

# #Strongerthanwinston: Tourism and crisis communication through Facebook following tropical cyclones in Fiji

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## ABSTRACT

Because the tourism industry can be affected by various natural disasters, the media landscape with increasing social media, brings to tourism new possibilities and challenges in its preparing for, and handling, such disasters. The literature has paid little attention to social media's part in such phenomena. Therefore, this study explores how social media are used by hotels following Tropical Cyclone Winston in Fiji using mixed methods, based on interviews (n = 12) and hotels' real time Facebook posts (n = 1288). While we find that social media were underused in preparing for the disaster and response that followed, it played a crucial role in raising funds and donations during the recovery phase. We apply the social mediated disaster resilience (SMDR) model to allow this study to fill the knowledge gap in organizational disaster resilience literature. We show how social media are integrated in resilience-building and its potential for increasing hotel resilience.

## 1. Introduction

Over the last few years, several tourism destinations have faced severe natural disasters, including earthquakes in New Zealand, hurricanes in the Caribbean, and volcanic activities in Bali. In February 2016, the Fiji Islands were hit by the tropical cyclone Winston (TC Winston), with winds exceeding 300 km an hour. This Category 5 cyclone significantly devastated local Fijian communities and seriously damaged hotel business (Government of Fiji, 2016; Robinson, Harris, Ray, Morrison, & Cross, 2016). Disasters like TC Winston demand preliminary and on-going communication between local communities and tourists. Accordingly, the increase of social media use involves new and faster ways for affected people to prepare and handle disasters (Liu, Palen, Sutton, Hughes, & Vieweg, 2008; Veil, Buehner, & Palenchar, 2011). Previous research into crisis informatics shows how social media are important to disaster communication to warn people, request assistance, and raise funds and donations afterwards for affected communities (Bruns, Burgess, Craford, & Shaw, 2012; Cho, Jung, & Park, 2013).

Yet the role of social media in crisis and disaster communication remains “an embryonic area of research in tourism” (Zeng & Gerritsen, 2014, p. 32). In other words, the studies that have been published cover only three aspects of social media: how they affect how tourists perceive risk, how the media can be used to manage brand and reputation, and how they restore the image of destinations or businesses following

a crisis (Horster & Gottschalk, 2012; Liu, Kim, & Pennington-Gray, 2015; Schroeder, Pennington-Gray, Donohoe, & Kioussis, 2013; Sigala, 2011). So far, from an organizational perspective, research focuses little on how social media is included in tourism businesses' disaster communication strategies. That is, few analyze tourism businesses' ‘real time’ social media use during a disaster to prepare, respond and recover (Houston et al., 2015; Hvass, 2013).

*Resilience* can generally describe the ability of a system to cope with disturbances (Holling, 1973). Walker, Holling, Carpenter, and Kinzig (2004, p. 6) go further to define it as “the capacity of a system to absorb disturbance and reorganize while undergoing change so as to retain essentially the same function, structure, identity and feedbacks”. In organizational research, *resilience* commonly refers to the way a business responds and resists the unfavorable effects of negative events (Annarelli & Nonino, 2016). Unsurprisingly, tourism organizations need to resile from the unpredictable and changing environment that results from significantly impactful natural disasters (Hall, 2017). Nevertheless, business resilience research is fragmented (Linnenluecke, 2015).

Although organizations and communities are often analysed separately in the resilience literature, we suggest that they should be analyzed as being closely interlinked. Firstly, tourism businesses and organizations are not merely commercial enterprises; they also serve as small communities during disasters. Organizations frequently act as emergency responders to sustain damage, to assist its employees and

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customers. Secondly, previous studies from Pacific Island countries show that tourism resorts in the local communities are the main employers and income providers for the local population (Bradly, 2015). In Fiji, the relationship between resorts and host communities can be described as interdependent in that the resorts rely on employing staff and local goods from villages, while some local village businesses ‘piggy back’ on successful resorts, by providing, for example, village stays and nature tours (Bradly, 2015; Movono, Pratt, & Harrison, 2015). Ongoing community projects in line with a resorts’ corporate social responsibility (CSR) initiatives, including donations and development projects, also illustrate the links between Fijian resorts and villages (Scheyvens & Hughes, 2015).

The levels of preparedness and procedures to avoid, minimize and handle the risks and impacts of disasters within the hotel sector are low (Brown, Rovins, Feldmann-Jensen, Orchiston, & Johnston, 2017; Wang & Ritchie, 2012). Thus, there is a need to analyze how communication through social media may be a way of achieving goals for tourism businesses to adapt during disaster, which goes beyond merely reputation management (Brown et al., 2017; Williams, Gruber, Sutcliffe, Shepherd, & Zhao, 2017).

This article explores the use of social media in disaster communication by hotels and its potential as a platform for building organizational resilience. We thus analyze both qualitative and quantitative data from two sources: (1) Facebook data (Facebook posts) from hotels in areas affected by the cyclone, based on location, size and operation, and (2) An interview study with hotel managers in Fiji, conducted in June 2016.

## 2. Literature review

### 2.1. Disaster management and resilience in tourism

The tourism industry is inevitably affected by various external uncontrollable factors, ranging from terrorism, financial crisis to natural disasters. The events sometimes result in relatively minor disturbances, but may cause a significant loss of services, business reputation or even human lives. In the wake of several disastrous events affecting tourism destinations, the last two decades have seen an increasing number of studies discussing crisis management within tourism (Pforr, 2009, pp. 37–52). Because of the overlap between ‘crisis’ and ‘disaster’, many scholars use both terms simultaneously (Faulkner, 2001; Moreira, 2007). Faulkner (2001) distinguishes between the definitions of ‘crisis’ and ‘disaster’, based on whether the cause is due to some internal organizational failure to act in a crisis or an external event over which the organization has no control (e.g., a disaster). He suggests that good management can avoid crises to some degree, whereas disasters are often more unpredictable. With that in mind, this study focuses more on cyclones because they are a natural disaster. Tourism research acknowledges the need for disaster management in different phases of cyclones and other disaster events, stressing the need for prevention, preparedness, response and recovery (Shurland & de Jong, 2008). However, tourism scholars have only recently started to recognize that building community and organizational resilience is important because the industry is vulnerable to disasters (Biggs, Hall, & Stoeckl, 2012; Butler, 2017). In tourism, resilience is widely understood to be the ability of the industry to cope with disaster/crisis so that its stability is sustained with the flexibility and diversity required for future development (Bruneau et al., 2003; Luthe & Wyss, 2014). Resilience was introduced to tourism research during the 1990s to extend the value of biodiversity in tourism development (Lovejoy, 1994).

The literature linking resilience to disaster management is vast. The “4R” model of resilience introduced by Bruneau et al. (2003) has been widely adopted. According to these authors, ‘resilience’ involves *robustness* describes the ability to immediately resist and overcome operational problems; *rapidity* refers to rate that the time required to solve those problems can be reduced; *redundancy* involves substituting

resources and replacing inventories needed to perform critical functions; and *resourcefulness* describes the ability to detect, prioritize and resolve problems by mobilizing resources. While ‘rapidity’ reflects mobilizing resources at great speed, ‘redundancy’ can be viewed as a ‘planned’ operational replacement function to ensure resource availability. The other two properties, ‘robustness’ and ‘resourcefulness’, are highly interrelated, and both refer to the ability to cope with problems during disasters. Bruneau et al.’s 4R resilience model (2003) has been criticized for excluding “how actors acquire resources and how resources are used” (Kapucu & Liou, 2014, p. 183). Zobel (2011) further commented that both robustness and resourcefulness are viewed as “means” rather than the “desired end” to enhance resilience by influencing redundancy and rapidity. Norris and her colleagues (2008) have therefore adapted three properties (namely ‘3Rs’ – *robustness*, *redundancy* and *rapidity*) under *resourcefulness* to highlight the link between resources and resilience.

Therefore, we apply the research model of resilience to crises and disasters within tourism (Cutter, Ash, & Emrich, 2014; Hall, 2010; Hayward, 2013) using the revised 3Rs: robustness, rapidity and redundancy. This means that we separate in our analysis the broader resilience measure, resourcefulness, to the extent of using it as the subject of our second research questions (see Section 2.4). We took this approach to extend most tourism resilience studies that focus both on tourism strengthening destinations economically and its “communities, policy and planning, and sustainable development” (Hall, 2017, p. 55). We also add quantitative research to the tourism literature which, till now, has measured how resilience is applied qualitatively (Luthe & Wyss, 2014).

### 2.2. Organizational resilience in the tourism context: the hotel sector

Tourism organizations, including hotels, are passive in risk assessment and planning in the case of disaster (Lamanna, Williams, & Childers, 2012). Despite the growing literature encouraging the tourism industry to pay more attention to disaster preparedness and prevention, no significant progress is found (Brown et al., 2017; Hystad & Keller, 2008). Within tourism studies, most literature investigates resilience as it is applied to communities. Organizational resilience only began emerging in 2010 (Hall, 2017; Orchiston, Prayag, & Brown, 2016). Furthermore, researchers do not agree about how to define *organizational resilience*. It refers firstly to the capacity to withstand and recover normality after a harmful event happens (Annarelli & Nonino, 2016). Resilience comprises three elements: the ability to adjust (Weick, Sutcliffe, & Obstfeld, 2008), recover (Sutcliffe & Vogus, 2003), and adapt (Gittell, Cameron, Lim, & Rivas, 2006) when dealing with unanticipated challenges. Hotel resilience is defined as “a dynamic condition describing the capacity of a hotel, together with its stakeholders, to assess, innovate, adapt, and overcome possible disruptions that may be triggered by a disaster” (Brown et al., 2017, p. 365, p. 365). A number of papers have focused on the survival of organizations under the premise that resilient organizations will result in a resilient community or destination (McManus, Seville, Vargo, & Brunson, 2008; Orchiston et al., 2016). The measurement of organizational resilience, nevertheless, is still under way with a dearth of works investigating transferable or direct factors (Linnenluecke, 2015).

From the CSR perspective, hotels are often required to care for communities located at their sites, their social development, the surrounding environment, and their own guests and staff (Brown et al., 2017; Henderson, 2007; Lee & Park, 2009). In Fiji and other Pacific island countries, CSR activities by hotels have assisted with local communities with school projects, scholarships and business mentoring, as well as patronizing local food suppliers and improving employment conditions and policies (Bradly, 2015; Scheyvens & Hughes, 2015). Notably, hotels themselves can be viewed as small communities that link to the local communities at large. When a natural disaster occurs, hotels assist by communicating the condition of the destination and its

properties at the times, and by reassuring and showing compassion to both affected individuals and victims (Brown et al., 2017; Henderson, 2007). This means, as well as being small communities themselves (see above), hotels are important to the local community.

### 2.3. Resilience and social media

Only recently, researchers have viewed social media as a way to build community resilience under an emergency/disaster situation albeit within only one case study (Irons, 2015). Based on the '3R' resilience model by Norris, Stevens, Pfefferbaum, Wyche, and Pfefferbaum (2008), social media itself is a robust technology that can be used during emergency when other communication facilities might be dysfunctional (Yin, Lampert, Cameron, Robinson, & Power, 2012). Moreover, social media can increase the speed of communication and information distribution (i.e., *rapidity*) (Ehnis & Bunker, 2012; Irons, 2015). Finally, but importantly, targeted information can be distributed to a larger crowd by being accessible, enabling those targeted to 'crowdsource' and, in turn, increase *replacement*. During September 2017, Facebook averaged 1.37 billion active-daily users (Facebook, n.d.), thus indicating its potential to reach a large audience. Generally, scholars examine how social media detect and document disaster (Huang, Chan, & Hyder, 2010), spread disaster warnings (Acar & Muraki, 2011), send and receive assistance (Taylor, Wells, Howell, & Raphael, 2012), and manage rumors (Ehnis & Bunker, 2012), donations and volunteering (Olteanu, Vieweg, & Castillo, 2015).

In the tourism literature, social media studies relate mostly to tourism marketing and destination management, tourist behavior and travel planning, and information creation and sharing (Leung, Law, Van Hoof, & Buhalis, 2013; Zeng & Gerritsen, 2014). Despite the wide adoption of social media in the tourism industry, the literature regarding its use during crisis remains undeveloped. One exception is a study on the social-mediated crisis communication model that examines the relationship between an organization under crisis and three important publics (i.e., social media followers, influential social media creators, and social media inactives), traditional media, and offline word-of-mouth communication (Austin, Liu, & Jin, 2012).

### 2.4. Development of the model

Because of the obvious gap in the literature regarding how social media relates to disaster and resilience to it, our two research questions address this gap:

**RQ1.** How do hotels use social media for crisis communication during different stages of a disaster (i.e., preparedness, response and recovery)?

**RQ2.** How can social media activities be used to meet the aims of organizational resilience as it relates to resourcefulness?

This study draws on Norris et al. (2008) in two ways: first, we note that they define resilience as a process whereby a network of resources with dynamic attributes is used to respond to a disturbance; and second, to take a 'process' and 'non-context-specific' approach (Taylor & Colvin, 2012), we note that resilience occurs when such resources are sufficiently robust, redundant and rapid (3Rs) to offset disasters. The use of social media in developing these three properties, however, has only been examined recently by Irons and Paton (2017) who link individual social media use and community resilience during a disaster. This use has never been examined with an organizational setting. This study thus develops a modified model, called the *Model of social mediated disaster resilience over time (SMDS)* (see Fig. 1), to explore how social media can contribute to developing resilient organizations.

The model is applied when a disaster occurs. A time axis has been added, illustrating different phases of the disaster. Severity, duration and surprise characterize disasters with 'surprise' modifying the

discrepancy between what is expected and what is experienced, and being more common than predictability especially during natural disasters (Longstaff, 2005). According to the purpose of this study, social media use has been added because of how it relates to the 3Rs by mobilizing resources in robust, redundant and rapid ways and to build adaptive capacities (Fig. 1).

Regarding the 3Rs, robustness refers to the strength of resources and that they will be unlikely to deteriorate. Social media can be useful for disaster communication. Notably, when using social media, the users also become robust resources since they do not need to live in the affected areas nor undergo the devastating effects of a disaster (Irons & Paton, 2017). Rapidity refers to the capacity to assess and use resource efficiently. Social media mobilizes resources rapidly to avoid disruption. Redundancy refers to the extent to which components can be substituted when a disaster disrupts. Social media can solve problems by strengthening social networks through diversifying communication channels.

The 'crisis' hypothesizes a balancing act between disasters and resources leading to three different paths in disaster management. The first ideal outcome after the crisis is *resistance*, whereby resources have effectively endured disasters with no dysfunction. The second outcome refers to transient dysfunction followed by a return to functioning. Robustness, rapidity and redundancy (3Rs) are said to be critical to resources in increasing resilience against the adverse effects of a disaster, which usually dissipate over time when resources have been replenished. Resilience-resources are synonymous with the capacity to adapt using four sets of networked resources: economic development, social capital, information and communication, and collective competence (Norris et al., 2008). Social media can facilitate identifying and allocating resources to: manage urgent demands; strengthen social networks in dynamic recovery settings to grow social capital; create cohesion and connection through story-telling and information sharing; facilitate donation and volunteering, and empower action during disaster response and recovery (Irons & Paton, 2017). *Resilience* thus links resources (a set of adaptive capacities) to outcomes (adaptation) after a disturbance (Norris et al., 2008).

On the other hand, vulnerability occurs when resources are not sufficiently robust, are redundant, or rapidly resist or resile, thus resulting in persistent dysfunction (Norris et al., 2008). According to Nelson, Kokic, Crimp, Meinke, and Howden (2010, p. 11), *vulnerability* describes how a system is susceptible to harm caused by anxiety and its sensitivity, and the capacity to recuperate from it. Our model proposes that social media is important to organizations in reducing their vulnerability and building adaptive capacities during disasters.

## 3. Methods

This study explores Fijian hotels' social media activities following TC Winston, using an approach that combines digital and 'traditional' methods to analyze both qualitative and quantitative data (Rogers, 2015; Venkatesh, Brown, & Bala, 2013). To do so, we apply the model provided by Norris et al. (2008) to local Fijian tourism and acknowledging that social media provides both global setting and networks. The aim is not to gain 'universal' solutions based on the findings, but to provide empirically derived outcomes that are relevant and applicable to other tourism destinations or businesses affected by disasters.

### 3.1. Study context

The literature highlights both challenges and opportunities in developing tourism in Fiji. On the one hand are its positive growth and its role as a foreign exchange earner (Kaufmann & Nakagawa, 2015). Fiji relies heavily on tourism, through its high contribution to GDP, and its significant share in generating direct employment (14.5% & 16%, respectively in 2016) (Harrison & Pratt, 2015; WTTC, 2017). Fiji welcomed 792,000 international visitors in 2016, mainly from Australia,

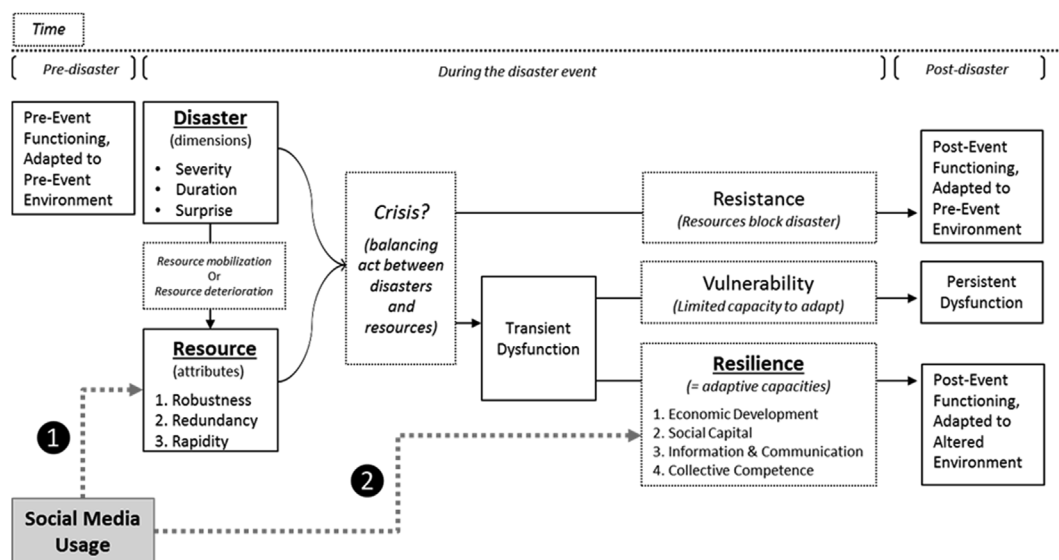


Fig. 1. Model of social mediated disaster resilience over time (SMDR).

(Adapted from Irons and Paton (2017); Norris et al. (2008).

(Note: ❶ Social media use mobilizes resources in robust, redundant and rapid way; ❷ it facilitates resource allocation, strengthen social networks, create connectedness, and empower action during the disaster response and recovery process).

New Zealand and the USA (Fiji Bureau of Statistics, 2018b). On the other hand, land ownership conflicts, the weak links between foreign-owned resorts and the socio-cultural benefits for indigenous communities (Movono et al., 2015), and the use of ethnic stereotypes in marketing Fiji as a hospitable destination and population (Kanemasu, 2015) challenge the role of tourism. Moreover, because it is located in a region subject to tropical cyclones and seismic activity, the Fiji islands experience numerous natural disasters, such as cyclones and severe flooding, which threaten tourism development (Bernard & Cook, 2015).

TC Winston formed near Vanuatu in the South Pacific on 6 February 2016 and made landfall to Fiji's Islands on 20 February 2016. After striking Fiji, it became a Category 5 cyclone, which left significant devastation with more than 40,000 destroyed homes and 44 deaths (Government of Fiji, 2016; Robinson et al., 2016). TC Winston caused extensive damage on the northern coast of the main island, Viti Levu, and the northern district of Fiji (Vanua Levu & Taveuni), thus significantly impacting upon the tourism sector. Around 19 percent of Fiji's 400 tourism businesses were significantly damaged after the cyclone, which costed F\$44 million (Government of Fiji, 2016). In April, Fiji was affected by two other storms: TC Zena, causing severe floods in Nadi and the Coral coast of Viti Levu, and TC Amos, which brought flooding in Vanua Levu. A national state of emergency was applied by

the Fijian Government until 20 April 2016, and travel warnings were issued for Australian and New Zealand travellers.

### 3.2. Data collection

The data set consists of (1) Facebook data (Facebook posts) from hotels in areas affected by the cyclone, based on location, size and operation, and (2) interviews with hotel owners and managers in Fiji, conducted in June 2016.

#### 3.2.1. Facebook study

We selected the hotels for study according to three criteria: (1) that they were located in the TC Winston-affected area; (2) that they had hotel STR-membership to provide a source of data about their scale, class and management (STR, 2017); and (3) that they used Facebook pages. According to Fiji Bureau of Statistics (2018a), Australia and New Zealand were the top two tourism source markets in 2016. National statistics identify Facebook as the leading social network in New Zealand and Australia. In Australia, Facebook had 15 million regular users in 2016, compared with 5 million Instagram users and 2.8 million monthly active Twitter users (Statista, 2018). A sample of 44 hotels met criteria 1 and 2 while, of those, only 38 hotels met criterion 3 because

Table 1  
Hotel sample of this study.

Island	Tourism destination	Impact <sup>a</sup>	Number of hotels <sup>b</sup>	Number of FB-posts	Number of crisis related FB-posts
Viti Levu	Denarau Island	Low	6	201	72
	Nadi	Low	8	166	44
	Sun coast (Rakiraki)	High	3	85	42
Mamanuca islands	Mamanuca islands	High	8	375	239
Yasawa islands	Yasawa islands	High	3	150	15
Vanua Levu	Savusavu	High	3	87	15
Taveuni, Matagi & Laucala islands	Taveuni	High	5	169	30
Lomaiviti islands	Lomaiviti islands	High	2	55	9
<b>Total</b>			<b>38</b>	<b>1288</b>	<b>466</b>

Source: Tourism destinations identified by Tourism Fiji (Tourism Fiji, n.d.).

<sup>a</sup> The impact of TC Winston regarding damage in general and for the tourism sector in particular, were highest in the Western and Northern divisions of Fiji. However, the tourism sector in Nadi and Denarau Island (as parts of the Western division) were left relatively unscathed (Government of Fiji, 2016).

<sup>b</sup> Small-, medium- and large-scale hotels are represented in the hotel sample.

five of them had no Facebook page and one was not operating when the cyclone occurred. The hotels operate within eight Fiji tourism destinations (see Table 1).

Facebook posts were extracted using the Netvizz application, a tool for exporting Facebook data (from pages and groups) using the Facebook API and temporal metadata from posts, users, ‘likes’ and other reactions, comments and shares (Rieder, 2012, 2013). Using digital methods required us to consider the ethics associated with accessing and handling the online material and any possible threat to participants’ privacy (Sormanen & Lauk, 2016). To prevent such a threat, we took three steps: (1) we included posts only from hotels’ official, public Facebook pages; (2) we did not analyse data derived from individual users; and (3) we do not display the names of individuals and resorts in the posts presented in our ‘findings’ sections.

To capture crisis communication before, during and the immediate period following the cyclone, all posts for each hotel made between 6 February and 4 May 2016 were downloaded into Excel spreadsheets. The posts were analysed both quantitatively and qualitatively. All “posts by page” (n = 1288) were coded manually based on (a) crisis-related (i.e., a y/n), and (b) the core theme and sub-themes of each post (see Table 2). A small pilot sample was used initially both to distinguish different themes more inductively by drawing from results and categories taken from the literature (see Bruns, Burgess, Craford, & Shaw, 2012; Wang, Kim, Xiao, & Jung, 2017). We cross-referenced these themes, revised them, and used them for the remaining sample of hotels.

In our analysis, the objective was to map and analyse the communication strategies used by the hotels, in relation to the SMDR model. Questions relating to measuring the impact and effectiveness of Facebook posts, in relation to the response and actions taken by users and stakeholders are beyond the scope of this study. We used the research of Norris et al. (2008) and Irons and Paton (2017) to qualitatively analyse the texts of crisis-related posts to assess the resilience involved. Research into fundraising has previously been used to assess resilience building through social media (Irons & Paton, 2017; Taylor et al., 2012). Notably, a majority (i.e., 39%) of the posts (n = 182) of the crisis-related posts were classified as “Fundraising, donations and community rebuilding”. We used NVivo 11 to analyze the text of the posts thematically as they relate to the 3Rs and the four dimensions of “adaptive capacities” (see Fig. 1).

### 3.2.2. Interview study

Interviews were conducted with Fijian hotel owners and managers in June 2016. Selection criterion 1 (see Sub-section 3.2.1) was further refined to the degree of impact felt by the hotels from TC Winston ranging from less-affected destinations (Nadi and Denarau island) to severely affected areas (Savusavu and Taveuni). These destinations represent different scales and niches of tourism: Denarau Island is one of the major tourism destination in Fiji with large scale resorts. Nadi is an important tourism hub with its airport and ferries connecting other islands (Yasawas & Mamanucas). Savusavu and Taveuni contain more small-scale resorts and niche tourism (including diving and honeymoon resorts). We initially contacted participants by e-mail, after which we contacted other participants whom the initial contacts had

recommended, a common research enlistment process known as snowballing. Twelve interviews were conducted in the following areas: Denarau island (3), Nadi (2), Savusavu (2), Taveuni (5). Four of the interviews were group interviews, including different representatives from the hotel (e.g., owner, marketing and sales director, manager, staff members). Thus, the study includes a total number of 16 respondents. The semi-structured interviews focusing on how social media was used before, during and after TC Winston. The questions sought data about routines for disaster management and crisis communication, interacting with guests on social media, and fundraising and donation initiatives. The interviews were transcribed and analysed thematically as described in the preceding sub-section.

## 4. Results

### 4.1. Timeline analysis

From Faulkner (2001), who identifies three periods of disaster control, we develop a three-way timeline: (1) pre-disaster, which covers preventive action; (2) response, which addresses urgent needs immediately after the disaster; and (3) recovery, which implements management strategies to improve services continually. However, because the disaster’s impact is felt in various sites, the times need for these three periods tend to fluctuate. Hotels at one destination might have already started their recovery, while others are still responding. The total share and number of crisis-related Facebook posts was found to be relatively low, comprising only 36.2 percent of the total number of posts (n = 1288). There was a significant difference in the numbers of crisis-related posts among different regions:  $\chi^2$  (1, N = 466) = 4.647, p < .05. Hotels located in the severely affected regions generated more (75.1%) crisis-related posts (see Table 3).

Fig. 2 shows the distribution of crisis-related posts in relation to the total number of posts on a timeline for TC Winston, TC Zena and TC Amos. Our dataset shows fluctuations over a larger time span compared with previous studies, which are usually based on larger data set (e.g., Twitter) over a shorter time (Murthy & Gross, 2016). For TC Winston, Facebook activity was more prominent during the recovery phase and, for TC Zena, in the response phase. This may be explained by TC Winston’s more impact. For TC Amos, none of the crisis-related posts mention the storm.

#### 4.1.1. Pre-disaster phase

After analyzing the timeline, we found it difficult to identify a stage of “preparedness” in the hotels’ Facebook postings for any of the three registered cyclones. The first crisis-related TC Winston posts appear on 18 February, two days before landfall. This indicates a focus on response and revealing, reactive rather than, proactive social media activity in Fijian hotels.

Significant gaps between post activity (by page) and reactions (by FB fans/followers) can be identified in the timeline (see Fig. 2). The significant peak of reactions before TC Winston could indicate requests for information, but the data detail the high number of reactions is related to (reduced) airfare campaigns. The crisis-related posts that gained the highest number of reactions before TC Winston involve

**Table 2**  
Core crisis themes and explanations.

Core crisis theme	Information
Warnings, safety info, weather information related to the cyclone	Pre-crisis related. Information based, rely on secondary information and existing routines.
Policies and apologies	Cancellation policies, re-bookings, practical advice, administrative questions. Customer oriented strategies.
Resort report I	Reports of damage, evacuations. Effects of the cyclone (physical damage, problems, facilities).
Resort report II	Reports of rebuilding, clean-up, reopening plans. Pro-active and more positive information. Post-crisis.
Fundraising, donations and community rebuilding	Money, goods, projects. Post-crisis.
Marketing strategies	For example, campaigns and events relating to the crisis (#fjinow). Post-crisis
Other	Key word describing the theme

**Table 3**  
Cross tabulation of Facebook posts and regions.

Regions	Low (different impact)	Frequency	Crisis-related Facebook posts		Total	Sig.
			Yes	No		
			High	Percentage		
Total	Frequency	350	571	921		
	Percentage	75.1%	69.5%	71.5%		
Total	Frequency	466	822	1288		
	Percentage	100.0%	100.0%	100.0%		

Note. \* Pearson Chi-square tests indicate there is a significant difference between groups.

weather updates, flight information and evacuations.

4.1.2. Response

The peak of crisis-related posts is found a couple of days after TC Winston, followed by a rise in the number of reactions. In the response phase, the most prominent crisis-related theme is “Resort Report I & II”, which updates the damage, clean-up process, well-being of guests and staff, and re-opening plans (see Fig. 3). Only a smaller share of the crisis-related posts contains warnings, safety and weather information. During TC Zena, the warnings also seem to trigger a significant number of reactions (see Fig. 4).

4.1.3. Recovery

The use of Facebook posts in the recovery phase is more prominent during TC Winston than TC Zena, which again can be related to severity of the first cyclone. Fig. 4 displays several peaks of crisis-related posts with different themes, and their reaction data. Two of the main peaks relate to fundraising activities and provide links to ‘gofundme’ pages. These do not seem to greatly resonate with fans. Crisis-related posts in the recovery phase also include marketing strategies, with special offers for accommodation and travel and references to the social media campaign #FijiNow.

4.2. Resource attributes (3Rs)

According to Norris et al. (2008), resilience is improved when resources are sufficiently robust, redundant, and rapid to offset disasters, which comprise the 3Rs. These authors define resources as “objects,

conditions, characteristics, and energies that people value” (p. 131). Below, we use our interviews and Facebook posts analysis, and apply the 3R model, to ascertain how hotels use social media generally and Facebook particularly to develop resources and thus promote resilience.

The interview study showed that hotels relied on a mix of both traditional crisis communication and social media. The hotels pointed out that TC Winston arrived earlier than predicted, which also reduced their ability to use crisis communication in the pre-disaster phase. Larger hotels prepared according to established crisis management and communication procedures, involving adding weather updates to guest notice boards, distributing flyers to hotel rooms, and holding meetings and talking individually with guests to inform them.

Social media was recognized as being crucial for quick and effective crisis communication, but also challenging and time-consuming. On the one hand, using Facebook or other social media channels before TC Winston was claimed to be “less prioritized”, because meeting the demands of in-house guests and preparing emergency procedures were essential. On the other hand, the hotel managers were busy answering Facebook messages and e-mails from concerned guests or families arriving from overseas who were seeking updates. Facebook was selected as the main source for crisis communication, partly in that it is used widely by Australians and New Zealanders, partly because they can better select and control messages than with other social media forums.

As an owner, you cannot go up on the forum saying, “don’t worry about us”, like “everything’s fine”, you can only respond if someone says “is Savusavu a problem after the cyclone?” Then you can get up. What I mean is the owners can’t control TripAdvisor, as an immediate source of information (Hotel G, small-scale resort owner, Savusavu).

4.2.1. Robustness

Robustness refers to the ability of resources to tolerate disturbing events and reduce the likelihood of deterioration (Irons & Paton, 2017; Norris et al., 2008). Social media could be considered to be a robust and reliable technological resource, which has the potential of being used even if Wi-Fi is overloaded, since the platforms require low bandwidth (Bird, Ling, & Haynes, 2012). The downside could be that it needs technical infrastructure that might be drastically damaged during disastrous events (Belblidia, 2012). Through social media, people outside of the disaster area who are not as affected by power cuts and technological challenges remain accessible (Kaigo, 2012).

The interview data showed significant geographical variations in

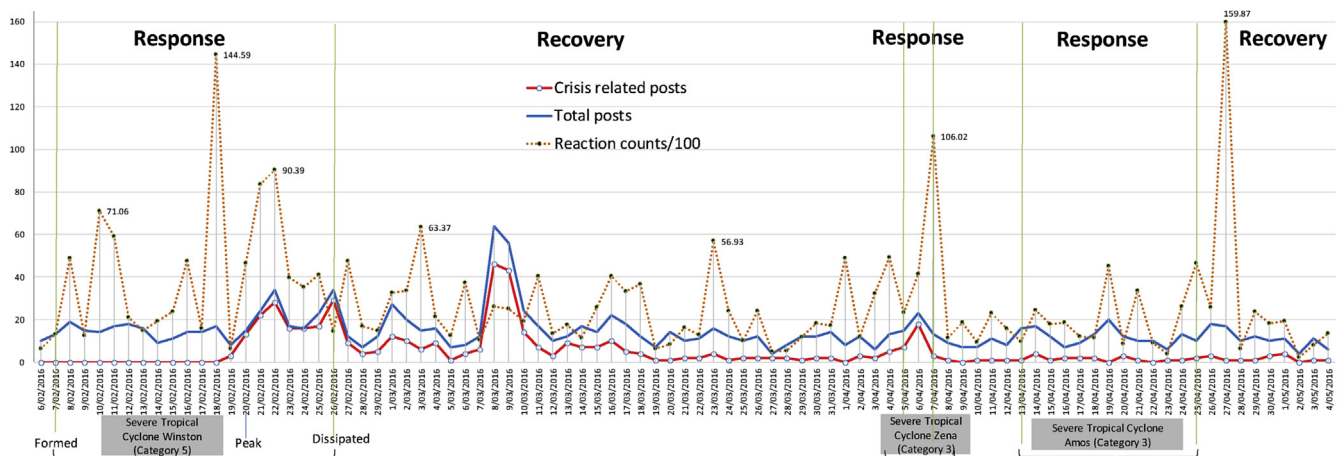


Fig. 2. Frequency for total Facebook posts, crisis-related posts, and reaction counts (/100).

Note: 1) Severe Tropical Cyclone Winston (Category 5): February 10–26, 2016.  
2) Severe Tropical Cyclone Zena (Category 3): April 5–7, 2016;  
3) Severe Tropical Cyclone Amos (Category 3): April 13–25, 2016  
(Reaction counts include likes and comments made by Facebook page fans).

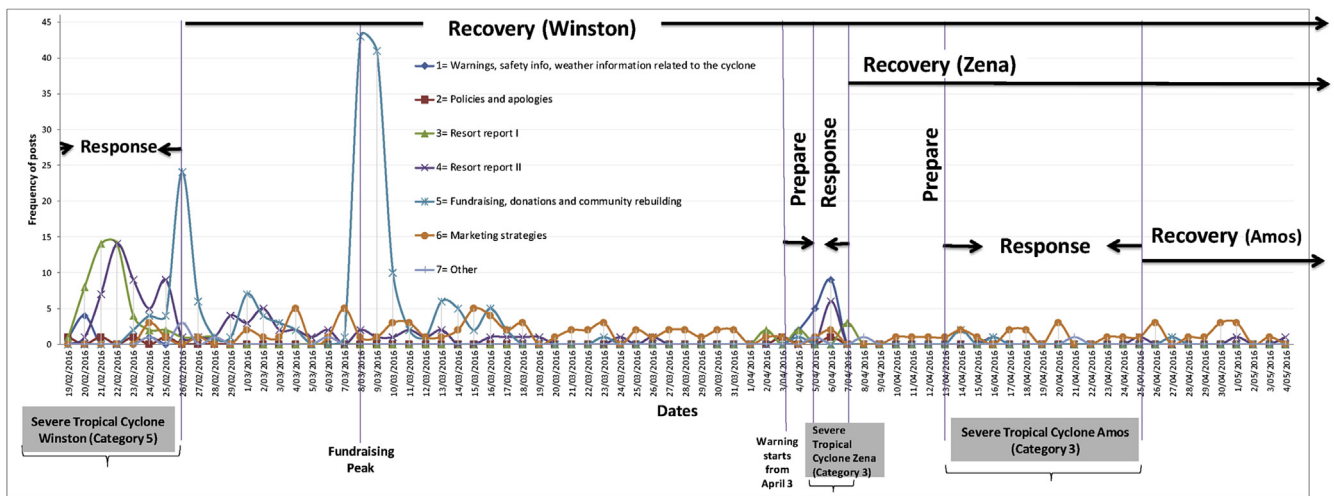


Fig. 3. Frequency of crisis-related posts on Facebook for each theme during the disaster management stages. Note.

- 1) Severe Tropical Cyclone Winston (Category 5): February 10–26, 2016;
- 2) Severe Tropical Cyclone Zena (Category 3): April 5–7, 2016;
- 3) Severe Tropical Cyclone Amos (Category 3): April 13–25, 2016.

the technological robustness provided through social media. On the one hand, Wi-Fi was accessible for larger hotels in Denarau Island and Nadi during TC Winston’s incursion. Our research shows Facebook to be a reliable alternative to communication with guests overseas when the phone lines were down. On the other hand, smaller hotels in more remote areas struggled with Internet connection and signal from mobile phone towers weeks after TC Winston:

(...) we didn’t have communication here ... it was actually further up the island. We had to walk up there and try to get communication. So we didn’t know if the rest of Fiji was destroyed, we didn’t know anything (Hotel K, small-scale resort owner, Taveuni).

Our research participants suggested that being able to remain robust involved relying on people, including the Fijian communities or staff, guests and Facebook fans. The ability to be resilient was described as having local and “natural” origins for the Fijian staff, based on their previous experience and knowledge of cyclones. The resources were mobilised both externally and internally through social media. In the Facebook posts, the hotels thanked guests and fans for contributing to fundraising and bringing donations to staff and local communities. The

posts made it known that the hotels were “back-in-business” and “stronger than Winston”.

However, the interview study revealed a lack of knowledge and experience among staff and management about handling social media in times of crisis. Especially small-scale hotels lacked a social media policy or even basic training in social media. This, in turn, affected their ability to initiate and respond to crisis communication through social media. Larger international chain hotels had more training, routines and back-up for social media use to rely on during the cyclones.

4.2.2. Redundancy

Redundancy relates to the degree to which affected resources can be diversified following a disaster event (Irons & Paton, 2017). This involves finding substitutes for technological systems, new social networks, or solutions in the recovery process (Norris et al., 2008). Social media extends the reach of messages to a larger audience, thus enabling crowdsourcing (Alexander, 2014; Lobb, Mock, & Hutchinson, 2012).

Several hotels in our sample have large and diverse audiences to draw resources from through social media. The number of fans of the hotels’ FB-pages ranges from 1200 to 71,000, of which a majority are

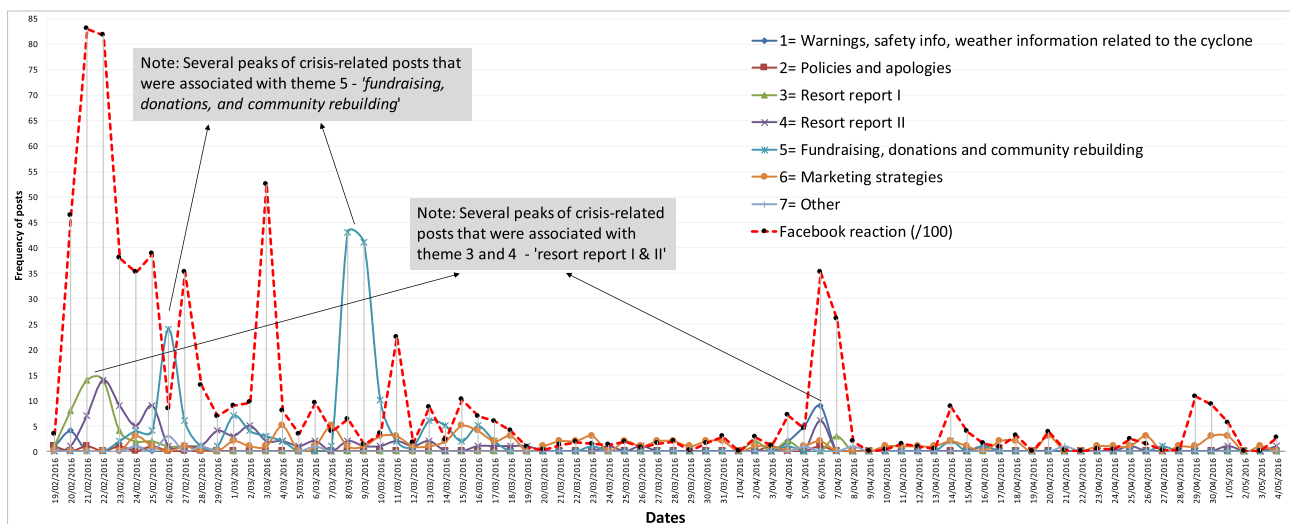


Fig. 4. Frequency of Facebook reaction (/100) related to each theme for crisis-related posts.

users from Australia, New Zealand and the USA. The *Facebook* posts made during the recovery phase also refer to fundraising and crowd funding initiatives, made by users from the main tourist markets.

Regarding technological resources, some hotels were able to mobilize “digital teams” abroad when Wi-Fi was lost or when priority was given to handling in-house guests’ needs. Thus, PR departments overseas could handle posts, questions and comments through social media. This was described as a strategic decision, as a way for the hotel staff to prioritise the contacts with guests in house.

What happens is that I have daily calls with our crisis management team, which is based on the Gold coast (Australia) ... so there will be a representative from social media there to work on that. So I don't have to worry about what is being published, we have a team that will do that for us (Hotel B, large-scale resort manager, Denarau Island).

#### 4.2.3. Rapidity

*Rapidity* applies to drawing resources and assigning tasks from a large audience in a timely manner (Irons, 2015). Irons (2015) suggests that resources are quickly detected and mobilized through social media's posting and sharing, thus indicating that this network can build resilience by increasing the speed of communication. Social media platforms are found to be helpful for online emergent groups to address needs and find available resources quickly (Ehnis & Bunker, 2012; Vieweg, Hughes, Starbird, & Palen, 2010).

The interviewees emphasised the importance of quickly posting updated resort reports after cyclones to include reopening plans, timely marketing campaigns and fundraising activities. The needs to respond quickly are evident in the published *Facebook* posts, that is, they provide plans to collect and distribute funds. The arrival of TC Zena only a few weeks after TC Winston, was described as a challenge to the hotels, especially on Denarau Island:

After the floods and Zena, we communicated that everything was back to normal, but we tried not to mention the cyclones any further ... So the idea was just to within the week after, back to normal, ok, floods and cyclone wasn't much, but then it was back to normal, so we had a daily schedule and every day we posted something relating to food, our associates, activities, normal schedule (Director, Sales and Marketing, large-scale hotel, Denarau Island).

In the aftermaths of the cyclones, a national social media marketing campaign was introduced by Tourism Fiji and representatives from the tourism sector, called #FijiNow. As part of a competition, tourists were encouraged to post their own images of their holidays in Fiji on social media, using the hashtag #FijiNow. The images and posts were in turn used by resorts to show that Fiji was “back in business”. However, our interview study showed that resorts in the northern parts of Fiji knew little about the campaign, even though they faced the most severe effects of the cyclone.

### 4.3. Adaptive capacities

According to Norris et al. (2008), *adaptive capacities* are crucial to community resilience building. What follows explores the four identified sets of networked resources (*economic development, social capital, information and communication and community competence*) related to social media.

#### 4.3.1. Economic development

*Economic development* concerns whether resources are diverse, shared and distributed fairly. Again, social media provides and coordinates resources for individuals with different needs, especially those who might not otherwise have access (Bruns et al., 2012; Cho et al., 2013; Irons & Paton, 2017).

The hotels contributed both directly and indirectly to the well-being

of local communities following TC Winston, by distributing donations and other funds collected through social media. The interviewees emphasised the hotels' social and economic responsibility towards the local communities, partly related to their role as employers, and partly to the existing ties between guests and the local community. A majority of the *Facebook* posts are aimed at collecting staff funds and assistance for the staff's families and villages. The posts contain damage reports from the villages and explain the needs for shelter, food and clothing in the villages following cyclone Winston.

We are already supporting the villages with essential items such as food parcels clothes and building materials. Thank you so much for your generosity towards the villages that have been badly damaged but we know with your care and concern they can be rebuilt to be stronger than before and you will have helped immensely in making this happen. Vinaka from all staff management and villagers at (resort) (Facebook-post, small-scale resort Yasawa islands).

Interviews with smaller hotels in Taveuni and Savusavu show how staff and managers served as “first aid workers” in nearby villages, by providing food, water, clothes and other necessities before national and foreign disaster assistance reached the communities. They immediately understood the needs for assistance and thus served as a hub for volunteers. Some hotel owners expressed distrust in the public disaster relief efforts to distribute funds evenly to more remote villages. Thus, they felt obliged to be responsible for the local communities. One of the smaller hotels in Taveuni raised more than 150,000 FJD through their personal social *Facebook* network of family, friends and previous guests. The funds were used for food and building materials and distributed in cooperation with a local aid organization.

We were every day posting pictures, posting pictures of the receipt of what we bought, what kind of foods. So we kept everybody updated, every day, what we did (Hotel L, small-scale resort staff member, Taveuni).

#### 4.3.2. Social capital

The connection between members of the community (i.e., social capital) improves resilience (Norris et al., 2008). Accessing and mobilizing resources using social media merges individual social networks into social capital (Coleman, 1988; Ellison, Vitak, Gray, & Lampe, 2014; Lin, 2008) by providing “emotional support, mutual trust, and access to social information” (Su & Chan, 2017, p. 260).

Often, social capital emerges through bridges, bonds and links (Wellman, Haase, Witte, & Hampton, 2001; Williams, 2006). Bridging ties are less obvious because they involve distant, casual or novel connections with friends and acquaintances. Bonding ties are more distinct because their support provides emotional, trustworthy and even financial benefits. Even though linking may produce lower social capital, as that between community and external agencies, it can provide influence policies or needed resources (Wellman et al., 2001). *Facebook* is said to have these strong and weak ties (Bakshy, Rosenn, Marlow, & Adamic, 2012). It offers messages broad coverage and thus maintains existing relationships and links strangers to each other (Houston et al., 2015).

From our interviews, we found that the guests' and fans' sense of belonging to a Fijian hotel, resort or a community was important for creating engagement on *Facebook* following TC Winston. Its posts describe the unifying power of the hotel social community in creating personal and long-lasting bonds, in the form of friendship and family relations, between staff members and (returning) guests. Many *Facebook* fans express their concerns, support and empathy for the resort, as exemplified in the following post of one of the hotels:

Sending best wishes to our (resort) family. All our love and best wishes to you all. (...) Hi guys my whole family feels for you and hope that this will help. The Fijian people are just so wonderful and



we look forward to seeing you all in August. Our family would have been visiting you next week. We hope you can recover because we can't wait to see your smiling faces again. Stay strong. See you soon (Facebook-post, medium sized Hotel Mamanuca islands, extract from longer post).

Both new and returning guests are encouraged to share links to raise funds and donations, reach new and wider audiences, and reflect both bridging and bonding forms of social capital.

The social capital between staff members and the local community also became evident in our interview research. Participants described hotel staff as resilient despite their villages being devastated, thus showing strong commitment to the hotel and guests. The team spirit and joint efforts to rebuild and restore the resort after the cyclone was emphasised in the *Facebook* posts and as an important resource.

#### 4.3.3. Information and communication

By information, we refer to the pertinent details that apply to a situation, in our case, the different phases of the cyclone. That information is communicated by those concerned with ensuring that the information is disseminated at a time and in a way that best serves all people affected by the disaster (Norris et al., 2008). Meanwhile, social media have been proven to support information dissemination fully and effectively among users (Huang et al., 2010; White, Plotnick, Kushma, Hiltz, & Turoff, 2009). Irons and Paton (2017) describe how resilience is built partly through access to communication technology and partly as a way of being able to voice and share stories of the events.

Large-scale hotels, which had to connect with many guests in house and those due to arrive to Fiji, strategically used social media for strong and rapid communication during TC Winston. *Facebook* messenger was used as a “private” channel of communication rather than publishing public posts on the hotel's *Facebook* page. Using social media also involved challenges arising from a lack of information control. Some disappointed guests chose to make their service complaints public on social media during the cyclone, rather than addressing the staff directly. These cases were handled individually and guests were contacted through social media and asked to remove their comments.

*Facebook* became a way of sharing stories and testimonials of tourists, hotel staff and people from the local communities. The hotels used the staff's stories to illustrate the effects of the cyclone, and to reveal the damage and impact of the cyclone from a local perspective. On the one hand, the events come with human attributes but, on the other hand, the local population is described as both victims and resilient heroes of the events.

To give you an idea of the challenges our staff are facing we would like to tell you about (staff name) ... During the first part of the storm the roof to (staff) home came off. He took members of his family to his neighbor's house one by one while debris flew all around them. ... He was very fortunate to come out of the storm alive but uninjured. The amazing thing about (staff) is that even though he and his family have lost literally everything they are so happy to still have each other that he can't help but still come to work each day with his huge trademark smile (Facebook-post, small-scale hotel, Rakiraki).

The stories of the tourists are also told in a more heroic way to focus on how tourists contribute with fundraising and donations, but also on their efforts as volunteers. These included images and movies showing volunteer working to clean-up the hotel, as well as rebuilding in other places more severely affected by the cyclone.

#### 4.3.4. Collective competence

The term *collective competence* describes the ability to tackle problems and act purposefully with others and think critically (Irons & Paton, 2017; Irons, 2015). Irons and Paton (2017) show how members of the online community felt empowered to share responsibilities and

respond independently — goals that the traditional command-and-control emergency model hardly achieve. This may in turn entail power struggles between different groups and require flexibility and the ability to creatively and quickly solve new problems and transform circumstances.

Our findings show that social media was used as a way of illustrating how the hotel empowered the guests to act in the recovery process following TC Winston. To do so, they encouraged visitors to return to Fiji and spend money locally to rebuild the destination, buy local crafts, and participate in fundraising. The guests' individual initiatives, achievements and donations are also highlighted in the hotels' *Facebook* posts.

QUOTE OF THE CENTURY\*\*\*\*\* PLEASE EMBRACE AND SHARE THIS Help the people of Fiji by booking your trip to Fiji. ... This is not going to be a typical diving trip. It is not just about us — not just about a vacation ... but a chance to be a Global Citizen - and to bring smiles compassion generosity and true friendship to those we meet. A neat chance for the tourists to be the givers and helpers instead of the Fijian people always being the ones who are giving and helping the tourists divers and visitors ... Donate here (website) #Strongerthanwinston #SuncoastFiji #Compassion (Facebook-post, small-scale hotel, Rakiraki).

The *Facebook*-posts describe tourists' volunteer work in the clean-up process at the hotel, as well as in other places more severely affected by the cyclone. One of the hotels that suffered extensive damage after the cyclone relied on former Australian guests as volunteers to rebuild staff housing. A separate FB-page was set up to raise money for building material in collaboration with a local community foundation. The volunteers' own practical expertise as builders was used to restore the staff homes.

It was like survival actually in a sense for us. We rationed our food. We made sure that we had rations for the staff so they all got flour. They got rice, crackers, water ... we paid them an extra month's salary. So that, when there was downtime, they could try and rebuild their lives. We had the (volunteers) come in. They rebuilt 24 homes. We put up 30 luxury tents, which are 300,000 dollars' worth of tents through the (name) community foundation (Hotel F, small-scale hotel manager, Vanua levu).

## 5. Discussion and conclusion

### 5.1. Adopt a more proactive approach in social mediated disaster communication

After examining how social media is used for disaster communication during the different disaster management stages (RQ1), we find that the results of this Fiji Cyclone case reveal a socially mediated communication strategy approach that predominantly reacted to the disaster. As it unfolded, hardly any crisis-related *Facebook* posts were found during the preparation phase. Interview results also indicated that social media were not considered by most hospitality professionals in the Fiji area as important to communication. Social media were rather seen as an additional and improvised and thus were not used to their fullest potential at the beginning. This finding is consistent with the literature addressing a passive approach to hotel disaster preparedness (Wang & Ritchie, 2012). However, the public became more active online and increasingly expected organizations to monitor and respond to their social media posts quickly (Fraustino, Liu, & Jin, 2012).

Importantly, the variations in disaster dimensions among TC Winston, TC Zena and TC Amos mean that their social media activities result differ greatly. As a Category 5 cyclone first reaching Fiji during the cyclone season, TC Winston extensively damaged the local economy and more greatly confronted people than the two other weaker

cyclones. Therefore, the frequency, themes, and timeline largely altered their crisis-related social media communication.

Overall, resort-reporting posts were identified as the prominent response form during the Fiji disaster response phase. While chain hotels, with their mobilized digital teams and resources, seemed to perform better, concerns are still raised about the overall lack of being prepared. Unfortunately, many Fijian hotels, especially those smaller ones located in the highly impacted areas, were seen to be struggling to disseminate information through social media, so that their expected guests could have neither enquired nor received reliable responses during the disaster. ‘Fundraising’ posts have been identified as the main crisis-related output during the Fiji disaster recovery phase. As Houston et al. (2015) indicate, social media can be used to raise awareness of the impact of a disaster and motivate individuals to donate or volunteer. Lobb et al. (2012) also find that more frequent social media messages about disasters were associated with increased financial donations. Our study further identified that multiple fundraising activities (such as ‘gofundme’ pages) have been conducted via the online social networks. Giving the increasing important role that social media play during and after disasters, it is essential to promote the use of this emerging technology in disaster management among hoteliers and urge the hotel industry to harness its power.

### 5.2. Social mediated disaster resilience over time

To explore how social media activities can be used to enhance organizational resilience relating to resourcefulness (RQ2), we have developed the model of social mediated disaster resilience (SMDR). Our research has helped to explain how social media can be employed during different phases of cyclone events and how resilience-resources can be built along with it. The use of social media has been highlighted not only in the response stage, but also in the post-disaster stages, thus contributing greatly to developing resilience and adaptability as a property of resources (Fig. 5).

First, the Facebook platform has mobilized resources in robust, redundant and rapid ways during the Fiji cyclone disasters. Our results reveal that social media has enabled valuable communication when other channels such as phone lines were damaged (Robustness). Facebook has shown great power to diversify resources by using hotels’

online social networks. Social media has been involved in donations and fundraising, and assisted with diversifying disaster aid and relief funds to reduce vulnerability (Redundancy). Furthermore, social media has also increased the reach and speed of communication among its users via ‘post’ and ‘share’ functions, allowing individuals to spread messages to a wider public (Rapidly).

The data have also shown the ability of social media to build organizational capacities to adapt. During the Fiji cyclones, social media enabled hotels guests, online fans and their social networks to participate in rebuilding, and thereafter strengthen the connection and sense of belonging among members of the hotel community and beyond. Empathy and emotional support expressed through Facebook improved the team spirit and resilience (Social Capital). The cost-effective online marketing campaigns and quickly responsive donations contributed to immediate actions for recovery (Economic Development). Social media has improved the way that information was delivered more quickly and the positive results of using real-time updates and touching stories instead of traditional one-way information (Information and Communication) (Fraustino & Liu, 2018). We also showed that social media provided the means to build collective behaviours and critical thinking so that problems could be solved creatively and quickly (Collective Competencies).

Still, we acknowledge that the lack of knowledge regarding social media's practices among hotel staff, together with the industry's preference for traditional media, has resulted in low use in many properties, especially during the preparedness phase. The model of socially mediated disaster resilience, therefore, has received support from our data, thus shedding light on the link between valuable disaster social media and resilient organizations, a topic that, to our knowledge, has not been addressed before in the literature. In summary, social media use enables hotel organizations to link virtual communities and expand their social capital; therefore, it needs to be considered as an important organizational disaster communication strategy in the resilience-building process.

### 6. Managerial implication, limitation and future direction

Our study suggests that social media, particularly Facebook, has the potential to build hotels' resilience during disasters. The ability to reach

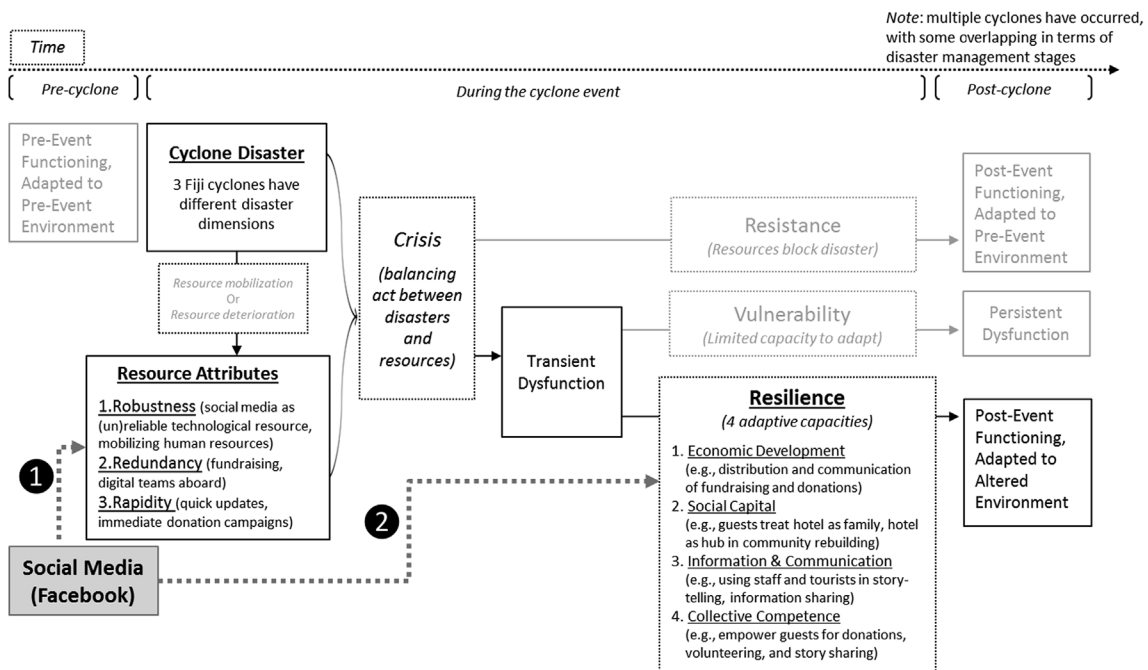


Fig. 5. Social mediated disaster management model for resilience over time (Fiji case with summarised findings).

a relatively large audience of different geographical locations with controlled messages has made social media crucial in not only disseminating crisis information but also providing emotional and physical support before, during and after a natural disaster. Recent years have seen many changes made on social networking sites such as *Facebook* and *Twitter* with many functions being invented to cope with disaster or crisis events such as *Facebook's* safety check. It is, as a result, essential for the hotel industry to know how to use social media when approaching disaster communication.

However, it is evident that hotel staff, even those at the management level, are not prepared when it comes to disaster social media, especially in small hotels. Therefore, social media and its value to disasters should be integrated into hotels' employee and management training and in hotels' emergency planning. This will ensure correct practices in a timely manner. Similarly, if a business can maintain its operative capacity when crisis happens, it can help the wider community to recover and thus enhance the resilience of an organization itself and the community being assisted.

This study is limited to an analysis of hotels' *Facebook* posts as the main source for crisis communication during TC Winston. Thus, other *Facebook* data, such as comments by fans and tourists, images, hashtags or posts by users, could complement future studies and allow them to focus on the engagement and interactions between management and page users in crisis communication. The links between *Facebook* and other social media platforms such as *Instagram* and *Twitter* during a disaster could also be explored, as well as the connections to traditional media channels.

Even though the results of our study show the potential of social media for building organizational resilience, the concrete economic and socio-cultural results of these activities for the local communities need further exploration. Because tourism is central to the Fijian economy and its everyday life, our findings should assist academics interested in developing resilience in communities. In this research, we viewed hotels as small social units strongly linked to a community. We also revealed that the hotel industry is left to deal not only with what hinders its recovery, but must also compensate for the surrounding community's hardship and its rebuilding after a natural disaster. Mobilizing support for staff and local communities through social media can be interpreted as part of a hotel's general CSR and reputation-management strategy. Once the hotels' full services are restored, additional resources will be used to fulfil the need of the social circle beyond the hotels. The suffering community, as a result, could gain support from these smaller social units and quickly recover. In other words, just like the fundamental role of organizations in community's resilience, a resilient hotel industry is at the heart of a tourism destination's resilience. However, the question of whether social media can assist community's resilience, as it does for organizations (as portrayed in our model), goes beyond the scope of this study and requires further research.

#### Author contribution

Dr Cecilia Möller contributed to leading the project in the overall design, research scope, theoretical framework development. She conducted the interview study in Fiji, including transcribing and analyzing the interview material. Dr Jie Wang contributed to study design, theory building, data analysis, manuscript writing and revision. Hanh Thuy Nguyen contributed to this article on literature review, data analysis, and manuscript writing. All authors wrote the manuscript, discussed the results and gave final approval of the version to be submitted.

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#### References

- Acar, A., & Muraki, Y. (2011). Twitter for crisis communication: Lessons learned from Japan's tsunami disaster. *International Journal of Web Based Communities*, 7(3), 392–402.
- Alexander, D. (2014). Social media in disaster risk reduction and crisis management. *Science and Engineering Ethics*, 20(3), 717–733.
- Annarelli, A., & Nonino, F. (2016). Strategic and operational management of organizational resilience: Current state of research and future directions. *Omega*, 62, 1–18.
- Austin, L., Liu, B. F., & Jin, Y. (2012). How audiences seek out crisis information: Exploring the social-mediated crisis communication model. *Journal of Applied Communication Research*, 40(2), 188–207.
- Bakshy, E., Rosenn, I., Marlow, C., & Adamic, L. (2012). The role of social networks in information diffusion. *Paper presented at the proceedings of the 21st international conference on world wide web*.
- Belblidia, M. S. (2012). Building community resilience through social networking Sites: Using online social networks. *Managing Crises and Disasters with Emerging Technologies: Advancements: Advancements*, 25.
- Bernard, K., & Cook, S. (2015). Luxury tourism investment and flood risk: Case study on unsustainable development in Denarau island resort in Fiji. *International Journal of Disaster Risk Reduction*, 14, 302–311. <http://dx.doi.org/10.1016/j.ijdr.2014.09.002>.
- Biggs, D., Hall, C. M., & Stoeckl, N. (2012). The resilience of formal and informal tourism enterprises to disasters: Reef tourism in Phuket, Thailand. *Journal of Sustainable Tourism*, 20(5), 645–665.
- Bird, D., Ling, M., & Haynes, K. (2012). Flooding Facebook - the use of social media during the Queensland and Victorian floods. *Australian Journal of Emergency Management*, 27(1), 27–33.
- Bradly, A. (2015). The business-case for community investment: Evidence from Fiji's tourism industry. *Social Responsibility Journal*, 11(2), 242–257. <http://dx.doi.org/10.1108/SRJ-05-2013-0062>.
- Brown, N. A., Rovins, J. E., Feldmann-Jensen, S., Orchiston, C., & Johnston, D. (2017). Exploring disaster resilience within the hotel sector: A systematic review of literature. *International Journal of Disaster Risk Reduction*, 22(Supplement C), 362–370. <http://dx.doi.org/10.1016/j.ijdr.2017.02.005>.
- Bruneau, M., Chang, S. E., Eguchi, R. T., Lee, G. C., O'Rourke, T. D., Reinhorn, A. M., ... Von Winterfeldt, D. (2003). A framework to quantitatively assess and enhance the seismic resilience of communities. *Earthquake Spectra*, 19(4), 733–752.
- Bruns, A., Burgess, J., Craford, K., & Shaw, F. (Eds.). (2012). *#qldfloods and @QPSMedia: Crisis communication on twitter in the 2011 South East Queensland floods*. Brisbane: ARC Centre of Excellence for Creative Industries & Innovation (CCI).
- Butler, R. W. (2017). *Tourism and resilience*. Wallingford, UK: CABI.
- Cho, S. E., Jung, K., & Park, H. W. (2013). Social media use during Japan's 2011 earthquake: How twitter transforms the locus of crisis communication. *Media International Australia*, 149(1), 28–40.
- Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, 94, 95–120.
- Cutter, S. L., Ash, K. D., & Emrich, C. T. (2014). The geographies of community disaster resilience. *Global Environmental Change*, 29, 65–77.
- Ehnis, C., & Bunker, D. (2012). Social media in disaster response: Queensland Police Service-public engagement during the 2011 floods. *Paper presented at the ACIS 2012: Location, location, location: Proceedings of the 23rd Australasian Conference on information systems: Vol. 2012*.
- Ellison, N. B., Vitak, J., Gray, R., & Lampe, C. (2014). Cultivating social resources on social network sites: Facebook relationship maintenance behaviors and their role in social capital processes. *Journal of Computer-Mediated Communication*, 19(4), 855–870.
- Facebook. (n.d.). Company Information. Retrieved from <https://newsroom.fb.com/company-info/>.
- Faulkner, B. (2001). Towards a framework for tourism disaster management. *Tourism Management*, 22(2), 135–147. [http://dx.doi.org/10.1016/S0261-5177\(00\)00048-0](http://dx.doi.org/10.1016/S0261-5177(00)00048-0).
- Fiji Bureau of Statistics (2018a). Provisional visitor arrivals - 2017. Retrieved from <http://www.statsfiji.gov.fj/latest-releases/tourism-and-migration/visitor-arrivals>.
- Fiji Bureau of Statistics (2018b). Visitor arrival tables. Retrieved from <http://www.statsfiji.gov.fj/statistics/tourism-and-migration-statistics/visitor-arrivals-statistics>.
- Fraustino, J. D., Liu, B. F. (2018). Toward more audience-oriented approaches to crisis communication and social media research. In L. L. Austin, & Y. Jin (Eds.). *Social media and crisis communication* (pp. 82–129). New York: Routledge.
- Fraustino, J. D., Liu, B., & Jin, Y. (2012). *Social media use during disasters: A review of the knowledge base and gaps*. College Park, MD: START.
- Gittell, J. H., Cameron, K., Lim, S., & Rivas, V. (2006). Relationships, layoffs, and organizational resilience: Airline industry responses to september 11. *The Journal of Applied Behavioral Science*, 42(3), 300–329.
- Government of Fiji (2016). Fiji post-disaster needs assessment. Tropical cyclone winston. February 20, 2016. Government of Fiji Retrieved from [https://www.gfdrr.org/sites/default/files/publication/Post%20Disaster%20Needs%20Assessments%20CYCLONE%20WINSTON%20Fiji%202016%20\(Online%20Version\).pdf](https://www.gfdrr.org/sites/default/files/publication/Post%20Disaster%20Needs%20Assessments%20CYCLONE%20WINSTON%20Fiji%202016%20(Online%20Version).pdf).
- Hall, C. M. (2010). Crisis events in tourism: Subjects of crisis in tourism. *Current Issues in Tourism*, 13(5), 401–417.
- Hall, C. M. (2017). Resilience in tourism: Development, theory and application. In J. M. Cheer, & A. A. Lew (Eds.). *Tourism, resilience and Sustainability: Adapting to social, political and economic change*. New York: Routledge.
- Harrison, D., & Pratt, S. (2015). Tourism in Pacific island countries. Current issues and future challenges. *Tourism in Pacific Islands. Current issues and future challenges* (pp. 3–

- 21). London: Routledge.
- Hayward, B. M. (2013). Rethinking Resilience: Reflections on the earthquakes in Christchurch, New Zealand, 2010 and 2011. *Ecology and Society*, 18(4), 37. <http://dx.doi.org/10.5751/ES-05947-180437>.
- Henderson, J. C. (2007). Corporate social responsibility and tourism: Hotel companies in Phuket, Thailand, after the Indian Ocean tsunami. *International Journal of Hospitality Management*, 26(1), 228–239. <http://dx.doi.org/10.1016/j.ijhm.2006.02.001>.
- Holling, C. S. (1973). Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics*, 4(1), 1–23.
- Horster, E., & Gottschalk, C. (2012). Computer-assisted webnography: A new approach to online reputation management in tourism. *Journal of Vacation Marketing*, 18(3), 229–238.
- Houston, J. B., Hawthorne, J., Perreault, M. F., Park, E. H., Goldstein Hode, M., & Halliwell, M. R. (2015). Social media and disasters: A functional framework for social media use in disaster planning, response, and research. *Disasters*, 39(1), 1–22.
- Huang, C. M., Chan, E., & Hyder, A. A. (2010). Web 2.0 and Internet social networking: A new tool for disaster Management? - lessons from Taiwan. *BMC Medical Informatics and Decision Making*, 10(1), 57. <http://dx.doi.org/10.1186/1472-6947-10-57>.
- Hvass, K. A. (2013). Tourism social media and crisis Communication: An erupting trend. In A. M. Munar, L. Cai, & S. Gyimóthy (Eds.). *Tourism social Media: Transformations in identity, community and culture* (pp. 177–192). Bradford: Emerald Group Publishing Limited.
- Hystad, P. W., & Keller, P. C. (2008). Towards a destination tourism disaster management framework: Long-term lessons from a forest fire disaster. *Tourism Management*, 29(1), 151–162. <http://dx.doi.org/10.1016/j.tourman.2007.02.017>.
- Irons, M. (2015). "We can help": An Australian case study of post-disaster online convergence and community resilience (PhD thesis). Australia: University of Tasmania.
- Irons, M., & Paton, D. (2017). Social media and emergent groups: The impact of high functionality of community resilience. In D. Paton, & D. Moore (Eds.). *Disaster Resilience: An integrated approach* (2 ed.). Springfield, Illinois: Charles C Thomas Publisher.
- Kaigo, M. (2012). Social media usage during disasters and social capital: Twitter and the Great East Japan earthquake. *Keio communication review*, 34(1), 19–35.
- Kanemasu, Y. (2015). Fiji tourism half a century on. *Tourism in Pacific Islands: Current issues and future challenges*: vol. 48, (pp. 63–84).
- Kapucu, N., & Liou, K. T. (2014). *Disaster and development: Examining global issues and cases*. Switzerland: Springer Science & Business Media.
- Kaufmann, U., & Nakagawa, H. (2015). Recent developments and changes in demand for tourism in Fiji. In S. Pratt, & D. Harrison (Eds.). *Tourism in Pacific Islands. Current issues and future challenges* (pp. 196–218). London: Routledge.
- Lamanna, Z., Williams, K. H., & Childers, C. (2012). An assessment of Resilience: Disaster management and recovery for greater new Orleans' hotels. *Journal of Human Resources in Hospitality & Tourism*, 11(3), 210–224. <http://dx.doi.org/10.1080/15332845.2012.668653>.
- Lee, S. K., & Park, S. Y. (2009). Do socially responsible activities help hotels and casinos achieve their financial goals? *International Journal of Hospitality Management*, 28(1), 105–112. <http://dx.doi.org/10.1016/j.ijhm.2008.06.003>.
- Leung, D., Law, R., Van Hoof, H., & Buhalis, D. (2013). Social media in tourism and hospitality: A literature review. *Journal of Travel & Tourism Marketing*, 30(1/2), 3–22.
- Lin, N. (2008). A network theory of social capital. *The handbook of social capital*: Vol. 50, (pp. 69–). New York: Oxford University Express.
- Linnenluecke, M. K. (2015). Resilience in business and management research: A review of influential publications and a research agenda. *International Journal of Management Reviews*, 19(1), 4–30.
- Liu, B., Kim, H., & Pennington-Gray, L. (2015). Responding to the bed bug crisis in social media. *International Journal of Hospitality Management*, 47, 76–84. <http://dx.doi.org/10.1016/j.ijhm.2015.03.005>.
- Liu, S. B., Palen, L., Sutton, J., Hughes, A., Lee, & Vieweg, S. (2008). In search of the bigger Picture: The emergent role of on-line photo sharing in times of disaster. *Paper presented at the proceedings of the 5th international ISCRAM conference may, Washington DC, USA*.
- Lobb, A., Mock, N., & Hutchinson, P. L. (2012). Traditional and social media coverage and charitable giving following the 2010 earthquake in Haiti. *Prehospital and Disaster Medicine*, 27(4), 319–324. <http://dx.doi.org/10.1017/S1049023X12000908>.
- Longstaff, P. H. (2005). Security, resilience, and communication in unpredictable environments such as terrorism, natural disasters, and complex technology. *Program on information resources policy*. Cambridge: Harvard University.
- Lovejoy, T. E. (1994). The quantification of biodiversity: An esoteric quest or a vital component of sustainable development? *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, 345(1311), 81–87.
- Luthe, T., & Wyss, R. (2014). Assessing and planning resilience in tourism. *Tourism Management*, 44, 161–163.
- McManus, S., Seville, E., Vargo, J., & Brunson, D. (2008). Facilitated process for improving organizational resilience. *Natural Hazards Review*, 9(2), 81–90.
- Moreira, P. (2007). Aftermath of crises and disasters: Notes for an impact assessment approach. In E. Laws, B. Prideaux, & K. Chon (Eds.). *Crisis management in tourism* (pp. 51–65). Wallingford, England: CAB.
- Movono, A., Pratt, S., & Harrison, D. (2015). Adapting and reacting to tourism development: A tale of two villages on Fiji's coral coast. In S. Pratt, & D. Harrison (Eds.). *Tourism in Pacific Islands. Current issues and future challenges* (pp. 101–117). London: Routledge.
- Murthy, D., & Gross, A. J. (2016). Social media processes in disasters: Implications of emergent technology use. *Social Science Research*, 63, 356–370. <http://dx.doi.org/10.1016/j.ssresearch.2016.09.015>.
- Nelson, R., Kocic, P., Crimp, S., Meinke, H., & Howden, S. M. (2010). The vulnerability of Australian rural communities to climate variability and change: Part I - conceptualising and measuring vulnerability. *Environmental Science & Policy*, 13(1), 8–17.
- Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., & Pfefferbaum, R. L. (2008). Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. *American Journal of Community Psychology*, 41(1–2), 127–150.
- Olteanu, A., Vieweg, S., & Castillo, C. (2015). What to expect when the unexpected happens: Social media communications across crises. *Paper presented at the proceedings of the 18th ACM conference on computer supported cooperative work & social computing*.
- Orchiston, C., Prayag, G., & Brown, C. (2016). Organizational resilience in the tourism sector. *Annals of Tourism Research*, 56, 145–148.
- Pfaff, C. (2009). Crisis management in tourism: A review of the emergent literature. In C. Pfaff, & P. Hosie (Eds.). *Crisis management in the tourism industry: Beating the odds?* (1st ed.). Surrey: Ashgate.
- Rieder, B. (2012). Netvizz. Retrieved from <https://wiki.digitalmethods.net/Dmi/ToolNetvizz>.
- Rieder, B. (2013). Studying Facebook via data extraction: The Netvizz application. *Paper presented at the proceedings of the 5th annual ACM web science conference, Paris, France*.
- Robinson, C., Harris, C., Ray, S., Morrison, I., & Cross, R. (2016). Case study: How a disaster simulation helped red cross prepare for cyclone winston. *Australian Journal of Emergency Management*, 31(3), 12–14.
- Rogers, R. (2015). *Digital methods*. Cambridge, Massachusetts: The MIT Press.
- Scheyvens, R., & Hughes, E. (2015). Tourism and CSR in the Pacific. In S. Pratt, & D. Harrison (Eds.). *Tourism in Pacific Islands. Current issues and future challenges* (pp. 134–147). London: Routledge.
- Schroeder, A., Pennington-Gray, L., Donohoe, H., & Kiousis, S. (2013). Using social media in times of crisis. *Journal of Travel & Tourism Marketing*, 30(1–2), 126–143. <http://dx.doi.org/10.1080/10548408.2013.751271>.
- Shurland, D., & de Jong, P. (2008). *Disaster risk management for coastal tourism destinations responding to climate change: A practical guide for decision makers: United nations environment programme*.
- Sigala, M. (2011). Social media and crisis communication in tourism: Applications and implications for research. *Information Technology & Tourism*, 13(4), 269–283.
- Sormanen, N., & Lauk, E. (2016). Editorial: Issues of ethics and methods in studying social media. *Media and Communication*, 4(4), 63–65.
- Statista (2018). Leading social networks in New Zealand as of January 2018. Retrieved from <https://www.statista.com/statistics/681840/new-zealand-most-popular-social-media-networks/>.
- STR (2017). About. Retrieved from <http://www.strglobal.com/>.
- Su, C. C., & Chan, N. (2017). Predicting social capital on Facebook: The implications of use intensity, perceived content desirability, and Facebook-enabled communication practices. *Computers in Human Behavior*, 72(Supplement C), 259–268. <http://dx.doi.org/10.1016/j.chb.2017.02.058>.
- Sutcliffe, K. M., & Vogus, T. J. (2003). Organizing for resilience. In K. Cameron, J. E. Dutton, & R. E. Quinn (Eds.). *Positive organizational scholarship* (pp. 94–110). San Francisco: Berrett-Koehler.
- Taylor, R. M., & Colvin, H. M. (2012). *Building a resilient workforce: Opportunities for the department of homeland security: Workshop summary*. Washington, DC: National Academies Press.
- Taylor, M., Wells, G., Howell, G., & Raphael, B. (2012). The role of social media as psychological first aid as a support to community resilience building. A Facebook study from 'Cyclone Yasi Update'. *Australian Journal of Emergency Management*, 27, 20–26.
- Tourism Fiji. (n.d.). Places. Retrieved from <https://www.fiji.travel/destinations>.
- Veil, S. R., Buehner, T., & Palenchar, M. J. (2011). A work-in-process literature Review: Incorporating social media in risk and crisis communication. *Journal of Contingencies and Crisis Management*, 19(2), 110–122.
- Venkatesh, V., Brown, S. A., & Bala, H. (2013). Bridging the qualitative-quantitative divide: Guidelines for conducting mixed methods research in information systems. *MIS Quarterly*, 37(1), 21–54.
- Vieweg, S., Hughes, A. L., Starbird, K., & Palen, L. (2010). Microblogging during two natural hazards events: What twitter may contribute to situational awareness. *Paper presented at the proceedings of the SIGCHI conference on human factors in computing systems*.
- Walker, B., Holling, C. S., Carpenter, S., & Kinzig, A. (2004). Resilience, adaptability and transformability in social-ecological systems. *Ecology and Society*, 9(2), 5.
- Wang, R., Kim, J., Xiao, A., & Jung, Y. J. (2017). Networked narratives on humans of New York: A content analysis of social media engagement on Facebook. *Computers in Human Behavior*, 66, 149–153. <http://dx.doi.org/10.1016/j.chb.2016.09.042>.
- Wang, J., & Ritchie, B. W. (2012). Understanding accommodation managers' crisis planning intention: An application of the theory of planned behaviour. *Tourism Management*, 3, 1057–1067. <http://dx.doi.org/10.1016/j.tourman.2011.12.006>.
- Weick, K. E., Sutcliffe, K. M., & Obstfeld, D. (2008). Organizing for high reliability: Processes of collective mindfulness. *Crisis management*, 3(1), 81–123.
- Wellman, B., Haase, A. Q., Witte, J., & Hampton, K. (2001). Does the Internet increase, decrease, or supplement social capital? Social networks, participation, and community commitment. *American Behavioral Scientist*, 45(3), 436–455.
- White, C., Plotnick, L., Kushma, J., Hiltz, S. R., & Turoff, M. (2009). An online social network for emergency management. *International Journal of Emergency Management*, 6(3–4), 369–382.
- Williams, D. (2006). On and off the 'Net: Scales for social capital in an online era. *Journal of Computer-Mediated Communication*, 11(2), 593–628. <http://dx.doi.org/10.1111/j.1083-6101.2006.00029.x>.
- Williams, T. A., Gruber, D. A., Sutcliffe, K. M., Shepherd, D. A., & Zhao, E. Y. (2017). Organizational response to Adversity: Fusing crisis management and resilience research streams. *The Academy of Management Annals*, 11(2), 733–769.

WTTC (2017). Travel & tourism: Economic impact 2017 Fiji. Retrieved from <https://www.wttc.org/-/media/files/reports/economic-impact-research/countries-2017/fiji2017.pdf>.

Yin, J., Lampert, A., Cameron, M., Robinson, B., & Power, R. (2012). Using social media to enhance emergency situation awareness. *IEEE Intelligent Systems*, 27(6), 52–59.

Zeng, B., & Gerritsen, R. (2014). What do we know about social media in tourism? A review. *Tourism Management Perspectives*, 10, 27–36. <http://dx.doi.org/10.1016/j.tmp.2014.01.001>.

Zobel, C. W. (2011). Representing perceived tradeoffs in defining disaster resilience. *Decision Support Systems*, 50(2), 394–403.



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