



UvA-DARE (Digital Academic Repository)

Crisis in the Air: An investigation of AirAsia's crisis-response effectiveness based on frame alignment

Gerken, F.; Van der Land, S.F.; van der Meer, T.G.L.A.

DOI

[10.1016/j.pubrev.2016.09.002](https://doi.org/10.1016/j.pubrev.2016.09.002)

Publication date

2016

Document Version

Final published version

Published in

Public Relations Review

[Link to publication](#)

Citation for published version (APA):

Gerken, F., Van der Land, S. F., & van der Meer, T. G. L. A. (2016). Crisis in the Air: An investigation of AirAsia's crisis-response effectiveness based on frame alignment. *Public Relations Review*, 42(5), 879-892. <https://doi.org/10.1016/j.pubrev.2016.09.002>

General rights

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

UvA-DARE is a service provided by the library of the University of Amsterdam (<https://dare.uva.nl>)



ELSEVIER

Contents lists available at [ScienceDirect](#)

Public Relations Review



Full Length Article

Crisis in the air: An investigation of AirAsia's crisis-response effectiveness based on frame alignment

Fynn Gerken^{a,*}, Sarah F. Van der Land^b, Toni G.L.A. van der Meer^a^a Amsterdam School of Communication Research, University of Amsterdam, Nieuwe Achtergracht 166, 1018 WV Amsterdam, The Netherlands^b Department of Communication and Information Science, Tilburg University, Warandelaan 2, 5000 LE Tilburg, The Netherlands

ARTICLE INFO

Article history:

Received 9 January 2016

Received in revised form 3 August 2016

Accepted 13 September 2016

Available online 27 September 2016

Keywords:

Crisis communication

Situational crisis communication theory

Semantic-network analysis

Frame alignment

AirAsia

ABSTRACT

This study explores the effectiveness of organisational crisis-response strategies and public online response by applying a framing perspective. This has been done to study the crash of AirAsia's flight QZ8501, in which a three-step methodological case study approach has been employed. First, a quantitative content analysis was conducted in order to identify AirAsia's (the sender) crisis-response strategy. Second, a semantic-network analysis was applied to analyse the response from the public (the receiver). Third, an extension of this semantic-network analysis was used to analyse to which extent the framing of AirAsia's online crisis communication had been aligned with the public framing of the crash. The results of the first step indicated that AirAsia predominately used an informational strategy (e.g., *Adjusting Information*). Moreover, the findings of the second and third steps revealed that there was an absence of frame alignment between AirAsia's response strategy and the public's response. Compared to the organisation, the public's reactions revealed more emotional aspects in their framing.

© 2016 Elsevier Inc. All rights reserved.

1. Introduction

On 28 December 2014, the AirAsia flight QZ8501 disappeared from the radar with 162 people on board on its way from Surabaya, Indonesia, to Singapore. This tragedy demonstrates once again that no organisation can entirely avoid a crisis, despite all the efforts spent in anticipating and preventing this. In the unfortunate event of such an aviation crisis, the crash is likely to gain considerable attention from the media, the public, industry and government (Vasterman, Yzermans, & Dirkzwager, 2005). A reason for this attention is that aviation accidents are characterised by their unpredictable character and the high number of fatalities involved in one single event, which triggers extreme emotions in the public sphere such as intense grief and anger (Ray, 1999). Therefore, airlines concerned are often faced with "accusations of blame, irresponsibility, or inadequacy" (p. 1) which can severely impact their organisational reputation (Ray, 1999). This damage to their reputation can eventually lead to bankruptcy, which was recently the case with Malaysian Airlines, when it encountered two crashes within the same year (Coombs & Holladay, 2008; DeBord, 2015).

Organisations can counteract this reputational damage by using crisis-response strategies that are evidence-based (Coombs, 2007b). The most widely acknowledged and evaluated framework in the field of crisis communication is the

* Corresponding author.

E-mail addresses: fynn.gerken@student.uva.nl, fynn.gerken@googlemail.com (F. Gerken), s.f.vdrland@uvt.nl (S.F. Van der Land), vanderMeer@uva.nl (T.G.L.A. van der Meer).

Situational Crisis Communication Theory (SCCT) (e.g., Coombs & Holladay, 2002; Ki & Nekmat, 2014; Liu, Austin, & Jin, 2011). SCCT is relevant because it proposes several crisis-response options so that to be effective it is advised that they are aligned with the crisis situation, crisis history, as well as the organisation's prior relationship with the public (Coombs, 2007b).

Recently, an emerging research avenue in the field of crisis communication is the focus on the concept of framing (Kleinnijenhuis, Schultz, Utz, & Oegema, 2015; Schultz, Kleinnijenhuis, Oegema, Utz, & van Atteveldt, 2012; Snow, Vliegenthart, & Corrigan-Brown, 2007; Van der Meer, Verhoeven, Beentjes, & Vliegenthart, 2014). An organisation's response strategy can be seen as an effort to frame a crisis situation in a certain manner to limit or prevent post-crisis reputational damage (Coombs, 2007b). Framing has been recognised to take on an important role in the evolution of crisis situations (Liu & Kim, 2011) and is acknowledged to be an intrinsic part of the SCCT (Coombs, 2007b). Despite its relevance, relatively limited research attention has been devoted to framing in the field of crisis communication (Van der Meer et al., 2014). Framing has been predominantly examined in a political context (e.g., Semetko & Valkenburg, 2000; Sniderman & Theriault, 2004), as well as in mass communication research (e.g., Cohen-Almagor, 2008; Scheufele, 1999). Previous studies have shown that frame alignment can be seen as an indicator of crisis-response effectiveness (Schultz et al., 2012).

Therefore, this study will argue for an approach that utilises the level of *frame alignment* between the organisation and the public's frames so as to understand the effectiveness of crisis-response strategies. In this study, frame alignment refers to a 'match' between the organisation's efforts to frame the crisis content in a certain way (e.g., in their press releases) and the way it resonates with the public's framing (adapted from Snow, Rochford, Worden, & Benford, 1986; Van der Meer & Verhoeven, 2014). The central research question has been formulated as follows: "How effective was AirAsia's crisis-response strategy after the crash of flight QZ8501?"

After a review of the literature, this paper is structured as follows. First, a quantitative content analysis will be conducted to identify which crisis-response strategy AirAsia applied in order to answer the first research question. Second, a semantic-network analysis is applied to find frames used in the public's reaction to AirAsia's crisis-response to answer the second research question. Third, to answer the third research question, the organisation's crisis-response strategy and the public's reaction will be compared in terms of frame alignment.

The contribution of this study is threefold. First, studies in the field of crisis communication predominantly rely on experimental research (Coombs, 2007b). The conclusions, drawn from experimental results, might not directly relate to the dynamics of an actual crisis, due to an experiment's artificial set up and sample of voluntary participants (Schwarz, 2012). This study applies an innovative method to automatically identify frames embedded in a large collection of texts and statistically tests them on their level of frame-alignment. Based on this analysis, insight can be obtained into the complex crisis dynamics after the AirAsia crash and the effectiveness of the organisation's crisis-response strategy. Second, this study also provides a detailed account of the receiver's responses to the crisis-response strategy, which will offer a more balanced and ecological valid approach. Third, by identifying and comparing the frames of the organisation and the public in an emotionally-charged crisis, this study sheds light on the role of emotions, thereby providing support for prior research that was in favour of including emotions in crisis-response (e.g., Coombs & Holladay, 2008; Van der Meer & Verhoeven, 2014).

2. Theoretical framework

2.1. Corporate reputation and crisis communication

A crisis can severely impact an organisation's financial performance, return on investment, competitive advantage, and may eventually lead to bankruptcy (Coombs & Holladay, 2008; DeBord, 2015). An organisational crisis is defined in this paper as "the perception of an unpredictable event that threatens important expectancies of stakeholders and can seriously impact an organisation's performance and generate negative outcomes" (Coombs, 2007a, pp. 2–3). For an airline carrier, a crash tends to be the most visible form of crisis (Ray, 1999).

Crises can disrupt an organisation's on-going operations, and result in reputational damage if the organisation's communication surrounding the crisis is not dealt with effectively (e.g., Christensen, Morsing, & Cheney, 2008; Coombs & Holladay, 2002). Reputation is defined in this paper as an "individual's collective representation of images of an organisation (induced through either communication or past experiences) established over time" (adapted from Cornelissen, 2011; p. 8). These definitions illustrate that not only information from organisational sources or media outlets could have an impact on the reputation, but also information distributed by other individuals (Coombs, 2007b). The latter point becomes especially important when considering that both organisations and the public have increasingly gained power to distribute information through social media.

2.2. Crisis-response strategies for organisations: informative versus emotional?

Traditionally, scholars made a distinction between four main response categories: (1) *Deny* (2) *Diminish* (3) *Rebuild*, and (4) *Reinforce* (Coombs, 2007b). Following an initial crisis, however, the organisation's first measures should be dedicated to protecting the public, and not focussed on rebuilding the reputation (Coombs, 2007b). Therefore, the first responses issued after a crisis should be *Instructing Information* and *Adjusting Information* (Coombs, 2007b). These first responses can be considered as a Basic (*Base*) response option. The difference between these two responses is that *Instructing Information*

is focused predominately on protecting the public physically (e.g., product recall), while *Adjusting Information* is concerned with the psychological well-being of the victims (Coombs, 2007b).

Scholars in favour of the informative approach argued that it is beneficial to focus exclusively on information for a higher post-crisis reputation (Distaso, Vafeiadis, & Amaral, 2014; Schultz, Utz, & Göritz, 2011). For instance, a study conducted by Schultz et al. (2011) indicated that an informational strategy evokes less reputational damage than a strategy of sympathy or apology. In a similar vein, Distaso et al. (2014) found that the informational strategy enhances credibility, which has been linked to a higher post-crisis reputation. According to their study, organisations should not express emotions in their social media response strategy, as this would only harm their reputations.

On the other hand, certain scholars are in favour of using emotions in crisis-response strategies, argued that using emotional messages is advantageous and that this could protect the organisational reputation (Coombs & Holladay, 2008; Read, 2007; Van der Meer & Verhoeven, 2014). More specifically, Coombs and Holladay (2008) have found evidence that expressing sympathy evokes less reputational damage than solely providing information. In addition, research by Van der Meer and Verhoeven (2014) indicated that the use of emotional cues in the crisis-response enhances the public's acceptance towards messages, reducing feelings of anger, and in turn positively affects the organisation's reputation as perceived by the public. This research showed that the use of emotional messages can help protect the organisational reputation, and thus, concludes that emotions should be part of a crisis-response strategy.

How should an airline company communicate following a major airline disaster considering the large emotional impact in the public sphere? The informative approach would suggest that an airline company's first responses issued after a crisis should be *Instructing Information* and *Adjusting Information* (Coombs, 2007b). However, the emotional approach would suggest that an airline company would display human characteristics such as empathy (Reynolds & Quinn Crouse, 2008). Due to mixed results in the literature on the effectiveness of these two different theoretical stances (Coombs, 2007b; Distaso et al., 2014; Kim & Cameron, 2011; Nabi, 2003), and the exploratory nature of this research, the first research question has been formulated as follows:

RQ1.

Which crisis-response strategy did Air Asia use to communicate after the crisis?

2.3. Framing literature

Framing theory provides researchers with a valuable approach for understanding individuals' interpretations and their constructions of meaning relating to relevant events (Gamson & Modigliani, 1989). One of the first scholars to define the concept was Goffman (1974), who stated that individuals draw on "schemata of interpretation" (p. 21) in order to organise new information and to construct meaning. Further building on Goffman's idea, Gitlin (1980) offered another definition which highlights that "frames are principles of selection, emphasis and presentation composed of few tacit theories about what exists, what happens, and what matters" (p. 6). With the goal to bring the various fields together and create an overarching discipline, Entman (1993) presented the definition: "to frame is to select some aspects of a perceived reality and make them more salient in the communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation and/or treatment recommendation for the item described" (p. 52), this definition has established itself as standard reference for the framing researcher. Thus, frames serve as a device to organise experience and direct action (Snow et al., 1986), by drawing individuals' attention to specific aspects and by making them more salient (De Vreese, 2005; Druckman, 2001).

So far, framing research has predominantly focused on frames in media content, often overlooking the public's role in the framing process (Borah, 2011). Especially with the rise of digital media, the public has increasingly gained power to influence the collective construction and negotiation of frames, as resources become more equally distributed (McQuail, 2010). This might have important ramifications for organisations in times of crises. For instance, frames constructed by the online public can influence frames of other actors, such as the media (Neuman, Guggenheim, Jang, & Bae, 2014; Zhou & Moy, 2007). Therefore, it is crucial to understand the role of the public in times of crisis and their frame construction on social media further.

2.4. Social media and crisis communication

Through social media, both organisations and the public have increasingly gained power to distribute information (González-Herrero & Smith, 2008). As such, social media is rapidly becoming one of the most important tools for crisis communication used by both organisations and the public (Castells, 2007; González-Herrero & Smith, 2008; Ki & Nekmat, 2014; Vielhaber & Waltman, 2008). In this section, the role of social media in crisis communication will be discussed and it will be argued for the importance of frames produced by the public.

It is no surprise why social media is such an important tool for organisations in crisis communication: Social media offers organisations a platform to provide rapid, real-time information and facilitates interaction with the public (Castells, 2007; González-Herrero & Smith, 2008; Ki & Nekmat, 2014; Vielhaber & Waltman, 2008). With the increasing interaction between organisations and the public on social media, researchers have started to utilise the potential of the available data and have analysed the public's reactions online (e.g., Coombs & Holladay, 2012; Schwarz, 2012). While studies have taken into account a great range of public reactions (e.g., perceived reputation, see e.g., Coombs & Holladay, 2007, 2008; or

statements of intended purchase behaviour, see [Coombs & Holladay, 2012](#)), these studies did not succeed in overcoming the organisation-centred and sender-based perspective ([Schultz et al., 2012](#)). As a consequence, there is limited knowledge about the public's communicative response to a chosen crisis-response strategy, particularly with respect to how to respond to the public's emotional messages.

2.5. Social media and the public's power

Due to social media, the public is empowered and therefore it plays a vital role in crisis communication ([Castells, 2007](#)). As the public can increasingly provide and access information through social media, it actively participates in public relations' activities ([Smith, 2010](#)). During a crisis, the public's social media usage and blog engagement increases ([Liu et al., 2011](#); [Thelwall & Stuart, 2007](#)), which can be interpreted as another indicator for the central role that these platforms take on in the crisis communication process. Recent studies showed that the public even perceives social media sites as being more dialogic and credible than traditional news ([Johnson & Kaye, 2004](#); [J. Seltzer & Mitrook, 2007](#)). Another reason why the public turns to social media, is that it offers a medium to gain emotional support in emotionally-charged crisis situations ([Macias, Hilyard, & Freimuth, 2009](#)) or simply to vent one's emotions ([Jin & Liu, 2010](#)).

The public response to the crisis is very important, as the frames they use may affect the evolution of the crisis ([Chong & Druckman, 2007](#)). For instance, a study by [Zhou and Moy \(2007\)](#) found that how the public discussed an issue online was significantly related to how the media reports it, demonstrating the frame-building and frame-setting effects. Moreover, comparative studies repeatedly have emphasised how the public's interest and prevailing ideology influences the framing of the news ([Akhavan-Majid & Ramaprasad, 2000](#); [Yang, 2003](#)). In order to answer the overall research question, the frames that the public used to respond to AirAsia's communication on social media will need to be investigated first. Therefore, this study poses the following second research question:

RQ2:

Which frames did the public use to respond to Air Asia's crisis-response?

2.6. Framing and crisis communication

Framing plays a fundamental role during crisis situations in order to prevent panic or confusion ([Liu & Kim, 2011](#); [Van der Meer & Verhoeven, 2013](#)), avoid escalation (e.g., [Seeger, 2002](#)), and to protect the organisational reputation ([Coombs, 2007a](#)). Yet, with the rapid development of digital media and public online communication, crisis framing has become a highly complex process ([Neuman et al., 2014](#)). Therefore, it is imperative for organisations to respond rapidly on social media during a crisis and to engage in the collective frame construction. Failing to do so could enhance the chance that other parties (e.g., journalists or the public) fill the 'information gap' with inaccurate broadcasting on the crisis ([Waters, Tindall, & Morton, 2010](#)). Thus, to limit or prevent reputational damage, an organisation needs to know how they can utilise social media and respond effectively to the crisis. One approach that can be used to determine the response strategy is to focus on 'frame alignment' ([Snow et al., 1986](#); [Van der Meer et al., 2014](#)), which is the final and last step in this research. According to [Coombs and Holladay \(2002\)](#), the public's perception of the crisis, should guide which response strategy the organisation uses. Moreover, it is important that the organisation ensure that the frames fit best with the crisis situation and are strong enough to influence the public frames ([Coombs, 2007b](#)).

So what makes an effective and strong frame? Strong frames appeal to the audience ([Chong & Druckman, 2007](#)), and are often those that resonate best with the public's values ([Sniderman & Theriault, 2004](#)). When translating this back to the SCCT, it becomes clear that an organisation can set out to specifically highlight certain aspects in their communication to influence the public perception and framing. Thus, in that case the organisation aims to shape the public crisis frame (or establishing new frames that the public adopts), by making specific cues more salient ([Coombs, 2007b](#)). If the public adopts the frame, which the organisation provided in their communication, the response strategy can be deemed successful ([Coombs, 2007b](#)). Therefore, the extent to which the crisis frames between the organisation and the public align is considered an indicator regarding the effectiveness of an organisation's crisis-response strategy. In other words, the similarity of the frames (used by the public and the frames used by the organisation) can indicate the effectiveness of the chosen response strategy, because it demonstrates that an organisation succeeded in establishing the most favourable frame.

To date, very limited research has been done on effectively using social media as a tool for crisis communication ([Ki & Nekmat, 2014](#)). Only a small number of studies have demonstrated that analysing the content on social media in the context of response strategies can yield evidence-based results ([Coombs & Holladay, 2012](#); [Ki & Nekmat, 2014](#); [Schwarz, 2012](#)). As there is a lack of empirical knowledge of both organisations and the public responses on social media, this study compares both AirAsia's crisis-response strategy and the public response to those on social media. The above leads to the third research question:

RQ3:

To what extent do the frames of AirAsia and the public align?

3. Method

The following sections outline sample, research design, and the three methodological steps that were taken to answer the research questions. Since this study combines traditional quantitative content analyses with automated content analysis, a detailed account of each method and the underlying rationale for choosing the particular approach will be given separately in each section.

3.1. Sample

The AirAsia flight QZ8501, which had 155 passengers and seven crewmembers on board, disappeared on December 28, 2014. The AirAsia case was selected for several reasons, most notably, because the recent crisis provides a unique opportunity to examine how organisations use social media to respond in a crisis situation and to study the public's reaction. AirAsia brought the breaking news about the disappearance of the flight to social media only 4 h and 24 min after contact was lost to the plane (AirAsia, 2014). In the following weeks daily updates were provided on the progress of the search and the recovery of the victims. The crash resulted in a peak in online activity (Gan & Sanidad, 2015) and four million social media conversations about the crash were recorded during the first six days alone (Yuniar, 2015).

Facebook is chosen particularly as a medium to investigate AirAsia's responses to the crisis for the following reasons. Although AirAsia has responded to the crisis on several social media channels (e.g., Twitter), Facebook is arguably the company's most popular channel with 2.9 million likes (AirAsia, 2015b), compared to 1.48 million followers on Twitter (AirAsia, 2015a). Another major reason for analysing Facebook is that the majority of Twitter posts, which were issued during the crisis, contained little information and instead they provided a link to the Facebook posts. This may be due to the character restrictions prominent on Twitter. Furthermore, with 1.41 billion active monthly users, Facebook is one of the most popular social networks worldwide (Statista.com, 2015).

The total sample consists of 38 posts and 13,305 comments which were retrieved from AirAsia's Facebook page between December 28, 2014 and January 28, 2015. This time period was chosen because it covers the first announcement of the disappearance of the flight, and after one month, the data showed that the company had started to post predominantly crisis unrelated messages. Data were collected using the tool *Netvizz* which was developed by Rieder (2013).

3.2. Research design

To answer the three research questions, three methodological steps were taken: First, a quantitative content analysis was conducted to identify which crisis-response strategy AirAsia applied; thus, shedding light into which frames Air Asia used to communicate after the crisis (RQ1). Second, a semantic-network analysis was applied (Hellsten, Dawson, & Leydesdorff, 2010) to reveal the frames that were used by the public in the comments. These were analysed to find out which frames the public used to respond to Air Asia's crisis-response (RQ2). Third, using a statistical extension of semantic-network analysis (Van der Meer & Verhoeven, 2014), the level of frame alignment of frames used by both AirAsia and the public was quantitatively assessed (RQ3).

3.3. RQ1: quantitative content analysis

To identify the crisis-response strategy, and thus answer the first research question, a quantitative content analysis was applied.

3.3.1. Measures

The response strategies (*Deny, Diminish, Rebuild, and Reinforce*) were operationalised according to the theoretical construct of the SCCT (Coombs, 2007b; Liu, 2010). However, since this case has not been researched in the context of crisis communication, the *Base* response option *Adjusting information* was newly operationalised. The concept of *Adjusting Information*, generally refers to the "information that helps people psychologically cope with the magnitude of the crisis situation" (Sturges, 1994, p. 308). To test if AirAsia's response strategy included emotional messages, *Adjusting Information* was divided into: (a) *Adjusting Information (Info)* and (b) *Adjusting Information (Emotion)*. The concept (a) *Adjusting Information (Info)* focused only on informational messages and was operationalised as 'providing information about the outbreak or development of the crisis'. Six items were used to measure it (See Table 1). The concept (b) *Adjusting Information (Emotion)* focused on messages that include concern and was operationalised as 'showing compassion, sympathy, and support for the victims'. Three items were used to measure it (See Table 1).

3.3.2. Procedure & data analysis

For this study all 38 posts that were published by AirAsia (in the time frame under study) served as the units of analysis. Each sentence in these posts served as a coding unit. In total 428 units were quantitatively coded to assess the main response strategy used by AirAsia. The units were coded into the different crisis-response strategies proposed by the SCCT (Coombs, 2007b; Liu, 2010).

Table 1
Response options and strategies employed by AirAsia (N = 428).

Response option	Strategy	Times used by AirAsia	% of time strategy is used
Base	Instructing Information	0	0%
Base	Adjusting Information: Info	348	81.3%
	Basic Information	259	60.5%
	Information Action	38	8.9%
	Information Intention	13	3%
	Protecting Public	34	7.9%
	Discussing Preparation	4	0.9%
	Confusion	0	0%
Base	Adjusting Information: Emotion	49	11.4%
	Sympathy/Compassion	34	7.9%
	Sadness	2	0.5%
	Counselling/Support	13	3%
Deny		12	2.8%
	Attack-the-Accuser	0	0%
	Denial	0	0%
	Scapegoat	0	0%
	Ignore	12	2.8%
Diminish		0	0%
	Excuse	0	0%
	Justification	0	0%
	Separate	0	0%
Rebuild		1	0.2%
	Compensation	0	0%
	Apology	1	0.2%
	Transcendence	0	0%
Reinforce		18	4.2%
	Bolstering	0	0%
	Ingratiation	0	0%
	Victimage	1	0%
	Endorsement	18	4.2%
	Other	0	0%
Total		428	100%

A codebook, which contained a definition and examples, was used for the analysis. The codebook and coding protocol were modelled after the one used in the study by Kim and Liu (2012), but adapted to the specific crisis context. Coding categories were carefully checked to make them mutually exclusive and exhaustive. A coding protocol was created where coders could record their results. The coders coded each category with 1 “present” and 0 “not present”. Twenty per cent of the units (N = 104) were randomly sampled and coded by a second coder to test inter-coder reliability. Krippendorff’s alpha (Hayes & Krippendorff, 2007) and Cohen’s Kappa (Cohen, 1968) ranged from 0.74 to 0.93, implying a reliable coding scheme (See Appendix A for inter-coder reliability per category).

To gain empirical insights into which crisis-response strategies were used most often, the coded data were analysed and frequencies were reported. In addition, one-sample χ^2 -test was conducted to test for significant differences among the variables.

3.4. RQ2: semantic-network analysis

To identify the frames used by the public in response to AirAsia’s crisis-response, and to answer subsequently the second research question, semantic-network analysis was applied. This semantic-network analysis is an appropriate research method considering our research question for the following reasons.

First, the research question focuses on exploring the public framing on social media, and semantic network analysis has proven to be able to identify the latent frames embedded in text automatically, namely implicit frames, that are often difficult to observe manually (Van der Meer et al., 2014). More specifically, implicit frames refers to “the spurious correlation between word (co-) occurrences in communication.” (...) and may reveal “systematic information on latent aspects in communications (Hellsten et al., 2010, p. 593).”

Second, over the past decade, the amount of (online) data, which is available to researchers, has significantly increased, promising communication scholars comprehensive insights into the complex framing process. Online archives of news

outlets as well as organisations make high quantities of text available and public communication is documented on social media platforms. Since, crisis situations especially trigger various actors to send a large amount of messages (Theilwall & Stuart, 2007), the unprecedented amount of data requires crisis scholars to consider large scale analysis. Thus, the focus on the public's online communication, which is characterised by a large number of Facebook comments ($N = 13,305$), warrants an innovative scientific inquiry.

Third, computer-based, quantitative methods hold the opportunity to overcome the restrictions on sample size and include a research period in which traditional quantitative and qualitative approaches have had to come to terms with. Framing studies, using automated content analysis, have demonstrated the capabilities of automated methods, by identifying frames in thousands of newspaper articles (e.g., Schultz et al., 2012) and conducting a time series analysis of frame complexity over several years (e.g., Kleinnijhuis, Schultz, & Oegema, 2015). By applying an automated content analysis, this study can provide supplementary evidence for what crisis scholars so far have observed based on qualitative or small-scale quantitative research.

Fourth, while a central part of semantic network analysis is the automated identification of frames that avoids interpretative bias, a qualitative evaluation of the automatically identified frames is essential. This qualitative step in the analysis can help to make sense of the nature of the frames and to understand their content.

3.4.1. Measures

This approach draws an analytical distinction between explicit and implicit frames. In contrast to explicit frames, implicit frames cannot be observed by analysing the choice of words, and thus, they are not detectable by using manual content analysis (Hellsten et al., 2010). Instead implicit frames can be detected by analysing the co-occurrence of words, which represent a higher-order structure within and between text (Leydesdorff & Hellsten, 2006).

The main premise is that documents can be considered as a *bag of words*, in which the sets of words is found to be sufficient for retrieving the general meaning of the text (Grimmer & Stewart, 2013; Hopkins & King, 2010). More specifically, the approach starts from the assumption that one word can have different meanings, depending on the context in which it is used (Leydesdorff & Hellsten, 2006). According to this context, words hold different positions in the 'semantic field', and in so doing they create a word network that conveys their meaning (Hellsten et al., 2010). Because frames emerge through the use of specific words (Leydesdorff & Hellsten, 2006), these different word networks can be understood as indicators for the frame they represent (Hellsten et al., 2010). In other words, frames "manifest themselves in different semantic contexts for word combinations" (Hellsten et al., 2010, p. 3). To assess this meaning, and the meaning of the frames, one needs to first quantify meaning in measurable units of analysis (Leydesdorff, 2005).

Measuring the co-occurrence of words has been identified as way to quantify meaning of words (e.g., Hellsten et al., 2010). However, the authors note that just analysing word co-occurrence is not sufficient, as words might not necessarily co-occur together in one sentence, yet may co-occur in the same relation within a text or between texts. Therefore, Hellsten et al. (2010) propose the semantic-network approach that measures meaning by analysing the words in the word network they are part of. More precisely, by calculating the co-occurrence of words on different levels (e.g., within a text, and between text), a semantic map can be created that represents the implicit frames (Hellsten et al., 2010). To put it differently, the position of the words and the resulting distance from one another is calculated and a word network visualised which indicates an implicit frame (Hellsten et al., 2010).

The idea that a frame manifest itself in text through the use of specific words, which form clusters that represent their meaning, is in line with Entman's (1993) assertion that "text contains frames, which are manifested by the presence or absence of certain keywords, stock phrases, stereotyped images, sources of information, and sentences that provide thematically reinforcing clusters of facts or judgments" (p. 52). In a similar vein, framing research has emphasised that word choice can be understood as a framing device, through which a frame is manifest itself in media content (Van Gorp, 2007), thereby further underlining the importance of word combinations for identifying frames (for a more detailed description of why frames can be analysed in this way, see, for example Grimmer & Stewart, 2013; Hellsten et al., 2010).

3.4.2. Procedure & data analysis

The identification of the implicit frames is based on several practical steps (Vlieger & Leydesdorff, 2011). First, a frequency list was created with the help of the programme *FrequencyList*, containing the 100 most frequently used words (filtering out stop words). Second, with the help of the programmes *Ti* and *FullText*, a word/document occurrence matrix was created. The matrices were used to conduct principle component factor analyses in order to identify clusters of words that can be interpreted as the implicit frames embedded in the texts of analysis. Varimax rotation was selected to maximise the variable loadings on one factor (Field, 2013). The analysis was limited to 12 components. Each retrieved component represented an implicit frame and the components with the largest eigenvalue (*EV*) and highest explained variance (R^2) can be considered the dominant frames (Van der Meer et al., 2014). The identified dominant and sub-frames were interpreted and labelled based on the words that form the clusters in order to interpret which frames were used by the public in the comments.

3.5. RQ3: semantic-network analysis

To answer the third research question, concerning the level of frame alignment of frames in AirAsia posts and those found in the public's comments, a statistical extension of the semantic-network approach was used. This statistical approach was

developed by Van der Meer et al. (2014) and enables one to quantitatively compare implicit frame alignment based on factor loading correlation. This approach has the advantage of avoiding comparing frames based on subjectively assigned labels, and instead assesses the alignment based on statistical results, as the author elaborates.

3.5.1. Measures

Following the approach of Van der Meer et al. (2014), the statistical extension is based on the results of the factor analyses that are part of the semantic-network analysis. Factor analysis allows one to assess not directly observable dimensions (Field, 2013), and therefore can be utilised to assess the latent dimension of communication – namely implicit frames. The components calculated through factor analysis, represent the implicit frame. The factor loading for each word indicates the degree to which the word represents a component. Subsequently, the factor loading also describes the meaning it has for the frame.

Because factor loadings uniquely differ among domains, factor loadings for words, which are mutually used across domains, can be statistically compared. Factor loadings rather than the whole component serve as unit of analysis, because components, and thus, implicit frames are never identical. Relating this theoretical knowledge back to the AirAsia case, one can expect that factor loading of words, which appear in the matrices of posts and comments, also differ. This enables one to test the correlation between the factor loadings. Thus, the strength and direction of the results of the correlation show the frame alignment.

3.5.2. Procedure & data analysis

The Posts ($N = 38$) and comments ($N = 10,523$) that appeared in the specified time span on the AirAsia Facebook page served as units of analysis to answer the third research question. The factor loading of all mutually used words are compared among the frames of the organisation and the public. The importance of the words in frames was tested by calculating the correlation of factor loadings of the mutual used words using Spearman's Rho correlation.

When the factor loading of the words between comments and post positively correlate, a close frame alignment is indicated, in which case, both AirAsia and the public would appear to have used the same words to a comparable degree in their framing. Similarly, a negative correlation indicates an absence of frame alignment, which would indicate that AirAsia and the public do not use the same words to a comparable degree.

4. Results

Three methodological steps were taken to answer the research questions; therefore, the results have been presented in three parts. The three research questions are discussed in succession.

4.1. Results RQ1: which strategy did AirAsia use?

To answer the first research question, the results of the quantitative content analysis are discussed to understand which crisis-response strategy AirAsia used. The responses options were used with following frequencies: the *Base* response option *Adjusting Information (Info)* was used to 81.3 per cent ($N = 348$); *Adjusting Information (Emotions)* was used to 11.4 per cent ($N = 49$); the *Reinforce* option was applied in 4.2 per cent ($N = 18$); *Deny* was used to 2.8 per cent incidences ($N = 12$); *Rebuild* was used to 0.2 per cent ($N = 1$). Notably, *Instructing Information* was not used at all. For a detailed overview concerning the SCCT strategies that were applied, please consult Table 1.

To determine if a response option was predominantly used, a one-sample χ^2 -test was conducted that revealed a significant difference in proportions between the strategies, $\chi^2 = (4, N = 428) = 1020,294, p < 0,001$. A follow-up test between the *Base* response options (*Adjusting Information (Info)* and *Adjusting Information (Emotions)*) that were used, included in total 92.8 per cent of the time ($n = 397$), and the other response strategies (*Diminish, Deny, Rebuild, and Reinforce*), which were applied 7.2 per cent of the time ($N = 31$), demonstrated a significant difference in proportion $\chi^2 = (1, N = 428) = 312,981 p < 0,001$. Further tests of the predominantly used *Base* response options revealed a significant difference in proportion between *Adjusting Information (Info)* and all the other response options $\chi^2 = (1, N = 428) = 167,813 p < 0,001$. In addition, a significant difference in proportions between the *Adjusting Information (Info)* and *Adjusting Information (Emotion)* $\chi^2 = (1, N = 397) = 225,919 p < 0,001$ was identified. The analysis of the primarily applied *Adjusting Information (Info)* ($N = 348$) strategy revealed that the item *Basic Information* was used with 74.4 per cent ($N = 259$) most frequently.

When looking closer at the results of the *Base* response option, it becomes apparent that *Adjusting Information (Emotion)* was only used 11.4 per cent of the time, which due to the high emotional character of the crash, should be further considered. The disappearances of the flight QZ8501 immediately caught the public's attention, and with 162 people missing, the emotional involvement of the public was quite high, also considering the amount of online attention the disappearance received (Gan & Sanidad, 2015). Yet, emotional messages were used on in 11.4 per cent of all responses. The crisis literature offers no clear advice on whether or not emotional messages should be included in the response strategy (e.g., Coombs & Holladay, 2008; Schultz et al., 2011).

4.2. Results RQ2: which frames did the public use?

The findings of the semantic-network analysis which was conducted in order to identify frames, has been used to understand which frames the public used, and thus in turn to answer the second research question. Of the 12 identified frames, two frames were predominant as they each had a higher eigenvalue and explained variance ($R^2 = 3.83, 2.78$) than all other frames ($R^2 < 2.16$) and can therefore both be interpreted as dominant frames. The remaining 10 frames, which had lower eigenvalue and explained variance, can be considered as the sub-frames.¹

The first dominant frame that the public used ($R^2 = 3.83$) was formed by predominant words such as 'service', 'customer', 'ticket', 'refund', and 'booking'. These key words indicate the need for service-related information. More specifically; the word cluster suggests that the public focused on reimbursement inquiries that might have been caused by anxiousness after the crash. Therefore; the frame was labelled 'service-inquiry-frame'. The second dominant frame identified in the public's comments ($R^2 = 2.78$) was labelled 'compassionate-frame' as the words indicate an emotional frame containing words such as 'families'; 'loved'; 'friend'; and 'love'. This latter frame showed clear signs that the public expressed empathy for the families and friends of the victims; who lost their loved ones in the tragedy.

Evidently, these two dominant frames seem to indicate that the public's response to AirAsia's crisis-response was twofold: While the first dominant frame indicates a need for information, the second dominant frame expresses an emotionally-laden discourse. An even clearer picture evolves when analysing the remaining 10 sub-frames, which also showed that these two discourses dominated the public's response.

In total, four of the 10 sub-frames used by the public indicated an informational discourse such as identified in the first dominant frame. These frames seem to emphasise the cause of the crash, the victims, and the rescue operations and were labelled: 'accident-cause-frame' ($R^2 = 2.16$; words e.g., 'weather' and 'pilot'), 'crashed-flight-frame' ($R^2 = 1.96$; words e.g., 'AirAsia', 'Indonesia', and 'flight'), 'rescue-mission-frame' ($R^2 = 1.69$; words e.g., 'rescue', 'search', and 'team'), and 'victim-frame' ($R^2 = 1.65$; words e.g., 'passenger' and 'crew').

In total, six of the 10 sub-frames used by the public indicated an emotional discourse. Similar to the second dominant frame, the public seemed to have expressed emotions by voicing empathy, support, and condolences for the victims and their relatives. The frames were labelled: 'hope-frame' ($R^2 = 1.82$; words e.g., 'safe' and 'hope'), 'consolation-frame' ($R^2 = 1.73$; words e.g., 'rest', 'peace', and 'soul'), 'spiritual-frame' ($R^2 = 1.58$; words e.g., 'god' and 'bless'), 'emotional-support-frame' ($R^2 = 1.56$; words e.g., "stay" and 'strong'), 'condolence-frame' ($R^2 = 1.53$; words e.g., 'condolence' and 'deepest'), and 'faith-frame' ($R^2 = 1.49$; words e.g., 'hopefully', 'all', and 'plane').²

From the analysis, it becomes evident that of the overall 12 identified public frames, the word clusters suggest five informative and seven emotional frames. Hence, this result indicates that, in contrast to the informative frames used by AirAsia, the public discourse seemed to be dominated by emotional as well as informative frames. The results of the first two methodological steps seem to indicate that the public emphasised the emotional element of the crisis more strongly than the organisation, potentially indicating an absence of frame alignment among the two actors. The next section will provide statistical clarification by testing the level of frame alignment.

4.3. Results RQ3: do the frames of AirAsia and the public align?

The level of frame alignment was addressed to answer the third and final research questions regarding the alignment between the frames of the organisation and the public and thus being able to assess the effectiveness of the crisis-response strategy. To statistically test whether frames that were used by the organisation, and frames used by the public align, a Spearman's Rho correlation test was performed. Using the Spearman's Rho correlation, evidence was found for a weak negative correlation between the factor loadings of mutually used words by the public and the organisation, $r_s = -0.32$.

The negative factor correlation indicates a deviation in word importance of mutually used words (Van der Meer et al., 2014). More specifically, the organisation and the public have not used these mutual words to a comparable degree in their crisis framing. For example, words such as 'board', 'victim', 'aircraft' poorly correlated among organisation: 0.64; 0.60, 0.55 and the public: 0.15; 0.21; 0.16, indicating that these informative words were more important in the organisational frames than the public. At the same time, factor loadings of mutually used words such as 'flight', 'rescue', and 'AirAsia' were similar among the public: 0.47; 0.61; 0.49, and organisation: 0.45; 0.66; 0.55, suggesting a comparable importance for the frames. The latter finding highlights that not all mutually used words diverged in their importance for meaning provision, subsequently accounting for the weak correlation.

Interestingly, the high loading of the word 'prayer' for the organisation (.55), in comparison to the small loading for the public (.18), seems to suggest that emotional frames were more important for the organisation than the public. This finding appears to be inconsistent with the results for RQ1 and RQ2. More specifically, the results for RQ1 indicated that the

¹ A complete overview, including the principle component matrices for Facebook post and comments, which display the word clusters that form the implicit frames, as well as the created dataset that was used for the factor loading comparison of the mutually used words, and can be requested from the authors.

² Translated from Indonesian

organisation only used a few emotional messages, while the findings for RQ2 demonstrated that the public was the group, which also emphasised emotions.

However, it should be noted that emotional words with high factor loadings for the public such as 'peace' (.82), 'god' (.79), and 'condolence' (.57), were completely absent in the organisational frames. Because the majority of emotional words only appear in the public frames, these words cannot be compared. Consequently, the high factor loading of the emotional word prayer in the organisational frames does not necessarily contradict the findings for RQ1 and RQ2 regarding the importance of emotions for the public.

In short, the findings indicate that while some informative frames were important to both the public and organisation, other informative frames were only important to the organisation. Yet, because of the predominant deviation in word importance, the result demonstrates an absence of frame alignment of frames used by AirAsia, and frames used by the public on the organisational Facebook page.

5. Discussion

This study aimed to answer the following RQ: "How effective was AirAsia's crisis-response strategy on Facebook after the crash of flight QZ8501?" To answer this question, three specific research questions were formulated that were answered by using both a manual and an automated content analysis.

The first research question focuses on which crisis-response strategy was most frequently applied by AirAsia after the crash of flight QZ8501. Results indicate that the *Base* response was significantly used more often than all the other response options. Using this response strategy is in line with the recommendations of the SCCT to provide information to help the public "adjust psychologically to the crisis" (Coombs & Holladay, 2007, p. 301). It is not a surprise that the organisation has not provided any *Instructing Information*, which should usually be priority (Coombs, 2007b), since a plane crash poses no immediate physical danger to the public (who were not directly involved in the crash). Information becomes available with the progress of the investigation and the public's need to be kept informed. Similarly, with the cause of the incident unknown, no *Corrective Action* can be proposed, which states how the organisation will protect public in the future (Coombs, 2007b). Based on these strategic choices, one might conclude that AirAsia did everything in their power to protect its organisational reputation.

The second research question focuses on which frames the public used to respond to Air Asia's crisis-response. Results of an automatic content analysis of the public framing online showed how the public discussed the crisis in both an informative and emotional way.

The public used informative frames to address what could have caused the crash, how people can be rescued, and who were the victims. However, the public predominantly used frames to emotionally communicate about the crisis. Frames related to emotional elements as hope, spirituality, emotional support, and faith were high on the public agenda. Hence, this result indicates that, in contrast to the informative response strategy applied by AirAsia, the public discourse was dominated by emotionally charged frames.

The third and final research question focuses on to what extent AirAsia's crisis-response strategy was successful by exploring the level of alignment among frames of the company and the public. In other words, the identified level of crisis frame alignment can be used as an indicator for crisis-response effectiveness. After performing the statistical test, the results indicated that the implicit frames do not align, pointing to the conclusion that the organisation and the public focus on different aspects in the crisis situation. Although the organisation seemed to have followed closely the recommendation of the SCCT by providing information to the public in their response strategy (Coombs, 2007b), the results also show that AirAsia did not include expressions of concern. The strong emotional focus in the framing of the public does not respond to the informative crisis-response and framing as applied by the company. Thus, the organisation failed to use what Coombs (2010) calls a "care response" (p. 42).

The absence of frame alignment in this specific case of AirAsia fuels the discussion regarding what effective crisis communication is, and if a company should include concern during a crisis (e.g., Coombs & Holladay, 2008; Schultz et al., 2011). On the one hand, it could be argued that the absence of alignment in the specific case was not necessarily problematic. Both actors focused on different aspects of the crisis, but both discourses could perhaps co-exist or even complement one another. The company provided the facts about the crisis and the public added the element of emotion. Following this line of thought, the public's response does not necessarily indicate that the informative framing of the organisation was a poor crisis-response. Arguably, the public quickly accepted the information provided by AirAsia and continued to emotionally cope with the crisis (Jin, 2009, 2010) by turning to social media to seek emotional support (Macias et al., 2009) and to vent their emotions (Jin & Liu, 2010). Adding the element of emotions might not be an indication of opposing the company's communication nor might it indicate a negative effect on the reputation. This argument suggests that the purely informative response strategy as that applied by AirAsia was not necessarily an ineffective approach in this specific crisis case.

On the other hand, public relations and crisis research suggest that organisational communication is successful when the content and framing of press releases resonate as intended in the public's communication (Schultz et al., 2012). Similarly, Coombs (2007b) argues that crisis communication can be considered as having failed when the public rejects the frames that have been provided by the organisation. Based on these arguments, it can be stated that the strategic communication of AirAsia was ineffective because the frames of the public and the company were not aligned. Both actors addressed different elements and spoke in a different discourse about the same crisis. This might also be an indication that communication had

failed and that there was a lack of negotiation of the meaning and understanding of the crisis. The absence of a collective effort to understand the crisis could indicate that the public meaning of crisis varied from the company's meaning, thus implying failed strategic communication. Hence, in this specific case, the company could have reached frame alignment if it would have included emotional elements in its communicative strategy and framing in response to the public's response. This suggestion is in line with previous research stating that showing sympathy and concern in fact can be effective in preserving post-crisis reputation (e.g., Coombs & Holladay, 2008; Van der Meer & Verhoeven, 2014).

In the end, these two explanations of the results suggest that companies undergoing a crisis should, per situation and crisis phase, evaluate whether providing information is sufficient or whether adding emotions would be the best approach. As no two crisis situations are the same, companies should real time monitor to what extent the public is satisfied with the company's response and whether they demand that the company shows concern.

The results of this study have contributed to theory on PR literature, crisis communication and framing, as well as having examined the methodological level. First, the research proposed a new theoretical framework that makes the first steps to empirically evaluate crisis-response effectiveness on Facebook by comparing implicit frames. This theoretical model is grounded in the theory of framing, which is intrinsic to the SCCT. By postulating a new framework, this study provides a methodological alternative to experiments with respect to empirically assessing crisis-response effectiveness on Facebook. By studying a large quantity of social media data, this study produces results with a high ecological validity. This can be seen as an important step if one considers that research into crisis-responses has predominantly relied on experiments in order to gain evidence-based insights (Coombs, 2007b).

Second, this study has analysed how the public communicated about the crisis by focusing on the frames that were used by the public in their comments, thereby providing new insights into their crisis-responses. Thus, this study goes beyond the traditional analysis of the public's reactions that focused on perceived reputation (e.g., Coombs & Holladay, 2007, 2008). Instead, the results of this study offer insight into the public's discursive reactions and clarify to what extent the public includes emotions in its sense-making process. Third, with the growing popularity of social media, researchers have called for more information regarding effective crisis management on social media (e.g., Ki & Nekmat, 2014). In this respect, the study's findings enrich the crisis communication literature by suggesting that an effective response strategy on Facebook, in an emotionally-laden crisis situation, should not only include information, but also emotional messages which show concern. At the same time, the results shed further light into the discussion about the use of effectiveness in using emotional messages in the *Base* response strategy, subsequently suggesting that the use of concern is appropriate.

Lastly, the study has utilised the semantic-network approach developed by Hellsten et al. (2010), combined with the analytical expansion of implicit frame alignment proposed by Van der Meer et al. (2014), to compare implicit frame in Facebook comments and post. By comparing post and comments, the study has demonstrated the possibility of assessing frame alignment between the organisation and the public on a Facebook page.

Moreover, the results of this study have certain practical implications. For airline companies which could encounter a similar tragic event, this study offers the following recommendations in order to limit the damage done to the corporate reputation. First, the airline should carefully assess the public's perception of the crisis. This includes not only assessing the public's need for information, but by also evaluating the emotional character of the crisis. Second, the airline should provide regular updates (on social media) about the developments of the crises in order to reduce uncertainty. To conclude, it is important to combine informational messages with emotional messages in the crisis-response. More specifically, the organisation should display concern for the public in its messages.

This study has several limitations, which is due to the fact that each of the research methods that were chosen has its disadvantages. First, the study focuses on a specific case, which limits the generalisability of the research (Petersen, 2008). Future research could validate the proposed model, as well as the findings, by applying the same method to a different case. In a similar vein, the generalisability is further affected by the focus on a specific media platform, which could be extended across platforms and into other domains (i.e., media).

Second, quantitative content analysis comes at the risk of bias, since the development of the coding scheme as well as the coding process requires interpretation (Rose, Spinks, & Canhoto, 2014). In addition, by analysing the post at the sentence level, phrases might be taken out of their context, which bears the risk of misinterpretation (Rose et al., 2014).

Third, the semantic-network analysis is further limited by the data that were collected. More specifically, there is a contrast between the public's comments and the organisational post which differs in quality and quantity of textual content, which can be found in the nature of social media data. As a computer analysis is restricted by the data input, this might have affected the results of the study. In addition, by operating with the underlying assumption that texts are bag of words, the syntax has subsequently not been taken into account in this analysis. While such an approach makes language analysis possible by reducing its complexity and quantify meaning (Grimmer & Stewart, 2013), it also limits the amount of information, which could have been inferred by analysing word order.

Finally, while this study offers statistical evidence for an absence of frame alignment, the underlying reasons for this difference in framing is open to interpretation. Subsequently, this study's explanation of the findings is limited to the available data and only able to determine what the public could have meant. Thus, the drawn conclusions require further validation by future research.

Finally, this study set out to answer the research question, "How effective was AirAsia's crisis-response strategy on Facebook after the crash of flight QZ8501?" The findings revealed an absence of frame alignment, indicating that the organisation and the public focus on different aspects in the crisis situation. Therefore, especially in an emotional crisis situation, such as a

plane crash, an organisation should combine informational messages with messages that show concern for the public that has been affected.

Appendix A. Intercoder reliability test results for all variables.

	Krippendorff's Alpha	Cohen's kappa
Base: Adjusting Information (Info)	0.933	0.933
Base: Adjusting Information (Emotion)	0.962	0.962
Denial	0.83	0.829
Reinforce	0.741	0.74
Rebuild	Not coded in intercoder reliability sample	
Diminish	Not coded in research	
Base: Instructing Information	Not coded in research	

Appendix B. Retrieved data from AirAsia Facebook page.

Post	Date	Time (UTC +0)	Likes	Comments (all)	Comments (replies)	Shares
1	28.12.2014	04:41:00	9651	2654	332	12848
2	28.12.2014	06:23:00	7681	4076	437	5831
3	28.12.2014	11:57:00	3121	1085	84	909
4	28.12.2014	16:34:00	2294	1053	259	684
5	29.12.2014	05:43:00	2247	1108	173	434
6	30.12.2014	12:21:00	2701	823	111	1546
7	31.12.2014	14:59:00	765	708	28	73
8	01.01.2015	14:58:00	821	94	26	60
9	02.01.2015	15:31:00	636	114	35	59
10	03.01.2015	15:52:00	526	153	79	53
11	04.01.2015	16:32:00	441	84	24	53
12	05.01.2015	15:36:00	371	89	48	41
13	06.01.2015	15:24:00	382	42	13	35
14	07.01.2015	13:43:00	326	41	14	38
15	08.01.2015	14:39:00	304	24	9	28
16	09.01.2015	13:00:00	282	29	12	29
17	10.01.2015	15:23:00	347	21	8	36
18	11.01.2015	15:44:00	345	37	16	26
19	12.01.2015	16:51:00	305	41	11	41
20	13.01.2015	16:01:00	326	26	5	33
21	14.01.2015	16:04:00	312	64	39	20
22	15.01.2015	15:15:00	256	41	17	15
23	16.01.2015	16:06:00	241	20	5	19
24	17.01.2015	13:06:00	286	33	19	19
25	18.01.2015	14:16:00	217	40	15	15
26	19.01.2015	14:31:00	219	19	5	12
27	20.01.2015	15:47:00	241	27	7	23
28	21.01.2015	14:00:00	190	57	23	18
29	22.01.2015	14:07:00	202	13	3	17
30	23.01.2015	14:06:00	209	31	19	17
31	24.01.2015	13:57:00	168	11	1	8
32	25.01.2015	15:02:00	210	24	6	25
33	26.01.2015	04:02:00	1573	369	176	469
34	26.01.2015	14:09:00	155	31	10	8
35	27.01.2015	03:49:00	507	72	34	35
36	27.01.2015	13:58:00	152	24	3	9
37	28.01.2015	03:00:00	524	110	58	39
38	28.01.2015	15:05:00	179	17	3	7
Total			39713	13305	2167	23632

Note: Data were retrieved from the AirAsia Facebook page on May 10, 2015.

References

- AirAsia. (2014). *News Update* AirAsia Indonesia Flight QZ8501.. Retrieved from. <https://www.facebook.com/18801397386/posts/10152667738358742>
- AirAsia. (2015a). *Followers* [Twitter account]. Retrieved from https://twitter.com/AirAsia?ref_src=twsrc%google|twcamp%serp|twgrauthor.
- AirAsia. (2015b). *Likes* [Facebook page].. Retrieved from. <https://www.facebook.com/AirAsia/likes>
- Akhavan-Majid, R., & Ramaprasad, J. (2000). Framing Beijing: Dominant ideological influences on the American press coverage of the fourth UN conference on women and the NGO forum. *International Communication Gazette*, 62(1), 45–59. <http://dx.doi.org/10.1177/0016549200062001004>
- Borah, P. (2011). Conceptual issues in framing theory: A systematic examination of a decade's literature. *Journal of Communication*, 61(2), 246–263. <http://dx.doi.org/10.1111/j.1460-2466.2011.01539.x>
- Castells, M. (2007). Communication, power and counter-power in the network society. *International Journal of Communication*, 1(29) <http://dx.doi.org/10.1080/13691180903390885>

- Chong, D., & Druckman, J. N. (2007). Framing theory. *Annual Review of Political Science*, 10(1), 103–126. <http://dx.doi.org/10.1146/annurev.polisci.10.072805.103054>
- Christensen, L. T., Morsing, M., & Cheney, G. (2008). *Corporate communications: Convention, complexity and critique*. California: Sage Publications Ltd.
- Cohen, J. (1968). Weighted kappa: Nominal scale agreement with provision for scaled disagreement or partial credit. *Psychological Bulletin*, 70(4), 213–220. <http://dx.doi.org/10.1037/h0026256>
- Cohen-Almagor, R. (2008). The limits of objective reporting. *Journal of Language and Politics*, 7(1) <http://dx.doi.org/10.1075/jlp.7.1.07alm>
- Coombs, W. T., & Holladay, S. J. (2002). Helping crisis managers protect reputational assets: Initial tests of the situational crisis communication theory. *Management Communication Quarterly*, 16(2), 165–186. <http://dx.doi.org/10.1177/089331802237233>
- Coombs, W. T., & Holladay, S. J. (2007). The negative communication dynamic: Exploring the impact of stakeholder affect on behavioral intentions. *Journal of Communication Management*, 11(4), 300–312. <http://dx.doi.org/10.1108/13632540710843913>
- Coombs, W. T., & Holladay, S. J. (2008). Comparing apology to equivalent crisis-response strategies: Clarifying apology's role and value in crisis communication. *Public Relations Review*, 34, 252–257. <http://dx.doi.org/10.1016/j.pubrev.2008.04.001>
- Coombs, W. T., & Holladay, S. J. (2012). Amazon.com's Orwellian nightmare: Exploring apology in an online environment. *Journal of Communication Management*, 16(3), 280–295. <http://dx.doi.org/10.1108/13632541211245758>
- Coombs, W. T. (2007a). *Ongoing crisis communication: Planning, managing, and responding*. Los Angeles: SAGE.
- Coombs, W. T. (2007b). Protecting organization reputations during a crisis: The development and application of situational crisis communication theory. *Corporate Reputation Review*, 10(3), 163–176. <http://dx.doi.org/10.1057/palgrave.crr.1550049>
- Coombs, W. T. (2010). Parameters for Crisis Communication. In W. T. Coombs, & S. J. Holladay (Eds.), *The handbook of crisis communication* (pp. 15–53). Chichester: Blackwell Publishing Ltd.
- Cornelissen, J. P. (2011). *Corporate communication: A guide to theory and practice*. London: Sage Publications Ltd.
- De Vreese, C. H. (2005). News framing: Theory and typology. *Information Design Journal*, 13(1), 51–62. <http://dx.doi.org/10.1075/idjdd.13.1.06>
- DeBord, M. (2015, June 1). *Malaysia airlines' new CEO has a big challenge*. Retrieved August 23, 2015, from <http://uk.businessinsider.com/r-malaysia-airlines-ceo-mueller-says-carrier-is-technically-bankrupt-2015-6?r=US&IR=T>
- Distaso, M. W., Vafeiadis, M., & Amaral, C. (2014). Strategies of apology, sympathy, and information influence public relations. *Public Relations Review*, 1–10. <http://dx.doi.org/10.1016/j.pubrev.2014.11.014>
- Druckman, J. N. (2001). The implications of framing effects for citizen competence. *Political Behavior*, 23(3), 225–256. <http://dx.doi.org/10.1023/A:1015006907312>
- Entman, R. M. (1993). Framing: Toward clarification of a fractured paradigm. *Journal of Communication*, 43(4), 51–58. <http://dx.doi.org/10.1111/j.1460-2466.1993.tb01304.x>
- Field, A. (2013). Exploratory factor analysis. In M. Verboord (Ed.), *Quantitative methods in media and communication* (pp. 207–261). London: Sage Publications.
- Gamson, W. A., & Modigliani, A. (1989). Media discourse and public opinion on nuclear power: A constructionist approach. *American Journal of Sociology*, 95(1), 1–37. <http://dx.doi.org/10.1086/229213>
- Gan, I., & Sanidad, E. (2015, January 13). *The social dynamics of tragedy: Online sentiment analysis surrounding AirAsia QZ8501*. Retrieved from <http://www.gmanetwork.com/news/story/403333/scitech/socialmedia/the-social-dynamics-of-tragedy-online-sentiment-analysis-surrounding-airasia-qz8501>
- Gitlin, T. (1980). *The whole world is watching: Mass media in the making & unmaking of the new left*. Berkeley: University of California Press.
- Goffman, E. (1974). *Frame analysis: An essay on the organization of experience*. New York: Harper and Row.
- González-Herrero, A., & Smith, S. (2008). Crisis communications management on the web: How internet-based technologies are changing the way public relations professionals handle business crises. *Journal of Contingencies and Crisis Management*, 16(3), 143–153. <http://dx.doi.org/10.1111/j.1468-5973.2008.00543.x>
- Grimmer, J., & Stewart, B. M. (2013). Text as data: The promise and pitfalls of automatic content analysis methods for political texts. *Political Analysis*, 21(3), 267–297. <http://dx.doi.org/10.1093/pan/mps028>
- Hayes, A. F., & Krippendorff, K. (2007). Answering the call for a standard reliability measure for coding data. *Communication Methods and Measures*, 1(1), 77–89. <http://dx.doi.org/10.1080/19312450709336664>
- Hellsten, I., Dawson, J., & Leydesdorff, L. (2010). Implicit media frames: Automated analysis of public debate on artificial sweeteners. *Public Understanding of Science*, 19(5), 590–608. <http://dx.doi.org/10.1177/0963662509343136>
- Hopkins, D. J., & King, G. (2010). A method of automated nonparametric content analysis for social science. *American Journal of Political Science*, 54(1), 229–247. <http://dx.doi.org/10.1111/j.1540-5907.2009.00428.x>
- Jin, Y., & Liu, B. F. (2010). The blog-mediated crisis communication model: Recommendations for responding to influential external blogs. *Journal of Public Relations Research*, 22(4), 429–455. <http://dx.doi.org/10.1080/10627261003801420>
- Jin, Y. (2009). The effects of public's cognitive appraisal of emotions in crises on crisis coping and strategy assessment. *Public Relations Review*, 35(3), 310–313. <http://dx.doi.org/10.1016/j.pubrev.2009.02.003>
- Jin, Y. (2010). Making sense sensibly in crisis communication: How publics' crisis appraisals influence their negative emotions, coping strategy preferences, and crisis-response Acceptance. *Communication Research*, 37(4), 522–552. <http://dx.doi.org/10.1177/0093650210368256>
- Johnson, T. J., & Kaye, B. K. (2004). Wag the blog: How reliance on traditional media and the Internet influence credibility perceptions on weblogs among blog users. *Journalism and Mass Communication Quarterly*, 81(3), 622–642.
- Ki, E.-J., & Nekmat, E. (2014). Situational crisis communication and interactivity: Usage and effectiveness of Facebook for crisis management by Fortune 500 companies. *Computers in Human Behavior*, 35, 140–147. <http://dx.doi.org/10.1016/j.chb.2014.02.039>
- Kim, H. J., & Cameron, G. T. (2011). Emotions matter in crisis: The role of anger and sadness in the publics' response to crisis news framing and corporate crisis-response. *Communication Research*, <http://dx.doi.org/10.1177/0093650210385813>
- Kim, S., & Liu, B. F. (2012). Are all crises opportunities? A comparison of how corporate and government organizations responded to the 2009 flu pandemic. *Journal of Public Relations Research*, 24, 69–85. <http://dx.doi.org/10.1080/1062726X.2012.626136>
- Kleinnijenhuis, J., Schultz, F., & Oegema, D. (2015). Frame complexity and the financial crisis: A comparison of the United States, the United Kingdom, and Germany in the period 2007–2012. *Journal of Communication*, 65(1), 1–23. <http://dx.doi.org/10.1111/jcom.12141>
- Kleinnijenhuis, J., Schultz, F., Utz, S., & Oegema, D. (2015). The mediating role of the news in the BP oil spill crisis 2010: How U.S. news is influenced by public relations and in turn influences public awareness, foreign news, and the share price. *Communication Research*, 42(3), 408–428. <http://dx.doi.org/10.1177/0093650213510940>
- Leydesdorff, L., & Hellsten, I. (2006). Measuring the meanings of words in contexts: Automated analysis of Monarch Butterflies, Frankenfoods and Stem Cells. *Scientometrics*, 67(2), 231–258. <http://dx.doi.org/10.1007/s11192-006-0096-y>
- Leydesdorff, L. (2005). Metaphors and diaphors in science communication: Mapping the case of stem cell research. *Science Communication*, 27(1), 64–99. <http://dx.doi.org/10.1177/1075547005278346>
- Liu, B. F., & Kim, S. (2011). How organizations framed the 2009 H1N1 pandemic via social and traditional media: Implications for U.S. health communicators. *Public Relations Review*, 37(3), 233–244. <http://dx.doi.org/10.1016/j.pubrev.2011.03.005>
- Liu, B. F., Austin, L. L., & Jin, Y. (2011). How publics respond to crisis communication strategies: The interplay of information form and source. *Public Relations Review*, 37(4), 345–353. <http://dx.doi.org/10.1016/j.pubrev.2011.08.004>
- Liu, B. F. (2010). *Effective public relations in racially charged crises: Not black or white*. In W. T. Coombs, & S. J. Holladay (Eds.), *The handbook of crisis communication* (pp. 335–358). Chichester: Blackwell Publishing Ltd.
- Macias, W., Hilyard, K., & Freimuth, V. (2009). Blog functions as risk and crisis communication during hurricane Katrina. *Journal of Computer-Mediated Communication*, 15(1), 1–31. <http://dx.doi.org/10.1111/j.1083-6101.2009.01490.x>

- McQuail, D. (2010). *McQuail's mass communication theory*. London, England: Sage.
- Nabi, R. L. (2003). Exploring the framing effects of emotion: Do discrete emotions differentially influence information accessibility, information seeking, and policy preference? *Communication Research*, <http://dx.doi.org/10.1177/0093650202250881>
- Neuman, R. W., Guggenheim, L., Jang, M. S., & Bae, S. Y. (2014). The dynamics of public attention: Agenda-setting theory meets big data. *Journal of Communication*, *64*(2), 193–214. <http://dx.doi.org/10.1111/jcom.12088>
- Petersen, N. J. (2008). Designing a rigorous small sample study. In *Best practices in quantitative methods*. pp. 137–147. Thousand Oaks, California: SAGE Publications, Inc.
- Ray, S. J. (1999). *Strategic communication in crisis management: Lessons from the airline industry*. Westport, CT: Quorum Books.
- Read, K. (2007). Corporate pathos: New approaches to quell hostile publics. *Journal of Communication Management*, *11*(4), 332–347. <http://dx.doi.org/10.1108/13632540710843931>
- Reynolds, B., & Quinn Crouse, S. (2008). Effective communication during an influenza pandemic: The value of using a crisis and emergency risk communication framework. *Health Promotion Practice*, *9*(4 Suppl), 13S–17S. <http://dx.doi.org/10.1177/1524839908325267>
- Rieder, B. (2013). Studying facebook via data extraction: The netvizz application. *Proceedings of the 5th annual ACM web science conference*, 346–355. <http://dx.doi.org/10.1145/2464464.2464475>
- Rose, S., Spinks, N., & Canhoto, A. I. (2014). *Management research: Applying the principles*. New York, NY: Routledge.
- Scheufele, D. A. (1999). Framing as a theory of media effects. *Journal of Communication*, 103–122. <http://dx.doi.org/10.1111/j.1460-2466.1999.tb02784.x>
- Schultz, F., Utz, S., & Göritz, A. (2011). Is the medium the message? Perceptions of and reactions to crisis communication via twitter, blogs and traditional media. *Public Relations Review*, *37*(1), 20–27. <http://dx.doi.org/10.1016/j.pubrev.2010.12.001>
- Schultz, F., Kleinrijenhuus, J., Oegema, D., Utz, S., & van Atteveldt, W. (2012). Strategic framing in the BP crisis: A semantic network analysis of associative frames. *Public Relations Review*, *38*(1), 97–107. <http://dx.doi.org/10.1016/j.pubrev.2011.08.003>
- Schwarz, A. (2012). How publics use social media to respond to blame games in crisis communication: The Love Parade tragedy in Duisburg 2010. *Public Relations Review*, *38*(3), 430–437. <http://dx.doi.org/10.1016/j.pubrev.2012.01.009>
- Seeger, M. W. (2002). Chaos and crisis: Propositions for a general theory of crisis communication. *Public Relations Review*, *28*(2002), 329–337. [http://dx.doi.org/10.1016/S0363-8111\(02\)00168-6](http://dx.doi.org/10.1016/S0363-8111(02)00168-6)
- Seltzer, T., & Mitrook, M. (2007). The dialogic potential of weblogs in relationship building. *Public Relations Review*, *33*(2), 227–229. <http://dx.doi.org/10.1016/j.pubrev.2007.02.011>
- Semetko, H. A., & Valkenburg, P. M. (2000). Framing European politics. A content analysis of press and television news. *Journal of Communication*, *50*(September (1998)), 93–1009. <http://dx.doi.org/10.1111/j.1460-2466.2000.tb02843.x>
- Smith, B. G. (2010). Socially distributing public relations: Twitter, Haiti, and interactivity in social media. *Public Relations Review*, *36*(4), 329–335. <http://dx.doi.org/10.1016/j.pubrev.2010.08.005>
- Sniderman, P. M., & Theriault, S. M. (2004). Studies in public opinion: Gauging attitudes, nonattitudes, measurement error and change. In W. E. Saris, & P. M. Sniderman (Eds.), *Studies in public opinion* (Vol. 3) (pp. 133–165). Princeton, NJ: Princeton University Press. <http://dx.doi.org/10.1017/S1537592705810254>
- Snow, D. A., Rochford, E. B., Worden, S. K., & Benford, R. D. (1986). Frame alignment processes, micromobilization, and movement participation. *American Sociological Review*, *51*(4), 464–481. <http://dx.doi.org/10.2307/2095581>
- Snow, D. A., Vliegenthart, R., & Corrigan-Brown, C. (2007). Framing the french riots: A comparative study of frame variation. *Social Forces*, *86*(2), 385–415. <http://dx.doi.org/10.1093/sf/86.2.385>
- Statista.com. (2015). *Leading social networks worldwide as of March 2015, ranked by number of active users (in millions)*. Retrieved from. <http://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/>
- Sturges, D. L. (1994). Communicating through crisis: A strategy for organizational survival. *Management Communication Quarterly*, *7*(3), 297. Retrieved from. http://mcq.sagepub.com/content/7/3_full.df+html
- Thelwall, M., & Stuart, D. (2007). RUOK? Blogging communication technologies during crises. *Journal of Computer-Mediated Communication*, *12*(2), 189–214. <http://dx.doi.org/10.1111/j.1083-6101.2007.00336.x>
- Van Gorp, B. (2007). The constructionist approach to framing: Bringing culture back in. *Journal of Communication*, *57*(1), 60–78. <http://dx.doi.org/10.1111/j.1460-2466.2006.00329.x>
- Van der Meer, T. G. L. A., & Verhoeven, P. (2013). Public framing organizational crisis situations: Social media versus news media. *Public Relations Review*, *39*(3), 229–231. <http://dx.doi.org/10.1016/j.pubrev.2012.12.001>
- Van der Meer, T. G. L. A., & Verhoeven, J. W. M. (2014). Emotional crisis communication. *Public Relations Review*, *40*(3), 526–536. <http://dx.doi.org/10.1016/j.pubrev.2014.03.004>
- Van der Meer, T. G. L. A., Verhoeven, P., Beentjes, H., & Vliegenthart, R. (2014). When frames align: The interplay between PR, news media, and the public in times of crisis. *Public Relations Review*, *40*(5), 751–761. <http://dx.doi.org/10.1016/j.pubrev.2014.07.008>
- Vasterman, P., Yzermans, C. J., & Dirkzwager, A. J. E. (2005). The role of the media and media hypes in the aftermath of disasters. *Epidemiologic Reviews*, *27*(1), 107–114. <http://dx.doi.org/10.1093/epirev/mxi002>
- Vielhaber, M. E., & Waltman, J. L. (2008). Changing uses of technology: Crisis communication responses in a faculty strike. *Journal of Business Communication*, *45*(3), 308–330. <http://dx.doi.org/10.1177/0021943608317112>
- Vlieger, E., & Leydesdorff, L. (2011). Content analysis and the measurement of meaning: The visualization of frames in collections of messages. *The Public Journal of Semiotics*, *3*(1), 28–50. Retrieved from. <http://www.leydesdorff.net/semiotics/semiotics.pdf>
- Waters, R. D., Tindall, N. T. J., & Morton, T. S. (2010). Media catching and the journalist-public relations practitioner relationship: How social media are changing the practice of media relations. *Journal of Public Relations Research*, *22*(3), 241–264. <http://dx.doi.org/10.1080/10627261003799202>
- Yang, J. (2003). Framing the NATO air strikes on Kosovo across countries: Comparison of Chinese and US newspaper coverage. *International Communication Gazette*, *65*(3), 231–249. <http://dx.doi.org/10.1177/0016549203065003002>
- Yuniar, R. (2015). (2015, January 6). *How the AirAsia search has played out on social media*. Retrieved from. <http://blogs.wsj.com/indonesiarealtime/2015/01/06/how-the-airasia-search-has-played-out-on-social-media/>
- Zhou, Y., & Moy, P. (2007). Parsing framing processes: The interplay between online public opinion and media coverage. *Journal of Communication*, *57*(1), 79–98. <http://dx.doi.org/10.1111/j.0021-9916.2007.00330.x>