space of the Twitter platform (Bruns & Burgess, 2012; Bruns & Moe, 2014; Scott, 2015; Small, 2011; Zangerle et al., 2013). While individuals might not continuously use a hashtag in all their tweets, their tweets that are inserted into the broader context remain in public view as long as the tweet is not deleted. Any user looking up, or using the hashtag would be able to respond to the tweet at any time, thus satisfying the requirement for participating over an extended period of time. However, to further demonstrate interactivity and a feeling of connectedness one would have to demonstrate that those using the hashtag have similar interests and are intentionally engaging with one another (Bruns & Burgess, 2011).

Some hashtags that are not created with events at their origin, cannot form participating communities, and only serve to inform, for example, #CdnPoli – a hashtag used by individuals to collect, create, and arrange information on Canadian politics (Small, 2011). During a disaster, a hashtag community is formed from the need of individuals to inform and connect with one another. Individuals using the emerging hashtags and tweeting about disasters mostly used Twitter and various hashtag communities in order to share information about their situation, to support others who would be affected by the disaster, and to request assistance or information (Kongthon et al., 2012).

#### Social Capital in Online Communities:

Wellman and Wortley state that individuals obtain social support from community ties with friends and family (1990); however, with the introduction of social media, individuals no longer have to be connected to each other through direct contact in order to receive support (Baym, 2010; Rainie & Wellman, 2012; Wellman et al., 2001). Twitter's functionality allows

each user to create their own individual community and be at the focus of their own network, by allowing an individual to choose which users to follow. This means that individuals are able to receive updates only from accounts they have a high enough interest in to follow. Usually these accounts are ones with which the user has a personal connection with, or ones that are of a high interest. For example, a Twitter user that is following close friends, organizations they are interested in, and celebrities. Therefore, the connections created on Twitter – because individuals are now in focus – are more meaningful which can lead to more social support. Furthermore, a study by Wellman et al. (2001), suggests that if individuals are using the internet more, and are also involved with online organizational and political activity, they are more likely to also be involved in offline positive activity. This demonstrates that fostering an online community of active individuals can lead to positive offline contributions, at the very least, engaging individuals to support efforts of information distribution or even support relief efforts. However, the creation of social capital within an online community can also lead to various kinds of online support, such as: emotional, esteem, informational, and tangible support (Baym, 2010).

Stepping back from social support is social capital, which “refers to connections among individuals – social networks and norms of reciprocity and trustworthiness that arise from them” (Putnam, 2000, p.18-19). Meaning that within the networks and communities that one shares with other individuals, there is a sense of trustworthiness in their connections, as well as knowledge that if an individual were to contribute something of value, eventually they would gain something of value in return. This is called generalized reciprocity (Putnam, 2000), and leads to bridging capital.

Bridging capital is one form of social capital that can be applied to the digital sphere. Bridging capital occurs when individuals who are not alike provide support to each other even though they do not have a strong relationship (Baym, 2010). This category of social capital is able to provide individuals with much needed support without the need for a close relationship. Additionally, bridging capital actually allows individuals to gain access to a wider variety of external assets as the individuals who are linked are usually rooted in different networks and communities (Baym, 2010; Granovetter, 1983; Putnam, 2000). Bridging capital is a benefit that is gained through weaker ties, and this type of social capital can be demonstrated in networked collectivism. This is because each individual is at the center of their own network, meaning that individuals are not just connected to other individuals, but are instead connected to other networks (Baym, 2010). During a disaster, individuals who use a hashtag to communicate and connect with others online are inherently creating weak ties, which lead to the creation of bridging capital. Furthermore, weak ties are also essential to the process of information diffusion (Granovetter, 1973). Hashtag communities have been shown to be very adept at diffusing information during a disaster, which was demonstrated by Sakaki et al. when they determined that Twitter spreads news of an earthquake faster than the agencies responsible for warning communities (2010). This fact makes it clear that due to the prevalence of weak ties in hashtag communities, information diffusion is much faster. On the other hand, bonding capital is the opposite of bridging capital – fostered from dense networks, creating specific reciprocity, and solidarity (Putnam, 2000). Specific reciprocity is where an individual will do something for another individual, expecting the receiver to do something of similar value for them (Putnam,

2000). Both bridging and bonding capital can be present in online communities and do not function independently (Putnam, 2000).

In order for social capital to exist in an online community there must be a common purpose within that community, as well as trust and norms of reciprocity. A common purpose is especially important, as it allows individuals to begin to establish community norms and build a sense of belonging (Lazar & Preece, 2002). A common purpose that demonstrates solidarity and specific reciprocity would show that there is bonding capital present within the community. On the other hand a prevalent purpose to diffuse information would demonstrate the presence of bridging capital. Secondly, trust must be present within the hashtag community. One can assume that trust among strangers in an online world would be difficult to foster. Nevertheless, trust is able to function the same online as it does offline, there are individuals both online and offline that do not trust others easily, but sometimes individuals who do not know each other are able to gather together and bond over shared adverse circumstances (Uslaner, 2000). In fact, during such a situation as a large-scale natural disaster, the circumstances of the event may even promote passive social media users to provide support, even without participating in the hashtag community. These passive social media users have social media accounts but do not participate, however it is important to remember that they are able to read and view posts online and can still be affected by the actions of active users (Xu & Montague, 2012).

Measuring trust in an online community is extremely challenging, but measuring credibility of information is possible. The credibility of information that is spread via social media platforms is extremely important during disasters (Mendoza et al., 2010). Especially since individuals who might be displaced may not be able to get information directly from traditional

and credible news sources. In these types of situations social media becomes advantageous, as individuals can go online to gather information. Since information on Twitter is not always vetted, being able to determine credibility is vital. Mendoza et al. conducted a study where they observed whether or not users interacted differently when faced with confirmed truths or false rumors (2010). They found that false rumors were more often denied and questioned, while confirmed truths were routinely affirmed (Mendoza et al., 2010). Demonstrating that Twitter users are adept at classifying and filtering information online, meaning that the information that is circulated, and the community it is circulated within, can be trustworthy.

Finally, in order for social capital to be present in a hashtag community, there must be norms of generalized reciprocity. In order for reciprocity to occur, the following characteristics must be present within an online community: “ongoing interaction, identity persistence, and knowledge of previous interactions, since they promote the creation and importance of reputation within a community” (Sankaranarayanan & Vassileva, 2009, p.102). For this reason, reciprocity can be found by looking at activity metrics within #RubyPH (Bruns & Stieglitz, 2013); specifically: retweets, as they are a form of positive engagement and reciprocity on twitter (Lee et al., 2010).

Ultimately, if social networks have value and can foster tendencies to support individuals in virtual communities, it is possible to determine if certain forms of information in hashtag communities can foster the creation of social capital. The creation of social capital would encourage individuals to provide support for those affected by a disaster, even if it is doing something as simple as sharing important emergency aid phone numbers. While many individuals take to twitter during a disaster, so do NGOs, news media, and various other parties.

To determine who could have the biggest influence on social capital within #RubyPH it is important to understand the role that these parties play.

#### NGOs and news media Twitter usage during a Disaster:

Twitter has been widely used by NGOs, private companies, traditional news media, and regular individuals during a disaster (Murthy & Longwell, 2013). Apart from general users who tweet about their daily activities and interests, some of the most common uses of Twitter include disaster relief efforts, and the use of Twitter as a platform for news media to gain or disseminate information quickly and effectively (Murthy & Longwell, 2013). NGOs use social media to provide updates on relief efforts, and use positive emotions to encourage public participation with recognized relief efforts, while news media are a purveyor of news updates and use negative emotions to procure attention (Muralidharan et al., 2011).

A number of studies have been conducted on the use of Twitter during a disaster, particularly on what type of information is being distributed to individuals and the effectiveness of this information (Zhu et al., 2011), and how information is disseminated and generates awareness (Sutton et al., 2014; Vieweg et al., 2010; Yin et al., 2012). Studies have also looked at how information can be collected from different social media platforms (Gao et al., 2011), and how this information can be extracted to help assess damage and improve relief efforts (Imran et al., 2013; Guan & Chen, 2014; Middleton et al., 2014). Finally, scholars have also examined how different parties – individuals, NGOs and news media – use Twitter during a disaster (Acar & Muraki, 2011; Lachlan et al., 2014; Muralidharan et al., 2011; Murthy & Longwell, 2013). However, not many studies have looked at whether or not there is evidence of social capital

within hashtag communities during a disaster, and which users contribute to social capital, if it exists.

NGOs and news media have the most influential voices during a disaster, as news media are usually the first to begin disseminating information (Miller & Goidel, 2009), and NGOs are usually the first receivers of those directly affected by a disaster (Shover, 2007). News media are influential due to their incredibly wide reach and saturation across communities that can be both local and international, the speed of their broadcast, their increasing surveillance and access to information, as well as their ability to provide viewers with a live visual report of any event (Cottle, 2014). Individuals are already aware that they are able to go to the news media as a prime source of information. However, sometimes this is not true, especially in countries where the news media heavily censors the information they broadcast, and individuals are forced to turn to other sources (Sultan, 2013).

The news media environment in the Philippines is partly free according to Freedom House, an international watchdog organization aiming to analyze media climates around the world and expand freedom across all nations (Philippines, 2013). Freedom House states that most of the news media in the Philippines is privately owned by individuals who have specific interests in the media or other areas of the economy, normally using the media to further their own political preferences, but that many different views are presented in the variety of outlets (Philippines, 2013). While news media might want to further their own political agenda, and governments may sometimes want to censor the media, this can become challenging in an environment where individuals have access to hundreds of outlets thanks to the web (Sultan, 2014). In spite of this media environment in the Philippines, reporting on disasters and

providing communities with updated information during an emergency is much less controversial than reporting would be during an election. For this reason, some credibility can be given to news media coverage in the Philippines during a disaster. Additionally, with such a large-scale disaster, many international news media also broadcast information (International Federation of Red Cross and Red Crescent Societies, 2005), since individuals can access foreign media via the web, this makes it much more difficult for local news to provide false information if they want to remain credible. Additionally, NGOs also have much influence, as they have an established identity of being the ones to alert communities of imminent disasters, are known to prepare for disasters ahead of time, and provide aid during and after destruction occurs (Shover, 2007). Some examples are the Red Cross, United Nations International Children's Emergency Fund, CARE, Oxfam, and Relief International ([reliefweb.int/organizations](http://reliefweb.int/organizations)). For the above reasons, NGOs and news media can be expected to be the most trustworthy and established sources of information during a disaster.

#### Research Questions Emerging From the Literature Review:

The literature discussed above demonstrates that social media, particularly Twitter, plays a big role during a disaster. Twitter allows individuals who would not connect in day-to-day life to connect online during a disaster, providing users with a platform to form an online community that has a lot of potential due to its capacity for the creation of social capital. This Major Research Project aims to look at Twitter use during Typhoon Ruby, in order to search for evidence of an online community and social capital in the hashtag #RubyPH. Furthermore, this Major Research Project will determine which users contribute more social capital to the

potential community that may be present within #RubyPH. First, #RubyPH will have to be analyzed to determine whether or not it forms a participatory community of individuals. Then, #RubyPH will be analyzed for evidence of social capital. After this, the users contributing to #RubyPH will be analyzed in order to establish the importance of communications from different users. Finally, the contributions and activity of NGOs and news media within #RubyPH will be examined to discern how much social capital they contribute to the hashtag. In order to proceed with this analysis, the following four research questions have been created:

**RQ1A:** Does the hashtag #RubyPH, which emerged during Typhoon Ruby, represent a participatory community of individuals who have similar interests and are intentionally engaging with one another?

**RQ1B:** Can any social capital be found within the #RubyPH hashtag? In other words, are individuals using #RubyPH able to make connections with other individuals using the hashtag, that lead them to gain something of value?

**RQ2A:** Within these hashtag communities, how important are the communications by NGOs and news media companies? Are any other parties equally or more visible?

**RQ2B:** Can tweets posted by NGOs and news media, using #RubyPH, contribute to the social capital within the hashtag?

These research questions will be answered by using the literature to break down the concepts in each question into specific characteristics that can be found on Twitter. Then, a content analysis of a subsample of 2,000 tweets will provide a useful analysis that will lead us to the findings and conclusions. The next section of this Major Research Project - the methodology section - details the data collection method, the subsampling process, and methods of analysis.

## **Methodology:**

### **Data collection method:**

Data for this Major Research Project was collected from Twitter during the occurrence of Typhoon Haiyan, using TweetArchivist. TweetArchivist is an online platform that allows users to monitor keywords on Twitter and provides users with a simple method of extracting the information and a simple analysis alongside it (tweetarchivist.com). Furthermore, this platform allows the user to enter a keyword, hashtag, or Boolean search to collect tweets, the platform then collects tweets until the users subscription is expired. Tweets were collected during the occurrence of Typhoon Hagupit, which landed in the Philippines on December 06, 2014 at 13:15 UCT, and left the Philippine Area in the evening of December 10, 2014 (“Typhoon Hagupit - Dec 2014,” n.d.). The tweets were collected beginning at 17:58 UTC on December 06, 2014 and ending at 21:50 UTC on January 1st, 2015. During this time period a total of 182,399 tweets were collected based on the hashtags #RubyPH, #Hagupit, and the search string “Typhoon Hagupit”.

The two hashtags and the search string were chosen because they had remained worldwide trending topics on Twitter for a number of hours prior to the collection of tweets, and had demonstrated increasing usage. Increasing usage was determined through using Keyhole (Keyhole, n.d.), a tweet- tracking platform that allows one to see a real-time preview of Twitter data. Both hashtags and search string were tracked, as this would allow the comparison of tweets in a hashtag community, and tweets outside of a hashtag community. Due to the limited scope of this Major Research Project only tweets containing #RubyPH were analyzed.

TweetArchivist collected two archives for #RubyPH, one with 50,114 tweets from December 6, 2014 to December 9, 2014, and the second with 20,059 tweets from December 9, 2014 to January 1, 2015. Since Typhoon Ruby landed in the Philippines on December 06, 2014 at 13:15 UCT, and left the Philippine Area in the evening of December 10, 2014 (“Typhoon Hagupit - Dec 2014,” n.d.), the first archive containing tweets from these days was selected to obtain a sample for analysis.

While a large amount of data can be gathered from collecting tweets using the most prevalent hashtags and keywords on Twitter, a few limitations of collecting data in this manner do exist. First of all, not all individuals creating tweets about the disaster may use the specific keywords and hashtags (Larsson & Moe, 2014). Secondly, robots that insert popular keywords into random tweets in order to generate impressions may lead to a number of tweets with irrelevant content (Larsson & Moe, 2014). Finally, many different hashtags are prevalent throughout such an event, and people in different areas may be using different ones, which could mean that data from different hashtags (localized vs. national) could be different (Lachlan et al., 2014). Using a smaller sample of tweets from the ones collected, and filtering out tweets that are irrelevant can minimize the limitations of this data collection method. Overall, the tweets collected would aid in the understanding of whether or not hashtags form participative communities, and what type of information NGOs and news media are disseminating during a disaster.

### Subsampling:

A content analysis of the data collected for this Major Research Project has provided the most useful analysis in regards to the questions asked. In the case of the data collected for this Major Research Project, the analysis involved looking at and examining tweets. In order to be able to conduct a thorough content analysis within the scope of this research project, a much smaller sample of tweets had to be taken from the data collected. Once a smaller sample of the data was created, qualitative and quantitative content analyses, along with a number of different tools was used to further analyse the data.

The rolled over archive of 50,114 tweets that contained the hashtag #RubyPH was downloaded from TweetArchivist in MS Excel format. In order to be able to properly analyze the tweets and avoid translation errors, only tweets in English were considered for this study. Therefore, since the MS Excel spreadsheet provided data of what the language the tweets were in, tweets from the archive were sorted by language and non-English tweets were removed. This left 33,886 tweets to derive a smaller sample from. Simple random sampling was used to pull 2,000 tweets from the 33,886 tweets, by randomizing the tweets using the RAND function in MS Excel. The first 2,000 tweets that appeared were separated into a different document. The smaller sample size contains tweets that had been collected from December 6, 2014 at 5:26:08 PM UT to December 9, 2014 7:54 AM UT. Simple random sampling allows each tweet to have the same probability of being selected, and has been used in other studies looking at tweets during a natural disaster to ensure an accurate representation (Takahashi et al., 2015). A random sample of 2,000 tweets yields a margin of error of approximately 2.24%, and a confidence level of 95%. This sample of 2,000 tweets was analyzed for a breakdown of the users who have sent

the tweets in the sample, as well as a breakdown of users who have been mentioned in the 2,000 tweets. The coding scheme and methods of analysis used to analyze the 2,000 tweets in this sample are presented in the following section.

### Method of Analysis:

To answer the presented research questions, tweets were coded for characteristics which can be found in Table 1, which is presented at the end of this section. For #RubyPH to represent a participatory community of individuals (**RQ1A**), individuals within the hashtag community must demonstrate that they have similar interests and are intentionally engaging with one another (Bruns & Burgess, 2011; Jones, 1977; McMillan & Chavis, 1986). The sample of 2,000 tweets was manually coded to determine if content was relevant, not relevant, spam, or other content. A majority of tweets relevant to the topic would indicate that individuals using the #RubyPH hashtag have similar interests. To determine whether or not there is intentional engagement within #RubyPH, tweets were also coded by style of tweet: an original tweet<sup>1</sup>, @mention<sup>2</sup>, retweet<sup>3</sup>, or a modified tweet<sup>4</sup>.

Boyd et al. have demonstrated that the simple act of a user retweeting a tweet demonstrates intentional engagement (2010). When a user reads a tweet, finds it interesting, and wants to share it with their followers (who might not be viewing tweets in #RubyPH) they are engaging with the tweet. Additionally, @mentions are used when one user purposefully wants to

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<sup>1</sup> Tweets created and sent out by that specific user usually to provide their followers with an update or information.

<sup>2</sup> Tweets where the @username is at the front of the tweet and the tweet is used to respond to, or engage with, another user.

<sup>3</sup> Retweets are simply tweets that the user has wanted to further disseminate.

<sup>4</sup> Retweets with added comment or which are simplified

alert another that they have been “tagged” in a tweet. For this reason, a high number of combined @mentions and retweets in the sample from #RubyPH would be an indication of intentional engagement from users. Finding both similar interest and intentional engagement within the hashtag would mean that #RubyPH is a hashtag community.

Even if #RubyPH is found to not constitute a community, an analysis for social capital can still be conducted and can provide valuable insight (**RQ1B**). Following from the work of Putnam (2000), the characteristics necessary for social capital to be present are: a common purpose within the community, trust, and norms of reciprocity. Individuals using a hashtag during a disaster mostly tweeted with the purpose of sharing information about their situation, to support others who were affected by the disaster, and to request assistance or information (Kongthon et al., 2012). Therefore, each tweet will be categorized as having a common purpose of informing, asking for aid, promoting action, providing support, or will be categorized as other. For example, tweets sent out by bots will not be relevant to the topic or fit into any of the common purposes and thus will be categorized as other. If one category were prevalent, it would demonstrate the hashtag community’s purpose.

The coding scheme for trust comes from a study conducted by Mendoza et al., where responses to false rumors were analyzed (2010). For this Major Research Project, comparing tweets to official sources and news articles identified false rumours. In a preliminary study, a challenge presented itself where no false rumors were found and therefore trust could not be measured. Only an assumption could be made that trust was present because there was no false information. This Major Research Project has taken the analysis of truth one step further by looking at whether or not any punishment of norms is present (Fehr & Fischbacher, 2004). If

punishment occurs when there is a violation of the norms within the hashtag community, it can be assumed that contributors are strict in enforcing the norms within the hashtag community, thus creating a trustworthy community, which is vital to establish a community that provides value to its participants.

Finally, individuals must reciprocate and engage with each other. Activity metrics, such as the number and type of tweets sent by a user, will provide data about the users' relative commitment to the hashtag they are participating in, and how active they are (Bruns & Stieglitz, 2013). First, the number of tweets sent by each user must be counted: The higher this number, the more active the user. Next, the tweets can be broken down into mentions sent, retweets or modified tweets, and original tweets, to further define the users and their activity. If there is a higher number of users being active, and sending many retweets, there is reciprocity within #RubyPH as retweets are a form of engagement and acknowledgement.

After a finding of whether or not #RubyPH represents a hashtag community containing social capital, it is important to determine how visible NGOs and news media are within the hashtag (**RQ2A**). Their importance will be determined by looking at what percentages of the collected tweets were posted by what parties. If a large percentage of posts were equally from NGOs and news media, it would be clear that they are relevant contributors to the hashtag community. To further this analysis, visibility metrics were used. Visibility metrics look at which users received the most amount of retweets and @mentions, by tallying the number of retweets and @mentions a user within the sample receives, and comparing all users to one another. A large amount of retweets and @mentions demonstrates that "other users have taken note of and gone to the trouble of replying to or mentioning the user" (Bruns & Stieglitz, 2013,

p96). Once the users and their number of mentions have been determined, it would be best to group the users by who they are. After establishing these groups, it can be seen if NGOs and news media are most visible in #RubyPH.

Due to the presence of various players, it is important to further break down the creation of social capital within the hashtag community and determine if different players contribute to social capital in differing capacities. If certain key players contribute more social capital to the hashtag community, they are possibly able to encourage individuals to contribute positively. For this reason, an examination of the contributions of various parties is necessary. This will be done by analyzing tweets to determine if NGOs and news media, using #RubyPH have an impact within #RubyPH and are credible (**RQ2B**). Impact in #RubyPH will be determined by using the impact ratio. The impact ratio is the ratio of the @mentions a user has received and the tweets they have sent. A ratio above 1, with a small amount of sent tweets in comparison to the number of times the user has been @mentioned, demonstrates an impact on the conversation occurring within #RubyPH (Bruns and Steiglitz, 2013). An impact on the hashtag community would mean that the user has some authority within the community and is able to sway the conversation. Through a qualitative content analysis, it will be necessary to determine the presence of certain user characteristics to be able to verify the user's credibility. Important features were determined based on the work of Castillo et al., who state that the characteristics of a user are an important component of verifying their online credibility (2011). Credibility is valuable, as a credible user allows for the creation of a trustworthy hashtag community. The characteristics that will be examined can be seen in Table 1. Evidence of both impact and credibility will demonstrate that NGOs and news media contribute to the social capital within #RubyPH.

**Table 1:** Partial coding manual created in order to determine whether or not #RubyPH is an online community, contains social capital, and whether or not NGOs and news media have any influence within #RubyPH.

<u>Research Question</u>	<u>Characteristic</u>	<u>Code</u>
RQ1A: Does the hashtag #RubyPH, which emerged during Typhoon Ruby, represent a participatory community of individuals who have similar interests and are intentionally engaging with one another?	Similar Interests	<ol style="list-style-type: none"> <li>1. Relevant Content</li> <li>2. Not Relevant but not spam either</li> <li>3. Spam</li> <li>4. Other</li> </ol>
	Deliberate Engagement	<ol style="list-style-type: none"> <li>1. Original tweet</li> <li>2. @Mention</li> <li>3. RT</li> <li>4. MT</li> </ol>
RQ1B: Can any social capital be found within the #RubyPH hashtag? In other words, are individuals using #RubyPH able to make connections with other individuals using the hashtag, that lead them to gain something of value?	Common Purpose	<ol style="list-style-type: none"> <li>1. To inform</li> <li>2. To ask for aid</li> <li>3. To promote action</li> <li>4. To provide support (emotional/physical)</li> <li>5. Other</li> </ol>
	Punishment	<ol style="list-style-type: none"> <li>1.No violation of norms</li> <li>2.Violation of norms w/ no punishment</li> <li>3.Punishment for violation of norms</li> </ol>
	Trust	<ol style="list-style-type: none"> <li>1. Not a false rumour</li> <li>2. Affirmation of false rumour</li> <li>3. Denial of false rumour</li> <li>4. Questioning of false rumour</li> </ol>
	Norms of Reciprocity (Activity Metrics)	<p>Steps: First, list unique users who have sent the tweets in the sample, and then code each users tweets with the following:</p> <ol style="list-style-type: none"> <li>1. Mention</li> <li>2. RT or MT</li> <li>3. Original Tweet</li> </ol>
RQ2A: Within these hashtag communities, how important are the communications by NGOs and news media companies? Are any other parties equally or more visible?	User Visibility (Visibility Metrics)	<p>Steps: Make a list of users who have been retweeted or mentioned in the sample and how many times they have been mentioned and retweeted. Then code the users by who they are:</p> <ol style="list-style-type: none"> <li>1. NGO or not-for-profit</li> </ol>

**Table 1:** Partial coding manual created in order to determine whether or not #RubyPH is an online community, contains social capital, and whether or not NGOs and news media have any influence within #RubyPH.

<u>Research Question</u>	<u>Characteristic</u>	<u>Code</u>
		2. News Media
		3. For-Profit
		4. Government
		5. Individual
		6. Bot
		7. Account Does Not Exist
		8. Other
RQ2B: Can tweets posted by NGOs and news media, using #RubyPH, contribute to the social capital within the hashtag?	A Users Impact #RubyPH (Impact Ratio):	Steps: Make a list of users who have been mentioned and who have sent tweets out in the sample. Give each user an @mentions received:tweets sent ratio. This points to the impact the users messages have on the conversation.
	Credibility	Steps: Look at the users with the highest impact ratio and answer the following questions: <ol style="list-style-type: none"> <li>1. Are they verified?</li> <li>2. How long have they had twitter?</li> <li>3. How many followers do they have?</li> <li>4. How many tweets have they posted?</li> <li>5. How many people do they follow?</li> <li>6. Do they have a description?</li> <li>7. Do they have a URL?</li> </ol>

## **Findings and Analysis:**

Briefly, this Major Research Project led to findings that Twitter was used significantly during Typhoon Ruby, and that #RubyPH did result in the creation of an online hashtag community, which contained social capital, and where NGOs, news media, and governments played an active role. The following section will present further findings and an analysis.

### **A General Overview of Twitter Activity During Typhoon Ruby:**

From December 6, 2014 to January 1, 2015 keywords “Typhoon Hagupit” and #RubyPH were tracked. “Typhoon Hagupit” resulted in 63,113 tweets, in 36 different languages, generating approximately 564 million impressions. During the same time period, 70,173 tweets contained #RubyPH, and posted in 31 different languages, creating nearly 2 billion impressions. The discrepancy between the numbers of impressions generated for the hashtag containing “Ruby” versus the hashtag containing “Hagupit” could be due to the fact that Typhoon Ruby is the name given to the typhoon by PAGASA, the Philippine weather agency (Erdman & Wiltgen, 2014). Additionally #RubyPH is a shorter hashtag, taking up less characters in a tweet, and contains both the typhoon name as well as the Philippine country code “PH” (“Complete List of Country & Dialing Codes,” n.d.). The great number of impressions, along with the variety of languages used in the tweets is an indication of the global scope of tweets related to Typhoon Ruby. Additionally, these findings further prove that a significant number of users are able to both access and create information online, related to a single significant event, from anywhere around the world (Haythornthwaite, 2005).

262 (13%) tweets in the sample are from accounts that no longer exist, where users changed their usernames, or where accounts were shut down or reported and removed. Additionally, 106 (5%) of tweets were from protected accounts where the data was collected because the accounts were public during the time of data collection. Perhaps, these individuals decided to make their accounts public for the duration of the disaster in order to contribute online, or they have simply protected their accounts for other reasons. There is no evidence to suggest either. Furthermore, 16 (0.8%) tweets are from suspended accounts. Tweets from accounts that do not exist, protected accounts, and suspended accounts have still been analyzed as their content was part of #RubyPH during Typhoon Ruby.

Finally, 28 (1.4%) tweets were found to be from other accounts. For example, an account of the official One Direction band street team in Marikina City was placed into the “other” category because it did not fit clearly into any of the initial categories. The same occurred with the 104 (5.4%) tweets that are categorized as spam, they were still included in the analysis but coded as “spam”. This was done in order to differentiate between spam sent out by bots, tweets that normally include all of the trending hashtags in order to gain attention, and non-relevant tweets sent out by individuals who chose to include #RubyPH. This differentiation is important, as bots *automatically* include all hashtags while users include hashtags *consciously*. For example, this tweet: Evon Latriel is looking for actress/actors for her 1st book that's now a movie. "When Mommy Went to Heaven"#evonlatrail #RubyPH (@Casey\_Anthony\_1, 2014), consciously included the #RubyPH hashtag, even though the tweet has no relevance to the typhoon. If many tweets are not relevant to the topic, this would either mean that users did not understand the purpose of the hashtag, the purpose was not communicated properly, or there are

no norms of communication within the hashtag. A lack of relevant tweets could indicate that there is no community within #RubyPH, as relevant tweets are necessary to demonstrate similar interests, which are key in the development of an online community (Baym, 2007). This general analysis demonstrates that the scope of the hashtag is large and that the hashtag has reached many individuals globally. Furthermore, showing that spam tweets and non-existent accounts do not make up a meaningful portion of the sample, but are still relevant enough to be analyzed. To answer the research questions and determine if #RubyPH is a community that contains social capital, further analysis is required.

#### The Creation of a Hashtag Community:

***RQ1A:** Does the hashtag #RubyPH, which emerged during Typhoon Ruby, represent a participatory community of individuals who have similar interests and are intentionally engaging with one another?*

#### **Findings:**

To determine if #RubyPH represents a participatory community of individuals, the sample of 2,000 tweets was coded for the characteristics of similar interests and deliberate engagement. This is in line with theories presented by Jones (1977), McMillan and Chavis (1986), and Bruns and Burgess (2011), who state that those characteristics are necessary for the formation of a community. If the tweets within #RubyPH contain information that is relevant to the same topic, similar interest within the hashtag would be apparent. For example, if a majority of tweets contains information relevant to Typhoon Ruby, it would be clear that users of the hashtag have a similar interest. It was found that 1,868 (93%) of tweets contain content that is

relevant to Typhoon Ruby, 27 (1%) tweets are not relevant to the topic but are also not considered spam, and 104 (5%) tweets are spam.

1,868 (93%) of the tweets contain relevant content, and 75% of tweets demonstrate intentional engagement with the hashtag. Only 1 tweet was grouped as “other”, the tweet was the following one, which made fun of a popular journalist in the Philippines, who was on air during Typhoon Ruby: “RT @tonyocruz: LOL: About Korina Sanchez (news reader and wife of Mar Roxas) and #RubyPH <http://t.co/5LsoYlsYhF>” (@elidoms, 2014). This retweet only contains the single hashtag #RubyPH, which leads to the conclusion that the tweet may have resulted from a viewer seeing the journalist live on air. The user then most likely reacted by tweeting their opinion, and used the hashtag in order to expose their tweet to a broader audience of individuals who were tuning in to #RubyPH.

Intentional engagement includes tweets that are @mentions, retweets, and modified retweets (Boyd et al., 2010). For a list of mentions and modified retweets please refer to Appendix 2 and 3. For #RubyPH, findings showed that 493 (25%) tweets are original tweets, 22 (1%) are @mentions, 1,442 (72%) are retweets, and 43 (2%) tweets are modified tweets. From this 75% of tweets in this sample demonstrate intentional engagement. Finally, of all the 1,868 relevant tweets, 447 (24%) are original tweets, 22 (1%) are @mentions, 1362 (73%) are retweets, and 37 (2%) are modified tweets. Within the relevant tweets, 1,421 (76%) of tweets demonstrate intentional engagement. Since this number is inline with the 75% obtained from the entire sample, including non-relevant tweets, it holds that users are intentionally engaging with the topic of the disaster.

### *Analysis:*

In order for #RubyPH to satisfy the requirements for a participatory community, the findings must demonstrate that those using the hashtag have similar interests, and are deliberately engaging with one another (Jones, 1977; McMillan & Chavis, 1986; Bruns & Burgess, 2011). A large number of tweets relevant to the topic (93%) serves as an indication that individuals using #RubyPH have similar interests. Similar interests are paramount to the creation of a community, especially a hashtag community that would take the form of networked collectivism (Baym, 2010). Individuals with an interest in Typhoon Ruby – who are at the center of their own networks – have joined on Twitter using the hashtag #RubyPH. While some individuals using the hashtag may have personal connections with one another, most individuals have very little connections to others using the hashtag, as these individuals are divided by languages and geography, as indicated earlier. Their central connection is the weak ties they have established by contributing to the hashtag. This is important because it demonstrates that a wide variety of people, who are not connected in day-to-day life, are able to connect to each other in a time of need.

According to Boyd et al., the act of retweeting allows tweets to be shared quickly and with minimum effort (2010). The simple act of broadcasting a message makes a statement from the user and adds the retweet as part of a broader conversation, because it captured the users attention who then deemed the tweet valuable enough to share with their personal network (Boyd et al., 2010). The presence of retweeting, along with the presence of @mentions and modified retweets, provides evidence of intentional engagement.

Most of the @mentions were used to directly inform users, or to ask questions, such as, “@rapplerdotcom #RubyPH any news on pnr ops later? (@eathealthyeatme, 2014)”, where the user tweeted directly to news media (Rappler.com) in order to ask a questions and gain more information. Many of the modified tweets within the sample were created in order to provide both information and support at the same time. This can be seen in this modified tweet by @briansoriente: “Be ready guys! Stay safe!! :) :) RT @ANCALERTS PAGASA: Metro Manila to feel effects of Typhoon Ruby around 8-10pm on Monday Dec. 8 #RubyPH (@briansoriente, 2014)” Where information was provided by retweeting @ANCALERTS, while the added comment provides support. Since many of the tweets have exhibited similar characteristics, usage of a hashtag as outlined by Kongthon et al. (2012) is reaffirmed. While the amount of both @mentions and modified retweets was not as high as the amount of retweets, the presence of both of these within the sample demonstrates intentional engagement. Therefore, since evidence of both characteristics (similar interest and intentional engagement) were present, it can be said that at the time of its creation, and during the typhoon, #RubyPH was a hashtag community focused on Typhoon Ruby. In accordance with the requirements of an online community as set out by Jones (1977), and McMillan & Chavis (1989), the findings suggest that users are intentionally participating within the hashtag community, and providing support. This is important, because it demonstrates that users who are not connected in day-to-day life are able to come together online to form a community with a purpose, and break through barriers of time and space. Not only demonstrating the ability of social media to connect individuals, but also giving us a glimpse into the potential power of these connections. Since #RubyPH is confirmed

to be a community, and social capital emerges from community ties, it is possible to have social capital within #RubyPH.

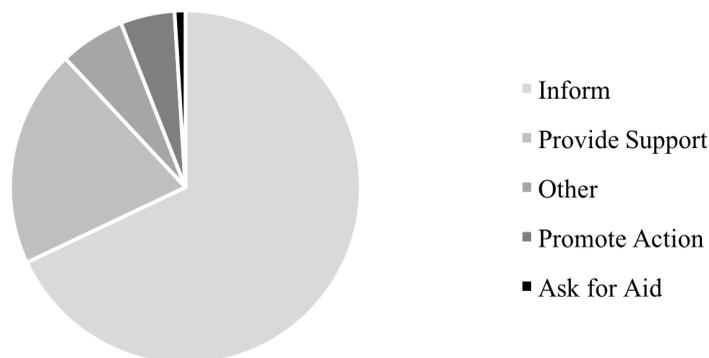
Social Capital within #RubyPH:

**RQ1B:** *Can any social capital be found within the #RubyPH hashtag? In other words, are individuals using #RubyPH able to make connections with other individuals using the hashtag, that lead them to gain something of value?*

**Findings:**

In order to code for social capital within the hashtag community of #RubyPH, an analysis to find evidence of the following characteristics was conducted: a common purpose of the community, the punishment of norms, trustworthiness within the community, and norms of reciprocity. Within the sample, all categories listed under the characteristic of common purpose are present. From most common they are to inform, to provide support, other, to promote action, and to ask for aid/information (See Figure 1 for a chart of the common purpose of tweets within #RubyPH). For examples of tweets within each category, refer to Appendix 4.

**Figure 1:** Chart depicting the common purpose of tweets within #RubyPH.



Only 3 tweets were found that punish users of #RubyPH for violating the common purpose, while 115 tweets demonstrate a violation of norms. Furthermore, no false rumours are present in the 2,000 sample tweets and all objective and fact based tweets are found to be accurate. A total of 1,804 unique users contributed to the creation of this sample of 2,000 tweets. The most active user was @BinoyaJoshua (18 tweets), and then @9newsph (7 tweets), @abscbnnews (6 tweets), @antipoloph (6 tweets), and @govph (6 tweets). On breaking down the analysis by user and type of tweet the user has sent, it is found that many users have similar levels of activity. Therefore, users are placed into categories of what type of user they are (NGO, news media, for profit, government, individual, bots, does not exist, or other), and their activity was recorded. Furthermore, the activity of each group of users is divided into “mentions sent”, “retweets” or “modified tweets”, and “original tweets;” as seen in Appendix 5, which shows activity metrics by account type. Government agencies and bots are most active in terms of creating original tweets since a small number of accounts contribute to a large number of tweets. 8 bots created 30 original tweets, while 27 government agency accounts contribute to 42 tweets. On the other hand, individuals contribute to 68% of the tweets that are in the sample of 2,000. 1,284 users contributed to 1,354 tweets, where 268 (20%) of those tweets are original, 16 (1%) tweets are mentions, 1,042 (76%) tweets are retweets, and 28 (2%) are modified retweets.

### ***Analysis:***

The data for social capital in the hashtag community #RubyPH demonstrates that there is a clear common purpose in the community, aligning with theory presented by Acar and Muraki (2011), and findings from Takahashi et al. (2015). The main purpose of the tweets within the

#RubyPH hashtag is to inform, while the second most common purpose is to provide support. Finding that there is a common purpose of informing and supporting those within the hashtag community provides evidence that social capital could be present within this community. This is important because one of the foundational pillars of social capital, as stated by Putnam, is norms of reciprocity (2000). When social capital is present, those individuals within a community have an understanding that they will gain something of value, in line with the common purpose, by participating, giving back, and adding value to this community.

In an online community that is cultivated through weak ties between individuals (Granovetter, 1983), gaining something of value is also called bridging capital (Putnam, 2000). In #RubyPH bridging capital is present in the form of tweets sent out to diffuse information, or even tweets to help provide those affected with links to resources they might not be aware of. Bridging capital is evident from the high amount of informative tweets, such as, “#RubyPH has been downgraded to tropical depression. It has maximum winds of 60 kph, moving at 13 kph (@ABSCBNNews, 2014)” a tweet serving to inform users of how Typhoon Ruby is progressing. Providing the community with up to date information on the threat of the typhoon makes an important contribution to the social capital within the hashtag community; it raises awareness, and once the information proves to be true, increases the bonds and trustworthiness of the community sharing the information. On the other hand, bonding capital, formed by stronger ties (Putnam, 2000), is also present in the tweets in #RubyPH. Bonding capital forms through the solidarity created by groups of people who live in the Philippines and who are immediately affected by the disaster, sending out tweets in order to provide emotional support for one another. For example: “So much destruction in Samar. Definitely not the news you want to wake

up to. Continue praying guys don't lose hope. #RubyPH” (@MazieBalbuena, 2014). This tweet provides support to the #RubyPH community, as it refers to religion, which many people turn to during difficult times. The presence of such tweets demonstrates that users within the community are providing emotional support for one another (Wellman, 1999), further proving that the hashtag is a community. Additionally, the presence of informative and supportive tweets also demonstrates that users are willing to do something (retweet important information or tweet their support) without necessarily getting something in return, thus reinforcing the evidence of social capital within the community. These are critical findings, as they demonstrate that the community found in **RQ1A** provides users with some benefit, of either support, information, or encouraging them to jump into action.

The tweets that did not fit in any of the categories were mostly spam, such as the following tweet by @TrendiePH: "Trending Philippines:04:13 PM PHT"1. #YungCrushMoNa2. #RubyPH3. #KBDTQAlbumLaunchOnASAP4. #KathNielASAPGlow (@TrendiePH, 2014).” Spam tweets were placed in the other category, even though they could be classified as tweets with a purpose of informing, because they are usually computer-generated tweets. While the information generated by computers can be useful, the tweets classified as “other” were not contributory to the topic of Typhoon Ruby. Additionally, it is important to consider spam tweets in this analysis. If spam saturated #RubyPH, it would mean that there is a lack of social capital. This is due to the fact that social capital is formed through the connections fostered between people who can provide something of value to each other (Putnam, 2000; For-mukwai, 2010). In this case, tweets fit into the categories that have been previously determined by literature (Kongthon et al., 2012), and tweets in the “other” category do not have much effect on the

overall purpose of the community. The large percentage of tweets that are either informing or supporting within #RubyPH indicate that both bridging capital and bonding capital are present within the hashtag community. Both bridging and bonding capital are forms of social capital (Putnam, 2000), and their presence within #RubyPH is a strong indication that this community supports social capital and can benefit from it.

It could not be determined if false rumours would be dispelled, because most of the sent tweets demonstrated accuracy of information. However, there was a single modified tweet that was sent to a news agency, letting them know that they had included an incorrect photograph in their news article. The tweet from @AmaldaAda, states the following: “@ABSCBNNews: Flooding NOT in #Calbayog, Samar. #RubyPH #Hagupit <http://t.co/0VToyqONz5> | via @atomaraullo” WRONG photo :) check source (@AmaldaAda, 2014)” This tweet did not deny a false rumour, as the actual information published was correct, but just pointed out that the correct photograph was not used. This tweet is an indication that individuals on Twitter are likely to disprove false information, as was demonstrated by Mendoza et al. (2010). It is already demonstrated that in #RubyPH users enjoy sharing information, this means that any information linked to the topic would spread widely. Increased diffusion of information would allow more users, in a variety of networks (since the hashtag community takes the form of networked collectivism), to view the information. This increases the possibility of a tweet containing incorrect information being disproved by users. The fact that users are willing to disprove information is further supported by the presence of tweets that punish those who do not abide by community norms.

The following three tweets were found to punish those that did not abide by community norms. These not only further affirm the development of a common purpose and general community norms within #RubyPH, but also the development of trust.

RT @dizoncommasam: Please lang. #RubyPH is for easier information dissemination, not for your fucking #sweaterweather selfies. Dufuq. (@irMINfinity, 2014)

RT @anti\_famewhore: In respect to all the victims and people monitoring typhoon, please stop using hashtag #RubyPH for selfies. Be a responsible netizen! (@nicolexeye, 2014)

Don't use #RubyPH as a perfect weather to get laid!!! U make yourself so cheap... Try praying ... #justsaying (@ keidg\_thisisme, 2014)

Two of the presented tweets are retweets, meaning that the original user was not the only individual with such an opinion, as someone has read their tweet and decided to share it with their own personal network. The tweets make it clear that using the hashtag #RubyPH for anything other than disseminating information related to the typhoon is unacceptable. These punishing tweets demonstrate that there is a norm within the hashtag community (Fehr & Fischbacher, 2004), allowing users to be aware of the fact that the community abides by their purpose and will enforce it; therefore, increasing trustworthiness within the community. As one of the pillars of social capital, the finding that there is the possibility of trust and that there is a punishment of the violation of norms is of great value, as trust within a community can allow users to gain a lot of value from one another and reciprocate any value that is received.

Finally, the number of users that contributed to the sample of tweets (1,804) is not drastically different from the number of tweets in the sample. On average each user tweeted 1.1 times. This indicates that users were, in general, equally active within this hashtag community.

The most active user, @BinoyaJoshua, is an individual who had written a love story and had tweeted the same tweet multiple times, using various hashtags, in order to gain attention. The user's tweet was "BEST PINOY M2M LOVE STORY <http://t.co/tVdgGIxyvP> #RubyPH #YunCrushMong #BestNewArtist #BattlesPh #TRBinManilaVicePH ArmysJiminSignalU (@BinoyaJoshua, 2014)." This tweet was not relevant to Typhoon Ruby, and there was no evidence of punishment for a violation of norms by @BinoyaJoshua. This user's activity on the hashtag can be likened to that of spam, because of the fact that all tweets were not related to the topic and were repetitive, only changing hashtags in order to gain attention. Additionally, this user does not have a large number of followers (a total of 69 followers), their tweets were not retweeted, and they are not mentioned in any tweets within the sample, meaning that they do not have much influence in the hashtag community.

News media and NGOs also demonstrate a lot of activity within the hashtag; however, individuals have a much higher level of activity within the hashtag. This was determined by using activity metrics that provide data on the users relative commitment to the hashtag they are participating in, and how active they are (Bruns and Steiglitz, 2013). Individuals contributed the most amounts of tweets to the hashtag, while news media contributed the second largest amount, and NGOs the third. In general, out of 1,804 unique users in the hashtag community, only 493 tweets were original tweets, indicating a lack of activity, as defined by Bruns and Stieglitz (2013). However, this lack of activity is due to the retweet function, a function that allows users to broadcast and share information without having to create an original tweet, a modified tweet, or link to the source, making information dissemination quicker and more credible. This is important for a community where the main purpose of the tweets is to inform. Many NGOs,

news agencies, and government accounts will send out original tweets with new information, which then get multiple retweets from users. Moreover, the high level of retweets indicates that there is a definite norm of reciprocity within this hashtag community, as retweets are a form of positive engagement on Twitter (Lee et al., 2010). This means that individuals have to actively read a tweet, decide it is important, and share it with their networks. “Ongoing interaction, identity persistence, and knowledge of previous interactions” is necessary to “promote the creation and importance of reputation within a community” in order for reciprocity to occur (Sankaranarayanan & Vassileva, 2009, p.102). Retweets demonstrate ongoing interaction and knowledge of previous interactions since the source is linked, while a common purpose within the community demonstrates identity persistence. Since both of these are present within #RubyPH reciprocity can occur within the community.

Overall, social capital is certainly present within #RubyPH, due to there being a prevalent common purpose of informing individuals who use the hashtag, and a presence of trust because users are willing to protect the community from those violating norms; furthermore, because of the fact that reciprocity can occur due to ongoing interaction and identity persistence. This finding is crucial to disaster communication, as the presence of social capital means that individuals within the community are willing to provide something of value to others within the community without expecting something immediately in return. When a disaster occurs, individuals may not have accurate information, resources, or familiar avenues of support; therefore, a community that is able to provide value, which can be in the form of information, resources, or support is indispensable to those affected by the disaster.

## Visibility of NGOs and news media within #RubyPH:

**RQ2A:** *Within these hashtag communities, how important are the communications by NGOs and news media companies? Are any other parties equally or more visible?*

### ***Findings:***

In order to determine whether NGOs and news media are significant contributors to #RubyPH, it is important to look at the number of tweets they have contributed to the community. Individuals contributed the largest number of tweets in the sample, with 1,354 tweets (67%), while news media contributed 158 tweets (7.9%), and government accounts contributed 42 tweets (1.5%). In order to further expand this analysis, it is vital to determine which users are the most visible. Determining the visibility of NGOs and news media within #RubyPH requires the use of visibility metrics, which means looking at a list of all of the users who were mentioned in tweets within the sample. Refer to Appendix 6 for visibility metrics by account type. It was found that there are 1,550 tweets that are either retweets, modified retweets, or @mentions and referred to another username. 584 unique users were mentioned within these tweets. Out of these mentioned accounts 190 (33%) are individuals, 141 (24%) were news media, 118 (20%) were NGOs, and 44 (7%) were corporations. Of the 1,550 retweets posted, 882 (57%) mentioned news media sources, 408 (26%) mentioned government sources, 319 (20%) mentioned individuals, and 258 (17%) mentioned NGOs. When calculating the visibility per unique user of each group of accounts, government accounts are found to be most visible with 9.27 retweets and/or @mentions per unique account. After that news media accounts received 6.25 retweets and/or @mentions per unique account, with NGOs coming in third at 2.18 retweets and/or @mentions per unique account.

### *Analysis:*

The previous breakdown has demonstrated that individual users are most active and contribute the most. The tweets of individual users make up the most of the sample of tweets from #RubyPH; however, just because individuals contribute the most to the hashtag community, does not mean that they are the most visible. Take @BinoyaJoshua as an example, while the user contributed to the community with numerous tweets they were not necessarily the most visible tweets due to the users low number of followers and that no other users mentioned @BinoyaJoshua in the sample. For this reason, visibility metrics are important to allow us to see which users are being retweeted/mentioned the most, and to determine their visibility in the community.

A high visibility of a specific user within the community (high amount of retweets and @mentions of the user) would mean that other participants of #RubyPH have noticed the users activity and have put the effort into responding to the user, thus validating the users tweets (Bruns & Steiglitz, 2013). Visibility metrics for #RubyPH show that government accounts are the most visible within the community, as they have received the highest number of retweets and @mentions per unique account. While news media received the highest overall retweets and @mentions, with 882, it is important to look at the average of how many retweets and/or @mentions a unique users receives to be able to measure the approximate impact of users within the hashtag community. Government accounts, on average, received 9.27 retweets and/or @mentions per unique account, meaning that the tweets sent from the mentioned government accounts were distributed widely by being retweeted often, and users were interacting with the accounts through retweets and/or @mentions.

The analysis for **RQ2A** demonstrates that government related Twitter accounts are the most visible within the #RubyPH community. While NGOs and news media are both important within the sample, government account visibility outranks them both. This is due to the fact that governments are usually the administrators of disaster management plans (Shover, 2007). From here the news media are tasked with getting important information from government agencies to the general public (Miller & Goidel, 2009). Additionally, the government is normally the one preparing for the impact of the disaster and helping to minimize the effect of the natural disaster (Kumar & Havey, 2013; Moe & Pathranarkul, 2006; Shover, 2007). Since governments are the first to create action plans, it is appropriate that they have the highest visibility within this hashtag community. However, timing also needs to be considered because if governments are the first to begin distributing important information, their visibility may be higher in the initial stages prior to and during a disaster. On the other hand NGOs are usually the ones that come in after a disaster to aid with relief and recovery (Kumar & Havey, 2013; Shover, 2007); therefore, their visibility could increase after a disaster. The findings in the sample of 2000 tweets containing #RubyPH demonstrate that during the landing of the typhoon, the government is most visible.

## Contributions of NGOs and News Media to Social Capital:

***RQ2B:*** *Can tweets posted by NGOs and news media, using #RubyPH, contribute to the social capital within the hashtag?*

### ***Findings:***

To determine whether or not NGOs and news media contribute to the social capital within a hashtag, it is important to look at their impact ratio as well as their credibility. An impact ratio is the ratio of the @mentions a user has received and the tweets they have sent (Bruns & Steiglitz, 2013). A ratio above 1 would mean that the user had an impact on the hashtag community in question (Bruns & Stieglitz, 2013). Within this sample of 2,000 tweets, it was found that government agencies had an impact ratio of 115:8, meaning that for every 115 tweets they are mentioned in, they send out 8. NGOs had an impact ratio of 19:7, while news media had one of 523:65. Due to the fact that government agencies were found to contribute to #RubyPH (**RQ2A**), a credibility assessment on government agency accounts was also conducted, and individual accounts were assessed for a comparison.

In order to determine credibility and reputation, an analysis was conducted on accounts containing impact ratios above 1. For a full credibility assessment of the NGOs, news media, government, and individual accounts refer to appendices 7, 8, and 9, and 10. Comparing the average credibility of each group of accounts resulted in the following data in Table 2:

**Table 2:** Average credibility assessment of each group of accounts

<u>Type of Account</u>	<u>Percentage of Verified Accounts</u>	<u>Average Years Active</u>	<u>Average Amount of Tweets</u>	<u>Average Number of Accounts Following</u>	<u>Average Number of Followers</u>	<u>Percentage of Accounts with Detailed Descriptions</u>	<u>Percentage of Accounts with a Link to an Official URL</u>
NGO	25%	4.8	14494	1855	64995	81%	100%
News Media	14%	4.86	96342	691	269584	92%	89%
Government	22%	4	30690	478	365503	44%	100%
Individuals	0%	4.78	23616	530	225646	36%	55%

Table 2 shows the average credibility assessment of each group of accounts. Allowing us to compare groups in order to determine which group is most credible. For NGOs, 25% of the accounts are verified. Some examples of verified accounts include the accounts of Humanity Road, (@HumanityRoad: a disaster response charity), UNICEF USA (@unicefusa), and The United Nations Development Program (@UNDP). This is the highest percentage of verified accounts of all 4 groups. A verified account is one that receives an official blue badge on their profile from Twitter as a sign of credibility, and affirmation that the user is who they say they are (“FAQs about verified accounts”, 2014). Twitter works to verify accounts of highly searched for, and well-known, users in various interest areas (such as sports, music, politics, media, and business to name a few) and does not accept public requests for verification (“FAQs about verified accounts”, 2014). Accounts are verified with a blue tick mark badge next to their name, this badge lends credibility to an account, because Twitter has gone through a process to ensure that the information is accurate; therefore, tweets from any account with a verification badge are more credible.

On average, news media accounts have the most amount of tweets, at more than 90,000 tweets, which is 3 times the amount of tweets by the group with the next highest number – governments with 30,000 tweets per account. Furthermore, NGOs follow the most amounts of individuals, following nearly twice as many accounts as news media do on average. In general, these accounts were all found to be more than 4 years old, and there was no significant difference between the groups based on age of accounts. On average, government accounts were found to have the most followers, with 365,503 followers. Surprisingly, individuals were found to have an average of 225,646 followers. With further investigation it was found that two accounts – that of a well-known Twitter user and a celebrity – with a large number of followers contributed to this high number. Without those two accounts, the average of followers for individual accounts would have been approximately 2,000 followers. Significantly below the number of followers of NGO, news media, and government accounts. However, this number is still relatively high, suggesting that the group of users within this sample of tweets taken from #RubyPH are quite active. Users with a higher number of followers could be more visible in the hashtag community as their tweets are being directly seen by more users, leading to a higher possibility of their tweets being retweeted or users responding to them. Further analysis of individual accounts with a larger sample of tweets would be necessary in order to determine if any very active users are using this hashtag. However, this is beyond the scope of this Major Research Project.

While not many government accounts and news media accounts are verified, most have a link to a credible homepage. However, while a high percentage of news media and NGO

accounts were found to contain detailed descriptions, most government accounts were found to have descriptions with very little detail.

### **Analysis:**

The impact ratio for each group has demonstrated that government agencies, as a whole, have the greatest impact on the hashtag community #RubyPH. This is notable because it means that the government agencies do not have to send out a message to many different users, in different networks, in order to gain more exposure. For example, the same way that bots include all hashtags in their tweets in order for a wider range of people to notice their tweets. This finding shows that government agencies are able to send a message using a single relevant hashtag and their message is then widely disseminated. The time period that Typhoon Hagupit landed in, and the time period of this sample overlap, which means that most of the activity in the hashtag community is related to the information needed during the disaster. The government was well aware of exactly when the typhoon was scheduled to land, and their aim was to educate and inform the general public. The educational and informative aspect of the government's tweets can be seen in the following example: "Update #RubyPH: 1:00AM 09Dec2014, The center of Tropical Storm RUBY was located at 60 km Southwest of Amabulong,... <http://t.co/RTIX2Be28q> (@dost\_pagasa, 2014)."

The credibility assessment of NGOs, news media, and government agencies also demonstrates that government accounts are highly credible, along with NGOs, and news media. The government accounts have the highest amount of followers even with sparse descriptions.

Take the following two account descriptions as an example:

NGO account @unicefusa: We support and advocate for UNICEF in the United States. UNICEF fights for the survival and development of all children, in all situations, all of the time. (UNICEF USA, 2007)

Government agency account @officialdohgov: The Official Twitter Page of the Department of Health of the Republic of the Philippines (Department of Health, n.d.)

Both NGO and news media accounts provide a description of what the organization does, while the government account description only affirms that the account is official. Even though the government accounts did not provide very detailed descriptions, they still have many followers. This is likely due to the fact that they are in fact valuable primary sources during a disaster (Moe & Pathranarakul, 2006; Shover, 2007).

Furthermore, NGO, news media, and government accounts had more followers than the amount of people they were following, which speaks to credibility because it shows that individuals want to be exposed to the information the accounts are distributing (Westerman et al., 2012). Credibility is very important, as it allows users to begin trusting the information that an organization is sharing. This trust is vital in a hashtag community that has social capital, because users need to be able to trust that they can receive something of value from participating (Putnam, 2000; For-mukwai, 2010). The finding of verified and credible accounts that have an impact on #RubyPH is very important in understanding how these users contribute to social capital within the hashtag community. Not only do these parties have their own credibility, but by using #RubyPH in a tweet they are contributing to the credibility of the hashtag community. They contribute credibility because the various features provided by twitter help prove their credibility (detailed descriptions and URLs), which allows users to trust them (Westerman et al.,

2012), ultimately contributing to social capital. Putnam states that “trustworthiness lubricates social life”, and is central to social capital (2000, p.21). Since these credible users, with an impact on the community, are using the hashtag in their tweets and contributing to the community, they lend trustworthiness to the community, which in turn encourages reciprocity (Putnam, 2000); thus, showing evidence that NGO, news media, and government accounts do contribute to social capital.

This sample analysis has made it clear that governments, NGOs, and news media have an impact on, and also encourage, the credibility of the hashtag community #RubyPH. The impact that these organizations leave increases social capital within the community, as these agencies are able to provide some element of trust, and encourage users to engage based on what they tweet. Ultimately, increasing social capital and the value of the community that #RubyPH creates.

## **Conclusion:**

This Major Research Project has aimed to demonstrate the presence of social capital within hashtag communities emerging during Typhoon Ruby. With the main goal of demonstrating whether or not information shared by different parties can have an impact on the social capital present, and if this information can encourage support from online hashtag communities to impacted individuals.

A deductive content analysis of 2,000 tweets containing #RubyPH demonstrated that #RubyPH is a hashtag community. This is due to the fact that the majority of the tweets within the hashtag demonstrated similar interests because they all contained information relevant to Typhoon Ruby. Additionally, tweets demonstrated deliberate engagement due to the high amount of retweets and @mentions from users.

#RubyPH was also found to contain social capital. The main purpose of the hashtag community is to inform, with a secondary purpose of providing support. This can constitute of a user informing others of the danger of the incoming typhoon, informing their friends of their safety, or sending prayers to loved ones. Interestingly enough, while there were challenges of measuring trust within the hashtag community, it can still be said that trust is present due to the inherent nature of Twitter, and previous studies that have looked at trust on the platform. However, while the presence of trust could not be accurately measured, the presence of social norms, especially the presence of punishment when norms were disobeyed was unmistakable. Finally, through an analysis of activity metrics it was found that norms of reciprocity are also present within #RubyPH. Overall, #RubyPH contains social capital because the hashtag

community demonstrates a common purpose, punishment, the development of hashtag usage norms, and norms of reciprocity.

Through research it was determined that NGOs and news media have an influence on Twitter activity during a natural disaster as they have a high level of activity within the hashtag community. To provide further support for this, it was necessary to determine who the key players are within #RubyPH. Using visibility metrics, it was found that news media and government agencies are most visible. NGOs were also visible, but did not have as much of a role as news media and government agencies. This could be due to the fact that the data being analyzed for this Major Research Project comes from a 3 day time period. News media and government agencies are likely more influential prior to and during a disaster, while NGOs play more of a role in recovery and relief. This is reflected in these results.

Finally, it was found that news media, NGOs, and government agencies do contribute to the social capital within #RubyPH. Social capital does not have to be a big act, but can instead be a small one, such as retweeting a tweet with very valuable information. While an impact assessment found government agencies to be most impactful in the hashtag community, an analysis of credibility found that NGOs and news media are also able to contribute to social capital. They are able to contribute due to the fact that all of these parties are very credible, and by utilizing #RubyPH in a tweet, and being a part of the already formed community, they are lending their credibility to the hashtag. This can have the effect of encouraging others to use the hashtag and to participate.

While this Major Research Project has found evidence of social capital within the #RubyPH community, and has also found that various parties can contribute to the social capital,

this Major Research Project only focuses on one scenario. Meaning that while the findings may be accurate for #RubyPH, they may not be accurate for a different disaster. The disaster at focus was a typhoon, which is predictable and allows individuals time to prepare and form online communities prior to and during the disaster. However, other disasters such as earthquakes and floods may not provide individuals opportunity to form online communities, and could result in less online social capital. It would be beneficial for future studies to conduct a similar study as presented here, but on a wide range of disasters to find out if hashtag communities are formed and whether or not they contain social capital.

Furthermore, this Major Research Paper only looks at tweets in English. However, it would also be beneficial for future studies to analyse tweets in various languages. Many non-government organizations and news media agencies are international and predominantly use English; however, focusing on the local languages used in the areas affected by a disaster could lead to results that show a dominance of different actors and characteristics within hashtag communities. Future research examining various disasters, using larger samples, and looking at tweets in a wide variety of languages would be beneficial to furthering our understanding of social capital, and which actors contribute to social capital in online hashtag communities.

## Appendices:

### Appendix 1:

#### Data Found From Tracking Keywords During Typhoon Haiyan and Typhoon Ruby

Using social media analytics software, Sheldon Levine at Marketwired - a social communication company – found the following:

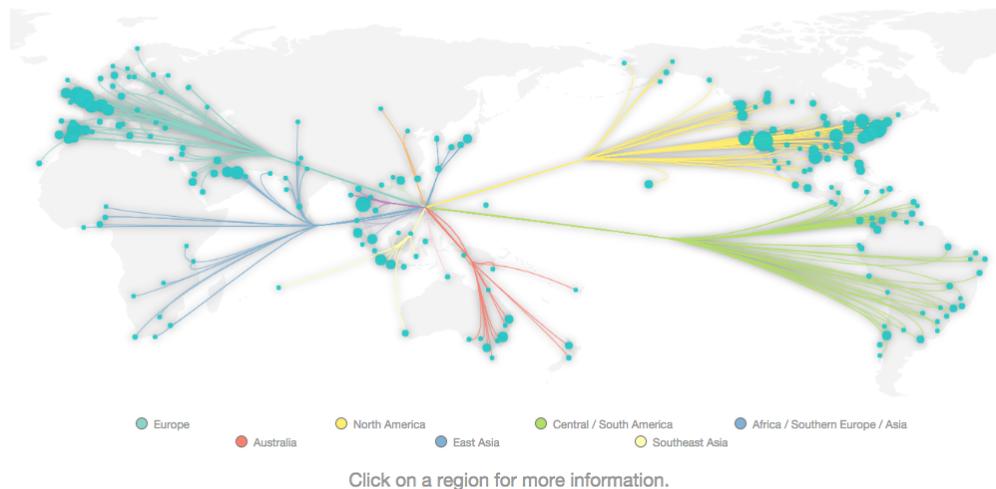
- Keywords of “Philippines,” “Haiyan” and “Yolanda” resulted in 5.6 million mentions
- Added the word “typhoon” resulted in 6.1 million mentions, contained 5 723 430 tweets.
- Most used hashtags surrounding the disaster were:
  - #haiyan
  - #philippines
  - #typhoonaid

(Levine, 2013)

The following interactive map of geo-tagged tweets, which contained the word “help” alongside various keywords related to Typhoon Haiyan, was created to demonstrate that tweets about the disaster were sent from all over the world (Belmonte, n.d.). This map demonstrates that individuals all over the world were aware of and tweeting about Typhoon Haiyan.

 Visualised: the world responds to Typhoon Haiyan on Twitter 

When Typhoon Haiyan struck the Philippines on November 7 it was the strongest tropical storm ever to hit land. Thousands of people have called for help and donations on Twitter. This interactive map shows every geotagged Tweet mentioning the word 'help' (in 22 different languages) combined with key terms around the disaster. Click on a region to see how the message spread on Twitter.



As a result of tracking Twitter activity during Typhoon Hagupit using specific keywords via Tweet Archivist (tweetarchivist.com), the following was found:

- 2.5 billion impressions were generated
- Tweets were written in more than 30 different languages.

## Appendix 2:

### List of @mentions containing #RubyPH in the sample of 2000 tweets

<u>User</u>	<u>@Mention</u>
9newsph	.@makatitrafic on number coding: As per MAPSA office, no advisory re lifting of number coding today, Dec. 8 #RubyPH <a href="http://t.co/BLtrrJNALx">http://t.co/BLtrrJNALx</a>
allealexander	@GMANewsOnline Gov. Miraflores: #walangpasok in all levels in the Province of Aklan. #RubyPH
ayawogpada	@iamflorabelle amen! but let's continue to pray as #RubyPH is still in our area of responsibility. I hope she does leave asap
BarbsDy	@YouScoop Despite the rains Pasiguenos flock to Sta. Lucia Parish in Manggahan for Immaculate Conception mass #RubyPH <a href="http://t.co/i9YGkFbTWj">http://t.co/i9YGkFbTWj</a>
bicolstandard	@AllNews_PH #RubyPH leaves 1 dead in Bicol <a href="http://t.co/8COOxOYgL5">http://t.co/8COOxOYgL5</a>
callejagrace	@rapplerdotcom: 2-meter deep waters reached the edge of the runway of the Catarman National Airport – report. <a href="http://t.co/TWu9FedCFf">http://t.co/TWu9FedCFf</a> #RubyPH
ChannelNewsAsia	.@govph revises storm signals for Metro Manila and several provinces. #Hagupit #RubyPH Live updates: <a href="http://t.co/Psmm7uIalo">http://t.co/Psmm7uIalo</a>
Convalescence2	@kfem Let fossil fuel companies pay for Philippines flood damage ... <a href="http://t.co/0KMVQyq7Xg">http://t.co/0KMVQyq7Xg</a> #RubyPH <a href="http://t.co/PNPqz6xkZg">http://t.co/PNPqz6xkZg</a> ...
Convalescence2	@GreenpeaceCA Let fossil fuel companies pay for Philippines flood damage ... <a href="http://t.co/0KMVQyq7Xg">http://t.co/0KMVQyq7Xg</a> #RubyPH <a href="http://t.co/PNPqz6xkZg">http://t.co/PNPqz6xkZg</a> ...
Convalescence2	@FossiloftheDay Let fossil fuel companies pay for Philippines flood damage ... <a href="http://t.co/0KMVQyq7Xg">http://t.co/0KMVQyq7Xg</a> #RubyPH <a href="http://t.co/PNPqz6xkZg">http://t.co/PNPqz6xkZg</a> ...
Convalescence2	@ecotricity Let fossil fuel companies pay for Philippines flood damage ... <a href="http://t.co/0KMVQyq7Xg">http://t.co/0KMVQyq7Xg</a> #RubyPH <a href="http://t.co/PNPqz6xkZg">http://t.co/PNPqz6xkZg</a> ...
Convalescence2	@350_DC Let fossil fuel companies pay for Philippines flood damage ... <a href="http://t.co/0KMVQyq7Xg">http://t.co/0KMVQyq7Xg</a> #RubyPH <a href="http://t.co/PNPqz6xkZg">http://t.co/PNPqz6xkZg</a> ...
earthspace101	@redcrossmakati @ABSCBNNews ISS Flyover of #Hagupit (#RubyPH): Approaching #Manila, #Philippines <a href="https://t.co/6EKmKdhDEr">https://t.co/6EKmKdhDEr</a>
eathealtyeatme	@rapplerdotcom #RubyPH any news on pnr ops later?
juntar	@cebugovph snds trcklod of rlief goods 2 #RubyPH afctd LGUs n northern Cebu wyl Gov. Davide visits the area. #9newsph <a href="http://t.co/WVZ0z7NNNT">http://t.co/WVZ0z7NNNT</a>
louiserecina	@larardrgz @KIRiosity @chiekatmorales the powers of #RubyPh
more_of_alouh	@cutePDGmike good morning sir! waiting for your official announcement. #staysafeteamworx #rubyph
PinoyPeteGabe	@atamaraullo reports on Ruby's impact in Calbayog: <a href="http://t.co/PoGKwFroN2">http://t.co/PoGKwFroN2</a> via @YouTube #RubyPH, #FloodPH
ReignGwapito	@aizaishere @dakki_16 @anzairaroxas the typhoon #RubyPH is getting weaker. We are safe and dry here in metro manila.
tetaypatis	@PlanPhilippines Borongan staff made contact thru SatPhone--37 of them r together and all are okay. Ready to respond when possible #RubyPH

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<u>User</u>	<u>@Mention</u>
thatmarianne	@Official_DILG this #RubyPH waiting game is killing me.
vanmartija	@dost_pagasa any update po about #RubyPH... from lipa city batangas. Thanks

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### Appendix 3:

#### List of modified tweets containing #RubyPH in the sample of 2000 tweets

<u>User</u>	<u>Modified Tweet</u>
_FifthSolomon_	"@ABSCBNNews: Starting today, Metro Manila will experience light to moderate rains. #RubyPH" keepsafe turtles! ☺
850cartier	"@HeySuperCedie: God is Good All The Time. We always need to Pray. #PrayForThePhilippines #RubyPH" #PrayHard
Aline_Carr	MT @dswdserves 19 h, 5 army trucks loaded w food reached Borongan & are on way to Dolores & other towns in E.Samar #ReliefPH #RubyPH #hmrdr
AmaldaAda	"@ABSCBNNews: Flooding NOT in #Calbayog, Samar. #RubyPH #Hagupit <a href="http://t.co/0VToyqONz5">http://t.co/0VToyqONz5</a>   via @atomaraullo" WRONG photo :) check source
angelineecruz	"@ANCALERTS: Caloocan suspends classes from elementary to high school tom, Dec.8, 2014. #RubyPH #walangpasok" HAHA THX
biancaeriin	"@JackoWackoDLSU: Before we get ready to #RaveWithTheWAVES this 2.7.15, let's be ready for #RubyPH first! :) Stay safe mates!" t
brandoybride	"@ABSCBNNews: Typhoon #RubyPH #Hagupit will pass extremely close to Batangas today, <a href="http://t.co/P6LPhXzX7V">http://t.co/P6LPhXzX7V</a> "@iambry21
briansoriente	Be ready guys! Stay safe!! :) :) RT @ANCALERTS PAGASA: Metro Manila to feel effects of Typhoon Ruby around 8-10pm on Monday Dec. 8 #RubyPH
ccregencia	"@angelineecruz: "@ANCALERTS: Caloocan suspends classes from elementary to high school tom, Dec.8, 2014. #RubyPH #walangpasok" HAHA THX"
ChicserSoldiers	"@ricksterz4ever: Ang lakas ng ulan dito. Keep safe everyone and always pray :) #RubyPH" keep safe ricky!!
danessanesses	Final update "@govph: #walangpasok • CEBU CITY: Classes in ALL LEVELS are suspended tomorrow, December 8, 2014. #RubyPH   via @cebugovph"
dckatrina	"@dost_pagasa: Typhoon "#RubyPH" has weakened while traversing Sibuyan Sea <a href="http://t.co/4wjdY57Uc9">http://t.co/4wjdY57Uc9</a> " yaaaay
denzelurieta	"@ABSCBNNews: PAGASA says strongest effect of #RubyPH will be felt in Metro Manila between 8 - 10 p.m. tomorrow, Monday" :(
eloisa_cruzz	"@CarLlyses: Pray for protection, not for suspension. #RubyPH"nga naman!
g_annesguerra	And this relieved me "@gmanews: Tacloban City is coming back to life. Some business establishments now in operation.   #RubyPH
gelvin2233	"@ABSCBNNews: Starting today, Metro Manila will experience light to moderate rains. #RubyPH" STAY SAFE EVERYONE ☹
Gio_Tonik	#RubyPH "@AstroTerry: Amazing moonlit view from directly above Typhoon #Hagupit <a href="http://t.co/d8WOrgzXXz">http://t.co/d8WOrgzXXz</a> " - yet so destructive below
HimeKuristeyyn_	"@ANCALERTS: PAGASA: #RubyPH not the last storm of 2014. We are expecting one more." Whut whut whut

User	Modified Tweet
httpbandfan	“@ANCALERTS: Tacloban power outage could last until a week. #RubyPH (Photo via @zhandercayabyab) <a href="http://t.co/1AuZIKICtu">http://t.co/1AuZIKICtu</a> ” @stylesftgrunge tf
HumanityRoad	MT @MSF_france @MSF <a href="http://t.co/RV8X0eexBx">http://t.co/RV8X0eexBx</a> #HagupitMSF hospital Tacloban, patients are safe but operating theater is damaged #hmrdr #RubyPH
iamanjdeleon	So kami waterproof?! RT <a href="http://t.co/Q2z9aJSEli">http://t.co/Q2z9aJSEli</a> #walangpasok #RubyPH <a href="http://t.co/yYNEeDHYdJ">http://t.co/yYNEeDHYdJ</a>   via @DepEd_PH”
j2united	“@ABSCBNNews PAGASA latest projected track of Typhoon #RubyPH as of 5am December 8. <a href="http://t.co/nOR7AfYIO6">http://t.co/nOR7AfYIO6</a> ” JOSHANELT Enthralls NKNKK
JackoWackoDLSU	"@ABSCBNNews: Starting today, Metro Manila will experience light to moderate rains. #RubyPH" STAY SAFE ☺
JazzTheJourno	"@ANCALERTS: VIDEO: Northern Cebu feels #RubyPH's ferocity <a href="http://t.co/u3loVHHDFx">http://t.co/u3loVHHDFx</a> " HURRICANE RUBY @RubyLuvsSweets
jewelvoidajaime	"@DepEd_PH: LAS PINAS   #walangpasok Classes in ALL LEVELS are suspended tomorrow, Dec. 8, 2014 (Mayor Aguilar) #RubyPH"@JaimeeeOfficial
JhaysOnMyFeet_	"@FEU_Tamaraws: No classes in all FEU schools tomorrow, December 8th #RubyPH"wowowowowow
jomartos_	"@News5AKSYON: #WalangPasok   MANILA: Classes in ALL LEVELS are suspended tomorrow, 09 December 2014 #RubyPH" ITO NA TALAGA! HAHA KEEP SAFE
kco3world	Ngee. Still? RT @sunstaronline: “@dost_pagasa 5pm bulletin: Northern Cebu, including #CebuCity, still under Signal Number 2. #RubyPH”
kparcasio	“@Allytrize: Keep safe everyone! #RubyPH” keep safe
loredo_Aj	"@ABSCBNNews: Typhoon #RubyPH to pass close to Metro Manila tonight <a href="http://t.co/VMyeCSi1ts">http://t.co/VMyeCSi1ts</a> " ***
Margarethloslo1	"@OliverLaance: #RubyPH Keep safe everyone. " Magingat ka din Love
nonopogi	Fuck you all who doubted @dost_pagasa RT @ANCALERTS: Lagmay: PAGASA was spot on in Ruby forecast <a href="http://t.co/6TSqF2NxYb">http://t.co/6TSqF2NxYb</a> #RubyPH
opena23	"@ANCALERTS: PAGASA: #RubyPH is expected to exit PAR on Thursday." FUCK!!!!
rixsaint	Leave now, Ruby. RT @ABSCBNNews PAGASA: Typhoon 'Ruby' is expected to exit PAR Tuesday night. #RubyPH #Hagupit
shielarizza	"@ABSCBNNews: PAGASA: Rains expected in Metro Manila Sunday night or Monday morning; may raise to Storm Signal #2. #RubyPH #Hagupit"#Prayers
supersharissa	“@feunrmfOFFICIAL: Classes will resume tomorrow, Wednesday, December 10, 2014. Be safe, NRMF. #NRMFBack2School #RubyPH” mag-aral na tayo
Valeriatwitting	MT @Greenpeace Massive evacuations underway as typhoon hits the Philippines <a href="http://t.co/rxa0UBmn0L">http://t.co/rxa0UBmn0L</a> #RubyPH #COP20 <a href="http://t.co/Ifu8ndNbDu">http://t.co/Ifu8ndNbDu</a>
Venicedizon	“@michsdewas: #RubyPH 'dont call my name, dont call my name, Alejandro” HAHAHAHA!

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<u>User</u>	<u>Modified Tweet</u>
TrendiePH	"Trending Philippines:04:13 PM PHT"1. #YungCrushMoNa2. #RubyPH3. #KBDTQAlbumLaunchOnASAP4. #KathNielASAPGlow
TrendiePH	"Trending Philippines:03:15 PM PHT"1. #ThingsToDoPagMalamig2. #RubyPH3. #BestNewArtist4. #24YearsOfMinho
TrendiePH	"Trending Philippines:02:29 AM PHT"1. #RubyPH2. #ThingsToDoPagMalamig3. #BestNewArtist4. #24YearsOfMinho
TrendiePH	"Trending Philippines:01:17 PM PHT"1. #RubyPH2. #ThingsToDoPagMalamig3. #24YearsOfMinho4. #BestNewArtist5. #GlobalArtistHMA
TrendieWW	"Trending World Wide:05:48 AM GMT"1. #SonriedeCorazon2. #LUV4thWin3. Art Briles4. #UFC1815. #RubyPH6. #YaMeCanse2

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Appendix 4:  
 Example of tweets containing each purpose

<u>Purpose of Tweet</u>	<u>User</u>	<u>Example</u>
To inform	ABSCBNNews	#RubyPH has been downgraded to tropical depression. It has maximum winds of 60 kph, moving at 13 kph
To provide support	MazieBalbuena	So much destruction in Samar. Definitely not the news you want to wake up to. Continue praying guys don't lose hope. #RubyPH
To promote action	TomTwitch91	#RubyPH #FloodPH If you, or someone you know that's in need of rescue, PLEASE use the #RescuePH hashtag!
To ask for aid/ information	alblloren	Does anyone know when and what time #RubyPH will hit Manila? Or is it already here? Huhuhu
Other	bloody_rainbow2	white hulk #UFC181#ICantBreathe#EricGarner#RubyPH#WeLoveYourNewH airJustinStreet Fighter VGrammyUberYakuza 5 <a href="http://t.co/pSPaeo5fVW">http://t.co/pSPaeo5fVW</a>

Appendix 5:  
Activity Metrics by Account Type

<u>Type of Account</u>	<u>Unique Accounts</u>	<u>Total tweets sent</u>	<u>Original tweets</u>	<u>Mentions</u>	<u>RTs</u>	<u>MTs</u>
1. NGO	72	84	21	0	62	1
2. News Media	112	158	84	5	68	1
3. For profit	23	26	11	0	15	0
4. Gov/Public	27	42	18	0	24	0
5. Individual	1284	1354	268	16	1042	28
6. Bots	8	30	23	0	2	5
7. DNE	244	262	54	1	199	8
8. Other	23	28	6	0	22	0
Suspended Accounts	11	16	8	0	8	0
Total	1804	2000	493	22	1442	43

Note: 106 protected accounts

Appendix 6:  
 Visibility Metrics by Account Type

<u>What kind of account:</u>	<u>Number of Unique Accounts Mentioned (A)</u>	<u>Retweets &amp; mentions received (B)</u>	<u>Average Retweets &amp; Mentions per Unique Account (B/A)</u>
1. NGO	118	258	2.18
2. News media	141	882	6.25
3. For profit	23	49	2.13
4. Government	44	408	9.27
5. Individual	190	319	1.67
6. Bots	4	8	2
7. DNE	39	65	1.66
8. Other/Suspended	24	42	1.75

Appendix 7:  
Credibility Assessment of NGOs

<u>Username</u>	<u>Verified</u>	<u>Joined</u>	<u>Tweets</u>	<u>Following</u>	<u>Followers</u>	<u>Description</u>	<u>URL</u>
PlanPhilippines	N	3	5618	573	1368	Detailed	Yes
annerichardsDRC	N	3	11700	111	824	Detailed	Yes
SaveChildrenPH	N	3	3125	1805	3059	Detailed	Yes
unicefphils	N	6	2932	101	31400	Detailed	Yes
carecanada	N	6	8553	4652	10000	Detailed	Yes
HumanityRoad	Y	5	38100	3314	7534	Detailed	Yes
unicefusa	Y	8	17400	4265	191000	Detailed	Yes
feunrmfOFFICIAL	N	3	142	16	2967	Not Detailed	Yes
Solidarites_Int	N	4	4974	1116	4535	Detailed	Yes
UNDP	Y	6	35200	4756	722000	Detailed	Yes
CebuInfocen	N	4	7943	673	4948	Not Detailed	Yes
CWS_global	N	7	18800	6796	8726	Detailed	Yes
IOM_Philippines	N	3	753	201	893	Detailed	Yes
justcallmelloyd	N	5	62700	492	2394	Detailed	Yes
mercycorps	Y	7	6387	782	40200	Detailed	Yes
NGCP_ALERT	N	5	7575	30	8066	Not Detailed	Yes

Appendix 8:  
Credibility Assessment of News Media

<u>Username</u>	<u>Verified</u>	<u>Joined</u>	<u>Tweets</u>	<u>Following</u>	<u>Followers</u>	<u>Description</u>	<u>URL</u>
ABSCBNNews	N	7	295000	1278	2700000	Detailed	Yes
PIANewsDesk	N	3	33800	260	20900	Detailed	Yes
AllNews_PH	N	No date	774000	152	2234	Detailed	No
rapplerdotcom	Y	4	248000	335	913000	Detailed	Yes
News5AKSYON	N	5	216000	2135	190000	Detailed	No
PanahonTV	N	3	34500	414	6113	Detailed	Yes
TomTwitch91	N	4	6538	508	283	Detailed	Yes
DZMMTeleRadyo	N	6	120000	94	686000	Detailed	Yes
InqLearning	N	3	13800	432	7363	Detailed	Yes
PTVph	N	7	105000	1015	76200	Detailed	Yes
TomSaterCNN	N	No date	921	141	1082	Detailed	No
PIAalerts	N	5	101000	257	11300	Detailed	Yes
PIA_NCR	N	5	14600	478	3562	Not Detailed	Yes
dzbb	N	3	160000	560	51900	Detailed	Yes
InqNational	N	2	25600	330	7840	Detailed	Yes
gmanews	Y	6	33200	713	3040000	Not Detailed	Yes
inquirerdotnet	Y	7	344000	1118	1050000	Detailed	Yes
9newsph	N	4	122000	652	40700	Detailed	Yes
sunstaronline	N	6	88100	641	89100	Detailed	Yes
ChannelNewsAsia	Y	6	174000	180	380000	Detailed	Yes
momblogger	N	8	170000	1686	18200	Detailed	Yes
Team_Inquirer	N	3	47900	357	25200	Detailed	Yes
TheFreemanNews	N	4.00	22200	990	9571	Detailed	Yes
ubeltmanila	N	2.00	273	1979	8605	Not Detailed	Yes
westpacwx	N	5.00	13000	9	908	Detailed	Yes
MovePH	N	4.00	24500	637	18400	Detailed	Yes
TheLaSallian	N	4.00	14000	47	32700	Detailed	Yes
UNDPFH	N	5.00	2757	896	4678	Detailed	Yes
PhilippineStar	N	3.00	202000	1465	234000	Detailed	Yes

<u>Username</u>	<u>Verified</u>	<u>Joined</u>	<u>Tweets</u>	<u>Following</u>	<u>Followers</u>	<u>Description</u>	<u>URL</u>
mlq3	Y	8.00	54300	1481	176000	Detailed	Yes
dolandcastro	N	5.00	7902	1074	24100	Detailed	No
JosephCataan	N	6.00	17400	694	945	Detailed	Yes
PIACentralViz	N	4.00	12000	354	5432	Detailed	Yes
piaranada	N	5.00	3161	928	1385	Detailed	Yes
The700ClubAsia	N	6.00	13700	175	12900	Detailed	Yes
thejudsonjones	N	7.00	990	350	1000	Detailed	Yes
UnangHirit	N	5.00	48500	738	123000	Detailed	Yes

Appendix 9:  
Credibility Assessment of Government Agencies

<u>Username</u>	<u>Verified</u>	<u>Joined</u>	<u>Tweets</u>	<u>Following</u>	<u>Followers</u>	<u>Description</u>	<u>URL</u>
dost_pagasa	Y	5	52600	14	2430000	Detailed	Yes
dswdserves	N	3	14100	510	40800	Not Detailed	Yes
cebugovph	N	2	8276	302	71700	Not Detailed	Yes
officialdohgov	N	No Date	2230	115	5227	Not Detailed	Yes
OneMapua	N	5	106000	884	15900	Not Detailed	Yes
PhilCoastGUard1	N	2	1500	803	11400	None	Yes
valenzuelacity	N	6	20400	445	31700	Detailed	Yes
govph	Y	5	54400	385	635000	Detailed	Yes
PNPHotline	N	No Date	16700	846	47800	Detailed	Yes

Appendix 10:  
Credibility Assessment of Individual Accounts

<u>Username</u>	<u>Verified</u>	<u>Joined</u>	<u>Tweets</u>	<u>Following</u>	<u>Followers</u>	<u>Description</u>	<u>URL</u>
WagTamad	N	No date	67	0	4585	None	No
philippinebeat	N	6.00	53600	1949	6522	Detailed	Yes
markleviste	N	6.00	12000	783	7464	None	Yes
YnnahBonina	N	3.00	19000	453	40000	Detailed	Yes
AaMangalili	N	No date	17300	154	481	Not Detailed	No
angelineecruz	N	3.00	33700	230	374	Not Detailed	No
iloveruffag	N	6.00	39000	262	2420000	Detailed	Yes
memeyreyes	N	5.00	48800	921	1744	Detailed	Yes
PinoyPeteGabe	N	6.00	11	104	16	Not Detailed	No
PogiSiRucha	N	4.00	5003	631	349	Not Detailed	Yes
Selshii	N	4.00	31300	344	574	Not Detailed	No

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