Constructing the Cultural Repertoire in a Natural Disaster: The Role of Social Media in the Thailand Flood of 2011

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Abstract
In 2011, Thailand witnessed its worst flooding catastrophe in half a century. In this study, we explored social media as a new and promising weapon to address the physical and morale challenges caused by the natural disaster. A case study was conducted in the context of crisis response, which investigated the use of social media to contribute to the collective cultural repertoire during the natural disaster. By investigating two paths toward the cultural repertoire construction considering different social groups, this study also identified the roles of social media as an information market and an information threshold in the crisis response.

Keywords
Social media, Crisis response, Cultural repertoire, Case study

INTRODUCTION

During the past two decades, along with the intensive development of information and communication technology, the implementations and opportunities provided by social media have been explored (Kaplan and Haenlein 2010). Currently, the use and role of social media have been extensively studied in various contexts. Certain researchers have investigated the technological development and usage of social media (e.g. Eyrich et al. 2008). Other researchers have investigated the influence of communication technology on the social network and social groups (e.g. Lenhart et al. 2010). The various studies assume different definitions of “social media”. Generally, social media is defined after the development of the technology and summarizes its use and effect on social development. Although a formal definition is lacking, "social media" can be conceptually understood as Internet-based applications that carry user-generated content that encompasses media impressions. The content is typically informed by relevant experiences and archived or shared online for easy access by other impressionable users (Xiang and Gretzel 2010). In addition, social media can be viewed as a platform whereby content and applications are no longer created and published by individuals; instead, they are continuously modified by all of the users in a

participatory and collaborative fashion (Kaplan and Haenlein 2010, p.61). The diversity of the definition suggests that an understanding of social media greatly depends on the context of the usage and diffusion of social media itself.

To study the influence of the characteristics of social media and to observe its diffusion and proliferation, we selected the crisis response to the natural disaster occurring in Thailand in 2011 as the context of our study. During a natural disaster, both physical and morale challenges can occur and damage the social groups (Leidner et al. 2009). Social media provides opportunities to alleviate the challenges during the crisis response. Social media is helpful in alleviating physical challenges and can communicate the significance of risk over geographic boundaries (Pan et al. 2012), enabling strong collaborative and cross-sector arrangements (Trumbo 2012) and facilitating evacuation and communication for risk control (Taylor-Clark et al. 2005). Social media also helps alleviate morale challenges, which are detrimental to social groups during a natural disaster. Due to the insecure feelings and panic of the victims, community conflicts may emerge among various participant groups (Quarantelli and Dynes 1977). Social media can facilitate the mental recovery of the victim from economic and life losses during a natural disaster (Harfoush 2009; Smith 2010). However, the theorization of social media during a crisis response in solving physical and morale challenges remains unexplored.

In this study, we argue that a collective *cultural repertoire* can be formed using social media during the crisis response. The cultural repertoire consists of those resources that individuals have selected from the broader societal cultural toolkits of symbols, stories, rituals, and worldviews (Swidler 1986; Weber 2005). We chose the cultural repertoire as our theoretical lens because it is a collection of approaches or rituals for people, formed by enduring a natural disaster to solve emerging problems. During the crisis response, social media can be used to facilitate the elements and the construction of a collective cultural repertoire, which includes a collection of approaches for socially recognized *communicative actions*, habitually enacted responsive *social structure* and a specialized *symbol system* to raise the morale and to introduce a formalized reactive strategy (adpated from Orlikowski and Yates 1994, p.544). In this study, we explore the role of social media in the construction of the cultural repertoire during a crisis response. Thus, our research question is as follows: *How can social media be used in the cultural repertoire construction during a crisis response?*

LITERATURE REVIEW

Social Media and the Crisis Response

Studies on crisis response have grown rapidly because of the large-scale influence and tremendous losses caused by disasters (Leidner et al. 2009; Pan et al. 2012). In addition to the traditional research on the prevention and avoidance of crises (Salmon 1993), researchers have also studied the mental or spiritual damage of victims caused by natural disasters that could be extensively detrimental to the crisis response and recovery (Cutter and Emrich 2005; Junglas and Ives 2009; Nolen-Hoeksema and Morrow 1991). Existing studies have revealed that an efficient crisis response must address the physical and morale problems occurring during the natural disaster. Physical problems emerged because of damage to facilities, large-scale and long-time power failure, traffic blockage, among others (Kenardy et al. 1996; Xie and Li 2006), and to overcome these problems, effective communication must be established to convey the significance of the risk over geographic boundaries (Quarantelli and Dynes 1977), arrangements for strong collaborative actions must be performed by a cross-sector of participants (Maon et al. 2009; Simo and Bies 2007), and a collective strategy for evacuation must be effectively planned and efficiently circulated (Perry 1979; Tsai and Chen 2011). Morale problems are also detrimental to the crisis response and recovery (Bland et al. 1996). Community conflicts emerged due to the insecure feelings and panic (Quarantelli and Dynes 1977). Mental distress and other psychological problems increased due to the loss experienced in a natural disaster (Nolen-Hoeksema and Morrow 1991). In addition, moral hazard increases within the community due to the decrease of moral judgment during a natural disaster, which may amplify the negative emotions and panic among the victims (Cutter and Emrich 2005; Gutmann et al. 2011).

Concerning the problems occurring during a natural disaster, various studies have explored the methods by which technology can facilitate effective communication during a crisis response (e.g., Leidner et al. 2009; Pan et al. 2012). Within the past two decades, because of its unique characteristics, the usage and diffusion of social media has been extensively studied and applied during a crisis response. Although a formal definition is lacking, "social media" can be conceptually understood as Internet-based applications that carry user-generated content that encompasses media

impressions. The content is typically informed by relevant experiences and archived or shared online for easy access by other impressionable users (Xiang and Gretzel 2010). However, social media can also be viewed "as a platform whereby content and applications are no longer created and published by individuals, but instead are continuously modified by all users in a participatory and collaborative fashion (Kaplan and Haenlein 2010, p.61)." Due to the uniqueness of its characteristics, the role of social media has also been studied in various contexts as the complementary of uneven resources (Stephen and Galak 2010; Webster and Trevino 1995), the self-organized community (Guimera et al. 2003), and the self-empowered community that can challenge authority (Burgess and Green 2009; Kietzmann et al. 2011).

To summarize the existing literature about the use of social media in a crisis response, we found that previous research emphasizes the role of social media as the knowledge provider and enabler of information sharing and communication but neglects the role of social media on the influence of social transition during the natural disaster among the participating social groups. Therefore, in this study, we view the application of social media as a vessel for the observation of the general behavior of participants in the natural disaster.

The Cultural Repertoire

To study the general social behavior of the participating social groups during the crisis response, we focused our theoretical lens on the cultural perspective that culture is the behavior of humans who are part of a group and the meanings that the people attach to their actions (Clinard and Meier 2010; Swidler 1986). Culture includes the values, visions, norms, working language, systems, symbols, beliefs and habits of people from similar social groups (Ting-Toomey 2012; Weber 2005). Culture is also the pattern of these collective behaviors and assumptions that are taught to new organizational members as a method of perceiving, thinking and feeling (Alvesson 2012; Matsumoto and Juang 2013). Culture affects the way people and groups interact with each other and with other stakeholders. Therefore, culture can be viewed as a signal and manifestation for the study of the behavior of people during the crisis response.

From a cultural perspective, after we summarized the previous studies on culture, we found that culture itself could be inconsistent with the majority of those studies. The formation of culture was identified as a chronic process based on the intellectual accumulation and formation of habits and procedures (Hetherington 1996; Hofstede 1984). Typically, the culture of a society would not be changed or transformed in a short period (Harrison and Corley 2011; Hudson 2007). To better measure and observe the cultural behavior and transition during the crisis response, a process of *cultural repertoire construction* is theorized in this study. In relation to the cultural transition during a crisis response, cultural repertoire is conceptualized as a collection of effective and efficient approaches to response to the demand during a natural disaster. To elucidate the construction of the cultural repertoire, we build our argument on the conceptualization of the genre repertoire (Levina and Orlikowski 2009; Orlikowski and Yates 1994). This repertoire has been identified as a collection of genres that "established within a particular community serves as an institutionalized template for social action-an organizing structure-that shapes the ongoing communicative actions of community members through their use of it" (Orlikowski and Yates 1994, p.542). This usage, in turn, can reinforce that a genre is a distinctive and useful organizing structure for the community. The cultural repertoire consisting of a collection of cultural resources will also follow the basic construction of "genre repertoires". Therefore, a collective cultural repertoire during a crisis response can be identified as a collection of approaches or rituals for people, formed by enduring a natural disaster to solve emerging problems. During the crisis response, social media can be used to facilitate the elements and the construction of a collective cultural repertoire to raise the morale and introduce a formalized reactive strategy. The collective cultural repertoire includes a collection of approaches for socially recognized *communicative actions* (which suggests the use of social media as an enabler of information sharing and communication), habitually enacted responsive *social structure* (which represents the social status and information disseminating approach of each participant group), and a specialized *symbol system* (which reveals formalized rules and rituals to clarify perceptions during the disaster) (adpated from Orlikowski and Yates 1994, p.544).

RESEARCH METHODOLOGY

The goal of our study is to contribute to the understanding of social behavior during the crisis response using an inductive qualitative approach. Therefore, this case study has been adopted as our research method. For theory

building during our conceptualization of the phenomenon, we followed the process of the structured-pragmatic-situational (SPS) approach (Pan and Tan 2011), which provides incisive and solid procedures.

We selected a natural disaster, the nationwide flood that occurred in Thailand in 2011, to serve as our research context. Prior to the fieldwork, we spent two months scanning both non-technical and technical materials, attempting to locate and conceptualize the phenomenon (Pan and Tan 2011). And the cultural repertoire construction was identified as the "anchor point" for our theoretical guide. Based on the initial research design before the fieldwork, we constructed a "sensitizing device" (Klein and Myers 1999), which served as a guide to our fieldwork in enabling our interviewees to speak from different perspectives (Myers and Newman 2007). During our first visit to Bangkok in March 2013, we conducted 56 interviews. The interviewees came from several social groups that actively participated during the crisis response, which included administrative agencies, NGOs (non-government organizations), online opinion leaders, student volunteers and victim groups. The majority of the interviews were conducted in Thai, and the transcripts were created and translated by professionals fluent in both Thai and English. After the fieldwork, we adopted selective coding (Strauss and Corbin 1998) based on the interview transcripts. After identifying the quotes related to our conceptual argument, we developed our initial theoretical framework and revised it during intensive discussions within our research team for another two months until we reached theoretical saturation (Glaser and Strauss 1967), indicating that the inductively derived model can comprehensively account for the case data (Eisenhardt 1989; Pan and Tan 2011).

CASE DESCRIPTION

The Thailand flood of 2011

In 2011, Thailand suffered from its worst flooding in half a century, leaving severe impairments to the country's economy, industrial sector, and society. Factors that contributed to the flood crisis ranged from natural to manmade. Consequently, from June 2011 to January 2012, the flood ultimately submerged 65 of Thailand's 77 provinces, including seven major industrial estates north of Bangkok, leaving 815 dead and 13.6 million affected. Floodwaters inundated 90 billion square kilometers of land, more than two-thirds of the country, ranking the natural disaster as the world's fourth costliest disaster as of 2011. The disaster was caused by Thailand's tropical savanna climate, which leaves Thailand extremely vulnerable to flooding during the monsoon season. However, in 2011, the situation became particularly severe. During the flood, the potential for the use of technology and social media was revealed. While the mainstream media was focused on the national election held on July 3, 2011, most of the Thai people, especially those living in Bangkok, were unaware of the floods that had begun in the north. The new government took office at the same time that the floods began to spread to the central part of Thailand, which presented immediate challenges for the effective management of the escalating crisis. Social media, such as Facebook and Twitter, played a key role during the flood emergency.

Table 1. Bottom-up Process of Cultural Repertoire Construction

Toward the construction of the social structure in collecting and disseminating information	*"The reason I followed the information through social media is because it is more reliable and during that time the university was closed so I was more on Facebook almost all the time. And some of my friends shoot and upload a video too." – Victim A* *"During that time, I didn't go anywhere just stayed home and monitored social network, like Facebook, and asked Facebook friends about areas nearby my house, so I can prepare. For example, My friend Moo's house was flooded and we were chatting on Facebook." – Victim B*
Toward the construction of a symbol system to create a positive attitude of crisis response	*"We exchanged information/knowledge on what to do, how to deal with the flood and I can encourage them, make them feel more comfortable and more relax." – Victim C* *"Social media was like our 'first window' where people contact us and then if thing escalate they give us a call on the phone. It helps that we have Thammasat brand attached to our social media community, so anyone that has affiliation with Thammasat (parent, friend and family) then would help share the resources and it spread out rather quickly" – Student volunteer*

Table 2. Top-down Process of Cultural Repertoire Construction

Approach toward the construction of a symbol system to create a positive attitude of crisis response	*"With social media we can post whatever we want so it is exactly what we wanted to say. So in summary, first the speed and second the clarity and validity of the message. But there is also disadvantage. In social media, we have a large group of followers so the information we posted may not be useful for everyone so some of them posted in reply in a sense of complaining or giving negative feedback and it became a big argument where some people agreed and some didn't." – Mr. Wim Rungwattanajinda, Secretary to Minister to Office of the Prime Minister*
Approach toward the construction of the social structure in collecting and disseminating information	*"Social media was a double-edge sword. Once the flood hit, the army need to look for something new that can reach the citizen so we start using Social Media to communicate with the flood victim. They called me in to help as a PR person because I was a movie star and had done PR project for the army before. Social media was deeming a critical tool for the army during the flood." – Colonel Bird, Army Lt-Colonel Wanchana "Bird" Sawatdee*

By reacting to the catastrophe with social media, several social groups participated during the crisis response, including administrative agencies, NGOs, opinion leaders, student volunteers and victims. Through an initial conflict, especially in addressing information collection and dissemination, social media played an important role in enabling these groups to construct a cultural repertoire. In this section, we analyze the transition of the community through the natural disaster and identify their approach in alleviating the problems caused by the disaster using social media and identify two process of cultural repertoire construction, the selected evidence was shown in Table 1 and Table 2.

PRELIMINARY FINDINGS

In this section, we illustrate the two paths toward the cultural repertoire construction and explore the role of social media during the cultural transition in a crisis response. Our framework is presented in Fig. 1. While responding to the crisis, based on initial information chaos, information blocks, uneven resources for information collection and dissemination and large-scale panic due to the disaster, a collective cultural repertoire was constructed using social media. To construct a cultural repertoire, the following three elements were identified as indispensable to raise the morale and introduce a formalized reactive strategy: a collection of approaches for socially recognized *communicative actions*, which suggests that social media as an enabler of information sharing and communication; a habitually enacted responsive *social structure*, which represents the social status and information disseminating approach of each participant group*;* and a specialized *symbol system*, which reveals formalized rules and rituals to clarify perceptions during the disaster (adpated from Orlikowski and Yates 1994, p.544). Because previous studies have recognized social media as an enabler of information sharing and communication (Awazu and Desouza 2004; Kaplan and Haenlein 2010; Yates and Paquette 2011), in our framework, we assume social media itself as the medium for communicative actions. Our data supported this assumption that during the flood, the use of social media as a tool for communication became significant among various social groups. In addition to the communicative actions, to construct a collective cultural repertoire, a constant social structure for information sharing and an aligned symbol system for the perception of the entire community should be further discussed in this framework. As we stated in the Case Description Section, two types of social groups could be identified to elucidate two paths for the construction of a social structure and symbol system. Here, we identity the bottom-up and top-down paths as Path A and Path B, respectively (shown in Fig. 1). In the following part in this section, we analyze the procedure and steps of each path.

Two Paths for the Repertoire Construction

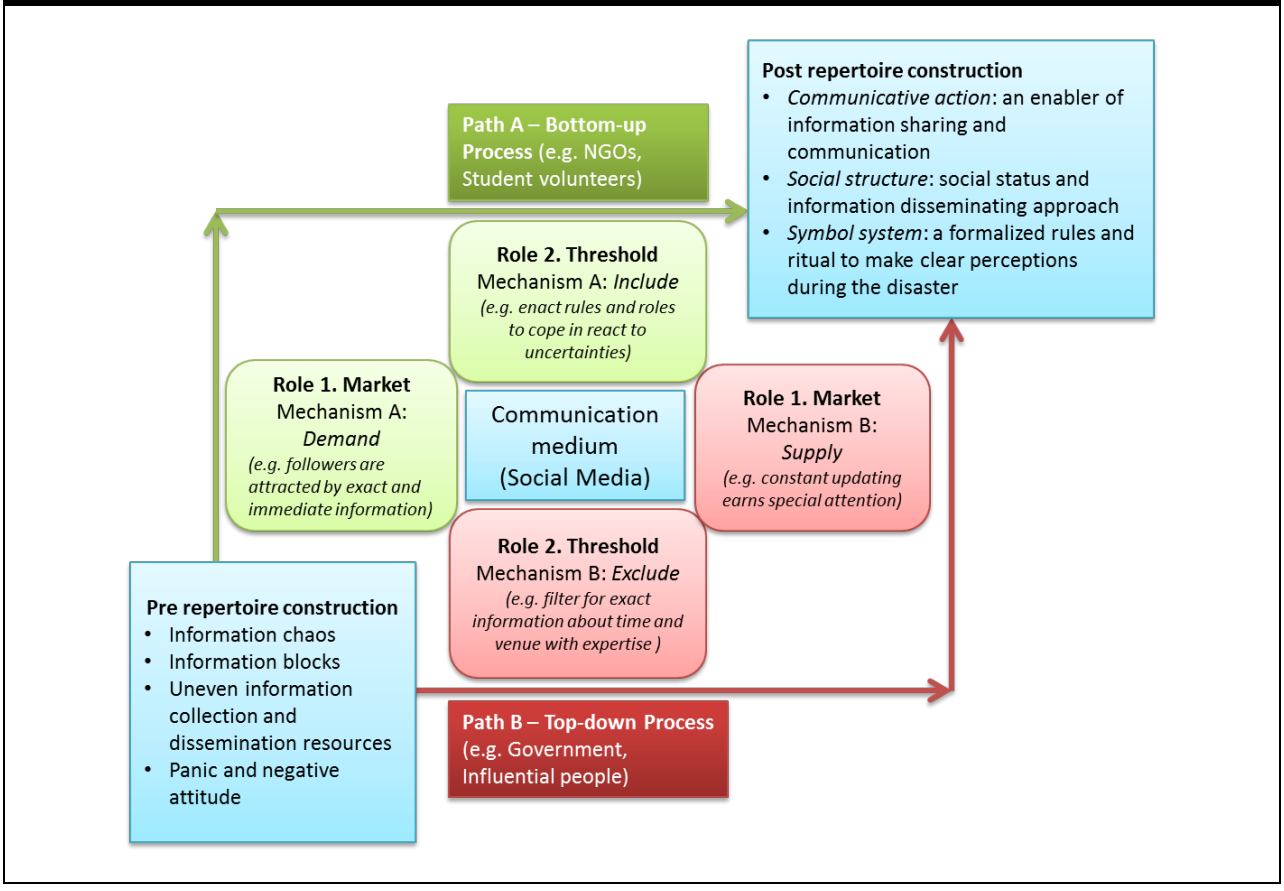
To consider the construction of the social structure and the symbol system, we must discuss how these two elements can be interpreted toward a crisis response. During the natural disaster, all of the community members suddenly fell into a new environment that can be identified as highly uncertain. Faced with the high level of uncertainty, the social structure is inevitably restructured to fit the new environment (Burt 2009; Uzzi 1997). Simultaneously, those social groups initially have a higher status in terms of information, such as administrative agencies and opinion leaders, and they do not lose their power entirely in information collection and dissemination. However, groups, such as student volunteers, NGOs, and victims, need to "claim their voice" before they can actually deliver their information

through social media. Therefore, to argue two sequences in the construction of the social structure and symbol system, two types of social structure were respectfully identified in terms of their initial social status. Fig. 1 below presents the our framework indicate the two processes of cultural repertoire construction.

Path A. The Bottom-up Process

For the social group in Type A, such as NGOs, student volunteers and victims who initially did not own a higher status in terms of information collection and dissemination, to acquire a higher quality of information, they must build up their social structure, which enables them to follow constant roles in receiving and delivering information. To build up their reactive cultural repertoire, they would "trade" information toward building up the social structure and retain their status as the first step in the repertoire construction process to ensure the quality of the information afterwards. This requirement is because during the flood, the uncertainty among social groups relies significantly on their capability of information sharing and communication (Board on Natural Disasters 2002). Therefore, uncertainty decreases after the information is aggregated and further empowers the social groups of this type. Although the requirements of the action create situations of uncertainty, the individuals who have to face them have power over those who are affected by the results of their choice (Crozier 1964; Crozier 1973). The power was created by the prediction of uncertainty based on the accumulated information. Therefore, we interpret the procedure advanced by social groups of Type A as *aggregating*. During this procedure, the information and resources are accumulated to decrease uncertainty and retain power to create a constant social structure.

Fig. 1. Framework of cultural repertoire construction during crisis response



A symbol system for the Type A groups is to be constructed after the social structure is established. For the members of the Type A group, they can only contribute to the collective cultural repertoire once they reach signification through the trade of their information to status. The interview data revealed that after these social groups attained a constant social structure in collecting and disseminating information, they strategized for their

image and fought for a consistent reputation of information quality through rumors and negative reports. During this procedure, the purpose was to create the perception for the public about a ritual or a routine in absorbing a high quality of information, which we conceptualized as *normalizing*. In the context of a high level of uncertainty (such as a natural disaster), people would like to shape their behavior similar to those of the focal leaders or the groups to avoid the risks (DiMaggio and Powell 2000). Therefore, after the social structure was established in the aggregation procedure through normalizing, the social groups improved their status of information to a higher confidence of information quality (Keister 2001) and were recognized as trustworthy so that the public followed them for information about the actual situation and a positive spirit.

Path B. The Top-down Process

Compared with the Type A groups, the Type B groups (such as administrative agencies and opinion leaders) initially enjoys the benefit of a high social status in processing information, especially in information dissemination. However, the limitation of the capacity in information collection restricted the Type B group's influence through social media (e.g., the government was blamed for the lack of efforts in providing immediate and reliable information). This limitation in collecting information was caused by the failure to rectify the information from each area, and the majority of the public expected them to provide reliable information efficiently because they had the power for information dissemination (e.g., traditional channels, such as the TV news report, the government's official website, or an official alert).

However, due to the sophistication of their structure and higher level in social status, members of Type B have access to observe the overall situation of the disaster. This advantage triggered the Type B group to contribute a collective strategy to the cultural repertoire, which was interpreted here as an icon for public trust and beliefs. Therefore, unlike Type A groups, the process of the members in Type B toward the cultural repertoire construction begins with the construction of a symbol system, which covers the icons for the norms and routines in reacting to the natural disaster through social media. In the context of a high level of uncertainty, with an initial sophisticated structure, the groups of Type B tend to follow a methodized approach created by their knowledge and experience. Therefore, the procedure of the groups of Type B can be identified as formalizing, toward homogenized norms and agreement in reacting to the disaster (DiMaggio and Powell 2000).

Once the symbol system is constructed into the cultural repertoire, the social groups regain the public's trust, and a formalized routine is established in information processing. The structure is improved to fit into the new context of the environment (Burt 2009; Uzzi 1997). For the cultural repertoire construction, apart from the sophistication of their social structure before the flood, the members from Type B also need to transit their social structure in terms of information processing, and adapt it into the consideration of uncertainty. In reacting to uncertainty, two perspectives must be considered: 1) risk control and 2) resource efficiency (Das and Teng 1998). For the social groups of Type B who have access to the allocation and strategy for resources, after formalizing for the norms and trust and attaining a signification state within the community, with the consideration of risk control and resource efficiency, they disseminate resources and information through the network (e.g., coordination of the FRVC to volunteer groups) to improve the structure in adapting to uncertainty. We identify this procedure used by Type B groups as *disseminating*, which is in contrast to the procedure adopted by members from Type A groups (as aggregating) toward social structure construction.

CONCLUSIONS AND LIMITATIONS

In 2011, Thailand witnessed its worst flooding catastrophe in half a century. During the disaster, the potential of social media during the crisis response was revealed in several aspects. In this study, we explored social media as a new and promising weapon to address the physical (Majchrzak et al. 2007; Pan et al. 2012) and morale challenges caused by the natural disaster (Quarantelli and Dynes 1977). Unlike the previous research that views social media as a knowledge provider (Velve and Zlateva 2012; Yin et al. 2012) and enabler of information sharing and communication (Awazu and Desouza 2004; Yates and Paquette 2011), in this study, we viewed the application of social media as a vessel for the observation of the general behavior of participants in the crisis response.

Our study contributes to the previous research from the following perspectives. We found that during the crisis response, a collective cultural repertoire (Swidler 1986; Weber 2005) was constructed in reaction to the information blocks, chaos, uneven resources in information collection and dissemination, panic and negative attitudes toward the crisis response. A fulfilled cultural repertoire during the disaster includes a collection of approaches for socially

recognized *communicative actions*, habitually enacted responsive *social structure* and a specialized *symbol system* to raise the morale and introduce a formalized reactive strategy (adpated from Orlikowski and Yates 1994, p.544).

Although previous studies have explored the nature of the cultural repertoire (e.g. Harrison and Corley 2011; Kellogg 2011; Rindova et al. 2011), there has been limited understanding about the process for cultural repertoire construction. After observing and analyzing the behavior of participants from various social groups, we theorized the following two paths toward the cultural repertoire construction: 1) a bottom-up process and 2) a top-down process, according to the behaviors of the two types of social groups. Then, based on the nature of the two types of groups, the elucidated procedures toward the social structure and symbol system were identified as aggregating versus disseminating and normalizing versus formalizing. Due to the extensively high level of uncertainty that remained during the disaster, social groups rely on each other to seek information, knowledge and experience, and they tend to shape their actions similar to those of the focal members and leaders in the community. Our study indicated that there is a demand and supply relationship between the social structure and information during the flood, and social media provides a platform to complement the imbalance.

Despite the theoretical and practical contributions, this study has limitations, which can be considered as important points in directing future research. Due to the context of this study, we were unable to observe broader cultural behaviors other than those related to communicative actions. Therefore, the constructed cultural repertoire was restricted to the collections of communicative cultural resources, such as the norms in collecting information and icons of reliable knowledge. However, this limitation did not narrow our theorization on the role of social media because social media itself is assumed to be the platform of communicative actions, which has been considered as the most important factor for the crisis response.

FUTURE RESEARCH AND EXPECTED CONTRIBUTION

This study is conducted by the primary data from our first round fieldwork. We have planned and accessed for more primary and secondary data from Thailand. In the coming stage of our research, we would like to extend our current progress to explore the role of social media in each process of cultural repertoire construction. We would like to collect more direct evidence from the users of social media (e.g. the comments from Facebook).

Furthermore, this study also expected to make significant contributions to the study of social media. Apart from viewing social media as a medium that enables communicative actions, it also explores the influence of social media toward the behavior transition during the crisis response (Awazu and Desouza 2004; Kaplan and Haenlein 2010; Yates and Paquette 2011). In addition, consistent with the nature of social media, such as the complementary of uneven resources (Stephen and Galak 2010; Webster and Trevino 1995), the self-organized community (Guimera et al. 2003), and the self-empowered community that can challenge authority (Burgess and Green 2009; Kietzmann et al. 2011), this study explores the role of social media toward the cultural repertoire construction. For the two elements of the cultural repertoire (social structure and the symbol system) with different purposes of the two processes, two roles were identified as: 1) information market and 2) information threshold. Using either role of social media, two mechanisms were further conceptualized according to the type of social groups.

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