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Pakhee Kumar

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# Social Media, Disasters, and Cultural Heritage: An Analysis of Twitter Images of the 2015 Nepal Earthquake

By Pakhee Kumar

*This article provides an understanding of the underlying themes and patterns in the photographic images of cultural heritage sites posted on Twitter immediately after the 2015 Nepal Earthquake. An analysis of 6,529 images available in the SMERP data set was carried out to identify and understand the main themes emerging from the discussion on Twitter regarding the damages to cultural heritage sites. Fewer than 10% of the tweets with images available in the data set have cultural heritage sites as the subject. Among them, six main themes emerged from the analysis presented. The dominant theme, with 67% of the heritage images posted, involves some kind of situational awareness where Twitter users aimed to communicate the state of heritage sites after the earthquake.*

Online social networks have changed how we create, interact with, and disseminate news. The availability of smartphones makes instantaneous creation of images and videos possible, and online participatory applications such as Twitter help people not only to create news but also rapidly circulate it, thereby potentially making every citizen also a journalist. This instantaneous creation and circulation of content on social media increases during a crisis. For instance, in Thailand, not only did social media usage increase by 20% during the 2010 flood (Robinson & Wall, 2012), the number of users also increased significantly. Similar trends have been observed in different countries across the world. During the Great Tohoku Earthquake of 2011 in Japan, approximately 1,200 tweets were posted per second<sup>1</sup> (Crowe, 2012). At the same time, numerous images are posted on social media during such events. For instance, Meier (2013) reported that social media use during Hurricane Sandy in 2012 produced a “haystack” of half-a-million Instagram photos and 20 million tweets.

Indeed, crises are becoming increasingly and intensely visual (Vis et al., 2013). As Vis et al. (2013) note, it is through images we discover, explore, and remember such events. It may be partly due to the fact that images are simple, easy to digest, emotionally evocative (Miller & LaPoe, 2016; Seo, 2014), and attention-getting that they are prominently connected to social media (Adami & Jewitt, 2016) during events. Often images are user-generated, bottom-up creations of content as opposed to the authoritative visual agenda setting (Miller & LaPoe, 2016) practiced by mainstream media before Web 2.0. Therefore, images posted during crises not only bear the eyewitness report but also show people’s relationship with the event, place, and technology. Besides, the images show the lack of such a relationship as social media contain a serious amount of irrelevant or redundant content. Despite the irrelevant content, information from social media is often irreplaceable, particularly immediately after the disaster (Castillo, 2016).

Consequently, researchers have studied several aspects of images posted on social media during disasters such as the underlying themes and patterns (Seo, 2014), the implications of images posted (Bozdog & Smets, 2017), the authenticity of images (Gupta et al., 2013), and automatic classification of images (Alam et al., 2018). However, not much attention has been given to cultural heritage in research of social media images posted during disasters. Aiming to bridge this gap in research, this article focuses on the 2015 Nepal Earthquake to answer the following research question:

RQ1: What types of photographic images depicting cultural heritage sites were posted on Twitter during and immediately after the earthquake? What is the dominant theme in images of cultural heritage sites posted on Twitter during and immediately after the earthquake?

This study investigates the use of images of cultural heritage sites during a disaster by utilizing the 2015 Nepal Earthquake as a case study for three reasons. First, the earthquake damaged several cultural heritage sites in Nepal. The Department of Archeology of Nepal (2015) estimated that a total of 743 heritage buildings in 20 districts of Nepal were affected. Out of the 743 buildings, 133 had collapsed, 95 were partially collapsed, and 515 suffered part damages. The postdisaster needs assessment report of the Government of Nepal estimated that the total value of cultural heritage effects (damages and losses) caused by the earthquakes is approximately US\$171 million (National Planning Commission Nepal, 2015). Secondly, a large number of reports were published on Twitter during the disaster, including reports from individual users and mainstream media. Further, several images showing the on-site situation were instantaneously posted on Twitter. Even though a small number of images were posted regarding cultural heritage sites, this article's findings are important to understand the experience of disasters affecting cultural heritage through images. Lastly, the 2015 Nepal Earthquake also provides an understanding of the Nepalese people's relationship with their heritage. Cultural heritage is often considered the most important foundation for constructing, maintaining, branding, and disseminating national identity and citizenship values (Dupree, 2002; Pietro et al., 2018; Soper, 2007). In Nepal, heritage is not only a part of people's national identity but also an important social, cultural, and economic asset. It is an inseparable part of Nepalese people's daily life; these sites include a number of temples that people visit daily for

religious purposes (Bhagat et al., 2018). Cultural heritage sites in Nepal also contribute significantly to the tourism industry, which is a major source of income for the country.

According to a report by the Nepal Telecommunication Authority (2015), mobile penetration was 97% in April–May 2015. However, only about 43% of Nepal's population had access to the Internet during the same period, despite some past attempts to lessen the digital divide. This may be due to several factors such as location, income, age, and education (Zhou et al., 2011). Further, only a small proportion of the Nepalese population active on social media are on Twitter (Statcounter, n.d.). Nevertheless, during the earthquake, Twitter was useful for coordinating the rescue efforts ("Social Media Helps to Locate Millions in the Aftermath of the Nepal Earthquake—ProQuest," 2015) and keeping the people updated with several trending hashtags such as #NepalEarthquake, #NepalQuake, #PrayforNepal, and so on.

The article is structured in four additional sections. The second section conceptually frames this research. The third section describes the data collection and methodology adopted for this research. The fourth section describes the results. The fifth section discusses the implication of this research. The sixth section concludes this article by suggesting possible future works.

## Literature Review

There is a growing interest among researchers to study images posted on social media, despite the difficulties in obtaining images from social media due to limitations of API and methodological challenges (Hand, 2017). Faulkner et al. (2017) present an overview of the current research on social media images by using three methodological approaches: large-scale image analysis, working with images at different scales, and in-depth qualitative analysis of images. Researchers have studied images from many different perspectives, including typology analysis (Hu et al., 2014), spatial and temporal pattern analysis (Hochman & Manovich, 2013), implications of images posted (Bozdog & Smets, 2017; Kharroub & Bas, 2016), and ethics (Gross et al., 2003; Pearl, 2015). Further, models for automatic classification of images posted on social media have been developed (Alam et al., 2018; Nguyen et al., 2017), including images of cultural heritage sites posted in disaster contexts (Kumar et al., 2020).

## *Heritage, Social Media, and Images*

With the advent of social media, heritage is being constantly reshaped and redefined. Social media have also reframed our perception and experience of heritage (Giaccardi, 2012) by providing various participatory methods for interaction. They can also act as a space for knowledge sharing and cocreating and engaging with cultural activities outside the formal institutions (Roued-Cunliffe & Copeland, 2017). Researchers have also studied how cultural institutions utilize social media to enhance participation, the tourism experience, and marketing. The heritage institutions are urged to use social media to connect and encourage visitors' active interaction with heritage (Simon, 2010). However, the findings of Liew et al. (2018) suggest that only about 20% of the institutions interviewed utilized social media to build community and enhance their collections. The majority of institutions instead focused on creating a "chattering space" (Liew et al., 2018, p. 103). Social media are also considered as an effective tool for marketing heritage sites as they act as a facilitator for e-word-of-mouth and are a major factor in consumer decision making (Nicol, 2014). The findings of Pepe and Bournique (2017) suggest that although the use of social media is growing, lack of resources prevents heritage institutions from using social media. Although there may be several challenges for the heritage institutions to actively engage in social media, particularly in developing countries such as Nepal, it does not prevent the visitors or cultural participants from engaging with heritage on social media.

The visual engagement of users with heritage on social media has received the attention of several researchers. Vigolo and Negri's (2015) analysis of 3,001 images posted on TripAdvisor highlighted that only a small number of images posted are of cultural heritage sites and experiences. Their study also emphasized tourists' role in the cocreation of heritage destinations. Researchers have also studied images of heritage circulated on social media. Mozaffari (2017) examined the relationship between the visitation practices and visual representations using images from Google. The analysis established three kinds of photographs: long shots, midrange shots, and close-ups. Further, he concluded that tangible objects are more likely to be photographed, and visitor behavior depends on emotional/cultural links with the site. Farahani et al. (2018) explore the understanding of the historic city of Shiraz using images posted on Flickr, 500px, and Instagram. Their analysis showed that the heritage buildings were the most popular subject of photographs. Moreover, certain buildings and

elements tend to be photographed more than others. In contrast, this article analyzes images of cultural heritage sites posted on social media during and immediately after a disaster.

## *Crisis, Social Media, and Visual Representation*

The importance of images posted on social media during a crisis was highlighted in Peters and De Albuquerque's work (2015). Their analysis of Twitter, Flickr, and Instagram images posted during the 2013 floods in Saxony, Germany, revealed that on-topic messages with images are closer to the event than the posts without images, and the content of images posted provided important information regarding the event. Researchers have done an in-depth qualitative analysis of images to understand the underlying themes and patterns of images posted during a crisis. For instance, Hjorth and Burgess (2014) analyzed the 100 most retweeted images during the 2011 Queensland, Australia, floods to understand the genres and resonating themes in images. Their work revealed the use of vernacular aesthetics in images circulated, especially in "larrikin," a type of Australian humor used as a coping mechanism. Moreover, traditional photographs and a conventional documentary style with do-it-yourself aesthetics were among the most retweeted images. Vis et al.'s (2013) exploratory study of the images tweeted during the 2011 UK riots also considers different types of images posted during the event. Their analysis highlighted 13 different categories of images based on their content, including police cars, burning buses, other vehicles, building, looting, screenshots, police, arrest, the image of text, riot cleanup, and others. Seo (2014) identified themes and frames prominently appearing in a total of 243 Twitter images posted by the Twitter accounts of the Israel Defense and Hamas Alqassam Brigades during the Israeli-Hamas Conflict between November 2012 and January 2013. The author highlighted that resistance and unity were the two main themes in the images posted by Israel; causalities of civilians and resistance were the main themes in Hamas's posts. In contrast, this article explores the themes in social media images of cultural heritage sites posted in a disaster context.

## *Visual Representation and the 2015 Nepal Earthquake*

Researchers have studied various visual aspects of the 2015 Nepal Earthquake. For instance, Hartung (2017) focused on the analysis of *selfies* posted on social media during the disaster. She analyzed two kinds of selfies posted during the 2015 Nepal Earthquake: selfies taken in Nepal

**Table 1** Details of SMERP Data Set

Category	Detail
Date	25.04.2015 to 10.05.2015
Number of Tweets	50,068
Number of Images	6,529
Keywords	Nepal earthquake, Nepal quake

and selfies taken outside Nepal to show support for the Nepalese. The study challenges the notion that selfies *for* and *of* Nepal can be regarded as “good” and “bad” selfies respectively. The ones taken outside Nepal can be seen as “savior citizenship” bearing the witness of global cooperation; the ones taken in Nepal are globally controversial due to the ethical and moral standards that label these images as disaster tourism or disaster porn. Hartung challenges these quick reactions and suggests that selfies are a relational practice that can have strong political resonance with intended or even unintended consequences. Kamil et al.’s. (2016) research, “Did we really #prayfornepal,” analyzed 1,500 images posted on Instagram using the hashtag #Prayfornepal. Their study concluded that seven types of photographs were posted on Instagram using the hashtag. The categories include: (1) broken links, i.e., unavailable due to deletion by the users; (2) irrelevant images, i.e., images that used the #prayfornepal but are not related to the event; (3) selfies not related to the event; (4) Nepal-related photographs not related to the disaster; (5) prayer-related; (6) Nepal Earthquake-related images; and (7) donation or volunteering activity. The most dominant category in their study was found to be Nepal-related photographs not related to the disaster (30.29%). Interestingly, prayer-related images were significantly low (5.11%). Saul and Waterton’s (2017) photo essay explores Nepal’s tangible, intangible, and living heritage with a focus on Katmandu. The authors provide a step toward rethinking the notion of intangible heritage that revolves around assistance, care, and compassion. To the best of my knowledge, no prior study has dealt with images of cultural heritage sites posted on social media during and immediately after the 2015 Nepal Earthquake.

## Material and Method

### Material

This article utilized 6,529 images posted on Twitter from the Nepal Earthquake from the Exploitation of Social Media for Emergency

Relief and Preparedness (SMERP) data set (Moens et al., 2018). The 50,068 tweets in this data set were collected using the keywords “Nepal earthquake” and “Nepal quake.” Table 1 provides details of the data.

As evident from Table 1, the data set was collected using generic disaster keywords with no heritage specific keywords. However, the data set provides information relevant to heritage damaged during the earthquake. Moreover, it is also useful in understanding the attention heritage receives in disasters that also affect people’s life, infrastructure, etc. The collection provides an overview of data posted immediately after the disaster as the collection begins on the same day as the disaster occurred and ends within 16 days. Further, the keywords used for collection did not include any of the popular hashtags for the event, and the collection is not limited to the geolocation of the user. According to Potts et al. (2011), hashtags usage during disasters can get mired due to several reasons, such as inconsistent format, spellings, and word order. Moreover, a small percentage of users provide their geolocation in the tweet. Therefore, this collection is not limited by these factors and provides a diverse view of the event.

Even though the data set does not include the entire data posted on Twitter during this period due to the limitations of Twitter API, it is representative of data posted immediately after the disaster.

### Methods

**Defining Heritage.** The research began with defining heritage for this research. It can be a challenging task as it is intrinsically a complex phenomenon and may contain conflicting meanings (Graham et al., 2000) depending on the context. However, the framework within which heritage is defined remains almost the same, i.e., things and practices from the past that are a part of our present should remain so in the future. This article acknowledges heritage in the form of protected monuments, buildings, and objects, i.e., *what is already established as heritage* by the governments. The strict approach was necessary to be able to create two distinct classes, *heritage* and *not-heritage*, for image analysis.

**Manual Coding of Images.** The methodology adopted in this article involved a qualitative content analysis of 6,529 images in two steps using NVivo, a qualitative data analysis software.

First, the images were manually classified under categories of *heritage* or *not-heritage* by the author.

**Table 2** Classification Details

Category	Description
Heritage	All images of cultural heritage sites (whether damaged or not-damaged, in Nepal or outside Nepal) were classified in this category.
Not-Heritage	All images that did not include cultural heritage sites were classified in this category. It included images that showed other aspects of the 2015 Nepal earthquake and irrelevant images.
Maybe-Heritage	Images that had little or no contextual information to firmly label them as heritage.
Removed	Images in which the content was not visible and, therefore, could not be analyzed.

**Table 3** Coding Scheme

Category	Description
Situation	Images showing the state of cultural heritage sites after the earthquake
Message	Images in which cultural heritage sites were used as a background to convey a message
Memory	Images showing the state of cultural heritage sites before the earthquake, personal images taken before the earthquake, and images of sites damaged in previous earthquakes in Nepal
Practices	Images showing how people used the cultural heritage sites after they were damaged
Screenshots and edited images	Edited images and screenshots of media articles, videos
Heritage from other countries	Images of heritage sites not from Nepal

This was done to prepare the data set for step two by extracting the images depicting cultural heritage sites. It was found that two new categories, *maybe-heritage* and *remove*, were needed due to the nature of data from social media, which not only includes irrelevant images but also indecipherable images. The coding scheme is explained in Table 2.

Secondly, the images classified under the heritage category were classified again using the grounded theory method (Bryant & Charmaz, 2007). The categories emerged initially from a close engagement with data. A process of constant comparison led to understanding the underlying theme and patterns. The final classification scheme is explained in Table 3.

As a heritage professional with several years of work experience in the field, I carried out the preparation of the data set for step two. Significant expertise and time were required for this task, particularly in the first step to distinguish images of heritage sites from the rest of the images. Official news sources, the Department of Archeology of Nepal's website, and heritage professionals working on site were consulted before step one to ensure accuracy in

the task. On the other hand, the coding scheme in step two was verified by two additional coders, as explained in the following section.

**Verification of Coding Scheme.** To test the reliability of the coding scheme, two additional coders and I coded a sample of 30 images from the heritage category. One of the coders is a heritage professional with work experience in postearthquake Nepal; the other coder's background is computer science. The reason for the selection of coders from different backgrounds was to test the robustness of the coding scheme and highlight the complexity of the task.

Cohen's kappa (Cohen, 1960) was calculated to identify intercoder reliability per category. Table 4 shows the kappa (k), percentage of agreement, and agreement level (Stolwijk et al., 1996) for each category. The intercoder reliability of "message" was rated as excellent, "memory" as very good, and "situation" and "practices" as good. On the other hand, "screenshot and edited images" and "heritage from other countries" were rated as slight. Slight agreement in these two categories clearly shows the complexity of the task. However, the percentage of agreement

**Table 4** Intercoder Reliability per Category (Kappa and Percentage of Agreement)

Category	K	Percentage of Agreement	Agreement Level
Situation	0.644	75	Good agreement
Message	1	100	Excellent agreement
Memory	0.86	92.9	Very good agreement
Visitation practice	0.736	89.3	Good agreement
Screenshots and edited images	0.333	92.9	Slight agreement
Heritage from other countries	0.3	89.3	Slight agreement

**Table 5** Distribution of the Images Data Set Among the Four Top-Level Classes

Class	Number	Percent
Not-Heritage	5,833	89.4
Heritage	566	8.7
Maybe-Heritage	71	1.0
Remove	59	0.9

indicates good agreement for each of the categories. Therefore, it was decided to retain the coding scheme.

### ***Ethical Considerations***

Ethical decision making in research that draw its data from the Internet can be challenging due to several factors, such as the global reach of the Internet, the diversity of research sites and online communities, and the diversity of research methodologies (McKee & Porter, 2009). Rapidly changing technology and people's practices on the Internet add more complexity in the ethical decision-making process. This research is informed by Markham and Buchanan's (2017) idea that an ethical researcher is present, prepared, honest, reflexive, and adaptable.

This content-based research sought a balance between maintaining the privacy of the users while providing evidence of research, the priority being *what is being done* rather than *who is doing it*. To maintain the privacy of individuals in the photographs while providing evidence of findings, their faces have been covered where their identity could be revealed. This was particularly necessary for selfies, a controversial practice during disasters that would potentially expose a person to negative public exposure, ridicule, and embarrassment.

### **Results**

Table 5 illustrates the result of the first round of classification to identify images of cultural

heritage sites from the entire data set. As evident from the table, the majority of images fall in the *not-heritage* category (5,833) followed by *heritage* (566), *maybe-heritage* (71), and *removed* (59). The results of the following analysis are divided into two parts. The next section briefly describes images that were classified in the not-heritage, maybe-heritage, and remove categories. The section after that answers the research questions of this article.

### ***Not-Heritage Images, Maybe-Heritage, and Removed Images***

The not-heritage category includes several irrelevant images posted during the earthquake. The irrelevant images are not related to the earthquake in any way. Figure 1 (left) shows a sample of irrelevant images. The not-heritage category also includes images related to the Nepal Earthquake that do not depict cultural heritage sites. These images show the damage to infrastructures and lives. It also includes helpline numbers, calls for help, and images of memorial events, as evident in Figure 1 (right).

The *maybe-heritage* category includes images that did not have enough information to label them as *heritage*. However, the presence of a few elements such as building materials or architectural style makes them a potential candidate for the *heritage* category. Figure 2 (left) shows a sample of images in this category.

Images whose contents were not clear were classified in the *remove* category. Mostly, these are



**Figure 1** The not-Heritage category contains both irrelevant images (left) and images from Nepal Earthquake (right) that are not relevant for cultural heritage.



**Figure 2** Maybe-heritage (left) and removed images (right).

**Table 6** Distribution of Images Classified Under the Heritage Category

Class	Percent
Situation	67%
Message	12%
Memory	10%
Visitation practice	5%
Screenshots and edited images	4%
Other country's heritage	2%

pixelated images, as evident in Figure 2 (right).

### Heritage Images

There are six themes in the 566 images of cultural heritage sites posted on Twitter during the 2015 Nepal Earthquake and available in the SMERP data set: situation, message, memory, practice, screenshots and edited images, and other country's heritage sites. The classification scheme is explained in the Methods section.

Table 6 shows the distribution of the types of images posted. The most dominant theme in the images classified under the heritage category is “situation”; 67% of images posted on Twitter during the 2015 Nepal Earthquake mainly showed the state of heritage sites after the earthquake. Twelve percent of the images in the heritage category were used to convey a message such as “Pray for Nepal.” Ten percent of the images depicted some form of personal memory,

the memory of the heritage site, or the memory of a past earthquake. Five percent of the images showed practices, i.e., how people in Nepal used the heritage sites after the earthquake; 4% of the images were screenshots or edited images. Lastly, 2% of the images were of heritage sites outside Nepal.

**Situation.** The analysis shows that 67% of the images posted on Twitter during the earthquake are photographs that show the situation of heritage sites after the earthquake. There are various kinds of images depicting the situation. First, some photographs solely show the situation of the heritage site. Second, the photographs show rescue efforts in heritage sites, both humanitarian and heritage materials. Lastly, before/after images are two juxtaposed photographs showing the original form of the building and the extent of damage the site suffered. Figure 3 shows examples of images classified under this theme.



Figure 3 Images classified under the theme situation.



Figure 4 Images classified under the theme message.

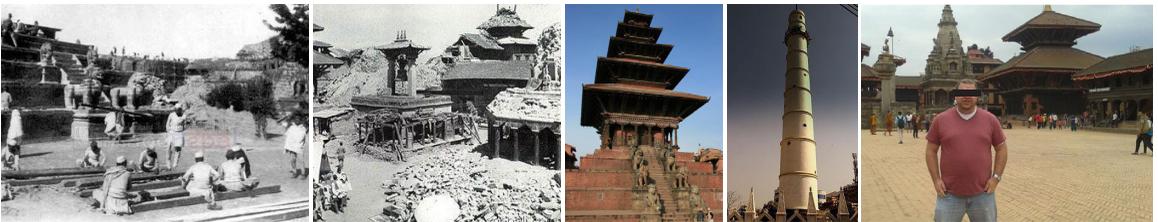


Figure 5 Images showing memories shared.

**Message.** The images classified under this category are edited images with a cultural heritage site as a background to convey sympathy, solidarity, aid, and fundraising messages. During the earthquake, messages such as Pray for Nepal and Stay Strong Nepal were circulated on social media. Images of both intact and damaged heritage sites were used to convey these messages. Moreover, images of heritage sites were also used as a background for conveying important messages such as the phone numbers of the 24-hour control room. Lastly, heritage also served as a background for fund-raising activities after the earthquake. Figure 4 shows examples of such images.

**Memory.** Images were also used to recollect events, the original form of the buildings, and personal memories. Memories of the 1934 earthquake were shared. Images showing the form of buildings before the disaster were also shared, i.e., the original form of the buildings was remembered after the earthquake. Lastly, people shared their photographs in the context of cultural heritage, thereby remembering their visit to cultural heritage sites. Figure 5 shows examples of images classified under this category.

**Visitation Practices.** The images classified under this category represent the practices in the context of cultural heritage in Nepal. The images show people's relation to their heritage. Even after the sites were severely damaged, people continued to pray in these sites. Moreover, the images classified under this category also show the practice of selfies being taken in the context of a damaged heritage site. Figure 6 shows examples of images classified under this category.

**Screenshots and Edited Images.** Screenshots and edited images are not original and/or significantly altered reports. Therefore, these two types were classified under one theme. Only 4% of images in the heritage category were classified under this theme. Images classified in this theme include screenshots of mainstream media reports in TV or newspapers and screenshots of images and videos posted during the earthquake. Moreover, images that were edited to a significant degree were also classified in this theme. Examples of images classified under this theme are provided in Figure 7.

**Other Countries' Heritage Sites.** The analysis shows that images posted on Twitter during the



**Figure 6** Images showing visitation practices around cultural heritage.



**Figure 7** Screenshots and edited images.



**Figure 8** Other countries' heritage sites mainly included images from India.

2015 Nepal Earthquake also included images of heritage sites in countries other than Nepal. Figure 8 shows some examples of images classified under this theme.

### Discussion

This article set out to understand the types of images and dominant theme in the images of cultural heritage sites posted on Twitter during the 2015 Nepal Earthquake. This study adds insights into how images of cultural heritage sites posted during a disaster can contribute to the understanding of underlying values of heritage. The results add empirical evidence to the people's relationship or the lack of relationship with the disaster, heritage, and technology, thereby illustrating the social experience of disasters (Murthy et al., 2016).

The analysis shows that approximately 8.7% of the images available in the SMERP data set were regarding cultural heritage. This is not surprising given that the data set used in this study was not curated for heritage purposes. Moreover, during disasters, the high intensity of redundant, irrelevant data is posted on Twitter (Castillo,

2016). Lastly, cultural heritage forms only a small section of items (in addition to human lives) affected during the 2015 Nepal Earthquake such as infrastructure and other buildings.

The analysis shows that the majority of images posted regarding cultural heritage (67%) showed the current situation of the heritage sites, whether in the form of before/after images, or images depicting ongoing rescue efforts. This research supports the findings of previous studies that recognize microblogging sites such as Twitter as a source for situation updates (Vieweg et al., 2010; Wang et al., 2016). Situational information from images posted on Twitter can help to reduce uncertainties and can be used for rapid damage analysis, particularly immediately after a disaster, a phase often characterized by the lack and need of information to prioritize action (Huang et al., 2010; Zook et al., 2010).

Images of heritage sites were also used to convey messages like "Pray for Nepal" and "Stay strong Nepal." Use of images of the heritage site as a background for conveying prayers, solidarity, aid, and fundraising messages highlight that the built heritage serves as an identity of the nation. It

confirms the researchers' argument that cultural heritage has the ability to represent a place and its people and creates a distinct sense of nationhood (Palmer, 1999) not only for its citizens but also for outsiders both in crises and in times of peace (Akagawa, 2014; Dupree, 2002; Munasinghe, 2005). Moreover, the images classified under the theme "message" highlight that users actively edit, remix, recreate, and reuse images available on the Internet, thereby making images available on the Internet an extremely complex subject (Hand, 2017).

The analysis shows that users posted personal memories, memories of the 1934 earthquake, and memories of sites before the 2015 earthquake. This highlights that Twitter is used not only for instantaneous information dissemination but also for preserving and sharing an individual's memory of events, sites, and visits. Memory plays an important role in shaping people's experience of disasters affecting cultural heritage. *What is remembered* individually and collectively is partly dependent on technologies of memory and sociotechnical practices (Van House & Churchill, 2008). Further, memory also plays an important role in motivating people to organize a response to rescue cultural heritage after a disaster (Kumar, 2020). Interestingly, memory is a unique category in disasters affecting cultural heritage, and it has not appeared earlier in other studies (Castillo, 2016; Murthy et al., 2016). On the contrary, the practice of collective online remembering, commemorating, and curating a crisis has been seen in several cases such as the 9/11 attack, Hurricane Katrina (Recuber, 2012), and the 1984 Bhopal gas leak (Liu, 2012).

Images depicting visitation practice in the cultural heritage sites illustrate that heritage in Nepal is an inseparable part of people's daily life. People continued to pray even after the sites were severely damaged, showing that for the Nepalese, the physical structure is not essential for it to serve as a place for prayer. These images confirm Kunwar and Chand's (2016, p. 32) argument that "heritage in Nepal is deeply connected to the nation's pride, the people's souls, belief and identity," making the heritage sites in Nepal exceptional examples of living heritage (Weise et al., 2015). The meaning and values attributed to heritage are intangible and implicit in understanding any heritage (Akagawa, 2014). The destruction of heritage sites evokes emotions; however, the approach to heritage damage is distinct in each region. The results of this article illustrate Nepalese praying in heritage sites after the disaster. The people of Paris also prayed for heritage after the fire in Norte Dame in 2019.

The practice of selfies represents how heritage sites serve as a context for taking photographs after a disaster. It also represents an inseparable integration of techniques afforded by mobile phones in people's daily lives, which can force them to disregard the condition of the context. This insertion of self in disaster settings certainly raises the question of ethical behavior (Hartung, 2017) and also reconfigures our relationship with death in the virtual world (Ibrahim, 2015). The practice of selfies also illustrates that through social media, events come with multiple interpretations (Cumiskey & Hjorth, 2017).

Images of cultural heritage sites produced and consumed during the 2015 Nepal Earthquake performed multiple functions. First, the images informed the Twitter users about the current situation of heritage sites. Second, the images of the built heritage of Nepal conveyed nationhood during the times of crisis. Third, the images depicted memory of past disasters, sites, and personal visits. Lastly, the images also illustrate the spiritual value of heritage sites for the community and different visitation practices around the sites. Unlike the visual-agenda setting (Miller & LaPoe, 2016) practiced by the mainstream media, images from social media can provide a wide perspective of disasters. Online social networks have truly changed how we create, interact with, and disseminate news during disasters.

### Limitations and Future Work

The article has a few limitations. First, it utilizes only Twitter as a source. Whether results are applicable to other social networking sites, particularly the image-based sites such as Instagram and Flickr, is a matter of future work. Secondly, the study did not distinguish between original tweets and retweets. A study of original tweets may provide a different understanding of the prevalence of themes. Thirdly, the study is limited to the 2015 Nepal Earthquake. Future work can include analysis of images posted during other disasters. A study of online commemorative events of the 2015 earthquake would add to the understanding of how damage to cultural heritage is remembered. Moreover, a comparative analysis of images posted on news media and social media during the disasters affecting cultural heritage would provide an in-depth understanding of image-sharing practices during disasters.

## Note

<sup>1</sup> Although this number is large, it is significantly smaller if compared to 6,939 tweets per second during New Year's Day in Japan in 2011 (Twitter Inc., 2011).

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#### ORCID

Pakhee Kumar  <https://orcid.org/0000-0002-6656-164X>

Pakhee Kumar is an architect and heritage management professional who has a PhD in Analysis and Management of Cultural Heritage from IMT School for Advanced Studies Lucca, Italy. She has worked with many interdisciplinary, international teams and challenging projects in her profession and academic work. Broadly, her research interests are crowdsourcing, social media, and disaster management in cultural heritage. Currently, she works as a Lecturer (Teaching) in Sustainable Heritage and Data Analysis at the Institute for Sustainable Heritage in University College London, UK.  
E-mail: [pakhee.kumar@ucl.ac.uk](mailto:pakhee.kumar@ucl.ac.uk)