

NETWORKS TO THE RESCUE:
TWEETING RELIEF AND AID DURING TYPHOON ONDOY

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Xenia Yasmin Zia Gutierrez Morales, B.A.

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Xenia Yasmin Zia Gutierrez Morales, B.A.

Thesis Advisor: Mirjana Dedaic, Ph.D.

ABSTRACT

In September 2009, the forces of social networking sites were harnessed to create a civil society network in aid of disaster relief operations in the Philippines. This occurred spontaneously, individually and then collectively in the midst of tropical storm Ondoy, forming a networked group of individuals bonded by shared goals and identities. Using data from Twitter in general and the RockEdRadio Twitter Network in particular, this thesis traces the emergence of relief and rescue networks during the Ondoy Typhoon and subsequent flooding. Diffusion Theory and Theories of Networked Interaction are employed in the analysis of the architecture and operability of the relevant disaster-relief oriented SNS networks. Furthermore, this thesis also analyses the content of selected Tweets and delves into the unique features of the Philippine context to explain how these online social networks of rescue and relief diffused so spontaneously, rapidly and seamlessly amidst challenging circumstances. The thesis concludes with recommendations regarding the use of SNS technologies in other national disaster scenarios.

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Introduction

In September 2009, the forces of social networking sites were harnessed to create a civil society network in aid of disaster relief operations in the Philippines. This effort occurred spontaneously, individually and then collectively in the midst of tropical storm Ondoy, forming a networked group of far-flung individuals bonded by shared citizenship and nationality. Storm status updates, on-the-ground video posts, requests for rescue on behalf of stranded individuals and calls for donations were all disseminated on social networking platforms such as Facebook and Twitter during the height of the storm and in its aftermath. Indeed, the vacuum created by inadequate government resources and services was filled by Filipino SNS-users located both in Manila and overseas. As phone connections foundered and power was cut off, many Filipinos managed to remain connected with each other through the internet in general and social networking platforms in particular. Many of them utilized and customized existing SNS platform technologies and related applications such as GoogleDocs, video and photo sharing, and Paypal, to provide information as well as relief to fellow citizens who were victimized by the calamity.

How and why did this happen? What is it about SNS that effectively, organically and spontaneously channeled the spirit of Filipino Twitter users towards concrete ends? And how did these networks proliferate so rapidly? In order to answer those questions, this thesis examines the architectural and functional features of SNS technology that enabled the network to function effectively and adapt to the unique needs of crises. Diffusion theory and theories of networked interaction are utilized in the analysis of SNS technology in general and Twitter in particular. The thesis also examines the unique aspects of Filipino culture that allowed Ondoy

networks to proliferate. I conclude with preliminary recommendations on how to facilitate disaster rescue and relief across different contexts.

Social Networking Sites: A Primer

Social networking sites (SNS), which first emerged in 1997 with the under-subscribed and now defunct SixDegrees.com, have evolved and become an indispensable part of many people's lives. They were initially engineered to support the maintenance and extension of pre-existing networks of friends, acquaintances, family and classmates and to a lesser extent, connect like-minded strangers based on shared interests and occupations. Online profiles, multi-media-sharing protocols, messaging functions and other information sharing capabilities enabled social network users to engage in one another's personal lives, consolidate existing social bonds and forge new ones.

In recent years, sites like MySpace, Facebook and Twitter have bonded millions of people from around the world into networks that are both discrete and interconnected. The popularity of these networks cannot be underestimated. According to a recent company release (Facebook.com, December 16, 2009), Facebook has a total of 350 million active users, 50% of whom log into the site on a daily basis.¹ Myspace has 125 million active users who log on at least once a month. (Arrington, 2009) Twitter currently has 18 million active users while LinkedIn counts 53 million members in over 200 countries around the world.

The prevalence of social networks, and their increasing relevance in millions of people's lives, has inspired organizations and entrepreneurs to use them for non-social functions.

¹ Millions of active Facebook users perform a variety of tasks upon logging in. Over 35 million users update their status each day. 55 million status updates are posted each day, 2.5 billion photos are uploaded to the site each month and 3.5 billion pieces of content (which includes web links, news stories, blog posts, notes and photo albums, among other things) are shared on the site each week.

LinkedIn, for example, allows members to network with cohorts in related industries and seek professional opportunities. Social-lending site Prosper.com matches fledging business enterprises and people in need of personal loans with prospective donor-investors. Social networking tools have also been harnessed towards more altruistic ends. Kiva.org works to alleviate poverty by connecting potential donors in the developed world with developing-world residents who need loans for entrepreneurial pursuits or personal expenses such as housing improvements. Indeed, networking technologies are flexible, versatile and customizable (Garcia, 2002: 4). In recent years, social networking sites have been used by major news outlets to broadcast news updates, by musical groups to sell their music and by individuals to raise funds for charities of their choice. Truly, the way social networking sites function within society is constantly evolving, depending on the needs and inclinations of its users.

Disaster Strikes: An Ondoy Typhoon Primer

On Saturday, September 26 at 10:00 a.m., Typhoon Ondoy/ Ketsana made landfall in the Philippines, bringing 455 mm of monsoon rain in 9 hours, the heaviest recorded rainfall in the country in over 4 decades. President Gloria Macapagal Arroyo declared that the country was in a State of Calamity by late afternoon. Before nightfall, heavy rains and clogged waterways caused flash floods that submerged 80% of Metro Manila. Throughout Saturday and Sunday, the National Disaster Coordinating Council (NDCC), which is the Philippine government department that handles calamity situations, issued reports of suspended water services, power outages, suspended transport routes, landslides and stranded individuals in need of rescue from around the country. While flood waters began subsiding on Sunday afternoon in most parts of the city, low-lying areas that were bounded by rivers, such as Marikina and Pasig, remained flooded into Monday.

When the waters receded, the full extent of the damage wrought by Ondoy was revealed as being worth a staggering P10.450 billion, with P3.684 billion in damages sustained in infrastructure and another P6.766 billion sustained in the agricultural sector (NDCC Report, October 13 2009). A total of 101,278 houses were damaged in the storm. The NDCC Report also claimed that 880,175 families and 432,0699 persons were affected in 155 municipalities in 32 cities around the country. 443 of the evacuation centers that were set up by the government served as a refuge for 216,941 people. No clear statistics detail the impact of the storm on non-urban residents, but it may be surmised from the level of agricultural damage that they didn't escape unscathed. Casualties of Typhoon Ondoy totaled 682, with 337 reported as dead, 308 injured and 37 registered as missing.

Less than a week later, the country was decimated by another natural disaster. Typhoon Pepeng/Parma hit the Philippines on October 2, 2009, causing more damage to the Northern parts of the Philippines, raising the death toll to 715 and property damage to P4.6 billion.

At the height of the storm and in its ensuing aftermath, the NDCC struggled to keep pace with the demand for relief. Despite coordinating with local, national, police and military agencies, efforts were disorganized and often failed to reach those in need. The lack of resources, funds and equipment greatly impeded the NDCC's rescue and relief efforts. Throughout the crisis, the NDCC had at its disposal 12 ambulances, 33 M35 trucks, 59 rubber boats and 112 assorted vehicles. The U.S. embassy provided the NDCC with personnel, 2 watercraft, 1 chopper and 8 island cruisers while the Philippine National Police provided 49 fire trucks to distribute water to stranded citizens, as well as 3 dump trucks to assist in the post-flooding clearing operations. The Department of Health (DOH) also sent teams of medical

workers out into affected areas with medicine and medical supplies totaling P19,742,610.37 to help contain diseases like Cholera, Leptospirosis, Hepatitis A and Dengue Fever. Meanwhile, the Department of Social Welfare and Development (DSWD) oversaw the provision of food, clothing, water, hygiene products and other relief goods to affected individuals.

Clearly, the available equipment and resources were inadequate to cope with the disaster, which affected hundreds of thousands of people. In their October 30 report, the NDCC claimed that a total of 7,908 persons were saved through their combined efforts—a figure that is considerably less than the 216,941 Filipinos who were driven from their homes and forced into evacuation centers.

Both local and international NGOs supplemented the efforts of the government relief effort. Red Cross Rapid Assessment Teams, IFRC Disaster Response Teams and Spanish Red Cross representatives participated in rescue and clearing operations. These organizations, as well as other NGOs like CARE and Christian Aid also donated material goods for distribution to victims of the disaster. In total, the NDCC reported that government and NGOs provided P94,224,687.51 worth of relief to affected citizens.

The private sector also made vital contributions in the aftermath of the disaster, both in terms of material relief goods and equipment to help facilitate rescue and relief efforts. Telecommunications companies such as Globe Telecom and Smart Telecom lent equipment and installed technology² to enhance mobile phone operations inside the NDCC headquarters. Geodata Systems Technologies INC provided rescuers with access to its situation mapping

technologies while Boston Home Corporation loaned roving teams of relief workers several sets of water purifying equipment. Food manufacturers like San Miguel Corporation and Robinsons Corporation also donated processed food and canned goods for distribution at evacuation centers. Finally, countries such as the United States, Japan and Malaysia and China made donations in both cash and kind towards relief and evacuation efforts.

Because of the combined scale of their resources, the agglomeration of the government, NGO and private sector drove the Typhoon Ondoy operations. However, another force also emerged to make a sustained and considerable contribution to rescue and relief efforts. Civil society, comprising hundreds of thousands of Filipinos living in both the Philippines and overseas³, organically and spontaneously forged a network that spanned several continents. Using Twitter, Facebook and associated multi-media technologies and platforms such as Paypal, Youtube, Flickr, Wordpress and Blogspot, Filipinos flooded cyberspace with calls for rescue, requests for donations, announcements about volunteer initiatives and benefit events, and informational updates about the situation on the ground.

³ According to the Philippine Overseas Employment Administration (POEA), 10% of the Philippines' 92 million citizens lives and works in over 140 countries.

Literature Review

Increasing globalization has transferred knowledge and action from the exclusive domain of experts into a more democratized arena that involves every individual citizen equipped with the right ideas, motivation and access to resources (Fernando et al, 2006: 294). In particular, technology has spearheaded the democratization of knowledge and action. From the Iranian Twitter Revolution to organizations such as KIVA, Web 2.0 and the internet have given agency to a greater number of people, in a greater number of places.

Social networking tools have emerged as a powerful societal force in recent years, with the proliferation and popularity of platforms such as Facebook and Friendster. Aside from strengthening social relationships, the power of social networking has been harnessed towards more pragmatic ends such as establishing professional ties and facilitating microfinance exchanges. While the case of Typhoon Ondoy proves that social networking tools can spontaneously bring together ordinary individuals to serve both informational and logistical purposes in disaster situations, the utility of social networking tools in disaster scenarios has yet to be fully explored in scholarly literature. Most of the existing literature relates to either disaster relief, web 2.0 tools or networks and groups. Occasionally, a connection is drawn among the three disparate topics.

Disaster Relief

Emergent Technologies and Disaster Management

Technology has long played a role in disaster management. In the past, amateur radios were used to mobilize and facilitate communication among volunteers in places where other telecommunications infrastructure had failed. In a similar vein, Télécoms Sans Frontières assembled Emergency Communication Centre kits to facilitate communication for aid agency

relief workers. Each of these kits contained a broadband global area network terminal (BGAN), satellite phones, a satellite dish, cellular phones, microwave relays, Wi-Fi routers and access points, GPS devices, laptops and power sources (Conti 2008: 72). These kits have filled in the void left by failed terrestrial communications infrastructure—in flood scenarios, for example, where GSM networks are spared but landlines are incapacitated, and in earthquakes, where, depending on the severity of the quake, most communication infrastructures are rendered useless (Conti 2008: 74). In recent years, the internet, specifically collaborative and social applications, have been used in the aftermath of storms, floods, terrorist bombings and other disasters to mobilize volunteers and disseminate information (Shankar, 2008: 117).

Web 2.0 tools have been used in disaster operations in the past, typically by established non-governmental organizations and charitable institutions. Web 2.0 technology has given these institutions the opportunity to evolve past previous communication restraints and expand their target audience by engaging in one-to-many communication and many-to-many communication (Triplett et al, 2009: 3). A recent case study briefly evaluated the American Red Cross' utilization of web 2.0 technology (Triplett et al, 2009: 1-6). Aside from acting as an official, top-down channel that broadcast information about job opportunities, fundraising activities and relevant news via blogging, RSS feeds, Youtube and Facebook, the American Red Cross website also enabled many-to-many communication via Flickr and Youtube applications that facilitated communication between Red Cross Staff and Volunteers with personal stories to share about Californian wildfires and Iowan floods. However, there was a demonstrated need for an effective many-to-one communication structure that would allow the American Red Cross to cull information at the grassroots level, via timely and accurate information from individuals directly affected by the disaster.

Because of weaknesses in institutionalized instruments of disaster relief, average citizens are necessary in any emergency management scenario. Well-designed networked information technologies provide effective means of engaging ordinary citizens, irrespective of their location, social status, professional affiliation or existing skill sets (Shankar, 2008: 1). The importance of grassroots-driven communication was demonstrated during the Ondoy disaster, which saw ordinary individuals using web 2.0 tools to provide updated, on-the-ground information and make direct appeals for aid. On a smaller scale, Twitter updates and Facebook groups also enabled over 5,000 residents of Fargo to protect their businesses and homes from the Red River's rising waters in March 2009 (Ward, K. 2009: 1). During Hurricane Katrina, the Asian Tsunami and the bombings in Mumbai, ordinary citizens used blogs and listservs to recruit volunteers, reunite evacuees with families and disseminate information on recovery services (Singh & Shahid, 2006). In disaster mitigation and recovery, the coordination of resources is instrumental. And in makeshift, post-disaster scenarios, robust and dynamic networks of both technologies and humans are crucial (Shankar, 2008: 116) and arguably made more effective by web 2.0 technology.

Web 2.0 technologies are also an effective means of reaching mass audiences for fundraising purposes. It is cheaper and quicker than traditional modes of fundraising such as telethons and direct-mail flyers (Metz, 2005: 83) and thus more suited to the purposes of disaster relief-oriented fundraising which requires immediate funds.

Groups and Networks

Much of the literature focuses on networks, and the role they play in mitigating the effects of disaster and facilitating disaster relief operations. A wide variety of networked groups have been described as both emergent and instrumental in disasters. They range from social networks, coordinated networks of professional relief workers, cooperatives of NGOs multi-agency

agglomerations of formal institutional bodies and combinations of the above. Some scholars have defined disaster-formed networks according to their unique characteristics, resulting in newly-defined entities such as Hastily Formed Networks and Emergent Response Groups.

Past disasters have shown that when institutional relief and aid falls short, collectives composed of concerned individuals consolidate and fill in the void. They can be family-driven networks, which, in disaster, act ‘like an octopus extending its tentacles outward to connect with other social units’ (Morrow, 1997: 143). They can also be networks of professionals, friends, acquaintances or community members. Some of these collectives may have existed in another incarnation prior to the disaster, as was the case with the women’s network that emerged as a potent force during Hurricane Katrina. Existing women’s daily care networks, which coordinated child care coverage, money lending, job information, helped facilitate evacuation and provide shelter for those affected by the flooding. These networks’ members were relatively easy to locate and draw on for aid because they were already embedded in the women’s daily lives. They also adapted rapidly to the exigencies of evacuation because they were grounded in years of mutual exchange and trust (Litt, 2008). Networks were also widened to include individuals who were previously connected to existing network members, without necessarily being entrenched members in the women’s daily care networks—such as brothers, cousins, acquaintances.

NGOs have also been known to combine forces and resources in order to deliver relief and aid. In the wake of the Tsunami, a group of 12 NGOs dubbed as the East Coast Development Forum (ECDF) coalesced to service the afflicted areas of Tamilnadu, Pondicherry, Andhra Pradesh and Kerala. They integrated their efforts to provide immediate relief, restore livelihood and advocate for better public services. While the group may have arisen

spontaneously, it soon organized itself under a systematic yet democratic code. Aside from employing procedures and forms that were common to NGOs and particular to the relief phase, the ECDF also established a decentralized hierarchy that rotated leadership among members. Each ECDF member also made use of the trust, confidence and credibility it had generated as a solo operator in the past⁴ on behalf of the collective, to access affected communities and determine how to proceed (Kilby, 2007: 124). While NGOs have been known to combine efforts when required to by donors or an existing demand, most of the time they compete for resources and to assert their particular values and world views. This behavior typically hampers cooperation. The ECDF was unique because it emerged organically in response to a particular event (Kilby, 2007: 125). Its emergence may have been perpetuated by the trust and cooperation it had built through years of collaborating on joint advocacy initiatives in the region. Thus, it can be argued that social relationships matter in networks, whether they are socially-oriented or more professional in their focus.

While the article ‘Hastily Formed Networks’ does not specifically focus on social networks, it does explore issues surrounding the emergence of networks in disaster situations. Dennings argues that due to the circumstances that spawned them, disaster-formed networks are, by their very nature, Hastily Formed Networks or HFN. He outlines six conditions that necessitate their emergence: genuine surprise or the lack of advance knowledge, planning or preparation; chaos; insufficient resources that are overwhelmed by the realities of the disaster event; the necessity of cooperation across several agencies and a response effort that combines the forces of the military, government, private organizations and civil society; distributed response or the diffusion of decision-making powers and the authority to allocate resources

⁴ Some members of the ECDF had worked in the area for over 20 years and had thus established themselves as credible partners in development.

across many jurisdictions, and a lack of or a failure in infrastructural resources such as electricity and water that necessitates the deployment of makeshift infrastructures (Dennings 2006: 16). According to Dennings, HFNs are comprised of a network of people from different communities that coalesces fairly rapidly, and works together in a shared conversation space wherein they plan, commit to and execute actions in fulfillment of a large, urgent mission. The conversation space, which he defines as a context and medium of communication among a set of players who are governed by a set of interaction rules, (Dennings 2006: 17) is the heart of the network because it allows network members to communicate, respond, plan and coordinate. These conversation spaces are defined by a decentralized and horizontal chain-of-command, their specific physical and technological systems and mechanisms, and their participants and the roles and core competencies they contribute to the interactions. Dennings argues that conversation spaces should be designed to prevent information glut so that participants receive only the information they need in order to respond effectively to the crisis. He suggests bandwidth restrictions as one way to achieve this.

Emergent response groups (Majchrzak et al, 2007) are similar to HFNs in that they arise from breakdowns in formal systems and planned responses. Indeed, post-disaster rescue, survival and rehabilitation has typically relied on informal networks of neighbors and community members in the immediate wake of a disaster (Fernando et al, 2006: 294). Essentially, emergent response groups are collectives of individuals that use non-routine resources and activities to apply to non-routine domains and tasks, using non-routine organizational arrangements (Majchrzak et al, 2007: 150). Operating outside of institutionalized authority structures and emergency relief plans, they can include relief organization workers, private sector organizations equipped with relevant resources, and private citizens with the information, relationships (such

as those related to the respective networks they belong to) and stamina to give aid (Majchrzak et al, 2007: 150). In the Sri Lankan Tsunami relief efforts, civilian members of the Sri Lankan diaspora, as well as tourists who had previously gone to Sri Lanka on holiday, spearheaded the relief efforts by collecting relief items and cash from their respective networks (Fernando et al, 2006: 294).

While bureaucracy-driven relief is characterized by ritualistic rigidity, emergent response groups foster flexibility and innovation. During Hurricane Katrina, innovation fostered the emergence of a KatrinaHelp Wiki, a resource put together by hundreds of people across several continents that listed shelters, government resources, safety and health information, and a people-finder service that helped coordinate rescue, recovery and relief efforts⁵ (Majchrzak et al: 148).

Furthermore, unlike disaster response groups such as firefighter teams and police task forces, emergent response groups are spontaneously-generated entities with no pre-existing structures such as group memberships, tasks, roles or expertise and are bound together by a sense of urgency, high levels of interdependence and operational environments that are in constant flux (Majchrzak et al, 2007: 147). Time-constraints hinder the exercise of consensus-driven decision-making, and the multiplicity of participants engenders a diffused and lateral, rather than hierarchical, decision process. The volatility that characterizes these groups extends into its membership, which is fleeting and diverse in terms of its motivations, perspectives and resources. Because a shared sense of identity may not exist, individual members can pursue

⁵ The KatrinaHelp Wiki was hosted by Amsterdam student Rudi Citibrasi. People added information such as people finder services, health and safety information, fundraising events and the website was soon receiving 100 million hits a day. Participation in the site was largely inconstant, as most people who posted information on the site joined and left the group as their personal needs dictated. See: from <http://katrinahelp.info/wikiarchives.katrina>.

multiple individual purposes simultaneously. Furthermore, the diverse membership also has access to a vast array of resources: during Hurricane Katrina, for example, social networks were tapped to locate electronic service providers that could operate under resource-scarce conditions. Despite the amorphous nature of the membership, and the fact that many of the members are unfamiliar with each other, ‘swift trust’ governs emergent response group interactions. Relationships are built on the positive expectation of the trustworthiness of other group members, and a common fate that is dependent on immediate, rather than pre-validated, action and consequently, a willingness to trust in others’ knowledge without social proof (Majchrzak et al, 2007: 155).

Social Networks and Relationships

Social networks are driven by relationships that contain an element of positive, reciprocal feeling. A link may be drawn between this aspect of social networking and disaster relief based on Nakagawa and Shaw’s argument stressing the importance of trust and social capital in disaster relief operations (Nakagawa et al, 2004). Indeed, emotional bonds constitute an expressive function of the network (Morrow, 1997). It must be noted that they divide disaster management into two parts: mitigation, which involves risk analysis, prevention and preparedness; and response, which consists of search and rescue, humanitarian assistance, rehabilitation and reconstruction. The latter category is more important in the context of this paper. According to them, the role of social capital in disaster relief has been largely ignored, as disaster operations have primarily been understood as a practical exercise of logistical work, engineering and technical solutions (Nakagawa et al, 2004: 5). They advocate a multi-disciplinary approach to disaster relief that combines technical and social solutions, especially since institutions such as government and military can be rendered incapacitated in the wake of a disaster. Invariably, these social solutions are collective, and thus require individual members of civil society to be

bonded together in relationships of trust and mutual concern. Thus, social capital is crucial to mobilizing network members during disaster relief efforts (Nakagawa et al, 2004: 5).

Social networking is a crucial part of Philippine society, both in routine living and crisis situations. Solid social relationships both within the family and in kinship, linguistic, territorial, professional, school, community, acquaintance and other assorted groups drive much of Filipino social and even professional and economic interaction. Two traditional dimensions of Philippine culture, namely *pakikipagkapwa* or communality and *bayanihan* or mutualization of labor are reflective of this fact (Gaillard et al, 2008: 391). Some scholars have described both of these cultural norms as mechanisms for coping with the specificities of Philippine life and society in general, and disaster situations in particular (Bankoff, 2004: 104). Indeed, this sense of shared community, which is often expressed operationally in terms of formal and informal community organizations, guarantees support for its members in times of both personal and common hardship.

Pakikipagkapwa means being one with the other or with others and being part of a group, but as a cultural concept, it denotes something deeper than just unity or togetherness. Indeed, as Bankoff asserts, it refers to a common bond forged through a shared, collective identity and conveys a sanction against breaking ranks with the community.

Bayanihan, meanwhile, refers to the cooperative way of life that shapes day-to-day interactions throughout the Philippines. It connotes “toiling on one another’s behalf and assuming each other’s burdens” (Bankoff, 2004: 104). Historically, this referred to the *barrio* (Filipino village) practice of village members working together to move *kubos* (huts made of nipa) from one lot to another. However, *bayanihan* can also refer to non-labour pursuits such as

shared meals, communal leisure activities and collective mourning. As a testament to the nation-wide prevalence of this cultural practice and belief, various Philippine dialects are replete with notions that relate to togetherness in labor, leisure activities and sorrow (Orata, 1968: 110). Indeed, as former Philippine Senator and writer Camilo Osias asserts, “the Filipinos, more or less unconsciously, for the most part, have been guided by the *Tayo* (we, us) or pluralized idea. It is ingrained in their being” (Osias, 1941).

In the context of a disaster, *Pakikipagkapwa* provides support in times of crisis and allows victims to call on neighbors, friends and relatives for monetary loans or food supplies. *Bayanihan*, on the other hand, helps mobilize labor in actions such as the rescue and evacuation of afflicted citizens and the distribution of relief goods. Both of these concepts reinforce a shared identity and a common fate that affects the way disaster relief is conducted in the Philippines. Indeed, during the 1990 earthquake, it was observed the Philippine military cadets and miners continued their rescue efforts long after their foreign counterparts had given up hope. Households and neighborhoods that were located near the affected areas also spontaneously organized transport pools, shelters and communal kitchens to aid earthquake victims (Bankoff, 2004: 105).

Methodology and Theoretical Framework

At the height and in the immediate aftermath of Typhoon Ondoy, Filipino ‘netizens’ spontaneously banded together over social networking sites and used the technology to actively participate in rescue and relief efforts. The incursion of social networking technologies into the offline worlds of Filipinos is nothing new. Social networking sites such as Facebook, Twitter and Friendster are fixtures in Philippine social life, with online communication very often spilling into or at least supplementing real-life interaction. However, the use of social networking technologies to organize collective relief and rescue action in the midst of disaster is unprecedented in the Philippines. In past disasters, such as the 1990 Luzon earthquake and the 1991 eruption of Mount Pinatubo, civil society did participate in grassroots aid efforts by opening up impromptu shelters and communal kitchens to serve victims. However, due to the lack of technology, infrastructure and means of networked communications, their efforts were relatively small in scale. During Ondoy, SNS technologies gave ordinary Filipinos a wider reach, and thus gave their attempts at disseminating information, soliciting aid, and disbursing rescue and relief a greater breadth. Indeed, by adding another dimension to the relief efforts, platforms such as Twitter, Facebook and YouTube gave increased numbers of Filipinos greater agency, irrespective of their location, access to institutionalized power structures and even financial capabilities. Thus, while SNS and their attendant technologies may not be nascent phenomena in Philippine life, the way they were applied in the context of disaster can certainly be classified as an innovation.

Analyzing Ondoy Networks: A Networked Approach

This study explores how this happened, and offers recommendations about the general applicability of SNS and SNS technologies in disaster operations across cultures, contexts and situations. While the activity occurred across a variety of SNS applications, my analysis centers

on Twitter and the feeds and links (which were occasionally linked to other SNS applications such as YouTube, BlogSpot and GoogleDocs) that it generated during the course of the typhoon and its immediate aftermath, from September 26-October 3. For efficacy, I have also limited my study to a network of individuals that was connected by Twitter User (Tweeter) RockEdRadio, a collective led by movement founder and radio show host Gang Badoy, which stayed on the air for 14 to 16 hours a day during a period of 4 days to dispense medical advice and vital information, send out distress calls and coordinate volunteer efforts. RockEdRadio has been identified by many as an instrumental force in the Ondoy relief and rescue efforts, and their activities during the disaster have been lauded in both the institutionalized media and the blogosphere.⁶ I evaluate the composition of RockEdRadio's network, as well as the Tweets that were exchanged within the said network in my study.

For a more incisive analysis of the role SNS played in Ondoy, I draw on theories of networked interaction to explore how connections between disparate individuals were forged and ultimately directed towards expanded outreach. Since the technology was instrumental to the diffusion of relief and rescue, I also provide an evaluation of the architectural aspects of SNS technology that enabled it to occur. Furthermore, I conduct a brief diffusion study and a discourse analysis of SNS activity both at the height of, and in the aftermath of the storm, in order to trace the evolution of the rescue and relief efforts.

Theories of Networked Interaction

Networks, which are an agglomeration of links between nodes, are characterized by structural as well as inter-nodal features that facilitate interaction and the dissemination of information.

⁶ RockEdRadio as represented by Gang Badoy was named one of the 'heroes who helped fight Ondoy' by spot.ph (<http://www.spot.ph/2009/10/01/10-fearless-fighters-the-heroic-helping-hands-that-fought-typhoon-ondoy/2/>) as well as the blog TechPinas.

Social networks are different from other networks due to the fact that they are markedly ‘small world’—compressed and bound together in physical space and time by links of varying degrees of strength (Buchanan, 2000: 24). This facilitates rapid and easy communication throughout the network, irrespective of its actual physical size.

Networks are composed of weak and strongly-linked nodes which are shaped by the realities of the socially-oriented context (social networks) in which they are embedded. Because of the existing ties, trust and credibility are fostered and shape the way interactions unfold. Furthermore, as in offline society, authority structures and the individuals that embody them also influence relations. These social realities and outcomes determine the way networks proliferate and the rate at which communication spreads. I analyze the Ondoy networks both structurally and operationally in light of these theoretical underpinnings.

Diffusion Theory

Diffusion studies determine the methods by which diffusion can be hastened (Rogers, 1962: 3) using diffusion theory, which is a multi-faceted framework that systematizes the analysis of how innovations are spread over time and through spaces that are both virtual and actual. Diffusion theory has four main elements: the innovation, communication, the social system within which it proliferates and a time frame within which its progress can be measured (Rogers, 1962: 12). It is important to note that the four elements of a diffusion study closely echo the four factors of its aforementioned counterpart theory: the tracing of an innovation (1), over time (2), through specific channels of communication (3) and within a social structure (4) (Rogers, 1962: 12). Very simply, a diffusion study traces an innovation over time, through specific channels of communication within a social structure (Rogers, 1962: 12). A diffusion study occurs within the framework of diffusion theory, which I explain in further detail below.

Everett Rogers defines innovation as an idea that is perceived as new by individuals (Rogers, 1962: 13). The objective or actual newness of the idea in terms of the lapse between its discovery/invention and first use is not the foremost measure of its ‘innovativeness’; rather, human perception of the idea is. Indeed, the newness of an idea to an individual largely determines how she or he reacts to it. According to this definition, the use of SNS technologies towards the ends of rescue and relief during Ondoy can be termed as an innovation because it was driven by novel ideas about agency and application, and engendered an unprecedented reaction. To this end, the thesis provides a brief description of how the technology was used, and how use of the technology evolved throughout the crisis.

Communication, meanwhile, is the process by which an innovation is diffused across society, from inventor to adopter, and from adopter to adopters. Human interaction is the main facilitator of diffusion (Rogers, 1962: 13). Indeed, social relationships can create either favorable or unfavorable conditions for the spread of an innovation. The centrality of social interaction to Philippine life, which is explored further in this thesis, certainly was a factor that influenced the speed and breadth of the diffusion of SNS use during Ondoy.

Because all diffusion occurs within and is shaped by context, it is important to analyse the existing social system as well as the factors that comprise it. Rogers defines a social system as a population of individuals who are functionally differentiated and engaged in collective problem-solving behavior (Rogers, 1962: 14). Adoption decisions occur on a continuum ranging from individual choice to group decision—there are the innovation adoptions that occur on the level of the individual regardless of the decisions of other members of his social system (1); innovations that are collectively adopted by a social system’s majority, leading to increased adoption by other individuals (2); group decision-driven adoptions that force acceptance on other

members of a social system, including those that are unwilling (3). Adoption is typically influenced by a number of factors, including the norms or frequently occurring patterns of behavior that prevail in a particular social system (Rogers, 1962: 16), as well as the types of individuals that comprise a social system. Social systems are populated by a wide variety of individuals, such as opinion leaders or individuals who others look to for information or advice and change agents or professionals who actively seek to influence other members of a community towards particular adoption ends. (Rogers, 1962: 17) In the case of Ondoy, individuals played a variety of roles to initiate the adoption of SNS technologies towards the ends of relief and rescue. Both the collective and individual characteristics of the community is analyzed in this thesis.

Finally, all innovation adoption decisions occur over several stages and within a specific period of time. Adoption is defined as the decision to continue full use of an innovation. According to Rogers, the process has five stages: awareness, interest, evaluation, trial and adoption. (Rogers, 1962: 17) Because of the unique circumstances of Ondoy, which necessitated immediate responses and fast adoptions of innovation, the adoption process was somewhat curtailed and didn't include all the requisite stages. A further analysis of this phenomenon is conducted later on in the thesis.

Apart from delving into the different facets of Philippine society that enabled the use of SNS technologies for rescue and relief efforts, I collected data related to SNS activity during the typhoon and evaluated it using the diffusion study framework. I also draw on discourse analysis to analyse and interpret the Twitter feeds in order to trace the progression of the rescue and relief activity during Ondoy. On the basis of my data analysis, I make conclusions on how to facilitate the use of SNS technologies in disaster relief scenarios.

Content Analysis

Tweets which have been selected as representative of the general Ondoy discourse were subjected to a content analysis. Specific attention was paid to the meaning of and behind each of the tweets, their intentionality, and how the content helped consolidate and facilitate rapid information diffusion within the Ondoy networks in general, and the RockEdRadio Ondoy network in particular. The content analysis focuses on words, concepts and metaphors: the meanings they create and the function they perform vis-à-vis the network when strung together.

Social Networking Sites and Ondoy: An Overview

As the waters rose and the extent of the calamity became apparent, Filipinos turned to Facebook, Twitter and other sites to share information about the situation on the ground. From the safety of their homes, residents posted alternate route options for commuters looking to avoid the floods, phone numbers to call for rescue, requests for food and other supplies, as well as the names of friends and relatives who were unreachable by phone, but known to reside in affected areas.

Depending on the state of their immediate surroundings and the point in disaster at which they were posting, status updates by Manila residents expressed worries about the rising floodwaters, shock and helplessness at the destruction that was being wrought in their homes and gratefulness at being spared the worst of the disaster. Meanwhile, Filipinos overseas conveyed their solidarity with and prayers for those affected by the disaster as well as their anxieties about being unable to reach loved ones back in the Philippines.

In the absence of mainstream news updates, many overseas Filipinos stayed glued to their Twitter and Facebook networks for timely and accurate news from the ground. Mainstream news outlets like BBC and CNN eventually followed suit, airing videos pulled off YouTube

during their news updates. As a testament to the high-levels of activity generated by Filipino SNS users, Ondoy-related content dominated Twitter so completely that at the height of the storm, 5 of the Top Ten Twitter Trending Topics related to the tropical storm.⁷

As the storm wore on, social networking sites became more than a forum for emotional expression and information sharing. Filipino ‘netizens’ imbued Facebook and Twitter with agency as they transformed these technologies into partners in the disaster relief efforts. This sense of agency enabled them to surpass the constraints that initially relegated their participation to passive expressions of anxiety and the sharing of second-hand information. By directing computer mediated communication towards concrete action, SNS users transformed themselves from content disseminators into active rescue and relief workers.

Individual updates gave way to organized, collective and collaborative action in the form of spreadsheets that people could access at will and update with information relevant to the flooding, and websites that allowed for online donation. A spreadsheet entitled RescueInfoHubCentral⁸ that was started by Edwin Soriano became an important resource that consolidated information about evacuation centers, emergency rescue numbers, news sources, donation drop off sites and stranded people in need of rescue and relief. Another group, led by Serge Gregorio, produced a GoogleMap entitled the Ondoy Situation Map for Metro Manila that situated distress calls from all over the metropolis in real time. This turned out to be an invaluable resource for relief workers and organizations that were engaged in field work. (Quezon, Manuel “Bayanihan” in The Philippine Daily Inquirer: September 28, 2009)

⁷ The Top 10 Twitter Trending Topics were: No Dams Will Be, Philippines, Typhoon Ondoy, Pasig Nature Park and NDCC.

⁸ <http://spreadsheets.google.com/ccc?key=tohu9kthNU6anlf21Low08g>

Meanwhile, a group of Filipino bloggers established Philippine Aid⁹ because when the typhoon hit the Philippines, there was no viable way for individuals to make online donations to relief efforts. Philippine Aid accepted nearly \$12,500 in donations via Paypal for the relief efforts before the Philippine Red Cross finally set up its own PayPal Account on September 30.

On-line calls were also made for off-line action, as individuals took to Twitter and Facebook to request donations and announce various community-based volunteer initiatives. Students from schools such as Ateneo de Manila University tweeted about the need for volunteers to help put together relief packets in the school gymnasium. Residential organizations, parish communities, professional associations and even small groups of friends collected and packed donations, assembled informal teams of psychologists to provide counseling to victims, set up soup kitchens and feeding centers and used personal speedboats and other equipment to conduct their own rescue missions. All of these initiatives were announced on Facebook and Twitter, in order to solicit supplies, engage prospective volunteers and inform typhoon victims that certain types of help were available.

Filipinos who were overseas or otherwise unable to physically participate in relief efforts organized benefit events and disseminated announcements about organizations that accepted donations. All of these were announced in status updates, or shared via links on Facebook walls. To bolster their pitch for donations, these announcements were sometimes accompanied by graphic photos and videos of the disaster, such as the widely-shared video by David Guerrero¹⁰ that ended starkly, with the word 'Help' emblazoned across a black screen. Ondoyphotos.com,

⁹ www.philippineaid.com

¹⁰ <http://www.youtube.com/watch?v=IO2TfqGi97k>

which was organized by various media professionals, served as a visual hub that enabled people to post as well as source photos of the disaster.

SNS also became a forum for vigilance and citizen activism. To ensure that the most devastated areas continued to receive attention, people visited them armed with cameras and questions. On September 30, Neva Talleden braved washed out roads and heavy traffic to visit Provident Village in Marikina City, which sustained some of the worst damage in the flooding. Her footage, which she later posted on YouTube and Facebook¹¹, revealed an unsecured residential area in complete darkness that was overrun with thieves and teeming with tension because residents had yet to receive any relief goods from the government.

How and why did an SNS-powered civil society network emerge to become such a potent informational and organizational force in the Ondoy disaster relief operations? Arguably, the architecture of the technology, the dominance of a particular segment of the Philippine population, as well as certain prevalent cultural characteristics enabled this phenomenon to diffuse rapidly and make a tangible impact during the Ondoy typhoon. Twitter, which is the subject of this thesis, is representative of the array of SNS applications that were utilized during Ondoy in terms of its functionality, accessibility, and utility in disaster.

The RockEdRadio Network

This thesis centers on the network that emerged around Twitter User RockEdRadio. While this user is listed as following 1,902 users and being followed by 2,510 users, the Ondoy network that is the focus of this study is limited to RockEdRadio and the 60 unique users that it interacted with (in the form of direct tweets and retweets) during the course of the typhoon and its

¹¹ <http://www.youtube.com/user/klinetalladen#play/all/uploads-all/1/UQi2Lehox8c>

immediate aftermath. As the following diagram shows, RockEdRadio and its immediate network of 60 unique users had access to a potential immediate audience of 104,180 followers:

Table 1

@ANCAAlerts (newsorganization) 15,801 followers

@gmanewstv (newsorganization) 7,218 followers

@donronX (news anchor) 512 followers

@alysalibao 103 followers

@ HowieSeverino (tv journalist) 6,236 followers

@JasonQua (blogger) 224 followers

@arncyn 518 followers

@leslieumaly 132 followers

@jaymsterbean 133 followers

@funktifiedheart 100 followers

@ka_edong (blogger) 381 followers

@KatoLoy 72 followers

@badingangbato 324 followers

@rjled (magazine publisher, media personality) 710 followers

@erwinromulo (magazine editor) 532 followers

@tagacreekside 30 followers

@quarklovesyou (film director) 5589 followers

@bamaquino (media personality) 2945 followers

@jiggycruz (grandson of Corazon Aquino) 21, 365
followers

@saabmagalona (actress) 28,466 followers

@arieroque 25 followers

@sheycollado 150 followers

@cyril_y 312 followers

@aprelle88 56 followers

@mlq3 (journalist and media personality) 5,425 followers

@tyroncaliente 81 followers

@candsmontenegro 115 followers

@arel1 97 followers

ROCKEDRADIO

@carlocasas 543 followers

@shealcordo (Dubai expat) 89 followers

@PH_Alerts 348 followers

@tom_arveen12 47 followers

@rockedpsa 58 followers

@gangbadoy (radio personality) 3,086 followers

@trafficmanila 1719 followrs

@aprillou 195 followers

@iloverobotboy 209 followers

@Criela173 followers

@hellokring 61 followers

@ageofbrillig (blogger) 659 followers

@kriziasupernova 46 followers
@BerlinWay 185 followers
@gwenespaldon 22 followers
@bombthecongress 75 followers
@chesuka_noelle 15 followers
@kimmarvilla 1,380 followers
@kresjoy 6 followers
@topyang 1 follower
@ianjaderemolona 16 followers
@jowana 398 followers
@MaRoxas (Senator and V.P. Candidate) 29,960 followers
@noynoyaquino (Presidential Candidate) 34038 followers
@riapavia 170 followers
@margretcalderon 75 followers
@pepediokno (filmmaker) 775 followers
@janis_ian 173 followers
@jhun_bacala 22 followers
@raincontreras (blogger) 377 followers
@antonette05 9 followers
@zach_lucero (musician) 500 followers

During the typhoon and its immediate aftermath, from September 26 to October 6, RockEdRadio sent a total of 221 tweets, 100 of which were ‘tweeted’ at specific users in its

network. Other members in its network sent hundreds more tweets, which I analyse at random in the succeeding section. Specifically, I explore how the rapid diffusion of relief and aid efforts via SNS networks was enabled by uniquely Filipino cultural concepts and behaviors, the composition of the Filipino online population, and the architecture of the technology using networked theory, diffusion theory and a discourse analysis of representative Tweets.

It's A Small World After All: Bayanihan Binds A SNS-Networked Philippines

Unlike the individualistic societies of the West, Philippine society is typically Asian in its communal orientation. Firm bonds are forged within families, and between friends, acquaintances and colleagues. Indeed, in the absence of strong institutions, individuals rely on social networks for emotional release, financial assistance, and other forms of support. And these social networks, despite their breadth, “possess a special and hitherto unsuspected organization and structure that truly make for a small world” (Buchanan, 2000: 24). Small worlds foster a sense of intimacy, trust and inter-reliance. Furthermore, information spreads more rapidly in a small world (Buchanan, 2000: 33).

This small-world social orientation has spilled over into the virtual world, shaping how Filipinos use the internet. According to a March 2009 study by advertising agency Universal McCann, out of 20 million active internet users from the Philippines, 19.7 claim to belong to a social networking site (Universal McCann Wave 4, 2009). On a related note, a similar study jointly conducted by Yahoo and Nielsen throughout 22 cities in the Philippines (Yahoo Nielsen Net Index Study, March 26 2009) indicated that 51% of Filipino internet users utilize social networking sites on a monthly basis and that photo uploading was the top content-sharing

activity. Indeed, the majority of Filipino internet users have integrated social networking into their normal routines.

In the midst of extraordinary circumstances, and in the absence of functioning phone connections and other modes of communication, Filipino internet users turned to the internet to reach out to friends, acquaintances, colleagues and fellow Filipinos. Ordinary social interaction was elevated to the level of *'bayanihan'* (cooperative way of life and mutualization of labour) and *'pakikipagkapwa'* (being one with others)—both of which are cultural concepts that are central to long-standing notions of Filipino-ness. These cultural concepts work on two levels—reinforcing a communal, national identity of people who engage in *'bayanihan'* and *'pakikipagkapwa'*, and consequently, driving behavior towards these very concrete ends. Indeed, netizens from disparate locations and social networks banded together under a shared national and cultural identity to participate in volunteer efforts, donate relief goods and express sympathy, empathy and one-ness, fully conscious that they were bounded by these two cultural forces and a common heritage and identity of 'Filipino-ness'.

The social orientation of Filipino society, which compelled Filipinos to connect with each other despite the isolating conditions of the flood, and was conveyed in cultural and nationalistic computer-mediated expressions of *'bayanihan'*, *'pakikipagkapwa'*, and *'Filipino-ness'*, enabled the Ondoy network to proliferate spontaneously and rapidly. Indeed, if Filipinos had not instinctively reached out to one another, no network would have emerged. The multiplicity of interactions that occurred on social networking sites as a result of the Filipino need to be social rapidly coalesced into a loosely-organized but coherent network of Ondoy-related expression and action.

Tweeting ‘Bayanihan’ and ‘Pakikipagkapwa’

The consciousness of a shared national identity shaped by *bayanihan* and *pakikipagkapwa* was reflected in Tweets that were generated within RockEdRadio’s Ondoy network. Tweets that explicitly referred to the cultural tradition of ‘bayanihan’ echoed throughout the network, in a clear attempt to inspire Filipino netizens and call them to action:

KaEdong: Sumisilip na ang araw. Rise and shine, Pilipinas! BAYANIhan tayo! (The sun is coming out. Rise and shine, Philippines! Let’s [engage] in Bayanihan) Sun Sep 27 00:10:34 +0000 2009

Kumusta Pilipinas!? Time to pick up the pieces. BAYANIhan tayo! (How are you, Philippines!? Time to pick up the pieces. Let’s [engage] in Bayanihan) Sat Sep 26 23:08:21 +0000 2009

JiggyCruz: Continue giving hope to the hopeless. Keep the Bayanihan Spirit alive!!!
6:42 AM Sep 29th, 2009_via web

HelloKring: (RT) Let's pray for all the victims... and let's pray for all the insensitive people... Let's show our Bayanihan spirit!!! 8:03 AM Sep 27th, 2009

In all of the above tweets, the spirit of ‘Bayanihan’ is transformed from an intangible force into a more action-oriented compulsion with instructions to ‘rise’ and ‘pick up the pieces’. Far from being a static entity, Bayanihan during Ondoy was an active agent that was ‘alive’ and meant to be shown through concrete action. Clearly, the shared consciousness reinforced by this shared cultural concept was harnessed by netizens as a call to concrete action, and a partner towards tangible ends of volunteerism and the donation of needed goods.

Some Tweets also alluded to the spirit of cooperation and oneness of *pakikipagkapwa* (communality) by emphasizing notions of ‘togetherness’ and the power of communal efforts to overcome the most dire circumstances:

KaEdong I see Filipinos transformed by realizing that TOGETHER we can move mountains! RT @dantenicogarcia trying to look beyond Ondoy... #fb Mon Sep 28 20:00:21 +0000 2009

Pinoys CAN pull together if we want to. RT @piaguanio: thankful that times like these filipinos can count on each other. Sun Sep 27 03:45:21 +0000 2009

Aside from inspiring citizens by appealing to a shared positive national identity on an intellectual and empathetic level, these tweets also aimed to endow its recipients with agency. Indeed, the tweets conjure active, rather than passive or static images, urging ‘transformation’ towards a collective attempt to achieve the impossible and ‘move mountains’ (a powerful image, especially in seemingly dire and overwhelming circumstances) and encouraging people to ‘pull together’.

Tweeting Towards an Imagined Community

Meanwhile, other tweets served to imagine the community of Filipino nationhood. Benedict Anderson speaks of an imagined national community where despite the fact that members never know, meet or even hear of their fellow members, they harbor, in the back of their minds, an image of community and communion (Anderson, 2006: 6). Crucial to this imagining is the forgetting of the actual inequality and exploitation that exists. Indeed, imagined national communities are built on the illusion of a deep, horizontal comradeship where all goals, rights and privileges are shared and everyone is equally of, from and privileged by the nation (Anderson, 2006: 7).

This notion of the imagined national community was certainly evident in many of the tweets, which stressed a shared ‘Filipino-ness’ that in turn worked to establish a unique, bordered community within the Twitterverse. Indeed, many tweets reinforced the shared identity of being ‘Pinoy’, a commonly used colloquialism for Filipino that has been increasingly appropriated by

nationalistic younger Filipinos. Some tweets emphasized the good qualities of Filipinos that emerged during the disaster, which served the dual purpose of inspiring pride in national heritage amidst disheartening circumstances, and encouraging recipients to participate and exhibit the goodness of Filipino-ness that was also inherent in them:

BamAquino: So many volunteers here, some since 10 am this morning. Tuloy tuloy pa rin! Nakakabilib mga pinoy! (The [volunteers] are continuing their work. *Pinoys* are impressive!) 4:55 AM Sep 27th, 2009_via [TweetDeck](#)

The notion of ‘Pinoy-ness’ was also expanded beyond the country’s immediate borders to include Filipinos overseas, effectively widening the pool from which to draw aid and establishing Filipino national identity as something cultural, intangible and endowed with an overarching power, rather than constrained by borders:

GwenEspaldon: ATTN. PINOYS ABROAD ! TO HELP : <http://bit.ly/vVn4w> 7:10 PM Sep 28th, 2009_via web

These tweets reflect the shared feelings and sense of cultural and national identity that bound Filipino internet users in the midst of the disaster, irrespective of their physical location. On one level, the Tweets drew on shared cultural concepts to reinforce a shared, imagined community that was united, and therefore strong, in the face of disaster. More than an empathetic appeal to emotion, however, the Tweets were also calls to specific action—action that, as following sections demonstrate, progressed along a continuum of increasing tangibility and organization as individuals moved from disseminating information to answering calls for rescue, donating funds and goods, and participating in volunteer initiatives. In this way, the discourse conducted on Twitter was not mere discourse but an active partner in relief and rescue efforts.

Twitter: A Networked Technology

How and why did a Twitter-powered civil society network emerge to become such a potent informational and organizational force in the disaster relief operations? Clearly, the architecture of the technology was crucial to how it was utilized. Specific features of Twitter, such as its customizability, interoperability and infrastructure allowed it to be used to such great effect during the Ondoy disaster. Because Twitter is a social networking application, its networked orientation is central to its architecture. Thus, Twitter's conduciveness to the formation of networks is discussed in this section as an architectural feature. Similarly, the architectural features of Twitter technology, such as its interoperability and flexibility as a content host, is largely discussed in the context of its networks.

Cut off from each other because of either power outages or faulty phone connections, Filipinos logged into Twitter using text, wifi and mobile web in order to reach out to their social networks. These networks grew in functionality and reach, and increasingly integrated into a single coherent network with the common aim of rescue and relief, as the devastation worsened.

Tweeting Ondoy: From Distress to Action

At first, RockEdRadio network members employed the Ondoy Network as an outlet for emotional distress and personal experience as early Tweets on September 26 demonstrate:

Badingangbato: @didipusrex when i lived on K7 our street would get flooded all the time. the car parked in front of my apartment floated 3 houses down. Sat Sep 26 05:22:44 +0000 2009

JiggyCruz: prayed to Lola (Grandma)... Asked her if she could ask God to make the rain stop... 9:00 PM Sep 26th, 2009_via mobile web

SheyCollado: @tiffanymw The floods in Metro Manila are intense. Heavy rain, love. A lot of people dying, stuck on top of their roof, stranded :(3:57 AM Sep 26th, 2009_via TweetDeck in reply to tiffanymw

@eyleynish Ate, nakakaiyak na talaga. (Sister, it really makes me want to cry) Two of my friends called me crying. And Sam and Papa are not yet home! :(1:45 AM Sep 26th, 2009 from TweetDeck in reply to eyleynish

Jaymsterbean: @arncyn Thanks! Do you have news about your in laws? I feel so helpless :(Sat Sep 26 11:17:17 +0000 2009

Clearly, these early tweets were self-centered rather than network-oriented in that they weren't directed towards ends that were outside of the Twitter user's immediate and personal concerns. The tweets that were generated within the RockEdRadio Ondoy Network in the early hours of the flooding recounted personal experiences of the flood, as typified by Badingangbado who described the situation on his street in a manner that was more personal narrative than informational and SheyCollado's personalized characterization of the flood as 'intense'. Other tweets, such as JiggyCruz' tweet about his personal prayer and SheyCollado's worried message about her missing relatives and urge to cry, expressed personal anxieties. None of these tweets engaged the network in a proactive way or encouraged concrete action. They took the form of personal expression and remained firmly on that level. For the most part, as demonstrated in Jaymsterbean's tweet, they expressed helplessness and a lack of agency in the face of overwhelming disaster.

As the storm wore on, tweets lost the tenor of helpless anxiety and personal narrative and took on a more objectively informational tone. Some of the information was intended for general audiences. Meanwhile some of the informational tweets were in response to specific queries, situations and problems. Differences in intent notwithstanding, this phase in the tweeting progression is characterized by increasing networked interaction and agency. As the following tweets demonstrate, the initial helplessness and anxiety gave way to targeted

attempts at action and impact. Passivity was gradually shed as a network of engaged and active agents who are committed to making a difference in the face of disaster emerges.

In the later hours of September 26 and beyond, self-centered expressions on RockEdRadio's Ondoy Network were replaced by more informational content. Those who had access to resources came to the aid of their networked associates with information, suggestions, and solutions to specific problems. In response to a call for help by a stranded friend, twitter user DonRonX suggests hotels in his immediate vicinity:

DonRonX: @tjmanotoc why don't you get a room at century or rembrandt for the night?
Sat Sep 26 23:11:16 +0000 2009

In a similar vein, another member of the RockEdRadio network urges a Twitter associate to make a specific call for aid so that he can get the help he needs, and provides him with information about a forum where he can do just that:

KaEdong: @JohnCray bro,announce ur specific help needed. Get online volunteers to help. Lets consolidate at <http://tinyurl.com/RescueHub> Sun Sep 27 10:59:40 +0000 2009

In addition to replying to specific queries, Twitter users also used the technology to solicit help and information. In the following tweet, KaEdong asks about the state of public transportation, opening up the question to his vast network, as well the vast networks cultivated by members of his network, thereby improving his chances of getting an accurate reply:

KaEdong: Is mrt (metro rail transit) running? Sat Sep 26 03:11:11 +0000 2009

A Multiplicity of Interactions and Audiences

The above exchanges were possible because Twitter is endowed with the capacity for one-to-one interaction in a public forum. Meanwhile, one-to-many interaction allowed for the following informational tweets, which were intended for a larger, even infinite audience rather than a single respondent.

Katoloy: International donations through Paypal please read:
<http://tinyurl.com/ondoytxtpower> Sun Sep 27 01:01:11 +0000 2009

Leslieumaly: chest-deep flood level: Kamias Road Sat Sep 26 11:34:30 +0000 2009

HowieSeverino: National Disaster Coordinating Council (NDCC) Emergency Numbers: 912-5668, 911-1406, 912-2665, 911-5061. Help hotlines: 734-2118, 734-2120. Sat Sep 26 08:23:11 +0000 2009

Cyril_Y: RT @ateneodemanilau: #Ondoy: Repost: 751-3330 -DTI HOTLINE FOR COMPLAINTS OF OVERPRICING OF BASIC GOODS & MEDICINES. 12:09 AM Sep 29th, 2009 via TweetDeck

The above tweets provide potentially useful to a general audience, rather than a specific respondent. The nature of Twitter provides each user with a potentially infinite audience—tweets can be retweeted by a recipient or a random web surfer and Twitter member, and retweeted again, ad-infinitum. Thus, information was disseminated rapidly and the network proliferated in an equally efficient manner.

Tweeting Ondoy: Content is King

As shown by the selected examples, information varied in content, which was enabled by the fact that Twitter placed no constraints on the substance of the disseminated Tweets. Some of the information detailed the situation on-the-ground for local commuters, while other tweets contained contact information for those caught in an emergency situation or individuals who wished to lodge a complaint with the authorities. As Katoloy's tweet about international

donations confirms, the real or perceived audience for such informational content was located around the globe. Indeed, in the second phase of the evolution of RockEdRadio's Ondoy Network, Twitter was utilized as a mechanism of information dissemination on both a local and global scale, as well as on an individual and general level. This was enabled by Twitter's flexibility as a content host: content wasn't censored or limited in terms of its substance.

As the waters subsided and the extent of the damage and need for relief and aid became apparent, calls to action began occurring with greater incidence within RockEdRadio's Ondoy Network. These calls fell into several categories and were delivered in an array of tones. There were requests for assistance on behalf of specific individuals as well as general appeals for material donations and equipment, and participation in volunteer efforts. While all calls to action shared a sense of urgency, the requests for human participation were typically delivered in a more inspirational tone than the material requests.

CaraloCasas: @juliusbabao help!!!.. pls check the address 34E delapaz st. felix subd. cainta rizal if they are safe...thank's... 7:09 PM Sep 28th, 2009_via web in reply to juliusbabao

Jamsterbean: RT @gangbadoy: Appeal: lend 4x4 trucks for rescue. Pls send truck to GrnhillsShoppngCntr Unimart Grocery to await deployment. 09209072902 Sat Sep 26 12:41:42 +0000 2009

Cyril_Y: Just got to the GK HQ, we need canned goods, rice, and water... We're deploying to 10000 families and the deficit is huge. Pls RT! 5:46 AM Sep 28th, 2009_via Gravity

We need tarps that can serve as make shift roofs,blankets,towels,pillows, clothes and food.Pls drop stuff to GK's Relief HQ at the RFM Gym 9:30 PM Sep 29th, 2009_via TweetDeck

The above tweets conveyed a sense of urgency with exclamation marks, direct calls for ‘help!’, as well as the use of verbs such as ‘rescue’ and ‘need’. Equally urgent were the targeted requests for help on behalf of individuals or problem areas that neglected to give specificities in terms of what sort of aid was needed:

Jiggy Cruz: PLEASE HELP! Still missing! Chris Magnaye with wife & 2 sons. 200 Pacific Drive, Brookside Subdivision, Cainta, Rizal. 8:22 AM Sep 28th, 2009_via web

Jaymsterbean: RT @skipskada: Policemen needed in Provident, Marikina. there are robbers all over the place trying to break inside the houses. HELP 3:36 AM Sep 28th, 2009_via [TweetDeck](#)

In the first tweet, the immediate need for assistance is conveyed but the type of assistance required is left to the discretion of the responder. The second tweet is similarly unspecific, requesting policemen but not detailing the exact service they would provide. Conceivably, these types of tweets would be more difficult to respond to.

Meanwhile, the tweets that encouraged volunteerism combined the urgency with an appeal to empathy and national pride, as well as an inspirational tone. Unlike the requests for material goods and specific assistance, the appeals in this category were significantly less explicit.

JiggyCruz: RT @iamsuperbianca: ATENEO, LSGH, and MEGAtent are all operating!! grabe, talagang (wow, it's really true that) "where i'm from, everyone's a hero"!!!! 8:13 PM Oct 2nd, 2009_via web

Jamysterbean: RT @saabmagalona: RT @yanyuzon: PLS RT: Kakayanin nating LAHAT, kakayanin natin ANG LAHAT. Mabuhay ang Pilipinas. (We will all ENDURE, we will endure ALL. Long live the Philippines.) [Thu Oct 01 18:15:31 +0000 2009](#)

Cyril_Y: RT @TheBabyIsABully: Operation Walang Iwanan (Operation No One Left Behind) has already dispatched 78,389 food packs since Monday. PEOPLE POWER OVER TRAGEDY! Walang Iwanan (No one will be left behind!) 1:01 AM Oct 1st, 2009 via [TweetDeck](#)

While none of these tweets made direct appeals for volunteerism, all of them subtly encouraged recipients to participate in the communal rescue and aid efforts by invoking the imagined community of the Philippine nation and reinforcing a collective identity. JiggyCruz asserts the notion of the Philippines as a ‘country of heroes’, subtly encouraging his audience to tap its inherent heroism as Filipinos and contribute to the ongoing volunteer initiatives. By linking the survival of the Philippines to the collective efforts, energies and endurance of its citizens, Jaymsterbean engages her audience to take on a more active role in the relief and rescue efforts. Cyril_Y, meanwhile, paints the assembly of nearly 80,000 food packs as a national triumph over tragedy and invites his audience to join in—no potential volunteers, as well as victims, will be left behind by Filipino People Power, which in itself is a powerful metaphor as *the* force that deposed the dictator Ferdinand Marcos and restored Philippine democracy.

Tweeting Ondoy: Networked Interaction of Relief and Rescue

When users decided to use the technology as an active partner in the relief efforts, they ultimately empowered themselves, forging a wide-reaching, active and proactive network bound by the shared goal of service. This civil-society network reached outliers that had been cut off from the mainstream by the calamity, and bridged the interstitial gaps that the institutional forces of government, NGO and other formal organizations could not fill.

Tweeting Ondoy: Reaching Out

A network, especially a dynamic and functional one, arises when the technological architecture engenders an environment for it that is both conducive and sustaining. Certainly, unique features of SNS architecture enabled the Twitter-driven Ondoy Network to emerge and thrive. Firstly, the fact that Twitter was endowed with an extended network reach allowed it to bridge both local and international gaps. Filipinos in Los Angeles, Dubai, Manila, Stockholm and Nairobi could

communicate with each other seamlessly and coalesce as a single unified community, irrespective of their transmission media or internet provider (Garcia, 2002: 44).

Distances were bridged via weak links that connected a network of virtual strangers and online acquaintances with each other and forged tenuous links between distant social worlds—these formed bridges that, despite being definitively ‘weak’, were crucial in sewing the social network together. (Buchanan, 2000: 43) Since each user was embedded in a small-world social network that was bound together by weak, strong and stronger links, every weak-link relationship could be strengthened by the fact that it probably had strong links with other network members in common. Each user was endowed with a certain amount of social capital resulting in an undeniable sense of community. Trust was fostered. Thus RockEdRadio’s Ondoy Network(which included Dubai-based user Shealcordo), as well as the multiple Ondoy Networks that emerged during the course of the disaster, operated within the bounds of familiarity, credibility and shared sentiments, goals and identities. No matter the distance or the weakness of the connection, certain shared factors (whether it was nationality, dedication to the cause or a common Twitter friend) worked to solidify the network and imbue it with a feeling of trust.

As a result, it was able to alert greater numbers of people to the situation in Manila, raise more money, and help more people in need. Indeed, expansive reach multiplies across a series of weak links is an integral part of a functioning, dynamic network. Weak ties keeps everyone socially close to the rest of the community despite how large it may be in terms of its actual size, and enables each person access to diverse information (Buchanan, 2000: 207).

Notably, the expansive reach engendered by infinite weak ties also fosters a small-world social network. In short, while the breadth of the network may be intimate, the clusters of relationship that comprise it ensures a smallness that facilitates rapid interaction and information dissemination, as well as social capital and a sense of collective trust and credibility that facilitates efficient collective decision-making—a phenomenon that occurred when the many Ondoy networks seemed to spontaneously and efficiently decide to shift their efforts towards relief and aid. As Buchanan argues, “when it comes to network architecture, the small-world network offers obvious advantages because of its intimacy....this pattern of connectivity fosters rapid communication between disparate elements” (Buchanan, 2000: 199).

Tweeting Ondoy: Real Time Interaction and Precision

Twitter also facilitated real-time engagement, which endowed the network with a sense of urgency, immediacy and active involvement, and enabled collaboration. Information was sent and received as soon as it was twittered or encoded in a status update. Thus, the information was perceived as timely, and individuals locked into the network responded in a similarly timely fashion—a key factor in disaster relief, which is driven by immediate response.

Furthermore, the format of the tweets—which are lines of text that are limited to 140 characters or less—ensured that Twitter users encoded information that mostly relevant and useful, and discouraged superfluous content. The concise nature of the tweets also made it easier for receivers to process the messages and react in a timely manner. Indeed, navigating large amounts of information to find the information you need is often a delaying factor. The fact that the Ondoy Network in general, and the RockEdRadio Ondoy Network in particular, focused on Ondoy-related content and disseminated it in a concise, targeted format allowed the content to spread and be responded to more rapidly.

The immediacy of the information transmissions also fostered a feeling of active involvement regardless of distance, which further consolidated the sense of community. And because the information was exchanged within the bounds of a solid community, it was cast in a credible light: it was posted by someone on the ground who was in a position to know, or at least sourced from someone on the ground by a fellow Ondoy Network member. Real-time engagement also enabled the collaborative efforts that produced GoogleDoc spreadsheets like RescueInfoHubCentral, which were embedded in tweets via links and tinyurls. All networked members had access to the document and could consult it for updated information, or update it themselves with information or requests for help.

Tweeting Ondoy: A Multiplicity of Communication

Furthermore, communication occurred on three levels: point to point, point to multipoint, and multipoint to multipoint (Garcia, 2002: 45). Many of the members of RockEdRadio's Ondoy Network have 'unlocked' Twitter pages, which means that their tweets can be accessed by Twitter users (as well as non-Twitter users) who are not on their list of followers. This ensured that information could be sent from one person to many, and many people to an equally vast audience, giving the network access to more resources than it would otherwise have access to. While Twitter users also engaged in point to point communication and replied directly to specific queries, as was shown by tweets above, the fact that their Twitter pages were unlocked meant that they could be accessed by anyone with an internet connection.

Tweeting Ondoy: Interoperability

The versatility of SNS technologies also allowed network members to harness the technologies towards more active ends. Through Twitter, the RockEdRadio Ondoy Network supported a wide variety of applications and services, and facilitated a high level of interoperability between disparate components and applications (Garcia, 2004: 46). Thus, networked individuals were

able to transform their Twitter pages from personally-oriented status feeds into hubs of relevant and urgent information that linked to photos, blogs and other relevant external websites such as GoogleDocs.

KaEdong RT @mlq3: Connect donors, volunteers,victims, GO's, NGO's: enable to manage information thru <http://tinyurl.com/y9n9l3u>, pls sign up & pass Sun Sep 27 18:50:56 +0000 2009

Video, photo and link-sharing allowed users to effectively solicit donations on Twitter. For example, the site Twitter.com/Ondoyphotos was a hub for pictures of the flooding that were sent in by various users in order to give site visitors an accurate sense of the flooding. The interoperability between the different applications allowed all of these elements to work in concert towards the shared goal of providing relief to a great number of people.

Tweeting Ondoy: Supporting Flexibility

The Ondoy Network in general was also marked by great flexibility, which allowed especially venturesome innovators like Soriano and Gregorio to customize the technology according to their needs. Flexibility relates to the ease with which a network can be modified and reconfigured (Garcia, 2004: 46). When GoogleDocs was transformed from a mere word-processing application into a dynamic, centralized hub of information that multiple parties could access and shape, the Ondoy Network was effectively reconfigured into a more dynamic, responsive one. In and of itself, the Twitter-driven Ondoy Network was also transformed from a SNS application and venue for online social interaction to a mechanism of Ondoy-related information diffusion, relief and rescue. The flexibility of the technology allowed all Twitter-hosted networks to adapt to the external circumstances of disaster, respond to urgent needs and be customized by users accordingly. Furthermore, the fact that ordinary individuals could

reconfigure and modify the network at will attests to the diffused intelligence that shaped the Ondoy Network. Because the intelligence that drove the network was so diffuse, it could be applied spontaneously, organically and in unexpected interstices. Thus, innovations like GoogleDocs and the Twitter-driven Ondoy network, which resulted in a larger, more expansive network than would have existed offline or without social networking technologies, were allowed to emerge.

Tweeting Ondoy: Equal Access for all...online

The Ondoy Network was also distinguished by a high degree of accessibility¹², which enabled 4.2 million internet users¹³ in both the Philippines and overseas to access and take advantage of the opportunities it offered. Users could interact with Twitter in a variety of ways: through the web interface, IM updates or SMS messages (Java, 2007: 2). It remained functional when other modes of communication, such as mobile phones and landlines, shut down. Everyone who had an internet connection could access it both during and after the disaster. Network access via the internet was also relatively affordable, which is an important consideration in a developing country such as the Philippines. For the price of an internet connection, which typically runs to about users could send unlimited messages via Twitter, which is free of charge to all its members. Furthermore, network members were largely familiar with SNS platforms and could thus utilize them towards rescue and relief efforts with ease.

Tweeting Ondoy: A Diffused Intelligence

Finally, the network functioned effectively to execute processes and disseminate information because of its high capacity and wide and diffused store of intelligence. The democratic and

¹² Accessibility relates to the ability to patterns of deployment, diffusion, cost of services, interoperability, rules of interconnection, technological complexity and ease of use. (Garcia, 2004:46)

¹³ According to statistics gathered by Sysomos, the Philippines has the 12th highest number of Twitter users internationally. Source: <http://techcrunchies.com/twitter-usage-across-the-world/>

horizontal nature of SNS networks engendered a RockEdRadio Ondoy Network that was similarly democratic and horizontal. Indeed, instead of a single network administrator, there emerged several collaborative hubs of leadership and organization that worked in concert towards mutually-supportive ends. Instead of static hierarchies, every member of the network had the opportunity to innovate, organize and implement, depending on his familiarity with the technology or his personal inclination. The organic and spontaneous manner in which the network arose and conducted itself, and its lack of an overarching hierarchical administration, attests to its high functionality (Garcia, 2004: 46).

The Ondoy Network: A Network of Opinion Leaders and Makers

While SNS networks are horizontal in structure, Filipino society at large is very hierarchical, vertical and patriarchal. At the top are clear echelons of power that are endowed with great authority as a result of class, educational, professional or economic status. Indeed, deep socio-economic divisions and inequalities make Philippine society highly stratified. One manifestation of this stratification is that those located at the top of the hierarchy—a strata of society that can include actors, media personalities and individuals with great wealth-- exert great influence on those situated on lower levels. Conversely, Filipinos located on lower levels of society take their cues in a variety of areas from their perceived superiors. Indeed, Filipinos are known to make decisions on matters such as clothing preferences and the patronage of certain products to political affiliation and choice of leisure activities based on decisions made by individuals they

hold in high esteem. This is reflected in the number of actors that run for and win public office (Heeney, 1999: 302) and the prevalence and power of celebrity product endorsers.¹⁴

Twitter has caught on with famous media personalities, actors and other celebrities both internationally, and in the Philippines. This is reflected in the composition of RockEdRadio's Ondoy Network, which included individuals who carried authority by virtue of their social, economic or professional status. Indeed, 20 of the network's 60 members identified themselves or are identified as media personalities, television journalists, politicians and actors. These individuals typically have high numbers of followers, as well as networks that include fellow famous personalities with their own attendant vast networks of followers. Aside from reaching greater numbers of people, these individuals' statements and tweets also conceivably carried greater weight because of their social status and therefore travelled further as a result. Indeed, many of their tweets were retweeted both within and outside RockEdRadio's Ondoy Network:

BamAquino:

RT @noynoyaquino: ...get in touch w Jana Vicente at 9285205499. Drop off for relief donations is at Balay Expo Center across Farmers Market 4:45 AM Sep 26th, 2009 via [TweetDeck](#)

Katoloy RT @jiggycruz: Calling all heroes! We need help in Packing operations here in Balay Expo, Araneta Center. Please bring relief goods [Sun Sep 27 02:43:22 +0000 2009](#)

As is shown above, tweets made by celebrities have the capacity to go further in a network due to retweeting. Noy Noy Aquino's stature as a presidential candidate conceivably gives his statements greater authority. Meanwhile, after emerging as a celebrity after the death of his

¹⁴ According to a survey conducted by Synergy Business Consulting among 1000 individuals aged between 15-60 from all socio-economic levels, 7 out of 10 polled claimed to have bought a product because of the celebrity endorser. (Lo, Ricardo [Top Ten Credible Endorsers](#) The Philippine Star February 24, 2010)

grandmother, former Philippine President Corazon Aquino, Jiggy Cruz's voice echoes louder among and is disseminated further by his 21,365 followers. It is reasonable to assume that the above retweets are just one of several hundreds.

Indeed, the fact that Twitter is used by individuals who are considered to be of high stature by the larger populace was instrumental in the dissemination of information during the typhoon. Not only did they have bigger audiences; in a highly-stratified society such as the Philippines where social status can determine character, value and credibility; the bloggers, actors and media personalities' twitter-missives carried more weight and authority and were therefore more likely to be believed, followed and spread by other Filipinos. While the internet is a democratic medium that supports diffused intelligence and horizontal, rather than vertical, social interactions, opinion leaders and individuals of high stature still hold some sort of authority over their audiences. And as the events of Ondoy demonstrate, this fosters rapid information dissemination and ultimately, action. Indeed, as Buchanan argues, "the social world gains much of its efficacy from our unquestioning acceptance of authoritative relationships" (Buchanan, 2000: 200). The way we are socialized to live in real societies, which are founded on unequal relationships, is to some extent carried over into the virtual world.

The Ondoy Network: A Diffused Innovation

The SNS-driven Ondoy Network emerged and became a potent force within a span of just a few days. Usually, innovations and networks take much longer to consolidate and take hold. What enabled the Ondoy Network to proliferate so rapidly?

In Diffusion of Innovations, Everett Rogers (1962: 155) argues that geographical location and status barriers can impede and affect interaction patterns. The fact that SNS technologies

operate irrespective of geographical location, and engendered horizontal rather than hierarchical communities determined by status, facilitated interaction patterns that were consistent, equitable, and conducive to the adaptation of new ideas and patterns of usage. Indeed, Twitter operated across several continents to engage both Filipinos living in the city of Manila and across the nation, as well as internationally-located members of the Filipino diaspora.

The adaptation of innovations is dependent on interaction (Rogers, 1962: 154). Consequently, the fact that the Ondoy Network proliferated through SNS technologies that facilitated greater interaction ensured that it spread rapidly, seamlessly and spontaneously. Indeed, by enabling interaction to continue during the disaster at little or no cost to and with great ease for its users, Twitter was able to host a rapidly-proliferating network.

Furthermore, the characteristics of Ondoy Network members also determined the rate of its diffusion. The innovation process as described by Rogers usually proceeds according to a slow but deliberate trajectory, passing from innovators to early adopters and the early majority, before being subscribed to by the late adopters and laggards. Certainly, the context in which the network emerged played a role-- the urgency of the calamity situation demanded a more rapid process of adaptation. However, I argue that the Ondoy Network was composed largely of innovators and early adopters, a fact that drove its rapid proliferation.

Innovators are characterized by their venturesomeness, while early adopters are change agents and role models that inspire change in the greater (specifically the early) majority (Rogers, 1962: 169). In a regular diffusion process, these individuals set the stage for an innovation to take root in larger segments of the population. In the Ondoy Network, these individuals comprised the majority, thus facilitating an accelerated diffusion and interaction

process. Innovators and Early Adopters were often one and the same. At the very least, the line between the two categories became increasingly blurred as the crisis wore on and individuals became increasingly active and innovative participants in the relief and rescue efforts.

According to Rogers, early adopters are younger (1962: 172), more educated (1962:175) and have better financial standing than the rest of the population. Most Filipino internet users, and therefore members of the RockEdRadio Ondoy Network, meet those characteristics. The Yahoo-Nielsen Net Index Study (March 26, 2009) indicates that Filipino internet users are likely to be below 29 years old:

Table 2

Internet Usage: Percentage of Filipino Users Who Access the Internet Monthly	
10-19 years old	50%
20-29 years old	41%
30-39 years old	19%
40-49 years old	12 %
50+ years old	3%

Clearly, Filipino internet users are younger, and therefore more capable of rapid adaptation to new ideas, technologies and patterns of usage. The same survey also says that Filipino internet users consider themselves opinion leaders and early adopters in comparison to traditional media consumers, and that they are usually better educated. Finally, in a country where 1/3 of the country's wealth is concentrated in the top 10% of the population and 23 million live on less than \$1.35 a day (Dumlao, Philippine Daily Inquirer, August 27 2008), Filipinos who have internet

access are undeniably part of a class that has considerable financial resources. Undeniably, the fact that the Ondoy Network was composed of individuals who shared similar characteristics not only fostered a more tightly bonded-network, but allowed it to proliferate more rapidly.

Conclusion

While social networking technologies may have been designed to foster and perpetuate internet-based social relationships, users have begun directing the technology towards other ends. Indeed, individuals have used social networking platforms such as Facebook and Twitter to advertise and publicize products, voice anti-government sentiments and stir up protest and advance their professional careers. Recently, social networking platforms have also been used in more calamitous situations. During the recent earthquake in Haiti, media outlets such as CNN used Twitter to broadcast breaking news and direct potential donors to charitable organizations. Haitian musician Wyclef Jean solicited donations through his Twitter account as well.

In September 2009, Typhoon Ondoy hit the Philippines, causing unprecedented flooding and property damage to bring about a calamity situation. At the height of and in the aftermath of the storm, social networking sites, and SNS-users emerged to contribute to relief and rescue efforts. Using sites such as Facebook, Twitter, Wordpress and Youtube, users called for rescue, coordinated volunteer efforts and solicited and collected donations and equipment. Twitter, which is the focus of this study, was particularly instrumental to civilian-led relief and rescue initiatives. Indeed, the technology fostered open and inter-linked networks of civilian volunteers who solicited donations on behalf of organizations like The Red Cross, dispatched on-the-ground situational reports and organized efforts to pack and distribute relief goods.

What enabled this phenomenon to arise spontaneously and rapidly? Would it arise just as spontaneously in different cultures, and across different disaster contexts? I argue that a combination of characteristics unique to Philippine culture and certain features of social networking technology (Twitter in particular) enabled users to form networks and use Twitter for disaster and relief operations. However, the use of Twitter, Facebook and other social

networking platforms during the Haiti earthquake and the Chinese earthquake suggest that this phenomenon isn't national context-dependent, but may be applied across different cultures and contexts. Indeed, this may be an interesting topic for future scholars to explore. As a preliminary step towards future studies of this sort, I suggest factors that might facilitate the use of social networking platforms in disasters later on in this section.

Context Matters: Ondoy-generated Twitter Networks and Philippine society

Undeniably, certain characteristics of Filipino society enabled networks of rescue and relief to emerge and work collectively towards common ends on Twitter. The centrality of social relationships, a potent sense of collective identity, the dynamics and influence of societal hierarchies, and the Philippine population's relative youth and participation in social network technologies facilitated the Ondoy Twitter network and allowed it to deliver relief in the midst of disaster.

Filipino society is bound by strong ties of 'bayanihan' and 'pakikipagkapwa'. Indeed, relationships are formed around a variety of linkages, such as regional origins, school affiliations, shared professions, schools, religious beliefs and common interests. Alumni organizations, church groups and associations of individuals from certain towns and provinces are a major factor in Philippine social life, serving to create lifelong friendships and provide emotional, economic and spiritual support when the need arises. As in the rest of the world, the internet and its attendant technologies have made increasing incursions into Philippine social life. Filipinos, especially those under 50 who make up the majority of Philippine society, now forge, pursue and maintain friendships and social relationships online, via online groups, Facebook, Twitter, blogs and other social networking tools. It can be argued that social networking sites are a normal and indispensable part of Filipino socializing, and that most

Filipinos who subscribe to these platforms are accustomed to using it and adapting it to their personal needs in a variety of ways.

Undeniably, when the disaster arose, Filipino users continued using social networking platforms to reach out in the midst of isolating circumstances (because they were stranded in their homes by the flooding, and other forms of communication such as mobile phones were unavailable, online social networks were the most accessible means of communication available). Furthermore, their familiarity with the technology made their transition to using it for purposes of disaster relief and rescue seamless and instinctive. In short, the centrality of social bonds in Philippine life, in addition to the prevalence of social networking technology in a largely youthful and dynamic Philippine society, made it easier for Filipinos to adapt platforms such as Twitter towards collective, socially-oriented ends.

The cultural notions of ‘bayanihan’ and ‘pakikipagkapwa’, which drove much of the relief and rescue-oriented actions on Twitter also served to reinforce a national oneness. This sense of collective national identity, which was evident in Tweets that evoked Filipino heroism, Filipino-ness and referred to a nation, spurred Filipino netizens to collective action in aid of each other. Indeed, because Filipinos were one, it was easier to forget and forgive differences and act in a unified way as one on Twitter, normally a platform comprised of individual voices.

While it may seem to be a contradiction, the hierarchical nature of Philippine society also worked to reinforce the ‘oneness’ that drove collective action on Twitter in that it facilitated efficient communication among and within Ondoy-generated networks. Media personalities, actors and politicians used their Twitter accounts to disseminate information about volunteer efforts, request donations and inspire action. Not only did they have a wider audience of

followers to receive and respond to their Tweets, their messages also carried increased credibility and weight due to their status in Philippine society. Individuals who idolized and followed these high-status personalities were more likely to respond to, act in line with and re-tweet the Tweets of individuals they held in high esteem. This was evident in the preceding section's sampling of tweets. Tweets made by JiggyCruz, who gained fame as former Philippine President Corazon Aquino's grandson, were re-tweeted within RockEdRadio's Ondoy Network and conceivably, outside of it as well. His re-tweeted Tweets reflected the general tone and message of most of the Tweets that were exchanged and sent out on Twitter networks during that time. Arguably, then, JiggyCruz's Tweets were distinguished not by their content, but by the fact that they were being sent by a figure of esteemed status and high popularity in Philippine society.

Form Matters: Ondoy-generated networks and technology

The online networks of relief and rescue that emerged during Typhoon Ondoy would not have been possible without the right technology. Indeed, social networking platforms, which enabled individual and collective exchanges of information and communication; remained accessible to a large number during the disaster, and could be adapted to a variety of ends, facilitated and perpetuated Ondoy-generated networks. Specifically, Twitter, which was open and accessible to a greater number of internet users, and delivered only concise, direct and targeted messaging, was especially conducive to the rapid dissemination of information and formation of spontaneous networks.

Compared to other social networking sites such as Facebook, Twitter is an open platform that can be accessed by subscribers and non-subscribers alike. Casual surfers of the internet can access anyone's Twitter feed providing it is not locked or set on high privacy settings. Because of this, Twitter was used to facilitate different modes of communication—one-to-one, one-to-

many, many-to-one, and one-to-infinite. Most of the Tweets in the RockEd Ondoy Network were made via unlocked accounts, and could thus be accessed, read and disseminated by a fairly sizeable audience. This allowed relief and rescue efforts that were hatched on the Twitter networks to proliferate rapidly and efficiently.

The fact that it is hosted on the internet also means that Twitter can be accessed at a relatively low-cost, and at any time, provided the infrastructure remains operational. Such was the case during Ondoy—as mobile phone and landline networks failed, internet connections remained operational and facilitated communication between individuals who were isolated by flooding or stranded in their homes. Furthermore, unlike text messages or other mediums which charge users per message sent, infinite messages can be sent via Twitter for the price of a regular, single internet subscription—the cost of which is usually absorbed monthly, per household. This enabled multiple and constant messages to be sent on and within the Ondoy Twitter networks, and allowed for these messages to be re-sent infinitely. Certainly, this is an important factor in a developing country such as the Philippines, where household disposable incomes are limited.

Twitter also has an international reach and can thus facilitate the formation of international networks. The Filipino Diaspora, which comprises nearly 8 million people, was crucial to the Ondoy network in terms of soliciting and making financial donations to organizations such as The Red Cross. Because of the calls for and manifestations of collective action, constant on-the-ground updates and unified national identity reinforced on Twitter, Filipinos overseas were constantly apprised of the situation in the Philippines and felt as if they were part of an overarching Filipino collective, even if they were located in other nations. Their links to the ongoing disaster, rather than being remote, were immediate and intimate. And

instead of being mere recipients of messages, they could be participants. Thus, they were compelled to participate in any way they could in the on-the-ground and online efforts, either by disseminating information or making material donations.

Twitter is also flexible in two respects—it can be adapted towards different ends as determined by its users, and is interoperable with different platforms. Unlike social-networking platform LinkedIn which is strictly professional in its orientation, Twitter facilitates communication without censoring or limiting the kinds of content that can be shared. Thus, during Ondoy, users sent a variety of messages pertaining to individual calls for rescue and evacuation and the need for material donations, effectively transforming Twitter from a mere platform of social exchange, into an active facilitator of relief and rescue. Furthermore, Twitter also enabled links to other platforms such as YouTube, Blogspot and Googledocs, which resulted in stronger messages (especially when video and photos were incorporated) and easier coordination between different players (as in the case of the Googledocs document that centralized calls for rescue in a single hub).

Finally, the fact that Twitter messages could be only be coded in a minimum of 140 characters resulted in efficacious information exchanges. Dispatches were potent, concise and precise. Audiences had no need to wade through large amounts of unnecessary text to get to what was needed and act accordingly. Twitter, then, was the perfect medium for sending and receiving urgent messages.

Implications for Other Contexts: Towards a Future of SNS-Driven Rescue and Relief

The Philippines' Ondoy-generated Twitter networks may have been the result of a unique combination of technology and national societal circumstances. However, some lessons may be

culled from the Philippine experience to engender networks of rescue and relief in other contexts.

Target Popular Personalities for Network Inclusion

Whether a society is hierarchical or not, popular personalities typically have larger audiences and in some cases, more credibility. Thus, any attempt to engender an online network of relief and rescue should involve noted personalities—whether they are actors, media people, politicians or noted bloggers. Usually, their tweets carry more authority by virtue of their societal status. Furthermore, the fact that they have bigger audiences ensures that their messages will be received, acted upon and disseminated by more people.

Reinforce a Common Identity or Goal

Large-scale collective action can only proceed when there is a shared goal or identity, especially in a forum such as Twitter, where there is an infinite variety of voices, motivations, goals and inclinations. Thus, if relief and rescue is to be an achievable goal in the midst of widespread disaster, it should be pursued on the level of the collective, rather than the individual. How can disparate individuals be united towards a common end? The reinforcement of commonality can be a strategic way to unify people. Identity commonalities based on nationality, shared empathy or even humanity can be reinforced, using language cues, images and symbols. Commonalities can also be forged around shared goals. Constant references to an ‘us’ or ‘we’, or shared cultural notions of giving and charity (which are potent ideas in the Western world) can be reinforced on Twitter to facilitate collective action towards relief and rescue.

Provide strong and affordable internet infrastructure

Governments and online providers should ensure that internet infrastructures are solid enough to withstand the ravages of disaster. This was the case in the Philippines, which enabled individuals to communicate via the internet even when other networks were inoperable.

Furthermore, the liberalization of the telecommunications industry and the breakup of monopolies under former Philippine President Ramos (Reidinger, 1994: 139) ensured that more communications companies could set up shop, and thus provide Filipinos with better and more affordable internet access. (Krinks, 2002: 210) Indeed, communications costs have fallen considerably since the time of Ferdinand Marcos in the 1980s.

Online networks have revolutionized the way most individuals the world over live, conduct social relationships, find jobs and consume products. As shown by the Philippine experience during Typhoon Ondoy, online social networks can also support relief and rescue in disaster situations by facilitating action, information dissemination and communication that ultimately spills over into the real world. Indeed, online interactions are no longer constrained by their medium. They very often have tangible effects on the living world by providing relief to those that need it, shedding light on urgent on-the-ground situations and even saving lives—and doing all of the above in ways that are cost-effective, efficient and reliable. Indeed, as individuals and organizations look for better ways to reach those in need during calamities, online social networks such as Twitter, Facebook and YouTube should be seriously considered as a partner in rescue and relief efforts.

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