Study of Twitter's Functional Framework during Natural Disaster in Indonesia

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Abstract

Understanding how social media functions during a disaster is one of the important tasks for disaster mitigation. This study is focusing "What are Twitter functions during a natural disaster in Indonesia?". The research uses the qualitative method with an online observation from Twitter between August to December 2018. Disaster communication research is important because it could help governance and NGO to have a better understanding of Twitter's functional framework before making an impactful policy. The findings showed that there are several Twitter functions during the three most current disaster in 2018, namely, showing organizational and individual support, organizing donations, coordinating for rescue efforts, sharing and combating false news, displaying amateur analysis, also gathering additional information. Additional research is needed to build a complete Twitter's framework during natural disaster in Indonesia.

Keywords: *Disaster Communication, Twitter Functional Framework, Disaster Risk Reduction.*

1. Introduction

On Friday evening, 28th September 2018, a massive shock struck the city of Palu, Sulawesi, as evening prayers were about to begin. The 7.5-magnitude quake was followed by a tsunami alert for the nearby Makassar Strait but was called off half an hour later. Not long after, an immense series of wave swept the shore, destroying houses and building on its way, while a local festival was also taking place on the beach in Palu. At nearly the same time, in nearby Balaroa area, the quake has caused houses to collapse and sink five meters into the ground. The joined effects of the earthquake and tsunami led to a huge number of the death toll, with at least 2,256 victims. The number makes it the deadliest earthquake in Indonesia in the last 12 years.

Before the devastating news in Palu, a major earthquake also hit Indonesia's tourist island of Lombok, killing more than 500 people. The 6.9-magnitude quake struck the island on Sunday, 5th August 2018, and causing extensive destruction. Since then, at least more than 300 aftershocks hit the island until August 19, which another 6.3-magnitude quake hit and causing landslides. The Indonesian government reports that more than 150,000 people have been displaced and more than 1,400 were injured.

Another disaster occurred on the evening of 22nd December 2018, as Anak Krakatoa erupts and causing an underwater landslide followed by a tsunami in Banten region. No tsunami alert before the waves hit the shore of Java and Sumatra. The early warning system owned by BMKG only detected tsunami caused by a tectonic earthquake, not a volcanic earthquake. With no warning and earthquake prior to the tsunami, the Banten disaster has a death toll of more than 400 people.

Sitting in the 'Ring of Fire', Indonesia is highly vulnerable to earthquakes and volcano eruptions. Weather- and climate-related hazards such as floods, landslides, droughts, and wildfires are also becoming more

pronounced (www.unicef.org; Djalante et al., 2017). Especially in 2018, Indonesia endured a big challenge. Ranging from serial earthquakes, floods, landslides, to tsunamis that killed hundreds of people and makes thousands of others suffered. These events are inevitable and mostly without warning. From that perspective, communication for disaster reduction is highly important. During the disaster, Indonesian citizen mostly turns to social media for a quick update on the situation. Jaeger et al., 2007 and Houston et al., 2014 stated that social media, offer the possibility of improved disaster communication, as these technologies have the potential for increased information capacity, dependability, and interactivity. So, it is safe to say that one of the important tools in disaster communication is social media.

A survey from the Indonesian Internet Service Provider Association (APJII) shows that internet users in Indonesia reach 143,26 million, which covers 54.68% of 262 million of Indonesia's total population. As one of the most active social media in the world (Jakarta Post, 2018), Indonesia became very attached to it. Even in 2012, Jakarta was named the most active Twitter city in the world by Semiocast, a Paris-based research company (Lamb, 2016). As social media become important tools in Indonesia, it's also used as communication tools during a natural disaster. The use of social media during a natural disaster can cover the absence of traditional media to give up-to-date information (Takahashi, Tandoc and Carmichael, 2015; Santoso, 2017). The spokesman for the Indonesia Disaster Management Agency (BNPB), Sutopo Purwo Nugroho also uses Twitter to spread the news about disasters in Indonesia. Through his Twitter account @Sutopo_PN, he became a source of reliable information during a fatal string of earthquakes, floods, landslides, and tsunamis in Indonesia.

This paper focused on Twitter because it can spread the news faster than any other social media platform. To tweet on Twitter, the user only needs 280 characters or less. It also very conversational, that is why Twitter is being considered as a means for emergency communications because of its growing ubiquity, communications rapidity, and cross-platform accessibility. This medium is also seen as a place for "harvesting" information during a crisis event to determine what is happening on the ground (Palen et al., 2010). Through Twitter, affected people or those who can reach the location (eg. Search and Rescue Team) could be able to communicate current condition to a wider audience. This study aims to give a descriptive analysis regarding Twitter functions during the natural disaster in Indonesia, especially from August to December 2018.

Twitter as Social Media

Baruah (2012) refers to social media as the use of web and mobile-based technology to transform communication into an interactive dialogue. Social media such as Facebook, Twitter, Myspace, Skype, etc., are widely used for communication purposes. Survey from the Indonesia Digital Landscape 2018 designate the top 10 most active social media platforms in Indonesia, including YouTube (43%), Facebook (41%), WhatsApp (40%), Instagram (38%), Line (33%), BBM (28%), Twitter (27%), Google+ (25%), FB Messenger (24%) and LinkedIn (16%) (We are Social, 2018).

Twitter occupies the seventh social media position with the highest users in Indonesia. This social network provides complete features, such as 280 characters text, photos, videos, GIFs, polls and locations. In addition to disseminating information, Twitter is often used as a means to communicate, build friendships, market products, and even build a company image. Not only used for individual activities, but Twitter is also considered to have the potential to be used as a means of communication for companies. Several benefits of Twitter including fast information delivery, easy feedback, also low cost to create and operate an account (Isnaini, 2012).

Unlike Facebook, Twitter is not a place to do lots of interactions. With the limitation of 280 characters makes it difficult to have long conversations. This limitation is what categorize Twitter into the microblogging category. A tweet can reach several million people and get some simple responses from those who see it (Nasrullah, 2015). Another thing that distinguishes Twitter is that the users are more likely to follow people outside their group of friends or family. On Twitter, tweeting to strangers is normal. Users are easy to search for trending topics, only by typing in the search bar and tweets containing the word will appear (Nasrullah, 2015). In addition, studies by Hughes and Palen (2009) and Smith (2010) have shown how Twitter can serve as a valuable communication and information-sharing resource during emergency-relief efforts.

Disaster Communication

McFarlane and Norris (2006) define disaster as 'a potentially traumatic event that is collectively experienced, has an acute onset and is time-delimited'. Houston et al., (2012) divided disaster type by cause as natural (such as an earthquake or a tsunami), technological (such as an oil spill), or human (such as terrorism), and may produce 'physical, social, psychosocial, sociodemographic, socioeconomic, and political consequences. Normally, disasters are conceptualized in phases and can be understood as including a pre-event, event, and post-event phase (Houston, 2012).

Disaster communication is part of public relations. Houston et al., (2014) stated that crisis and risk communication are relevant to disaster communication. For example, the study of how to design and deliver disaster warnings is an important component of risk communication with significant relevance to disaster communication (Rodriguez et al., 2007). However, disaster communication also centers on additional objectives beyond those found in the crisis and risk communication literature. For instance, recent disaster communication approaches, such as the Crisis and Emergency Risk Communication (CERC) model (Reynolds and Seeger, 2012) and the Disaster Communication Intervention Framework (DCIF) (Houston, 2012), target outcomes beyond protecting an organizational image or influencing understanding of risk. The CERC model proposes using disaster communication to 'prevent further illness, injury, or death; restore or maintain calm; and engender confidence in the operational response' (Reynolds, 2006), whereas the DCIF concentrates on outcomes such as: improving individual and community disaster preparedness; increasing individual and community resilience; decreasing disaster-related distress and maladaptive behavior; promoting wellness, coping, and recovery; helping a community to make sense of what happened; and (re)connecting the community (Houston, et al., 2015).

The Uses of Social Media in Disaster Communication

There are several studies that focus on the use of social media in disaster communication. Alexander (2014) specified that in the emergencies field, social media (blogs, messaging, sites such as Facebook, wikis and so on) are used in seven different ways: listening to public debate, monitoring situations, extending emergency response and management, crowd-sourcing and collaborative development, creating social cohesion, furthering causes (including charitable donation) and enhancing research. Appreciation of the positive side of social media is balanced by their potential for negative developments, such as disseminating rumors, undermining the authority and promoting terrorist acts.

Houston et al., (2014) tried to figure out the disaster social media users in the framework including communities, government, individuals, organizations, and media outlets. They found fifteen distinct social media uses during disasters, ranging from receiving disaster preparedness information and warnings, signaling and detecting disasters prior to an event to (re)connecting community members following a disaster. The framework illustrates that a variety of entities may utilize and produce disaster social media content. Consequently, disaster social media use can be conceptualized as occurring at several levels, even within the same disaster.

Lindsay (2011) in her CRS Report for Congress stated that the use of social media for emergencies and disasters may be conceptualized as two broad categories. First, social media can be used somewhat passively to disseminate information and receive user feedback via incoming messages, wall posts, and polls. To date, this is how most emergency management organizations, including the Federal Emergency Management Agency (FEMA), use social media. A second approach involves the systematic use of social media as an emergency management tool. Systematic usage might include using the medium to conduct emergency communications and issue warnings; using social media to receive victim requests for assistance; monitoring user activities to establish situational awareness; and using uploaded images to create damage estimates, among others. Many of these applications remain speculative, while others use is still in their infancy. Consequently, most emergency management organizations have confined their use of social media to the dissemination of information. However, recent stories and reports describe how a wide range of international, state and local organizations have successfully used social media during emergencies and disasters have spurred congressional interest and discussion concerning how social media might be used to improve government response and recovery capabilities.

In the context of Indonesia, Santoso (2017) categorize social media usage during the disaster as a situational report from a personal perspective, secondhand reporting, request for help, coordination of rescue effort, providing mental counselling, criticizing the government, express the hope and sympathy, discussing the cause of disaster and (re)connecting community members.

2. Methodology

To understand Twitter's functional framework, we use qualitative study. Creswell (2014) explains qualitative research as an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. The process of research involves emerging questions and procedures, data typically collected in the participant's setting, data analysis inductively building from particulars to general themes, and the researcher making interpretations of the meaning of the data. The final written report has a flexible structure. Those who engage in this form of inquiry support a way of looking at research that honors an inductive style, a focus on individual meaning, and the importance of rendering the complexity of a situation.

We use several steps of data collections for this study. First, we gather raw data from Twitter using digital observation method. Data collected in a certain range of time, from 5st of August until December 31st, 2018 using specific hashtags like #tsunamiselatsunda, #tsunamibanten, #gempalombok, #prayforlombok, #tsunamipalu. We also virtually observe several key opinion leaders for disaster issue on Twitter, like @Sutopo_PN, @infohumas_BMKG, @BNPB_Indonesia, and @Basarnas. On the next step, the collected tweet is then categorized based on its usage. This study is a preliminary study for bigger research with an extended timeline from 2018 to 2019. The end-goal of the study is to build Twitter's functional framework during natural disasters in Indonesia.

3. Results

Between August 2018 and December 2018, Indonesia was struck by three major natural disasters in several regions, namely Lombok, Palu, and Banten. All related to a series of earthquakes and tsunamis. During these devastating situations, citizens eagerly waited for updated news in all media outlets. While waiting for news journalists to arrive in the area, citizens turned to social media for quick updates. Indonesia is already considered as one of the most talkative countries in social media. Based on We are Social (2018) active social media users, including Twitter hit an all-time high of 130 million in 2018, while social media penetration reaches 49% out of the total population. It shows that almost half of the population are on social media.

During the natural disaster, Twitter has proven to be the fastest way to spread the news. All three disasters in Lombok, Palu, and Banten became viral and considered as trending topics for the country. In this study, we analyze the viral hashtags during the three natural disasters: #PrayForLombok, #GempaLombok, #PrayForPalu, #TsunamiPalu, and #TsunamiBanten. By analyzing these hashtags, we categorize the tweets into three parts, based on whether the Twitter account represent (1) institutions, (2) individual or (3) media. We also divide the institutions' section further of whether the account represents Indonesian government agencies or NGOs.

First, on the institutions category we found several accounts actively used the hashtags that represent the Indonesian governmental agencies, including The National Search and Rescue Agency (Basarnas); The Indonesian National Board for Disaster Management (BNPB); Meteorological, Climatological, and Geophysical Agency (BMKG); Department of Public Works (KemenPU); and Jasa Raharja – an Indonesian state-owned insurance agency. While accounts under NGOs includes Indonesian Red Cross Society (PMI), Oxfam International, and WWF.

Among all accounts under the institutions' category, we can further classify the tweets of different functions. Tweets from Basarnas, BNPB, and BMKG have the main function for giving real-time information, especially on-site facts and coordination progress for rescue efforts. While other institutions' accounts use Twitter to show support and condolences, to organize fundraising and to give donations.

Next, on the individual category, we also classify further whether the account is from an influential person, which we categorize under key opinion leader category, or from a regular person. The key opinion leader for natural disasters in Indonesia is Sutopo Purwo Nugroho (@Sutopo_PN). He is the spokesperson of The Indonesian National Board for Disaster Management (BNPB). His tweets are mostly about possible or already occurred disasters in Indonesia; both natural and human error. However, because it is his personal

account, he also shared about other things, like his health condition due to his lung cancer, and his muse, a famous Indonesian singer, Raisa. Whenever Indonesia is hit by a disaster, Sutopo is the most awaited person to share official information from Indonesia government.

For the regular masses, the functions are more diverse, such as expressing sympathy and support by tweeting using several hashtags #prayforpalu, #prayforbanten, and #prayforlombok. Most individual accounts are also keen to rise crowdsourcing donations or retweet other accounts who initiated the donations. On the contrary, another function of Twitter is the distribution of hoax or fake news. During a disaster, a great number of fake news spread over Twitter. For example, throughout the Lombok earthquake, there are false news about logistics being hoarded and there will be bigger aftershocks.

Fortunately, the Indonesian government is very concerned about false news, the government responded immediately using several official Twitter accounts (e.g. @infohumas_BMKG, and BNPB_Indonesia). This positive initiative from the government to combat false news has spread to the citizens. A lot of individual accounts are also concerned and try to remind each other not to spread the false news.

Another Twitter's function for the citizens during natural disasters is to show their amateur analysis. Many people strived to express their opinions and analysis about the disaster. As its nature, Twitter is a decent place to discuss and debate over almost everything including natural disaster. That is why many people - even if they are not expert in the field of natural disaster - are eager to express their opinion about it.

Lastly, the media category which is different from the other categories since the nature of media is to disseminate information. However, we also found out that media uses Twitter to gather additional information regarding the natural disaster. For instance, during the tsunami in Palu, several international media channels asked permission to Twitter users whether they can use the video footage as a source for their media. This fact is unique due to how thin the line between media and individual. In social media, everyone can be a content creator and consumer at the same time.

4. Discussion

Based on digital observation during the three current natural disasters in Indonesia, we classify several functions related to Twitter and disaster communication. The table below summarizes our findings in this preliminary study.

Table 1. Different Twitter functions during natural disasters in Indonesia

Institutions	Individual	Media
• Disseminating information • Fundraising • Showing organizational support • Coordinating for rescue efforts	• Expressing support and empathy • Crowdsourcing • Distributing false news • Displaying amateur analysis	• Stating facts and information • Gathering additional information

These findings are in line with the previous study by Alexander (2014), who stated that in emergencies social media can be used in seven ways, from listening to public debate to enhancing research. However, we have not found the enhancing research function during digital observation from August 2018 to December 2018. Also, on the high note, most Twitter users in Indonesia do not use social media to undermine the government or local authorities. These users are capable to differentiate between natural disasters and human errors, also appreciative of government efforts and transparencies.

Most of the most active tweets are from outside of the devastated area, especially since the heavily-impacted are located on the shore and rural areas of Indonesia. When disaster strikes, the electricity will go out and the victims maybe in the position of not able to communicate, both to another victim or to the rescue team. In this period, social media may be utilized to produce disaster-related content and raise awareness of the source of the problem and improve response should the disaster strikes again.

5. Conclusion

Based on the findings, Twitter's functions during natural disasters in Indonesia are showing organizational and individual support, organizing donations, coordinating for rescue efforts, sharing and combating false news, displaying amateur analysis, also gathering additional information. Additional research is needed to build a complete Twitter's framework during natural disaster in Indonesia.

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