

Configuring Social Media Listening Practices in Crisis Management

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ABSTRACT

Social media listening practices are increasingly adopted in crisis management and have become an object of interest for researchers and practitioners. This article analyzes how these enactments have been studied. Through a systematic review of the available literature, features from studies involving depictions of practice were extracted, analyzed, and turned into a narrative by using an inductive approach. Strategies of improvisation, overreliance on personal and professional networks, manual work, spontaneous coordination, and re-assignment of tasks represent the main findings in the multidisciplinary literature. This article provides a consolidated overview of experiences from social media listening in practice beyond listing the benefits of social media as a source of information. Moreover, this paper sets the basis for future studies on the range of possible configurations and the institutionalization of practices to manage disruptive crises.

Keywords

Social media listening, practice, improvisation, crisis management strategy, configuration.

INTRODUCTION

Insights into situational awareness in areas affected by crises, maintaining two-way conversations with affected communities, the possibility to respond to requests for help, and early warning of sudden events are some features embedded in data emanating from social media conversations that are useful for crisis management operations. The benefits of data from social media have been recognized, assimilated, and documented (Hughes and Palen, 2012; Tobias, 2011); however, difficulties remain in adopting, configuring, and strategizing practices of social media listening in crisis management. Therefore, social media strategies are often a result of improvisation and “spur-of-the-moment” decisions with limited information sources available. Using social media as an information source is a relatively new practice that has encountered barriers in an already rigid field with established and somewhat rigid command-and-control procedures (Reuter, Hughes, and Kaufhold, 2018; Stieglitz, Mirbabaie, Fromm, and Melzer, 2018). Therefore, an ideal starting point to reveal configurations of practices is to review existing academic literature for insights into adoption, implementation, benefits, challenges, and intrinsic characteristics surrounding the collection, analysis, synthesis, and reporting of information to fulfill organizational, operational, or strategic objectives.

Although a new practice, social media listening counts with an available body of literature that is numerous and encompasses diverse disciplines from social and natural sciences. At first glance, the literature focuses on single independent case studies that provide insights into the disconnect between social media’s potential and current practices or on the design of technological solutions that address challenges in collecting and handling data. This article seeks to aggregate previous findings through a systematic literature review and to generalize emerging concepts intrinsic to the configurations of social media listening practices in crises. The result is a consolidated picture of the enactment of crisis management strategies and a future research agenda. In social media listening, practices are inherently different and context dependent. The findings illustrate overarching themes that explain the implementation and configuration of practices.

Listening to social media conversations is often regarded as intelligence, surveillance, or monitoring. In essence, it refers to the extraction and analysis of data found on social media, usually with the help of one or several technological solutions with analytical capabilities for social media listening. For this article, *social media listening* is a term that encompasses these commonly used terms. Moreover, practice is understood as the set of interactions between entwined entities, people, and objects and is a part of an ecosystem that seeks to achieve objectives (Kallinikos, Leonardi, and Nardi, 2012). Attention is placed on “the situated practices surrounding the

socio-technical accomplishment of representing the world through data” (Soden and Palen, 2018, p. 3). Social, technological, organizational, and contextual features with unclear boundaries work together to fulfill decision-making objectives (Kaufhold, Rupp, Reuter, and Amelunxen, 2018; Olteanu, Vieweg, and Castillo, 2015). The practice of social media listening is an all-hazard approach that, with each incident, transforms in parallel to the spatiotemporal progression of crisis life cycle, namely: preparedness, response, recovery, mitigation, and prevention (Blanford et al., 2014; Gu et al., 2014). Thus, social media listening exists because of the need for information so that decisions that translate into actions can be made (Quarantelli, 1988). In crisis management, disasters (i.e., disruptions of established societal dynamics with slow-onset or rapid-onset characteristics) produce an environment where novel and unexpected problems emerge and directly or indirectly affected populations actively engage in problem solving (Dynes, 1994; Quarantelli, 1998); these individuals or groups then support the disaster life cycle. The different types of disasters that originate from the complex interactions of physical, social, and built environments (Mileti, 1999) are classified into natural, human-made, organizational, and public health (Henriksen et al., 2018).

This literature review seeks answers to the following question:

How are configurations of social media listening practices in crisis management studied in the literature?

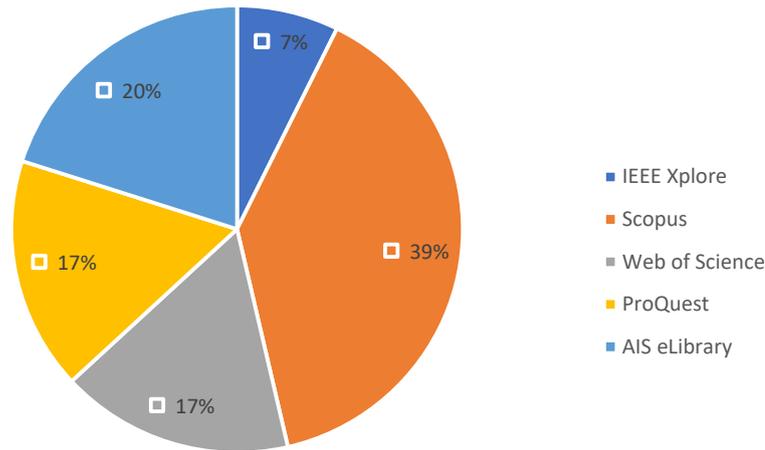
This article makes two main contributions. First, it provides a comprehensive overview of social media listening practices and their contributions as captured in the literature. Second, it deepens understanding of these practices by discussing implications and proposing research avenues. The remainder is structured as follows: Section II describes the systematic methodology for reviewing and analyzing the literature. Section III presents the findings, and Section IV presents a discussion and future research directions. Section V concludes with a brief overview of the discussed content and a future research agenda.

METHODOLOGY: FINDING, CLASSIFYING, AND ANALYZING THE LITERATURE

This systematic literature review follows the approach from Okoli and Schabram (2010) and Webster and Watson (2002). The study of Kitchenham (2004) was used as the primary guide for protocol development.

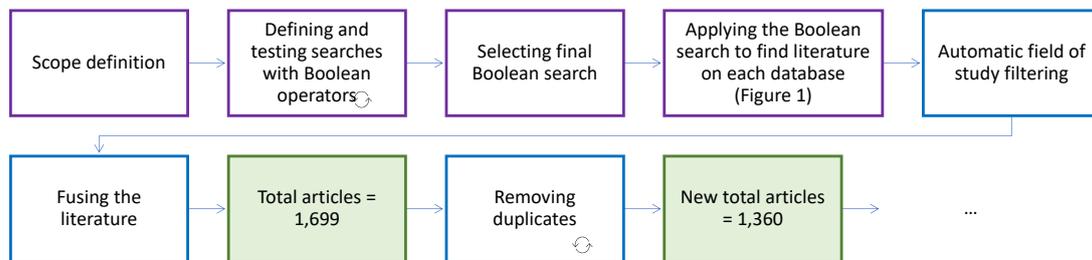
The compilation of 109 final articles was used as the basis for analyzing results from a rigorous selection and classification process that started with the building of a protocol for review; the protocol contained parameters that guided the selection process in this study (Kitchenham, 2004). The scope included papers that are written in English and have no timeframe of publication, as most of the research related to this phenomenon has been conducted in the last decade. The papers involve the use of social media as a source of information in crisis management. The selected articles should also focus on the enactments of practices as a socio-technical phenomenon through case studies and other methodologies involving experts in managing crises.

The process started with the construction of simple keyword searches to obtain an overview of the field. First, Google searches of the terms “social listening” and “social media listening” yielded numerous results about commercial tools and services for social media analytics. This result indicates that social media listening is a well-established practice across field boundaries. However, the same search on Google Scholar and other academic databases yielded mostly irrelevant articles from diverse disciplines. At this point, the diversity of concepts associated with social media listening clearly poses a challenge in retrieving relevant knowledge (Boell and Cecez-Kecmanovic, 2015). Therefore, several combinations of terms were tested to find the most relevant results by leveraging Boolean operators. Associated terms, such as monitoring, intelligence, analytics, citizen-generated content, and surveillance, were integrated. Subsequently, the search stream was refined with characterizations of disasters, including terms such as emergency, crisis, situational awareness, and similar variations. Then, descriptors of practice, such as process, operations, and systems, were added to obtain more focused results. Automated filtering was applied by restricting searches to abstracts, titles, and keywords. Papers involving disciplines, such as sports sciences, astronomy, and biology, were automatically discarded. The final search was applied in five academic databases considering social media listening’s multidisciplinary nature (Figure 1). As a result, 1,699 peer-reviewed articles and conference papers were selected as potential candidates for screening. After duplicates between databases were removed, 1,360 articles were obtained (Figure 2).



Note: The volume of articles are presented as a percentage of total articles (n=1699) resulting from the database search using the Boolean operators.

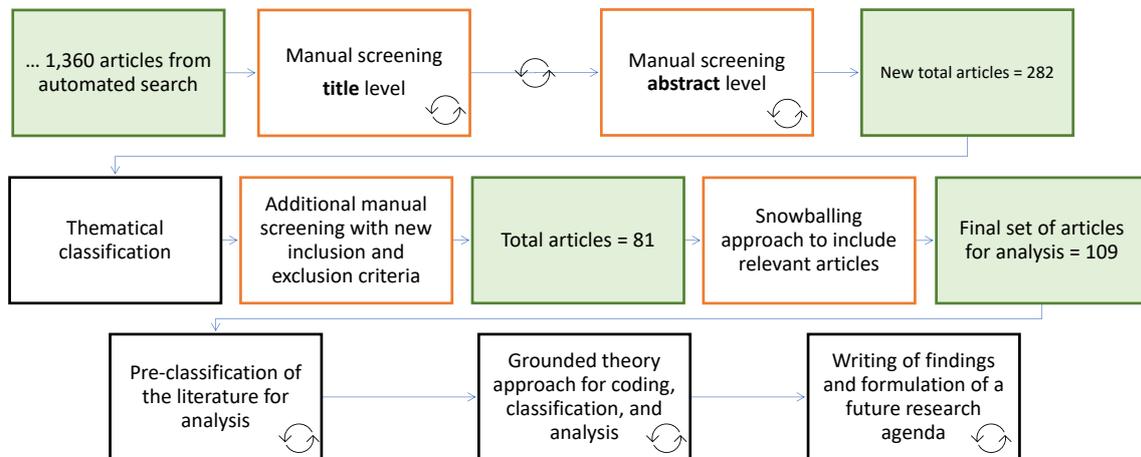
Figure 1. Distribution of articles from scientific databases obtained via a final Boolean search (% of total)



Note: Automatic steps are indicated in blue, ↻ denotes an iterative step.

Figure 2. Literature review process: criteria definition and automated search for literature

The body of literature was further narrowed down by manually screening articles by title and abstract with at least two reiterations, as this process was challenging. Then, 282 articles were selected to thematically analyze at the abstract level to identify preliminary themes and structures of practices based on topics of concern and methodologies used. At this point, only articles with case studies and methodologies that involved practitioners were included., yielding 81 articles. Finally, additional articles were added using a snowballing approach (Webster and Watson, 2002) with a focus on known authors in the field (Figure 3), yielding a final count of 109 articles.



Note: Manual steps are indicated in orange, analysis steps in black, ↻ denotes an iterative step.

Figure 3. Literature review process: manual screening steps and analysis

The selected articles' contents were coded and analyzed following an inductive approach, and the results of abstract-level analysis were used as basis for further classifications. The descriptions and features of social media listening practices emerged from each article. Then, codes were compared, and connections were made from the findings in the literature to construct a narrative that describes the features of practices according to previous studies.

FINDINGS: THE FEATURES OF PRACTICE

Performing academic research is an avenue to understand the adoption, integration, and perception of practices of social media listening in different organizational, technical, and environmental contexts (Stieglitz et al., 2018). However, given the fast-paced and volatile nature of the field, the performance of immediate tasks, mostly related to response and recovery, is prioritized over the research, process improvement, training, and design of solutions that are performed during "steady-state operations" or non-crisis periods (Tapia and Moore, 2014), which is a disadvantage in such a volatile field of analysis.

The main concern of studies is the *adoption and benefits of social media in crisis management operations*. Practitioners and volunteers recognize the benefits of social media as a good source of situational awareness (Munkvold, Flaten, and Nguyen, 2015; Stieglitz et al., 2018) and disaster risk reduction (Allaire, 2016). However, how actual practices are developed from possible ideas remains uncertain (Reuter, Kaufhold, Spahr, Spielhofer, and Hahne, 2020) because current research mostly recounts factual events and results in personal perceptions that may differ from actual situations during crisis operations in real time (Avery, 2017).

Research in social media listening is found under the general umbrella of social media use in crisis management, which includes:

- Information dissemination and extraction (Petersen et al., 2018; Reuter et al., 2020);
- A source of traces that provide a picture of a crisis (Castillo, 2016; Simon, Goldberg, Aharonson-Daniel, Leykin, and Adini, 2014);
- A configuration of decision support systems (Moßgraber et al., 2018); and
- A source for innovations (Soden and Palen, 2018). Turning to social media to extract information seems to be a second priority after pushing content (Chatfield and Reddick, 2015; Szymczak, Kuecukbalaban, Knuth, and Schmidt, 2015).

Methods of Study

The existing body of literature uses diverse methodologies to analyze practices around social media. In turn, *what the practice does in real time, the researcher investigates in the future*. Table 1 summarizes the methodologies used for the study of practice, which goes from the description and analysis of past events, user patterns, information flows, and stakeholder attitudes to the use of social media, software development, and organizational strategies and configurations. The study of practice shows that *once systems are in place, organizational configurations become a more evident challenge*.

Research and technological tool development also enact social media listening practices. However, *whereas social media listening practices need real-time analysis that is time sensitive and resource constrained*, most research tasks are performed with historical data, allowing in-depth understanding. Moreover, data collection is not automated, mainly in qualitative research. As methods of information extraction achieve more sophistication over time, research will be able to follow. For example, in the early 2010s, user identification, coding, and location were determined by manual investigation (Vieweg, Hughes, Starbird, and Palen, 2010), currently, crowdsourcing mechanisms aid the performance of these tasks (Imran, Castillo, Lucas, Meier, and Vieweg, 2014).

The following subsections present the features of practice from *ideal to actual* enactments, as described in the literature.

Table 1. Methodologies and objectives when researching social media use in crisis management

Methodology	Objective
Interviews	Recount experiences from main stakeholders in crisis management and analyze flows of social media information during past crisis events (Burns, 2015; Munkvold et al., 2015; Simon, Goldberg, and Adini, 2015)
Observations	
Document and literature analysis	Analyze the perceived technological, organizational, and environmental challenges in social media adoption (Stieglitz et al., 2018)

Table 1. *continued.*

Methodology	Objective
Historical analysis of social media data and big data analytics	Analyze collective activities in digital humanitarian and formal response authorities (Burns, 2015). Analyze crisis management patterns, such as user roles and useful information, for situational awareness (Mirbabaie, Ehnis, Stieglitz, and Bunker, 2014; Vieweg et al., 2010; Zade et al., 2018).
Online and offline simulations	Analyze and discover generic user types and behaviors acting in a crisis and analyze responders' actions and attitudes toward the use of social media as a part of response operations in disaster and rescue scenarios (Lappas, Karampelas, and Fessakis, 2019; Meesters, van Beek, and Van de Walle, 2016)
Delphi study	Reach consensus between practice and technological requirements elicited for software development (Hiltz et al., 2020).
Organizational strategies, tasks, performances, and operations analysis	Explore structures, procedures, and technical features required to deploy intelligence-gathering efforts that influence decision making (Cobb et al., 2014; Fathi, Thom, Koch, Ertl, and Fiedrich, 2019; Markenson and Howe, 2014; Power and Kibell, 2017)
Comparative and longitudinal analyses (short term)	Conduct the same study with two or three years of intervals to analyze the evolution of practices (Reuter et al., 2020; Tapia and Moore, 2014).

Emergence of Practices

Given the diversity of objectives that can be fulfilled through social media, research in the field focuses on individual case studies. For example, through the study of *virtual operation support teams (VOSTs)*, Fathi et al. (2019) discuss the ideation, structuration, and deployment of a team to aid in surveillance during a mass gathering event. The structure of VOSTs is decentralized, usually removed from the actual emergency and the emergency operations; furthermore, it is also familiarized with procedures, protocols, and communication channels of the agency that uses them (Fathi et al., 2019).

The American Red Cross (ARC) concept of a digital operations center is based on key tasks surrounding information, linkages with emergency management protocols, and staffing (Markenson and Howe, 2014). Information gathering includes diverse, publicly accessible, and geotagged digital sources beyond social media (Markenson and Howe, 2014).

Bunker, Ehnis, Levine, Babar, and Sleight (2018) explain how centralized information and linear decision-making processes from knowledge to action constitute the essence of command and control rigidity that exhibits incompatibility with other systems from other organizations, in turn limiting possible collaborations and coordination (Bunker et al., 2018).

In studies about terrorist attacks, *social media listening practices emerge as an accelerated process* that jumps protocols, leading to the possible institutionalization of the “experiment” after the response (Petersen et al., 2018). These studies find that social media is the first source for the situation awareness of these events rather than traditional media, the customary venue for sense making (Petersen et al., 2018). Social media is the first place where attacks are reported by eyewitnesses and quickly transforms into the communication hub, as emergency phone lines are usually overwhelmed (Simon et al., 2014).

Despite the uniqueness of each enactment of social media listening, distinctive patterns and characteristics have been discovered through this literature review. Table 2 presents a summary of findings that serve as guidance throughout the rest of the section.

Table 2. Radiography of social media listening

Umbrella	Social media use
Objectives	Situational awareness
	Constant surveillance
	Two-way conversations
	Monitoring for requests for help (when traditional lines are overwhelmed)
Housed in	Communication functions
	Operational/tactical tasks
	Mix
	Ad-hoc set-ups
Configured and performed by	Analysts
	Information officers
	Digital volunteers
	Artificial Intelligence
	Software
Phases	Steady state
	Crisis response
	Post-crisis response and return to steady state
Activities	Keyword searches
	Data analysis
	Relevant social media user identification
Features of practice	Tight organizational networks from long-standing relationships
	Flexible configurations
	Adapted to objectives of the organization
	Improvisation and spontaneous coordination
	Rapid flow of information and decision making
	Online and offline actions
Barriers	High expectations
	Technical and field experience required to maximize technologies capabilities
	Trust
	No institutionalization of practices
	Hyper-targeted crisis communications

Permanent Operations or Steady-State Operations During Non-Disaster Times

Some crisis management and humanitarian organizations have adopted social media routines where surveillance and situational awareness regularly happen. Examples in the literature describe how constant surveillance is set up based on topic interest (Boersma, 2013; Markenson and Howe, 2014) and social media accounts (Ehnis and Bunker, 2020) or how situational awareness is provided to the public on minor events (Simon et al., 2014). In any case, each organization has intrinsic processes, technologies, and information systems that respond to the capabilities and requirements of their specific operations and mission (Bunker et al., 2018)

Social media listening is traditionally placed in communication roles because social media is mostly used for disseminating content (Avery, 2017; Hughes and Palen, 2012). Thus, tasks of social media listening tasks compete with crisis communications and traditional media, making listening lower in priority as practitioners expect the public to trust their content published on social media but are reluctant to trust insights from social media (Silvestri, 2017; Szymczak et al., 2015). However, with the operational benefits of social media data, the practice finds a place within operation center configurations to support decision making and operations that have not

previously considered social media information, such as emergency dispatchers and humanitarian relief (Ma and Zhang, 2018; Purohit, Castillo, Imran, and Pandey, 2018).

Routines in operation center structures align with other functions within the same organization (Purohit et al., 2018). Power and Kibell (2017) describe three components of day-to-day operations for a social media intelligence analyst working in shifts, namely, arrival, where priorities and objectives are passed on from the previous shift, and systems are prepared for activities of the day; monitoring and collaboration, which refers to the performance of the core tasks of monitoring and verifying for incidents and developments that respond to needs and objectives; and handover, where a smooth transition is ensured by communicating and collaborating with an incoming team (Power and Kibell, 2017). Unless constant monitoring is demanded due to the nature of the operations, such as an emergency dispatcher or police surveillance, no 24/7 monitoring occurs during steady-state operations; if incidents are reported on social media channels, they may not be heard until the following business hours (Ehnis and Bunker, 2020). Regardless of the constant or ad hoc nature of social media listening, the following are the basic features in setting up practices.

Basics

Keyword searches are the method usually employed for social media listening. More sophisticated configurations display dashboards with continuous updates related to an organization's core mission and reputation (Markenson and Howe, 2014). The objective is *to watch for the potential surge of disasters or controversies* that hinder the organization and its mission (Markenson and Howe, 2014) or the emergence of potential needs from the general public (Ehnis and Bunker, 2020). If an emergency is spotted, systems adapt from everyday operations into crisis management, and established protocols are activated, such as 24/7 surveillance (Power and Kibell, 2017) or coordination with support resources, such as volunteers or temporary staff (Bunker et al., 2018; Markenson and Howe, 2014). Organizational structures demand flexibility for the scalation of capabilities in terms of trained and skilled additional staff, volunteers, and resources (Markenson and Howe, 2014) that integrate temporary operations that do not need to be physically located in the organization (Abdulhamid, Perry, and Kashefi, 2018; Bonaretti and Piccoli, 2018; Hughes and Tapia, 2015).

The shift in operations due to a major event is evident as social media behavior from response authorities changes from providing to extracting situational awareness and broadcasting safety and response contents (Pogrebnyakov and Maldonado, 2018; Simon et al., 2014).

Preparation Beforehand

Studies argue that strategies and infrastructure for practicing social media listening need to be established before a crisis emerges (Reuter and Kaufhold, 2018). When practices are set up based on previous knowledge of crisis management operations and disaster needs, practitioners spend some *steady-state* time identifying relevant social media users, such as politicians, journalists, celebrities, and other influencers, with common and emergent hashtags. These preparation steps enhance the effectiveness of social media listening (Power and Kibell, 2017).

Moreover, in the collaboration realm, the crisis management field relies, on the one hand, on tight organizational networks with long-standing relationships formally called upon when capacity enhancement through other entities, such as authorities or volunteers, is needed. When setting up collaborations, strategy meetings are carried out, where expectations and relationships are defined (Abdulhamid et al., 2018; Fathi et al., 2019). On the other hand, collaborations emerge informally through personal networks from conferences or previous working teams that understand the nature of the field and can be reached on short notice (Petersen et al., 2018; Tapia and Moore, 2014). Figure 4 illustrates the stages of social media listening from steady state to crisis management.

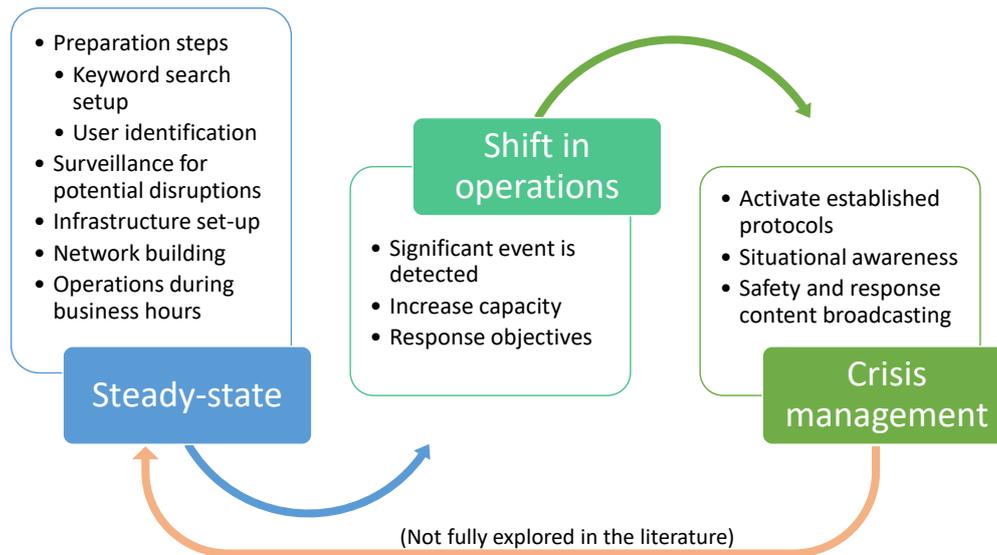


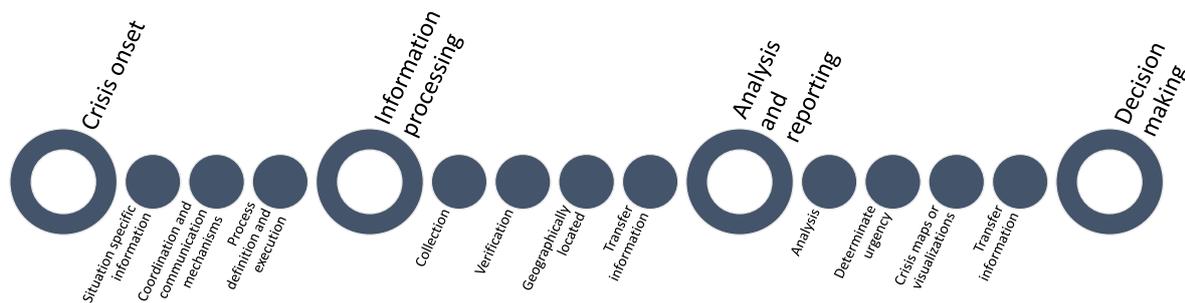
Figure 4. Transitions of practices of social media listening from steady-state operations to crisis management

Crisis Management: From Information Discovery to Decision Making

During crises, the role of social media listening is for information to flow from discovery to decision making through internal and external structures. The enactment of the practice is fast paced and stressful (Cobb et al., 2014). Processes are performed starting from predominantly automated data collection and sometimes analysis tasks to manual tasks mostly related to visualizations and reports that are highly customized to a decision maker's requirements (Fathi et al., 2019). Technology tools that aid processes are numerous and used depending on tasks performed, such as following hashtags or identifying users (Cobb et al., 2014). Teams performing social media listening find value in using many tools as the access and variety of information are enriched (Cobb et al., 2014).

At the onset of crises, a preparation phase involves the assessment of a situation and the identification of keywords, hashtags, possible relevant stakeholders, users to follow, location, and situation-specific information (Cobb et al., 2014). Coordination and communication mechanisms then aid the realization of tasks for social media listening tasks. For example, backchannel communications, such as internal social media team forums or ongoing conference calls; help verify, revise, and communicate changes in information requirements and decision making throughout the monitoring and reporting of findings (Cobb et al., 2014). Sometimes, a manually created and maintained *central document that serves as a response operations' basic guidelines* is used (Fathi et al., 2019; Petersen et al., 2018). The document is dynamic and starts as a repository for information requirements and available information at any given time. Manual updates are entered as situations change, and sub-events emerge within a crisis. The central document also serves as a team-tracking device to delegate assignments and coordinate activities (Cobb et al., 2014). Search parameters are continuously adapted and manually updated both in the central document and in different monitoring tools (Fathi et al., 2019; Petersen et al., 2018). Information from the central document is selected, compiled, and summarized by a team leader that presents a report to an official (Fathi et al., 2019). In cases where resources are not sufficient to allow working in teams, these tasks are performed by one analyst (Avery, 2017). The central document and the reports that are used for decision making serve as guidance, and record-keeping for the operation. These documents *tell a story of* the crisis and the performance of the practice in crisis response (Fathi et al., 2019). However, the manual work involved in maintaining the central document slows down other aspects of social media listening.

In volunteer organizations that are often linked to formal crisis management organizations to enhance crisis response capabilities, both internal and external organizational and team configurations are observed (Abdulhamid et al., 2018). Internally, relevant information is collected, verified, and located geographically following established protocols and then transferred to crisis maps that include an analysis of details found on the content (Fathi et al., 2019). Subsequently, a coordination liaison assesses and transfers the results to the requesting organization into the decision-making process (Fathi et al., 2019). In turn, the literature demonstrates that additional resources quickly meet requirements and enhance processes within the response of events (Petersen et al., 2018).



Note: This is a simplified representation of the social media listening process based on findings from the literature. However, enactments of practice are unique and non-linear as described in the text. Furthermore, processes oscillate from manual to automated. Automated processes are most likely to be found in the information processing stage. Likewise, the social media practice encounters features of improvisation mainly in the onset of crises and the reporting of findings. However, as the practice matures, there is a need for standardization and institutionalization of processes.

Figure 5. Representation of the process of social media listening: summary of findings

Rapid Decision Making Versus Improvisation, Spontaneous Coordination, and the Emergence of Institutionalization

The rapid decision-making nature of disaster response makes crisis management rely on mechanisms, such as improvisation, spontaneous coordination, network contacts, and previous knowledge, as the main concern is speed. These mechanisms are especially evident during the first 48 hours of crisis management activation, where many unknowns exist and the pressure to act is high (Tapia and Moore, 2014). Decisions are made right away and sometimes bypass established protocols such as meetings, approvals, and reviews (Tapia and Moore, 2014). Practitioners hesitate to act based solely on social media information (Anson, Watson, Wadhwa, and Metz, 2017; Ehnis and Bunker, 2020; Stieglitz et al., 2018). However, during crisis response, social media listening practices may emerge as a result of *spontaneous coordination* when unexpected developments bring new objectives, and dynamic information requirements surpass established structures; this process results in “breaking the rules” or relying on alternative means to respond to the immediate needs of an emerging situation (Chatfield, Scholl, and Brajawidagda, 2014; Fathi et al., 2019).

Even though social media can be an established channel for responders to interact with the public, the uncertainty and the lack of formalized procedures that emerge from the needs of response operations result in delays in responses and the waste of resources (Conrado, Neville, Woodworth, and O’Riordan, 2016; Simon et al., 2014; Stieglitz et al., 2018). For example, during the 2015 Paris attacks, when an operation center for crisis management received a requirement for information from a higher authority in charge of the response, an analyst used personal contacts to establish a temporary collaboration relationship with a digital volunteer organization that quickly adapted practices within the requesting organization and rapidly provided the required information, including preliminary analyses (Petersen et al., 2018). After the benefits of social media information were experienced in action, authorities allowed the development of a keyword-based monitoring tool that had been planned for some time (Petersen et al., 2018). Another example is during Hurricane Sandy in the US, where authorities started to respond to requests for help from the public on social media, as the emergency line was overloaded (Chatfield et al., 2014). In this scenario, resources were dispatched despite the unverified and untrusted nature of the information provided before resources were used (Chatfield et al., 2014; Conrado et al., 2016).

When receiving requests for help or incident reports on social media becomes a continuous habit, unofficial processes emerge from current social media listening practices and the moral responsibility to meet the public’s expectations (Ehnis and Bunker, 2020). Likewise, examples from volunteer teams revealed that the awareness of changes in operational procedures can result in temporary assignments and the redistribution of tasks (Fathi et al., 2019), evidencing a dynamic structure that is flexible to mirror the specific emerging needs of a situation (Fathi et al., 2019). This restructuring spontaneously emerged from the needs of an operation and was not preestablished (Fathi et al., 2019). These examples of practiced *improvisation* exhibit the need to loosen command-and-control structures as citizens are more active and have higher expectations of social media use by authorities (Hughes and Tapia, 2015; Stieglitz et al., 2018). Moreover, organizations temporarily experiment with technologies to perform tasks, such as the monitoring of presidential elections by leveraging popular social messaging apps (Moreno, Garrison, and Bhat, 2017).

Patterns of Collaboration and Integration Across Organizational Boundaries

During crises, stakeholders interact both offline and online. Twitter and Facebook are social media platforms that are mainly used in crisis management (Latonero and Shklovski, 2011). However, the lack of awareness of key stakeholders (e.g., government bodies, influencers, other organizations) on social media presence in each crisis makes it challenging to coordinate and monitor information flow (Simon et al., 2014), unless connections are made offline. Tapia and Moore (2014) find that practitioners lack information sources rather than content itself. Crisis managers traditionally rely on sources that are a result of trusted relationships and networks formed in time that simplify the exchange of data across organizational boundaries when needed (Tapia and Moore, 2014). In this sense, social media contributes to maintaining the personal and professional networks practitioners make along with their professional experiences. Trusted networks are a source of information in themselves, as “the broadcast nature of social media data greatly reduces the effort required to gather information” (Tapia and Moore, 2014, p. 498).

Fathi et al. (2019) highlight the role of *familiarity* and *flexibility* in a VOST’s integration with the organization they are embedded in, the tasks, and the scenarios related to activities performed. The transfer of expertise to a digital volunteer organization is regarded as an advantage in the humanitarian sector because of the infrastructure and skills that surpass the resources available in a responding organization (Tapia and Moore, 2014). However, for the better integration of different organizations and systems, the alignment should include technological, organizational, and structural attributes defined as outcomes, principles, community, action, social fabric, infrastructure, services, and governance (Bunker et al., 2018). These considerations need to be in place before a crisis occurs and strengthened as collaborations extend through time (Tapia and Moore, 2014). This process is important so that initiatives materialize from ideas to relationships. Conversely, when social media listening practices are analyzed in isolation, research finds similarities across cases, such as collaborative work, the geographic dispersion of team members, backchannel conversations, and trusted networks (Cobb et al., 2014).

Proximity/Closeness to Decision Making

The flow of information assumes a direct link to decision makers. In the case of VOSTs, the structure uses a liaison figure that physically connects the VOSTs with authorities in planning meetings, operation decisions, and deployment. The liaison acts as a synchronizer by ensuring that information and strategies arrive at respective parties. In addition, the liaison figure and leaders in VOST participate in situation meetings to ensure that both organizations are aligned (Fathi et al., 2019). Digital operations with a more permanent nature are physically located within the eyesight of decision makers, enabling open access to situational awareness (Markenson and Howe, 2014).

Knowledge, Experience, Training, Guidance, and Craft in Crisis Management

Social media listening is strengthened by the ability to navigate through social media platforms, formulate and refine searches and keywords, and understand the event as a crisis evolves; these features are possible not only by the power of technology solutions but also by an intrinsic experience that only comes from both crisis management and social media (Power and Kibell, 2017; Reuter et al., 2020). Through social media listening, reality is observed remotely, detached from direct human experience in crises. Therefore, the practice relies on representations found on social media platforms to construct a perceived reality (Burns, 2015). A survey of analytical tools for social media conversation used for preparedness shows that although the majority of respondents use social media platforms, less than 40% use social media analytical tools to make sense of data from social media conversation because users likely lack knowledge of these tools (Anson et al., 2017). Therefore, practitioners recognize the need to be educated better in using social media to contribute to the development of proper technical solutions when working with social media (Latonero and Shklovski, 2011; Reuter et al., 2020). “If the usability barriers of a method are too high or if the results are difficult to understand, the users, usually fall back on their more traditional, hands-on means of analyzing the available data” (Fathi et al., 2019, p. 22).

The literature asserts that a plausible solution is employing volunteered labor through collaborations between digital humanitarians and formal institutions for emergency management (Burns, 2015; Hughes and Tapia, 2015). Moreover, financial support may foster the adoption of social media analytics (Stieglitz et al., 2018). Likewise, training and organizational changes are essential to increase the usage of social media in organizations (Reuter et al., 2020). However, trainings are commonly focused on the provision of services for affected communities and do not include social media listening strategies (Stieglitz et al., 2018). A unique feature observed in the concept of the ARC is that social media use is not an isolated task managed by social media staff. Instead, field units, staff, and volunteers beyond communications are trained and encouraged to engage with social media on behalf of the institution (Markenson and Howe, 2014), which increases the proficiency of social media and engagement at an organizational level.

High Expectations, Ideal Versus Existing Practices, Barriers, and Fears

Current technological possibilities do not seem to match expectations from practitioners (Hiltz et al., 2020), who are overloaded with tasks and want to delegate or automate information extraction and analysis (Hiltz, Kushma, and Plotnick, 2014; Kaufhold, Rupp, Reuter, and Habdank, 2020). For example, in controlled simulation studies, when providing practitioners with social media analytical tools, information from social media is addressed individually, and every piece of content is given the same importance (Grace, Halse, Kropczynski, Tapia, and Fonseca, 2019; Meesters et al., 2016) indicating that the lack of training and knowledge on processes, tools, and disasters leads to an *overload of information*. The response fails to consider the big picture, where networks form and users take the role of “information hubs” (Meesters et al., 2016).

In turn, with all the existing possibilities in technological development that enhance the practice (Imran, Castillo, Diaz, and Vieweg, 2015), existing social media analytical tools are not fully understood or used by practitioners (Anson et al., 2017) due to the lack of awareness of available possibilities or reluctance to try new technologies that may not serve the mission of each organization (Hiltz et al., 2020). Even though practitioners exhibit enthusiasm about improving software, achieving high expectations is questionable and unrealistic (Hiltz et al., 2020; Stieglitz et al., 2018; Tapia and Moore, 2014). Customizable algorithms are expected to satisfy the requirements of specific contexts and types of crises, be understandable, and support crisis management goals (Stieglitz et al., 2018). As Burns (2015) asserts, challenges with practices are often framed “in ways that make them addressable through technological means” (Burns, 2015, p. 480). By contrast, research is more concerned with the technological challenges of social media analytical tools and the veracity and quality of information extracted from social media (Stieglitz et al., 2018). To bridge this gap, researchers have started to bring together technology developers and practitioners to seek consensus and understanding of needs and possibilities and provide a list of priorities for future software developments (Hiltz et al., 2020). The lack of understanding and familiarity with social media in crisis management results in an apprehension toward implementing social media listening practices before attempting to incorporate this practice into already established protocols (Munkvold et al., 2015).

Moreover, barriers to social media use are mainly organizational rather than technical (Hiltz et al., 2014), causing inadequate humanitarian response (Burns, 2015). Such challenges include but are not limited to: the lack of resources (technology, finances, staff, time, experience, knowledge, and training); the lack of guidelines, standards, and policies; inaccuracies in information; rumors; and the malicious use of social media (Lindsay, 2011; Stieglitz et al., 2018). In addition, organizational culture change is needed before the adoption of social media. Hierarchical structures also complicate the usage of technologies, such as social media analytics (Stieglitz et al., 2018). The literature briefly considers the possible risks of unexpected outcomes emerging from operating on social media without sufficient knowledge. For example, audience profiling and linguistic matching are evidenced when computational tools facilitate a sensitive and personalized experience for crisis communications, which in turn leads to the phenomenon of hyper-targeted crisis communications (Leykin, Aharonson-Daniel, and Lahad, 2016). In addition, communities and intrinsic contextual characteristics that do not fit the limiting parameters are overlooked (Burns, 2015). Regarding social media listening practices, practical guidance and the institutionalization of practices are missing in terms of evaluating, judging, and using social media (Tapia and Moore, 2014).

DISCUSSION AND FUTURE RESEARCH AGENDA

Rapid decision making and fast-paced operations are intrinsic characteristics of practices in crisis management. By compiling studies of practices, this review discovers patterns of social media use as a source of information in this field. The academic literature provides evidence that current practices are moving from discussing the benefits of social media data as a source of information to the study of practice adoption and implementation. Therefore, the article argues that social media listening practices are maturing from the mere monitoring of one’s own social media presence to more specialized configurations that aim to take full advantage of the possibilities of social media data to help achieve objectives; some of these objectives include two-way communications or constant surveillance for early warnings of events. Thus, listening and understanding social media conversations contributes to decision making, operations, the design of technology tools, and information dissemination (Avery, 2017; Kaufhold et al., 2018; Markenson and Howe, 2014; Meesters et al., 2016). Although strict protocols and guidelines exist for traditional response operations, the lack of knowledge and trust in social media generates spontaneous coordination and reconfigurations that demand the momentaneous bypassing of established organizational protocols to fulfill information objectives (Fathi et al., 2019).

The differences in strategizing and adopting social media listening practices are related to remaining challenges in the technical, organizational, and environmental realms (Stieglitz et al., 2018). Although technology may not be fully understood or used for their intended purpose, (Hiltz et al., 2020) and staff who work with social media

may lack knowledge and resources (Avery, 2017); technology interventions combined with organizational strategies that are context- and survivor-centric may aid in overcoming the challenges. The influx of resources dedicated to this function depends on the importance that decision makers place on social media data and the other intrinsic characteristics of each enactment of practice. Response staff already operate and expect to perform tasks with imperfect information and uncertainty, as the nature of the work is driven by action and judgment calls (Tapia and Moore, 2014). Spontaneous coordination and momentaneous reconfigurations act as barriers to institutionalizing social media listening practices in crisis management. Research calls for the relaxing of strict command and control structures. However, understanding reactions and processes that trigger improvisation together with operational training and formalized guidelines can identify ways to encourage the flexibility and acceptance of social media listening practices in crisis management and thus overcome current challenges in practice (Bunker et al., 2018; Ehnis and Bunker, 2020). Therefore, the first proposition on the research agenda is:

How can features from current practices inform the future design and institutionalization of social media listening in crisis management strategy?

Moreover, a great deal of manual work goes into social media listening practice, which sometimes constitutes tasks that can be delegated or even automated. Therefore, further understanding of the pressure identifies where the practice can use reconfigurations with automation. The following formulations are then yielded:

How can practices achieve more fluidity by streamlining manual work?

Techniques that help process information from social media advance at an incredible pace (Castillo, 2016; Imran et al., 2015; Purohit et al., 2018). Approaches are developed but stay as a research prototype, or only a few tech-savvy practitioners take the time to use tools at their full potential (Anson et al., 2017; Hiltz et al., 2020). Moreover, intrinsic practice features that are context- and organizational-dependent rather than technology-dependent are left behind as challenges are framed in a techno-deterministic fashion that promises solutions through *the click of a button* (Burns, 2015; Stieglitz et al., 2018). This perception also influences the adoption of practices.

How can proficiency in social media listening be achieved to design, improve, and re-design future practices?

Throughout the study of social media listening, the practice and research about the practice lack integration with other systems (Ehnis and Bunker, 2020; Hiltz et al., 2020). Therefore, an additional area for future focus is the design of social media listening practices that encourage the integration and orchestration of features of social media listening practice with established crisis management systems and internal and external collaboration routines together with the weight of social media and other sources of information that influence decision making.

CONCLUSION

The social media listening practice counts with different manifestations, from digital volunteerism to command-and-control responses for crisis management. This literature review revealed that some practices emerge from improvisations and spontaneous coordination that originate from practitioners' strong networks established offline. In addition, the lack of knowledge, familiarity, training, and guidance keep practices in an experimental phase, where decision makers have not reached complete trust in social media as an information source. Additional work is needed in helping the configuration of practices to optimize the benefits that social media contributes to crisis management organizations.

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