Social Networks in Crisis Management: A Literature Review to Address the Criticality of the Challenge

Subjects: Communication

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This review proposes a concise literature review aimed at identifying the current body of knowledge on the adoption of Social Networks in crisis management. The major input is a structured research question based on the initial reading about the topic. Before the recent pandemic, most literature focused on local crises, with relatively few exceptions. Additionally, self-organising systems are spontaneously established between people who are affected by a crisis. The fundamental assumption underlying this study is the huge potential of Social Networks in the field of crisis management. That is supported, directly or indirectly, by a number of previous studies, which emphasise how effective adoption leads to better decision-making for crisis managers and local communities. Among the identified challenges is the need to integrate official communication by emergency agencies with citizen-generated content in a contest for credibility and trustworthiness. In certain cases, it has been reported that there is a lack of specific competence, knowledge, and expertise, as well as a lack of sufficient policies and guidelines for the use of Social Networks. Those challenges need to be framed by considering the classic difficulties of providing timely and accurate information to deal with fake news, unverified or misleading information, and information overload. Bridging major gaps through advanced analytics and AI-based technology is expected to provide a key contribution to establishing and safely enabling the practice of effective and efficient communication. This technology can help contrast dissonant mental models, which are often fostered by Social Networks, and enable shared situational awareness. Future research may take a closer look at AI technology and its impact on the role of Social Networks in managing crises.

social media | social networks | crisis management | mental model | situational awareness | disinformation | misinformation and fake news | infodemic | COVID-19

Despite several different definitions, there is currently no unique universally accepted definition for crisis, which may refer, among others, to disaster, emergency, and catastrophe [1][2]. One definition characterises a defined crisis as an event that has been observed in time and space where societies/communities face physical losses/damages/disruption of their functioning routine. Ref. [3] has classified crises into natural and human-made crises.

Crisis management is commonly understood as the process by which an organisation and/or government deal with an emergency [4][5]. Crisis management is typically approached in four different phases: mitigation, preparedness (prior to a crisis event), response, and recovery [4][5]. The mitigation phase aims to prevent the occurrence of a crisis event as well as mitigate known vulnerabilities inherent within the socioeconomic system. The preparedness phase explicitly targets enabling crisis managers and responders to act effectively [6]. In the response phase, responders act to prevent any further damage from ongoing issues, while during recovery, the focus is on restoring the pre-crisis state [6].

There is a tangible and increasing adoption of Social Media within the specific context of crisis management [7][8]. Indeed, Social Media has become an integral part of communication during crisis events, enabling the effective real-time dissemination of relevant information [9][10][11].

Social Media has become an important communication channel for emergency agencies [12][13] to manage crises [14]. Social Networks are used during crises for information gathering [15], situation awareness [16][17], maintaining relationships [18], emotional support [19], volunteer coordination [20][21], disseminating relevant information, and providing advice and guidance [22]. For instance, Social Media was widely beneficial during the flood crisis in Queensland in 2011 [23].

In this research, Social Media is defined within the specific context of crisis management as a socio-technical system that provides real-time information on the crisis and assists in protecting lives and properties [24][25]. Situational awareness is defined as being aware of what events are unfolding around people and gaining an understanding of what potentially relevant information means to them in that specific moment and in the future [26][27]. A significant aspect of situation awareness is the gathering of data from a wide number of sources by crisis managers [28][29].

A mental model is defined as a cognitive model that people use to understand the world [30][31]. A mental model is shaped by various factors, including cultural, environmental, and social factors, as well as people's experiences [31][32][33]. For instance, people use their personal experiences to develop their own models of understanding the world, which influence their responses [34][35]. A shared mental model is useful in a multi-stakeholder context [35]. Shared mental models are about sharing

information, knowledge, concepts, and word usage among individuals to achieve sufficient agreement among stakeholders [36].

In a complex environment, mental models are related to systematic understanding and normally affect decision-making as a determinant of situational awareness [26]. Situation awareness is described as goal-oriented, and a goal–task analysis was used to decide which data the users needed to be aware of. This analysis helps in understanding how the dataset needs to be used in relation to the goal and what projections need to be established to reach these goals [26][37]. Further, situation awareness contributed to 88% of human error as people misunderstood the situation. To avoid these errors, there is a need to develop a higher level of situational awareness [26][37].

The majority of the studies focused on the use of Social Media in crisis management in the United States [38][39], while there are a relatively limited number of studies in other countries or with a more generic focus [40].

Many organisations have invested in incorporating Social Media into their crisis response strategies [41]. It is important to observe how crisis management agencies currently leverage Social Networks to enhance both situational awareness and decision-making. Furthermore, Social Networks are a critical component of any emergency response and preparedness [42]. Government officials have turned to Social Media for various purposes, including information sharing and direct connection with citizens [42].

The Virtual Social Media Working Group (VSMWG) has been established by the US Department of Homeland Security Science and Technology Directorate [42][43], which focuses on providing guidance to emergency agencies on safe practices in using Social Media technologies [42]. There is a general interest in understanding the relationship between Social Media and situational awareness in public safety [42][44]. Many authors emphasise that several organisations have not yet fully understood how to use Social Media to effectively communicate during a crisis [45][46][47][48][49][50].

Crisis management is a relevant topic that is often the object of review as well as holistic and more specific discussion. This review aims to provide a concise literature review on the adoption of Social Networks in the specific field of crisis management. In this context, Social Networks and Social Media are used indistinctly [51].

Such an analysis aims to frame the challenges within the context of the current body of knowledge. It pointed out a fundamental need for integrating official communication by emergency agencies with citizen-generated content in a context of credibility and trustworthiness. It becomes especially challenging as several sources report a lack of specific competence, knowledge, and expertise, as well as sufficient policies and guidelines. Advanced analytics and AI-based technology provide unprecedented opportunities to establish effective and efficient communication, contrast dissonant mental models, and enable shared situational awareness. It should contribute to the classic difficulties and barriers to providing timely and accurate information, dealing with fake news, unverified or misleading information, and information overload.

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