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The Use of Social Media in Risk and Crisis Communication

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WORKING PAPER

"THE USE OF SOCIAL MEDIA IN RISK AND CRISIS COMMUNICATION"

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ABSTRACT

This report highlights the changing landscape of risk and crisis communications and in particular how social media can be a beneficial tool, but also create challenges for crisis managers. It explores different practices of risk and crisis communications experts related to the use of social media and proposes a framework for monitoring the development of practices among countries in the use of social media for risk and crisis communications. The three step process spans passive to dynamic use of social media, and provides governments a self-assessment tool to monitor and track progress in the uptake of effective use of social media by emergency services or crisis managers.

NOTE BY THE SECRETARIAT

This report addresses risk and crisis communications, a core policy area for the High Level Risk Forum. It draws on the outcome of the discussions held at a workshop organized jointly by the OECD and the International Risk Governance Council (IRGC), in Geneva (Switzerland), on 29 June 2012 on the theme of "Risk and crisis communication: the challenges of social media". This workshop gathered participants from 12 OECD countries, think tanks, academia, the private sector and international organizations to discuss the challenges that emergency services and public relations managers confront in relation to the emergence of social media. The agenda, summary and key presentations at the workshop can be found here:

www.oecd.org/gov/riskmanagement/oecdworkshoponinter-agencycrisismanagement.htm

www.irgc.org/event/social-media-workshop/

The report was prepared by Ms. Cécile Wendling, Director of Research at '*Futuribles'*, under the supervision of Jack Radisch and Stephane Jacobzone.[1]

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LIST OF ABBREVIATIONS

CCC	Crisis Communication Centre
CDC	Centre for Disease Control and Prevention
CERT	Community Emergency Response Team
EPIC	Empowering the Public with Information in Crisis
FEMA	Federal Emergency Management Agency
GIS	Geographic Information Systems
HADR	humanitarian assistance and disaster relief
OEMC	Office of Emergency Management and Communications
RSS	Really Simple Syndication
SHOC	Strategic Health Operations Centre
UNDAC	United Nations Disaster Assessment and Coordination
VGI	Volunteered Graphic Information
VTC	Volunteers Technology Community
WHO	World Health Organisation

BACKGROUND

The objective of this report is to contribute to the identification of guiding principles for risk and crisis communication, and in particular as regards the uses of social media in emergency services. Recent large scale disasters such as the 2010 earthquake in Haiti have revealed the utility of Internet based social media tools such as Twitter, Facebook and the Sahana for risk and crisis communication. Risk and crisis communication were identified early on by the OECD in the 1990s as key topics. In 2003, the OECD report on *Emerging Risks in the 21st Century* pointed to new technologies such as remote sensing that held potential to enhance early warning systems and thereby risk and crisis communication. In 2011, the OECD report *Future Global Shocks* again pointed to the development of new communication technologies that could be useful during disasters converging around different media platform such as those offered by internet social media. The emergence of new communication channels (Facebook, Twitter, blogs, among others) represents an opportunity to broaden warnings to diverse segments of the population in times of emergency. These technologies have the potential to prevent communication breakdown through reliance on just one platform and thereby to reinforce the diffusion of warning messages but also present policy makers with new challenges.

Stakeholders in the OECD High Level Risk Forum called for taking a closer look at how to create and sustain dialog with the population in times of crisis through social media and the internet. Even though the potential for using social media as a crisis management tool had been identified, the way forward remained unclear and interest was high to lean from an exchange of practices in different governments, businesses and international organisations. Building credibility and maintaining trust are key to the emergence of effective risk and crisis management both for public and private actors. The new social media such as Facebook enables citizens increasingly to disseminate information in real time, as well as question government actions at low cost and high efficacy. The new social media were recognized as creating opportunity in times of crisis, but the challenges of using social media in risk and crisis communication were stressed as well.

As communication technology diversifies and proliferates, social media (Facebook, Twitter, etc.) are increasingly used to convey information during crises to send warnings, to conduct situational awareness, and even to catalyse action and sustain dialogs and feedback loops among public authorities, volunteer groups, the business sector and citizens. Despite their usefulness, governments view social media with some caution due to the cost that could be incurred by trying to keep pace with growing citizen expectations. The reliability of social media content is sometimes questioned, though filtering tools have been developed that may be used to reduce time spent reading irrelevant messages and untrustworthy sources.

While there is no one-size-fits-all approach, this report offers a typology of its uses to reflect a range of practices in countries and what strategic approaches governments and other organisations could adopt to go beyond ad-hoc uses in these tools to achieve better outcomes, especially for emergency services. The report draws from independent research and the presentations of experts at the OECD-IRGC workshop on risk and crisis communication held on 29 June 2012 in Geneva to identify best practices and paths to overcome the main challenges of using social media. The report also draws from studies of expert reports and a review of the literature to provide the readers with a state of the art regarding the use of social media in risk and crisis communication.

POLICY CONTEXT: RISK AND CRISIS COMMUNICATION

Main policy objectives of risk and crisis communication

Risk and crisis communication strategies and policies underpin an organisation's overall risk management strategy. Risk management policy often involves trade-offs among values and focuses thinking to help stakeholders select among alternative courses of action. Carefully tested risk and crisis communication can help improve emergency preparedness and response, reduce costs of disaster, improve transparency of decisions, and increase the potential of acceptance of outcomes. In recent years, young developers have been building new information and communication applications and modules that connect the innovation of different social media to place them at the services of risk and crisis managers. Adapting risk management policies to take into account these recent technological changes is important if policy makers are to keep pace with sociological changes among their end users. This report therefore addresses the conditions under which the risk and crisis communications strategies can be adapted to be successful under this new environment.

Improve preparedness and response

Risk and crisis communications are valuable to enhance preparedness and response as they help to raise the level of awareness of citizens and their capacity to take the appropriate measures. Radio, television, newspapers, wallpaper, face book, twitter and other channels can be employed to transmit critically valuable information to as many people as possible. Internet can nowadays speed up communication and awareness, beyond that of the traditional risk and crisis communication strategy because it allows real time communication. The number of calls coming from traditional media, the number of press conferences can hence be reduced during disaster and become more manageable by the staff in charge, through the use of internet and other new media. With emerging disease and chemical or radiological threats, it is essential to identify effective risk communication strategies for informing both the public and professionals, to promote and achieve appropriate behavioural patterns that mitigate public health risks. These behavioural aspects are also a key component of the new behavioural economics, where governments are to "Nudge" their citizens to help improve decisions about health safety and well-being.[2]

Reduce costs of disaster

The cost of disaster can be reduced with appropriate risk and crisis communication strategies. These can help avoid new arrivals of people on a disaster site, can foster the recall of products which are dangerous for the population, etc. The increasing use of the internet and availability of mobile phones offers the possibility to go one step further by linking volunteers together beyond the official and traditional channels of communication. Furthermore, the monitoring of the social media through analytics can also help reduce costs of disaster, thanks to the early detection of digital smoke signals. Various tools of crowd sourcing and participatory sensing are being developed to enhance early detection of crises. Research[1] has shown the potential for using mobile phones as remote sensors or for

2. See Richard H. Thaler and Cass R. Sunstein, Nudge. Yale University Pressa 2008.

encouraging volunteers to report any abnormal situations to help decision makers take appropriate measures using this participatory sensing.

Improve transparency of decisions

Experts and politicians are often accused of not being transparent enough, especially in times of crisis. Beyond traditional communication strategies, which are often being questioned, the internet can be used to communicate hard facts in a timely manner, so that the rational for decisions can be shared with a large audience and be better understood. The people who want further details can go online on the Web pages of the emergency services to get more precise information.

Increase the potential acceptance of outcomes

When people are suffering the impact of an event, but also at the same time placed in the active role of information sharing, they may feel empowered and involved in the emergency response. They are moving from passive observers or victims to becoming actors. This situation increases their ownership of the situation and potential acceptance of outcomes, as they feel that they can be part of the solution.

Challenges for risk and crisis communication

Multiple players and channels of communication

The first challenge for risk and crisis communication is that a broad range of players can communicate, using various channels simultaneously. This multiplicity of players and channels raises the question of the coordination, of the inclusion/exclusion of players or of channels of communication, and what directions are given for communication. This also raises the question of timing: internet speeds all the processes in a scale unknown in recent history, which represents both an opportunity, as it can speed the appropriate emergency responses, but presents with challenges in terms of spreading inappropriate rumours.

Managing perceptions

Risk and crisis communication have to address perceptions. Polarization between the perception of the public and the perception of the authorities/regulators/experts is a key issue. Moreover the boundary between the public and experts is also porous. Social scientists studying risks have shown that not only the scientists or the regulators can be experts for a given risk but that also specific categories of people can build experience and expertise when they are engaged in NGOs or are the victims of an event, etc. The layman expertise that these specific individuals have acquired implies that they can communicate their own analysis and perceptions of a risk or crisis and shake the traditional boundaries between those who know and those who don't. Moreover the social media like YouTube or Facebook can give the perception that not only experts are the ones who know, and that individuals who become aware of a risk can also report in real time using their mobile phones. New forms of communication cab also change perceptions further. Ripley shows in the book *The Unthinkable: who survives when disaster strikes and why* that people turn to others to decide for instance when to evacuate during a hurricane. The average person checks with four to five sources before reaching a decision. The new social media could change the type of sources that people use and how they reach their decisions. This can also help people in their need for comfort and human connections, hence changing their perception of the risk and crisis they face.

The combination of facts and values

Risk and crisis communication are about both facts and values. Often scientific expertise is mixed with ethical or political considerations and concerns. The communication in times of disasters carries both an objective part conveying facts and a subjective part about emotion, feelings. Stephane Koch explains that social media can become emotional networks in times of crisis where facts are convey through emoticons, particular signals for emotions. This mix of facts and values which are shared with a new tone and vocabulary is becoming a new research area. Communicating facts is a priority for some experts, while others relying on behavioural research note that values and emotions can be key levers for enhancing risk awareness in the population and for strengthening preparedness.

A high priority issue on the policy agenda

Risk and crisis communication issues are high on the policy agenda as they are brought to the fore by the media and politicised. They can be instrumentalised, especially if the risk is having a negative impact for some people and a positive one for others. For instance the BSE crisis had negative repercussions for the meat industry, but was seen as positive by the vegetarians in their fight to limit meat consumption. The existence of multiple social media and channels of communications enhances the potential for instrumentalisation.

Possible errors and the supply of inaccurate information

Errors can occur such as the provision of inaccurate or incomprehensible information, mishandling of sensitive information. Mitigating these errors is a major challenge.

The cultural bias

Risk and crisis communication vary depending on the culture. In a global context, risk and crises are perceived differently in different countries and communities. Addressing both the local audience and the global one during a major crisis is becoming very difficult.

The variety of risks and crises

Risk and crisis communication need to be customised to the type of risk and crisis that people face, as there is no one-size-fits-all approach. For instance, communications needs to separate voluntary exposure to risks from the rest. Voluntary exposure to risk is done with full knowledge of the possible consequences and thus implies people's responsibility, an element which needs to be addressed in communications. For the other risks, people's responsibility may not be involved, but the public will still want to be informed about remedial actions. Risk and crisis communication can also differ for natural versus man-made risks because the social impacts can differ. Finally a distinction must be made between routine risks such as a tornado in a region which is frequently hit and non-routine risks and major events such as 9-11 in the United State, or the earthquake and tsunami in Japan in 2011.

The impossibility of not communicating

Even silence conveys a message and may not be an option anymore. Organisations that choose not to use social media during a crisis may be taken as disorganized by the public or even sending a signal of disinterest or disdain. This choice can be seen as revealing the organisational culture of the organisation, its way to consider the public, etc.

An evolving context for risk and crisis communication strategies are evolving over time due to society's expectation, perception of risks, etc.

Top-down communication

Risk and crisis communication strategies developed in the 1960s-1970s, especially with the contribution of research from cognitive and social psychology experts. This research concluded that people use cognitive short cuts to process information, and that perceptions could diverge greatly due to expectations, leading to over reactions, mistrust, etc.. Risk and crisis communication was developed as a strategy to make people's behaviour more "rational" so that they could make informed decision.

Multidisciplinary dialogues for collective model of decisions

In the 1990s, this unidirectional model of risk and crisis communication was criticised as leading to a one way communication track from the expert to the lay public which did not give enough place for dialogue and feedback. The idea emerged to create platforms for discussion where people could discuss and exchange opinions and information about risks. The focus was on consensus building and conflict resolution. It became key to gather multiple viewpoints. Collective model of decision making were put in place together with new participatory approaches for communication. Risk and crisis communication research became multidisciplinary: in addition to psychology, communication science, sociology, political science also came to play. Organisation dealing with risks and crises opened up and integrated social scientists in their communication department to develop new ways to interact with the public.

The emergence of the social media

Since the late 1990's, the new social media have not only changed the perception of risk and crises, but also citizens' expectations towards emergency response officials, the private sector, volunteer organisations, etc. Twitter, Facebook and Ushahidi among others have been widely used to communicate about risks and crisis situations (e.g. 2010 Haiti earthquake, 2011 Fukushima nuclear accident, etc.). This change is linked to the rapid development of the Web 2.0 and its applications. While Internet traffic is expected to grow 25-30% between 2011 and 2015 in North America, Western Europe and Japan, and to reach or surpass 50% in Latin America, the Middle East and Africa according to *the UN global pulse white book*, the use of social media such as Facebook and Twitter is growing even more rapidly. In Senegal, for example, Facebook receives about 100,000 new users per month.

This technological innovation spurs social and institutional change (IRGC, 2012). Best practices are emerging slowly to drive broader changes such as refining linguistic and other behavioural norms in the use of social media for risk and crisis communication. In many countries public expectations and roles are changing in terms of the desire for increased transparency of information, in the spirit of open government, and participation in information gathering, sharing and verification. The trust in established experts, public officials and numerous bloggers has changed. The public is no longer content to receive official recommendations and advice in a passive way. People are gradually shifting from a situation where the information was pushed on them and made available by authorities, to a situation where the information can also be pulled: followers can register to Really Simple Syndication (RSS) feeds gathering the fragmented information they want and filter the data they access according to their own interests. Social media have also created new arenas of information exchange where dynamic and interactive flows of data are in the hands of millions of individuals, who seek a more evidence-based participatory form of risk and crisis communication. New services exist to deal with

online communication among official emergency responders. Advanced tools can help map crisis communications on the Web in real time.

The social media can be used to enhance risk and crisis communication in several ways. First, they are collaborative and participatory. Online discussions can improve situation awareness. Second, they are decentralised. The information can circulate very quickly among actors, thanks to RSS feeds or Tweets, which are immediately available online to multiple organisations. Third, social media are popular and accessible. Emergency services can extend their reach when sending information or warning. Finally, social media can provide data that are geographically or temporally traceable. It becomes possible to monitor the geographical and time development of a crisis thanks to digitally generated content.

Five types of social media can be identified (see Table 1). ***Social networking*** media such as Facebook, Myspace bring groups of people together, because they share common interests. ***Content sharing media***, such as YouTube, Flickr allow anyone to upload content such as videos or pictures to be shared with everyone or with a restrictive community of users. ***Collaborating knowledge sharing media*** such as Wikis and podcasts enable participants to ask questions and wait for answers coming from different users. ***Blogging social media*** are used to share facts and values, emotions and expectations. Finally, ***volunteer technology communities*** (VTC), such as Ushahidi and Sahana are social media platforms or modules created especially for risk and crisis communication.

The different types of social media can be complementary in risk and crisis management. The social networking media can help enhance coordination among volunteers and emergency services. The content sharing media can help in conducting situational awareness by identifying images or videos of how a crisis is evolving in real time. The collaborative knowledge sharing media can help develop dialogues between different stakeholders in a risk or crisis management situation. The blogging or micro blogging tools, such as Twitter, can be used to share facts in real time, but also to convey recommendations and warnings very rapidly. Finally the social media platforms or modules like Ushahidi create a synthesis of various social media content to help emergency managers and volunteers to be more efficient in their activities.

Working inside communities like Ushahidi, volunteers have already responded to major disasters, such as earthquakes in Haiti, Chile and flooding in Pakistan. Volunteers created detailed maps, processed imagery, and geo-located posts made by the affected population to a very broad number of channels in social media. Some have already been deployed under the United Nations Disaster Assessment and Coordination (UNDAC). Others provided reach back support to the European Union, United States and across the globe, making their supercomputers and large storage arrays available for managing translation workflows, and serving large data sets.

Table 1. The different types of social media used in risk and crisis management

Type of social media	Examples	Use for risk and crisis communication
Social networking	Facebook Myspace Friendster	Enhance coordination among volunteers and emergency services, allow to share information inside a community, provide swift update on emergency situation, etc.
Content sharing	YouTube Flickr Vimeo	Enhance situational awareness in real time through exchange of pictures and videos, allow emergency services to easily launch viral campaigns about risks, can help identify missing individuals, victims, etc.
Collaborating knowledge sharing social media	Wikis Forums Message boards Podcasts	Enhance dialogs between victims and emergency services
Blogging and microblogging	Blogger Worldpress Tumblr Twitter	Convey Recommendations, warnings, share facts Twitter allows to have immediate information sharing with a wide reach and feedback possibilities
Specialised crisis management platform managed by Volunteer Technology Communities (VTCs)	-MAPPING COLLABORATION OpenStreetMap Crisis mappers Google map maker -ONLINE AND ONSITE CONTRIBUTION Ushahidi Crisis commons Sahana foundation Geeks without bounds -PUBLIC-PRIVATE-PEOPLE PARTNERSHIP Random Hacks of Kindness (with Google, Microsoft, Yahoo, NASA, World Bank)	Mapping of emergencies, Community Emergency response team facilitator

Note: For a description of each social media, please refer to Annex 1.

Finally, it is important to mention the Geotagging and Volunteered Graphic Information (VGI). Geotagging is the process of adding location information to social media posts, videos, or photos. When the public uploads any of these media to the internet they may have the ability to add this geotag to their post. Emergency managers, especially at the state or regional level, can obtain a picture of the destruction occurring in an area through these posts. Through the use of internal Geographic Information Systems (GIS) or free online sources (such as Google Earth) these posts can be plotted on a map which will give a high angle view of what is occurring in the community. Many social networks, like Facebook, Twitter, and Flickr are making their services compatible with geotagging, which can most easily be accomplished when updating social media through a smart phone.

Whether increased use of social media is needed in risk and crisis communication?

The uptake and deployment of social media in emergency services entails development, training and operations costs. The technical and social knowledge to work with social media may represent a steep learning curve for risk and crisis managers who are used to working with traditional media. Senior level management tends often to not be among the primary community of social media users

and to be less exposed to the social changes brought about by Facebook and Twitter than younger generations. Still, they are also exposed to politicians, and often politicians are picking upon this change quickly as a way to remain connected to voters. Finally, there is also tendency among experts and public officials to fear that too much reliance on the social media could give rise to new public expectations that would be hard to meet by the authorities in charge. As a result, many organisations still consider that traditional media should be the primary channel to inform the public in risk and crisis communication. Many still operate by relying on daily news conference and public briefings. They do not see the need for a constant update in real time. Many do not monitor social media networks to conduct their situation awareness or to communicate with the public. Often they miss a communication infrastructure to make appropriate use of the social media in risk and crisis management.

Nevertheless social media also have the potential to bring beneficial change in risk and crisis communication. First, recent studies show that behavioural changes are more easily achieved through personalised communication. Social media can be powerful tools to encourage resilient behaviour in a community. Thanks to the social media, the messages sent out can be adapted to different categories of the targeted population. Second, a recent study of the American Red Cross shows that expectations are changing. Nearly half of respondents would sign up for SMS, RSS or other electronic types of alerts providing safety information and this percentage is growing year after year. One in seven general public respondents experienced an emergency or witnessed a newsworthy event and posted information or photos about that event to a social media site. Facebook is the most popular way to do so, followed by Twitter and Flickr. If unable to reach emergency services with traditional means, one in five of the general public will turn to online channel to convey their help. Nearly a fourth of the general public and a third of the online population would definitely use social media to let loved ones know they are safe. The public is demanding constant updates. It will accept that a situation evolves but they will not tolerate to be kept in the dark.

Third recent studies show that seniors (baby boomers) are now investing the social media as well. This evolution means that the scope of population which can be targeted through social media becomes bigger by the day. Finally new organisational structures exist that go beyond the traditional government centric approach towards a “Whole of community” approach to risk and crisis management. According to a recent study conducted for the World Bank, the rise of the Volunteer Technology Communities (VTC) like Ushahidi brought a new set of organizational designs to problems that have often become snagged in bureaucracy. VTCs rely on flattened, decentralized structures with decision-making and conflict resolution mechanisms that were adapted from online communities like Wikipedia and open source software projects. As a result, the VTCs moved far faster than larger players in nearly all circumstances—and perhaps faster than established protocols would allow.

New forms of risk and crisis communication are emerging as a result. Social media can be used in major catastrophic events and in steady state situations to enhance both risk and crisis communication. A study of the University of Copenhagen analysing the motivation to use social media show that the use of these technologies by emergency services is tied to individuals pushing their organisation to change. Part of the impetus to interact more with citizens directly derives from dissatisfaction with traditional media. The officers interviewed had the feeling they would be better served if they could interact directly online with the citizens rather than through the media. The study showed that the emergency services users of the social media during a crisis do not only listen to the tweets, but also encourage reporting and reward them. To validate the information they read on social media, they try to interact with the persons to verify the fact and see if they can trust it. Their experience of the use of social media helps them know better which tweet to trust, and thus reinforces their motivation to continue using the social media, even if they do not necessary receive further organisational support.

What has worked well/ What did not work out well in risk and crisis communication

Several examples can be used to illustrate what can work well or not when using social media in risk and crisis communication.

What has worked well

FEMA and Twitter : bouncing effects of using social media

The United States Federal Emergency Administration (FEMA) has taken a proactive approach to communicating with the public, particularly via social media. FEMA maintains an active presence on Twitter, as does its administrator, and both have been pumping out messages during recent emergencies. According to OhMyGov Media Monitoring, FEMA's main Twitter feed is currently the tenth most popular account among large federal agencies in the US, with nearly 48,000 followers. The agency head has another 9,400 followers of his own. Meanwhile FEMA's jurisdiction is broken up into ten regions, each one of which has its own Twitter feed, with followers numbering in the thousands. Once all of these Twitter feeds are accounted for, FEMA boasts a total of 86,250 followers. Yet it is not just the existence of these social media outlets that has taken FEMA into the 21st century, but also the fact that the agency is actively using them to communicate with disaster victims seeking information and assistance.

The EU MASSCRISCOM project

In most EU countries, risk and crisis communication mostly focuses on radio and television. Sirens are used to a considerable degree in some areas to warn the public directly. A major problem is reach the public in innovative ways, while making it possible for people to provide information when catastrophic events occur. The Masscriscom project explains the added value of using new media such as RSS feed, YouTube, Twitter or Facebook. It gives the example of so called Crisis Communication Centre (CCC) which can rely on a multiplicity of risk and crisis communication channels coupled with geographical information systems to be as precise as possible in the warning messages and situational awareness. The CCC is thought as a two way communication cell where information can both be sent to the public and received from it. The CCC is also connected to the EU 112 emergency call number cell. To ensure interoperability and facilitate the distribution on all kinds of communication channels, the CCC relies on a standard format or template, the common alerting protocol. The CCC consists of three main components namely the operators, the monitoring and alarm function and the editorial office. The operators respond to the demand of the public on the different types of communication channels and transmit the information to the authorities. The monitoring and alarm function detects and follows events. It has the capability to detect anomalies which may indicate that something has happened or is happening. The editorial office assists the authorities in elaborating and updating the basis for the FAQ for an event, preparing the information to the different groups and in different languages. It conducts quality assurance of the messages. The office is responsible for the communication on the web and for the traditional media contact. To sum up, the CCC serves as contact point for the public in order to reduce the burden on the 112 emergency call number. It provides the opportunity for supplying the public quickly with information. It also provides a channel for compiled and coordinated information from the authorities to the public.

Community Emergency Response Team (CERT) and the Sahana module

A series of storm flooded Chicago’s south west side. The temperature was supposed to get very cold and a lot of households were without power. Chicago’s police and fire departments on site were overwhelmed by the number of people needing assistance. The Chicago Office of Emergency

Management and Communications (OEMC) was asked to find more volunteers, and the office looks to the Community Emergency Response Team (CERT) which uses the so called Sahana module. This social media platform dedicated to emergency situation offers the possibility to create an event to mobilise volunteers, both medically trained and not. The system sends out the deployment requests and processes the replies. Each volunteer willing to be deployed is automatically sent details on where to go and to whom to report. The general deployment volunteers report to the OEMC Incident Commander while the medical deployment is sent to the on-scene Medical Director.

Ushahidi interactive mapping

The Ushahidi platform helped to crowd source information during Haiti's earthquake in January 2010. It aggregated data coming from different social media into an interactive mapping. When telephone lines are not working, people turned to the social media. The fact that they can see their input on the interactive mapping motivates them to continue to contribute. The Haiti Ushahidi map, backed up by a volunteer network that included Haitian-Americans translating text messages from Creole, was used by search and rescue teams to find survivors. It enhanced both the situational awareness and the crisis response provided on site. Since then, Ushahidi interactive mapping has been used to map the impact on communities of the BP oil spill and the consequences of Japan's earthquake and Tsunami in 2011.

The X 24 Exercises

The exercises X 24 (http://24.inrelief.org/) are virtual, open-invitation, humanitarian assistance and disaster relief (HADR) exercises with real-world functional components that are hosted every year by San Diego State University's "Immersive Visualization Center" (VizCenter). On 24-25 September 2010, the VizCenter hosted the first virtual HADR event called "Exercise X24". X24 involved over 12500 people from 79 nations and 90 US government, non-government organizations, and public/private partners in a collaborative environment using crowd sourcing, social media, and cloud computing applications. A second exercise, X24 Europe, was held from March 28-31, 2011. X24 Europe transcended formed a collaborative bridge between individuals, communities, and nations with over 49000 participants from 92 nations that included two ambassadors, a US major general, as well as representatives from US European Command (EUCOM), US Northern Command, US Transportation Command, Office of Navy Research, STAR-TIDES at the Center for Technology and National Security Policy from National Defense University, and many others. The focus area for the scenario was the Balkans region with a seismic event that generated a tsunami in the Adriatic Sea followed by aftershock damage inland. 78% of participants were from the Croatia, Macedonia, Bosnia and Herzegovina. The emergency managers and military officers say the idea was to tap the potential of social media to create video and text channels of communication that offer more immediacy and flexibility than the standard command-and-control operation anchored in a government war room. This new model for emergency response relies on volunteer technical communities of software developers, social media monitors and field volunteers during the crisis management. According to an article published in *USA today* following this exercise, working online from locations around the globe they meet via video, audio and text on Skype, in what they call "virtual emergency operations centres" and carry out countless tasks critical to the rescue and response effort.

The Australian Alert SA web portal: social media messages in an emergency in one place

The Alert SA website brings together social media messages from South Australia's emergency services via Twitter, Facebook and RSS in one place, so that all the users of the portal can have a comprehensive pictures of what is shared on social media. http://www.alert.sa.gov.au/ brings together the Facebook page of the police and of the firemen services, the Twitter page of the state emergency

services, the RSS feed of the Bureau of meteorology, and so on. It also provides all the emergency contacts (phone numbers, bureau, etc.).

What has not worked well

Non including volunteers who turn to the blogosphere instead

The risk of not including the people who felt concerned by a disaster is that they can now turn to the blogosphere if they have the impression they are not heard to. This was the case during the Cosco Busan oil spill in November 2007 in the United States. The heavy fuel oil of the Cosco Busan container ship spilled into San Francisco bay. The California governor declared a state of emergency. State personnel, funding and equipment were made available to assess and clean the environmental damage. However no clear guidelines existed on how to include the help volunteers wanted to provide on the spot. So they turn to the blogosphere. The coast guards and other emergency services were so much involved in the crisis response that they did not monitor or counterbalance the communication of these people who, as they could not be involved, criticised their actions. Still, it is very hard for an organisation to deal with its image and reputation on the net while dealing with a crisis.

The case of information coming from another source than emergency services

A study of the University of Georgia shows that on 22 may 2011 during Joplin tornado, a Facebook employee started to create a dedicated page from her IPhone called *Joplin tornado info*, less than two hours after the event. She quickly received 44000 followers, which means that people searching for information on the situation were relying on her and other volunteers instead of on the direct official services of FEMA, which felt they could have done better. This example raises the question of the sources that should prevail for social media crisis communication. Is it better to develop of government led social media risk and crisis communication or to enhance citizen-led social media use during crisis to develop resilient communities?

The Overload of Information

Hurricane Irene gave rise to a very broad number of tweets, and Facebook pages, which were very difficult to use to pull the meaning out of the flow. Therefore a need for new tools was identified by FEMA to be able to conduct situational awareness through the social media. What type of tools can be used to get meaning out of flows of tweets?

The Fear and the “Shiny new object” Syndrome

Organisations had often to battle against the fear of using social media, when they emerged. But they also had to be aware of the “shiny new object” syndrome. As new social media tools emerged, some organisations want to jump on each technology bandwagon, without strategic thinking. For the Red Cross a solution was instead to first develop a disaster online philosophy with the objective to use social media to empower the public and to get or give help during disaster. How to move towards more use of social media in an efficient manner without falling neither into the *shiny new object syndrome* nor into the fear of innovative technologies?

TWELVE GOOD PRACTICES IN THE USE OF SOCIAL MEDIA IN RISK AND CRISIS COMMUNICATION

After illustrating the increasing potential for the use of the new social media for risk and crisis communication, this section seeks to identify good practices in their use, following discussions at the June 2012 OECD-IRGC workshop. It presents twelve sets of effective practices for using social media in risk and crisis communication. It is important to decide when an organisation starts to use social media what goals are identified as a priority. Is the objective to be more visible? To enhance recovery management? To improve situational awareness? Depending on the goals, the audience, the content and the tools to be used will differ, as is presented below.

Raising public awareness about risks and crises

Various cases can illustrate best practice in the use of social media to raise awareness about risks and crises.

The case of the "Hurricane tip of the week" and the e-cards of the United State Center for Disease Control and Prevention

Since the 9 11 terrorist attacks on US soil, the Center for Disease Control and Prevention (CDC) has developed innovative strategies to raise awareness through social media. For example, the "Hurricane tip of the week" is a CDC initiative which relies on the social media to post a tip per week. The weekly tip, which has more than 1600 Twitter followers and 34000 email subscribers is also available as a widget (i.e. a small programs that users can download onto their computers or embed in their social media profiles or blogs to pass along to others). Widgets have been used for product recall, like the peanut product recall with more than 15.5 million page views of the salmonella peanut product recall widget, which included a searchable database of recalled products. Another example is the use of e-cards by CDC to encourage disaster preparedness. During the national hurricane week, a dozen of e-cards were launched, with a mobile phone version as well. More than 100000 people have opened those e-cards. Finally CDC makes public services announcements also available as podcasts on the web.

The "Get prepared" portal of Public Safety Canada

The portal is available online and on mobile phone. The General public can stay connected and receive regular update via Twitter, RSS feed, email, among others. There is an emergency preparedness week in May which has the objective to have people know their risk, according to their region. This initiative to raise awareness via social media is made in partnership with the Red Cross, the Salvation Army, the Canadian association of fire chiefs, among others. The idea is to work closely with provinces and territories as well as with non-governmental organisations. The tweets sent during the emergency preparedness week are approved by Public Safety Canada and then re-tweeted by the partners.

Recommendations

It is important to use social media prior to crises as an awareness raising strategy, as the corresponding Tweets or Facebook pages become the recognised authority for the information prior to the event. People can become accustomed to refer to these official sources on social media portals. Using social media to raise public risk and crisis awareness is crucial because it allows emergency services to increase access to audiences of different types, such as younger audiences who rely less on traditional media than digital ones. The use of social media to raise risk and crisis awareness also helps to reduce the dependence on traditional media channels and to develop new types of campaign using personalised tones and creative digital tools to enhance behavioural change. Using social media can give way to viral dissemination through communities.

Surveillance, monitoring, situation awareness and early warning system

The content of the social media can be a way to know better and understand more accurately what is happening during a crisis. Because of the broad flow of information, two options are currently used: a technical one and a "volunteer" option.

The technical option

The technical option relies on the technology of crowd sourcing and data mining. Computer programmes can be used to synthesise what type of content are shared and provide meaning. Pilot projects exist in various universities to develop such tools. The EPIC project (Empowering the Public with Information in Crisis) carried tries to figure out how to create situational awareness from Twitter during crises. Within EPIC a study called "Tweak the tweet" is looking at recent events and how to extract more useful information from Twitter in times of crises, especially if the tweet follow the TtT format and can be geo-located. Similarly the Twitcident project from the Delft University of technology in the Netherlands filters Twitter to obtain real time intelligence. The researchers introduce a web based system for filtering, searching and analysing information about incidents or crises. Another example is that of the US FEMA, for which geospatial data and mapping applications are central. One new FEMA application maps emergency declarations, earthquakes, models of building failures, status and location of relief facilities, and the progression of search operations. This application integrates with Microsoft's Bing search to provide a birds-eye view of maps, and disaster relief workers can send SMS updates from the field that are integrated with the maps. Similarly in Japan, in the aftermath of the March 2011 earthquake and tsunami, Georepublic Japan and OpenStreetMap Foundation Japan launched a crisis map that provided and visualised real-time information on news and official reports as well as information provided by the crisis-affected community (via SMS/text and internet platforms) on evacuation centres, damages, and requests for help. Finally Google Flu Trends uses aggregated Google search data to estimate current flu activity around the world in near real-time. In other words, emergency services can use automated data extraction and analysis methods. Different approaches already exist to extract and analyse data from Twitter. Many crisis mapping application techniques can visualise crisis developments in real time. Emergency services can also rely on content analysis tools, such as these provided by Google. In addition to that, emergency services can use network analysis to visualise who retweets what and be able to monitor rumours.

The volunteer option

The second option is to rely on volunteers. For instance, 67 volunteers were trained to support media monitoring for the United Nations humanitarian response to the Libyan civil war in 2011. US

meteorological services relies as well on people taking pictures or videos of tornadoes using GPS locator and text messaging to provide a real time situational awareness.

Recommendations

The combination of the technological and volunteer option can led to very innovative practices such as these of Volunteer Technology Communities (VTC). Learning about the different options available and following the innovations taking place in the field of crisis situational awareness is important to get the best meaning out of the overload of information and have a clearer picture of how to respond to the crisis. According to a study of the ETH Zurich on crisis mapping, this new tool mainly managed by non-state actors can provide states with a low cost solution to analyse the terrain in an emergency situation. This phenomenon could develop because the applications are increasingly known and because teams of volunteers get organised across the globe to initiate and manage the maps when a crisis strikes.

Improving preparedness

Social media can be used to improve preparedness.

Examples from the health field

During the 2009 influenza pandemic, tweets and SMS were used to indicate where vaccination against H1N1 influenza was available. Social media were used to encourage the population to vaccinate and to indicate where the nearest place was to do so. In Kenya, which has 33 million people, there are 11.3 million mobile phone subscribers but only 264000 landline and 3 million internet users. An opt-in system for blood donors enables them to receive text messages or email reminders stating when they are eligible to donate again but also messages calling for donors of specific blood types during shortages or crises. This reflects in general the potential for M-Government in developing and emerging economies (OECD 2011).

The World Health Organisation (WHO) uses social media in its Strategic Health Operations Centre (SHOC) which operate 24-7. Thanks to TweetDeck, they conduct search by selected keywords on Twitter. WHO now has two full-time social media staff and receives nearly 6,000 new followers on Twitter per week and about the same number on Facebook per month. These numbers are growing, which helps WHO both to monitor health crisis and provide good advices to the followers. During the Fukushima events, the TweetDeck observed that some people were telling their friends to drink wound cleaners, which contain iodine, because they thought this would help their body be prepared for the nuclear radiation coming up. Via Twitter and Facebook, the WHO social media team warned people not to drink it because it could be harmful. The same day, WHO noticed people rushing to take iodine pills and tweeted: “Consult your doctor before taking iodine pills. Do not self-medicate!”

Example from natural disasters cases

The social media can also be used to raise awareness of the risks related to the geographical areas where the follower is located and provide recommendations if needed (e.g. what to do in case of major storms or earthquakes). They differ from other channels of communication because the style of communication can be different, more informal and conversational, which can have an impact on audiences, which are not receptive to very official informational messages.

Recommendations

The social media can improve preparedness through the diversification of the type of posture an emergency service can take. It can be a way to go beyond the command and control position, towards more various tones and styles of exchange of information, according to a recent study conducted by Booz Allen Hamilton with the American Public Health Association (APHA). The fact that the communication can be more individual and less massive can have a greater impact on behavioural changes. Social media can also be used to prevent false medical advice to circulate and to clarify rumours while disseminating good tips on crisis preparedness.

Providing information and warning

Social media can be a way to provide information and instructions, with real time alerts and warnings.

Provision of information and instruction

Social media like blogs can be used to provide advice by posting information such as emergency phone numbers, location of hospitals requiring blood donations, evacuation routes, etc. In its disaster recovery scenario, FEMA can ask retailers which of their stores are closed, then overlay that information on a map to provide food aid to areas where needed. During the earthquake in Indonesia in April 2012, 15 to 20 minutes after the earthquake, a tweet from the US Geo service said a tsunami was not likely, which was crucial information for the public and the emergency services. In Mexico, the crisis centre use social media to communicate facts on a timely manner. These examples shows that real time communication via social media can change the way crisis are managed and experienced by the population.

Real time alert and warning

Social media represent one more channel for emergency services to send an alert and warning. This is the case for natural disasters like storms or tornadoes. The use of twitter sign-off ‘Please RT’ (retweet) and the target of influential online individual allows for increasing the diffusion of warning messages. Many emergencies require an early warning which reaches many people as quickly as possible. Speed can become important to alert a massive number of persons. Tweeter and Facebook can offer solutions because most of the users will receive the notification instantly and spread it in their network. During the Iceland volcano eruption, people turned to Facebook and Twitter to know if they could fly, and to get information on alternative travel plans in real time. Travellers asked for accommodation and others offered it.

Recommendations

Experienced users of the social media for emergency warning recommend to stick to facts and to be as objective as possible. There is a need to focus not only on communicating to the affected persons but also to take into account that even the unaffected can be worried and in need of information. These unaffected persons can be included in the communication strategy, to enhance resilience on the long run, to improve their knowledge of crisis, and to get their mobilisation. Preparation also matters. It is often the case that services use pre-messaging. It means that they have tweets or email alerts ready and validated that they can adapt to the circumstances at the last minute very quickly. Crisis communication is more and more integrated into the crisis management, as crisis communicator and managers are working hand in hand. Finally, this creates a dynamic context where it is important to

use the opportunities for information to flow both ways. For instance travellers during the Volcano eruption in Iceland were helping each other find alternative travel plan or accommodation.

Improving crisis response through mobilising volunteers

Social media can be used to mobilise volunteers both during and after a crisis

Mobilising volunteers

Social media can also be used to indicate willingness to help in the event of an emergency. Indicating in the "status" of a social media like Facebook availability and skills for both professionals and volunteers could be a way for public authorities to know in real time who to mobilise in a given area of disaster.

Social media can also help to direct and target the effort. During the Deepwater horizon oil spill in the Gulf of Mexico, pictures presenting oiled birds were texted to the Louisiana Bucket Brigade, which contributed to the mapping of the most affected areas, where efforts should be concentrated. During the earthquake in Christchurch, New Zeeland, a large group of volunteers gathered thanks to a Facebook campaign organised by students to the sufferers: "supporting Christchurch earthquake 22-02-2011", working closely with the civil defence units.

Mobilising online volunteers far away from the epicentre of the crisis

Online volunteers can be used to relay information provided by emergency services, what the Japanese called the "big mouth". But they can also be mobilised not only to communicate but also to improve the situation awareness. The Red Cross had the idea to listen to the people who needed help during a disaster and from their loved ones who also needed to know what is going on. 150 public affairs volunteers received training on how to use social media. They can now upload content onto a website and Red Cross personnel screen that information for appropriateness. The Red Cross platforms include a word press blog, a Facebook page, and an online disaster's newsroom. The latter includes shelter locations, numbers of meals served, and other information the media might want to use. The Red Cross twitter account has 10000 followers. Tweets cover topics such as shelter, preparedness information, on the ground situational awareness and can be retweeted by volunteers.

Recommendations

Social media change risk and crisis communication as they empower and connect large numbers of volunteers. Governments can no longer focus their risk and crisis communication solely on how much to share and how to package it. Rather, they face a large numbers of citizens, volunteers, professionals, who can exchange between themselves critical information, and respond both locally or through remote action. Government officers need to take into account this major change in their risk and communication strategy, and become a steering force for this powerful source of help, information and energy.

Identifying survivors and victims

The social media can be used to identify both survivors and victims.

Identify as "safe and sound" or "victims" to inform your love ones

Social media can help to know if family and friends are safe. Applications like *safeandwell.org* of the American Red Cross were created for people to register if they are safe in an area of disaster so that their loved ones can know whether are ok. This application makes it possible to enter names during an emergency to check if family members or friends are in good health. Concerned family and friends can search the list of those who have registered themselves as "safe and well" by clicking on the "Search Registrants" button. The results of a successful search will display a loved one's first name, last name and a brief message. In Japan, during the earthquake and tsunami which occurred in 2011, people turned to Google person finder. 320 000 posts were made in one week. People also published photos of the lists of people in evacuation centres on *Picasa*.

Report as a victim and request assistance

Social media combined with use of mobile phones can help to report an accident precisely and to send requests for assistance. An application is currently in use in Korea. 25000 reports from citizens were processed by public authorities. Korea emergency services and police now promote two-way information sharing, by using Geographic Information System (GIS) combined with new technologies.

Recommendations

The use of the social media to identify survivors and victims has proved successful. However the use of social media to request assistance remains limited to a few examples, such as in Korea. The question is to identify if social media can help avoid crowded emergency phone lines or if on the contrary there are too many risks of false online declarations to rely on them to request and send assistance. Another issue lies with providing names of victims. During attacks on campus in the US, the government had asked for no communication of names online. At the same time, these names were available on Wikipedia.

Managing reputational effects

Using social media for risk and crisis communication can help to counter inaccurate press coverage or to counterbalance rumours.

Counterbalancing fake rumours

If an organisation is not present in the social media arena, someone else can be who can speak for it, and damage its reputation. This immediate dissemination could be dangerous if the organisation is not present to counterbalance the information provided. This situation was experienced by *Nestlé*, in the case of an anti-Kit Kat campaign, where Greenpeace used the social media to accuse the group of using palm oil for its chocolate bars. The company now monitors and uses the social media to prevent the reoccurrence of such situations which can damage the brand.

Communicating about the organisation's own actions

The general public is not always aware of the effort provided by emergency organisations. Using social media to communicate about what an organisation is doing can help change the perception of the public about the actions taken to respond to an emergency.

Recommendations

It is important to be open to complaints and critics, and to respond to them in an appropriate manner. Both public and private participants stressed that they work on providing positive tweets and posts. It is important to invest in social media presence to avoid letting bad situation get out of control, which can happen quickly. Social media are to be used not only to communicate but also to listen.

Providing incentives to collect funding and support

Social media can be used to collect funding and support.

Encouraging donations

Social media can be used to solicit donations when major catastrophes occur. People can indicate on their Facebook page that they have contributed to funding an NGO for crisis response and hence encourage their friends, families and networks to do so. The Red Cross is using social media to encourage collective action towards more funding during emergencies.

Facilitating the supply of support

During an emergency, people who want to help by providing blankets or a safe place to stay for victims of a disaster often do not know who to turn to. By indicating precisely on social media what type of in kind contribution could be needed, emergency services can avoid flows of unnecessary materials and develop synergies in the communities.

Recommendations

It is important to be specific about what precisely is needed and to be aware that fundraising tweets account for a minor percentage of messages during the crisis phase; They are more efficient in the post crisis phase, when people turn to recovery, according to a study conducted by Queensland University of Technology and the University of New South Wales in Australia during the 2011 South East Queensland Floods. In addition, it is important to take into account that there might be a gap between the expressed intention to donate and the ultimate decision to do so.

Learning from the crisis ex post

Social media can be used after a crisis to facilitate the lessons learnt processes and as useful materials for risk and crisis researchers.

Facilitating the lessons learnt processes

Social media provide content which is associated with a date of post. This marking of the date can help emergency manager keep a very detailed report of what happen hour per hour. Tweets and photographs linked to maps and a time line can help build a comprehensive story of what happened and identify the main vulnerabilities.

Developing skills and knowledge on risks and crisis

The content of social media during a crisis can be a rich material for social scientists to analyse in order to have a better knowledge on risks and crises. In the United Kingdom, emergency and health services work with behavioural scientists and communication specialists to conduct audience research

and track feedback during risk and crisis communication campaign, such as during the 2009 influenza pandemic. A key lesson from this crisis management is that the group of social scientists could have been even more involved than it actually was.

Recommendations

Some websites can help keep record, archives, on tweets, or associate them with a timeline to have a visual mapping of the crisis enfolding and ending. Many applications for mapping or placing tweets on timelines are available for free, which can be an incentive for a greater number of researchers to use these materials. Social scientists could be mobilised in multidisciplinary expert groups to learn from past crises and develop new ways to engage with the public through tailored risk and crisis communication.

Improving partnerships and cooperation between national and international players, between public and private actors

International cooperation and public-private partnerships in the field of social media in risk and crisis communication are identified as a way forward.

The ICT4Peace Crisis Information Management Advisory Group initiative

Innovative initiatives are taking place, such as the pioneering ICT4Peace initiative based in Geneva and operated through a partnership called the Crisis Information Management Advisory Group (CIMAG). This partnership includes the United Nations Department for Peacekeeping Operation, United Nations Department of Political affairs, the United Nations Office for coordination of humanitarian affairs (OCHA), the World Food Programme, the United Nations development programme, the United Nations children's fund (UNICEF), the United Nations refugees agency (UNHACR) and ICT4Peace. The partners work together towards enhancing the crisis portal such as OCHA OneResponse, and also work on bringing together practitioners, developers, policymakers to develop crisis mapping and address emerging needs in crisis communication.

The lessons from the 2009 influenza pandemic in the United Kingdom: build partnership to enhance use of digital media

The study of the United Kingdom response to the 2009 influenza pandemic stresses that health departments should seek to further explore the use of social media, using independent partners such as the Science Media Centre. The study underlines that the development of such a partnership will help to engage the wider independent scientific community and the media.

The UN Global pulse initiative

The UN Global pulse initiative uses real times analytics to protect the vulnerable and strengthen resilience to global shocks. The programme brings together expertise from UN agencies, governments, academia, and the private sector to research, develop, test and share tools and approaches for harnessing real-time data of the web 2.0 for more effective and efficient policy action. This cooperation has the objective to provide toolkits of free and open source software tools to help making evidence based decision. In a climate of budget austerity and financial crisis, decision makers at every level face pressures on limited resources. Global Pulse has the objective to assist them to plan and target interventions in times of crisis to ensure that those populations most at risk are protected from harm. The idea of UN Global pulse is to detect "digital smoke signals", according to the UN white

paper published in May 2012. The programme aims at turning imperfect, unstructured, and complex information available on the web into actionable information for officials in charge.

Recommendations

Partnerships for using the social media in the area of emergency management and communication exist but they come with difficulties. Not all players have the same interests or the same background. Some are from the humanitarian sector, others are technologists who can build new platform for imagery, mapping, etc. Traditional players of emergency management teams and the new players coming from the social media need to make sure they are on the same line, speak the same language, and can learn from each other. In addition to that, technologists have a tendency to focus their energy on crisis communication, while emergency services would need better risk communication on the long run as well. Finally the question of the financing and sustainability of the cooperation is crucial. Most of the current Volunteer Technology Communities rely on rather small resources and it is not sure that the public sector has the means to contribute to greater investment in risk and crisis communication in the future. Public authorities could collaborate with Twitter and Facebook to facilitate quicker responses in the case when an official emergency services' account gets high-jacked.

Building trust

Social media risk and crisis communication are useful tools to build trust.

Ensuring your organisation is trusted online

The use of social media could improve transparency and trust in public authorities. Government authorities and more broadly experts are not easily trusted anymore in crisis situations after cases of misinformation. They are under pressure to respond within tighter time frames as soon as an event occurs. With reliable and updated public safety and emergency notification via Twitter or RSS feeds they could work on enhancing the level of transparency. Developing a community of followers to whom to communicate hard facts and timely information on disasters could help public authorities benefiting from and adapting to the breaking news effect, capitalising trust over time.

Knowing which online sources to trust

It is important to know which types of Facebook pages, tweets or blogs can be trusted or not. Therefore lessons must be learnt from each crisis, to identify the trusted ones and these who are not reliable.

Recommendations

Studies show that the more citizens can engage with their government online, the more they develop trust. Public authorities in charge need to be aware of this result when they decide how to engage with their citizens.

Enhancing recovery management

Social media can be used to enhance recovery management in two ways: through the sending of information on reconstruction and recovery and through the provision of stress management.

Sending information on reconstruction and recovery

In post crisis phases, social media can be used to send information about recovery, reconstruction, etc. Social media can be used to communicate recovery of infrastructure (bridges, routes, water supply), to identify areas that are in most need of recovery. Site clearance can also be co-ordinated.

Planning stress management

In post crisis phases, the social media can help identify where stress management is most needed in the recovery phase and to offer tools for managing stress through interactive platforms. Research conducting after Hurricane Katrina shows that interactive information is preferred to static. Those who were affected rather turn to social media interactive forums rather than static traditional media to share their thoughts and feelings. The sense of belonging to an online community with whom to share emotions can help in the post crisis phase.

Recommendations

Social media can play a role after the crisis to enhance recovery and reconstruction. Communication plans must be structured according to the phase of the crisis, and, as it is difficult to turn off social media, ensuring continuity in the use of social media over the risk management cycle is crucial.

CHALLENGES IN THE USE OF SOCIAL MEDIA IN RISK AND CRISIS COMMUNICATION AND SOME SOLUTIONS/WAY FORWARD

The challenges in the use of social media in risk and crisis communication can be identified and have to be taken into account when developing social media strategies? Social media use in risk and crisis communication is complex and must be handled with care. Financial issues, legal issues, political issues, security issues are at stake when deciding to develop the use of Facebook or twitter in case of emergencies. For each challenge, solutions and remedial strategies are presented below.

The challenges of multiple players and communication channels: speaking with one voice or choosing multichannel approaches?

The first challenge that emergency officers face is the multiplicity of players and channels of communication that exist during a crisis situation. These can be national, regional or local players. They can be official or volunteers. They can use traditional media or social media. This can blur the picture and provoke an information overload.

Solutions

Some countries have opted for a subsidiarity principle regarding the different government levels of public emergency management. So the level of risk and crisis communication is the closest to the community concerned. Others use a multi-channel approach so that people can rely on different

sources of information, some more factual some more subjective. Finally others favour a centralised use of social media to eliminate multiple communication strategies from multiple departments. The challenge is hence for an organisation to decide how best to deal with the broad range of players and channels which could potentially be part of their risk and communication strategies. They must see if their organisational and national culture is potentially served better by a subsidiarity approach, a multichannel approach or a centralised one. The choice must be clearly stated. It is important to have a guideline and a comprehensive strategy for risk and crisis management giving precise rules and recommendations on how to engage with the social media. Afterwards, on a day to day business, it is possible to have an online and social media division in the risk and crisis communication department. This unit plans the social media strategy on a weekly basis with all the relevant services.

It is also possible to have social media roundups with a daily or weekly presentation of the situation awareness through crowd sourcing of social media content. It is important to validate pre messaging strategies in case of crisis during inter services meetings. The experience of EUROPOL during the ash cloud over European airspace that resulted from a volcanic eruption in Iceland, shows the importance of an integrated approach. An organisation's staff in charge of monitoring and using social media must integrate with the crisis manager, and with the staff involved with the traditional media, etc. Furthermore the use of social media needs structure. The services in charge of its use must have a clear view of what information goes on what social media, the tone to be favoured for different social media, etc.

Transparency and reliability: avoiding the propagation of rumours / misinformation and the situation of panic in a population

The content of social media does not follow a process of validation to indicate its validity. Therefore there is a risk for propagating rumours and misinformation. Retweeting can make the rumour spread very quickly and get out of control. This could lead to panic in a population which would not be justified by facts but only spread through misinformation. As traditional media can quote online interaction, the traditional media could relay false social media information, without the reader noticing.

Solutions

Social media information from official channels should be clearly labelled as such. In March 2011, Researchers from Kobe City University of Foreign Studies surveyed Twitter users and tracked updates from earthquake victims in Tohoku, Japan. This survey shows that in order to increase validity of tweets during an emergency, management officials could announce them with an official "hashtags," or topics labelled with the "#" symbol, via multiple social media platforms. Establishing official accounts that can be retweeted increase the validity and reliability of using Twitter as a tool during a disaster event. The official tweets should be clearly labelled. In Japan during the 2011 earthquake and Tsunami, each official service had an icon to indicate from which official sources the tweets were coming. In addition to that, it is crucial to educate the people to the use and risks of social media. Communication campaigns, school programmes, and other initiatives could be developed to explain the risk of misinformation, rumours.

Mobile wireless devices (e.g. smartphones) are often equipped with advanced sensor technology, GPS, accelerometer, digital compass. They offer the potential for remote sensing and information fusion in an emergency. They could ensure information integrity thanks to sensor measurements to avoid misinformation to be spread too easily. Combining sensor measurements with the information shared online via social media could be a way to limit misinformation.

Regulation can also be an option for misuse having vital consequences. In Mexico, Twitter has more than four million users in the country, ninety eight percent of the citizens have a Facebook profile and thirty million people are able to access the Internet. As these figures keep on increasing a bill has been passed called the Veracruz Law. This law prohibits citizens from spreading false rumours and information that may trigger panic. The difficulty relies in the definition of the false rumours. A risk is to use these types of legislation or regulation to censor social media.

Finally to avoid panic, it is possible to rely on the geographical precision of the communication tool used. In certain cases, social media offers the possibility to see the localisation of the account holder. In these cases, to avoid unwanted movement of people that may block escape routes or cause unnecessary panic, it is possible to target only the persons positioned in a limited geographical area, instead of addressing everyone like with mass traditional media.

Image damage: limiting negative reputational effect?

The Japanese authorities used social media during the earthquake and tsunamis occurring in 2011. On 13 March 2011 they started a Twitter page in Japanese, and on 16 March 2011 a twitter page in English. On 23 March 2011 they started to use Facebook, and the number of followers increased rapidly. However the Facebook and Twitter pages were also used to attack Japan's image, even about unrelated topics- a practice known as trolling. For instance anti-government messages were posted to protest against the killing of whales, as well as against the use of nuclear power plants.

Solutions

It is important not to overcome the illusion that social media can be controlled. Social media allow for responding to criticism and attacks as quickly as possible. Respectful correction of inaccurate information can stop the spreading of rumours.

Keeping in touch: addressing the population segments who are not familiar with social media?

The elderly, the disabled, people who do not speak the local language may not be able to access the data provided by social media.

Solutions

A solution is to use multimodal warnings and alerts. In Japan during the 2011 earthquake and tsunami, emergency responders used both tweets and traditional wallpapers at the same time. The important aspect is to be consistent in the communication strategy throughout different channels. By multiplying the types of channels, it is possible to increase the probability that the crucial information will be received by the targeted public. A technical solution is also to use the different social media in some aggregated ways. Websites such as Hootsuite and Tweetdeck provide such aggregation services. A user can type content into one webpage and have it given out through multiple social media channels. This solution can help save precious time in an emergency situation. Prior to Facebook and twitter, public communication officers had to organise press conferences, press releases during a crisis situation. Now they can also use social media which the press can access directly.

Avoiding the information overload: How to get meaning out of the flow of data?

During a crisis, the number of information exchange through social media can be so high that it becomes impossible to have a clear picture of what is happening. Bloggers or Facebook users can also publish false information. Their perception of the reality might be biased during a crisis, which can

lead to a situation where it is difficult of emergency manager to get the right picture of the situation. The overload of true and false information can even go as far as blocking the all system and raising the question of the allocation of the ban, like in Japan during the 2011 earthquake and tsunami.

Solutions

A solution is trending or data mining: Starting with the right question, following the right data with the right metrics, one can get a clearer picture out of the intense flow of exchange of information. Using services such as Trendistics or Google analytics, one can see if there are trends in what people are exchanging. Caution must be exercised though so as not to conduct inaccurate interpretation of the social media data coming in. For instance emergency services must take into account the sampling selection bias. Social media users are not always representative groups of the larger population affected by a disaster. An "Information and Communication Technologies for Development" blogger from the university of London expressed his doubts on the use of Ushahidi during the Haiti earthquake. A correlation could be found by Ushahidi staff between the building damage and the SMS streams. However after controlling for the presence of any buildings (damaged or undamaged), the text message stream had a weak negative correlation with the presence of damaged buildings. This example shows that caution and learning from past experiences are crucial when using crowd sourcing and data mining based on new media.

Finally to avoid jamming of the system with too many exchanges of information, public authorities can rely on their decision regarding the allocation of the ban during a major emergency. In Japan during the earthquake and Tsunami the government decided to give priority to exchanges of emails for instance in some affected areas.

Promoting open data while protecting privacy and confidentiality: how to ensure ethical and legal use of the social media?

Maintaining open data is important in the use of social media to be able to crowd source them easily. Although most social media do not have the in-house capacity to develop specific products for emergency managers, they keep the platform open and adaptable so that third-party developers can build customized tools on the platform to do crisis situational awareness. However, a risk could arise from this openness. The level of confidentiality of the data provided by users on their social media pages could be endangered. It is not clear weather bloggers or Facebook / twitter users actually consent to the analysis of their data. According to a study of the ICT4Peace Foundation on the potential and challenges of open data for crisis informatics management, there is still a long way to go before all the actors are convinced of the benefit of openness. On the one hand, citizens can prefer to protect the privacy of their internet exchanges; on the other hand, companies can wish to protect their competitiveness.

Solution:

Overcoming the challenges of open data requires working on several fronts. First, legal experts can be mobilized to address confidentiality issues. For instance, there is a need to make a distinction between the monitoring of one personal page and of a massive amount of pages. In the Netherlands, the law authorized the analysis of a flow of data coming from social media platforms but banned the monitoring of individual use of social media. Second, legal experts can also be mobilized to deal with proprietary technologies. A clear line must be found to protect commercial interests and to save lives. Law, policies and guidelines should be develop to ensure the use of social media in crisis situation does not become out of control, without regulations and laws restraining too strongly the innovative processes taking place.

The question of liability: Who is liable for what?

Are social media reliable? Experts expressed their fears that people could believe they should receive assistance if they have indicated via a social media that they are in need of help. There is a risk that emergency services could be held liable if they don't answer to an online request. Going one step further, could they be liable for providing incorrect or unclear information?

Solution

The Web 2.0 and the use of social media in risk and crisis management may require adapting laws and public policies. But more important, the emergency services and authorities in charge must have a clear process of internal validation of what can be put online on social media or not. This process must however be reasonable not to include too many layers of validation, hindering the provision of a swift social media response.

Managing public expectations

The use of social media in emergency management can create new expectation in the population, in a time where human and material resources are scarce. For instance, according to the social media emergency management camp organised in 2011, the use of social media by the Los Angeles Fire Department(LAFD) 24- 7, means that they commit three LAFD officers to provide support over a 24-hour period, engaging in information dissemination and discussion across their Twitter profiles, @LAFD and @LAFDtalk. On a steady state basis, they use the tools to monitor user-provided information and look for emergency reports and opportunities to provide clarifying information to citizens with questions or concerns. Not all emergency services can dedicate as much means for the use of social media.

Solution

It does not require a large resource commitment to begin using social media within an emergency organization. Creating a Facebook page or a twitter account is not too time consuming. The question is how far to go, and for which type of purpose of objective. Once it is decided, it is important to make clear what the organization can and cannot do with social media.

Moreover, during emergencies, social media can play an important back-up role in disseminating warning and response information if traditional services are overwhelmed by demand. For example, during the 2011 floods in Queensland, Australia, Facebook was used to share warning information when official emergency services websites failed to cope with the heavy traffic. The use of social media can also be a way to avoid overload of information coming from phone calls. In the case of the Volcano eruption in Iceland, the use of Facebook and twitter helped facing the shortage of resources to deal with phone calls and incoming emails.

Addressing security issues in a globalized context: How to avoid potential misuse of the information provided on social media?

With the social media, one message packaged for a targeted audience can be read by others, who do not necessarily share the same culture or the same intention. This situation can create misunderstanding at the minimum but can also offer opportunities for terrorists or criminals to use catastrophes to their own advantages. As it is not possible to know who the reader of the information will be, terrorists could use the social media to identify vulnerability and plan deadly attacks. The

question can hence be raised of the danger of too many transparent exchange of information during a disaster, as social media do not guarantee security in the authentication.

Solution

There is a need to clearly define at high level what information can be made available online, and what type of information should not. Rules can be discussed in advance such as for instance not communicating names of victims, not giving information that could be used to endanger parts of the population.

Assessing the impact of the social media: How to ensure effective and efficient use of the social media?

There is still limited evidence on the impact of social media in crisis communication and management. Followers of social media in time of emergencies can have diverse strategies as identified in the literature, depending on why they converge on social media in times of crisis: helping, being anxious, knowing if it is possible to return to the affected area, supporting emergency services, mourning, exploiting the situation, being curious are very different incentives to use social media and they can ask for different strategy for officials in charge. It is also difficult to evaluate precisely the costs and benefits of using the social media in risk and crisis communication.

When metrics can be used (like Google analytics) to assess how many followers exist for a given social media, they do not provide information on the extent to which people's practices are affected by their click on social media pages in times of crisis. It is also very difficult to know how much of the information conveyed by the social media is reliable or not, how much it could enhance the effectiveness or create additional difficulties. According to a study conducted by Booz Allen Hamilton and the American Public Health Association, most of the emergency services use a combination of metrics, online comments and surveys to find ways to evaluate their use of social media in times of crisis. However, the recent crowd sourced use of social media makes it difficult to have enough data available to evaluate the impact of the social media in risk and crisis management.

Solution

Crisis information systems and analytics aim at bridging the gaps across social sciences to analyse the non-routine use of social media (in times of crisis) and how it can differ from the regular use. Further surveys and research are necessary to obtain a fuller assessment.

DEVELOPING STRATEGIES FOR THE DYNAMIC USE OF SOCIAL MEDIA

Social media are not only a knowledge gathering tool to ascertain the public sentiment or to disseminate a message to the public in times of crisis. They allow for a dialogue with the public, and for the public to interact about an event without the intermediation of public authorities. Searching for a dynamic use of the social media requires multistep strategies. Large discrepancies exist between different emergency services, different countries, etc. This section presents a grid of analysis on how countries and organisations can use the social media beyond an ad hoc approach towards a more

strategic and empowered approach. This should help emergency services to review their current social media use, and develop more comprehensive, flexible communication strategies.

Bottom up: Situation awareness tool to identify digital smoke signals

When the use of social media is coupled with the possession of Smartphones, everyone can send information from the site of an accident or catastrophe. For the emergency services' perspective, it can be beneficial to receive this real time information (pictures, videos…) to react accordingly. Moreover, the measurement of trends on Twitter or other social media made electronically or through the help of volunteer can help conduct situational awareness in real time. Early detection of digital anomalies in how population suddenly tweet can enable faster responses in times of crisis if they are interpreted correctly and timely as digital smoke signals. The social media manager can provide daily social media update on ongoing crisis or risk, or conduct weekly analysis of trends. Table 2 provides for a self-assessment checklist for organisations on the uses of social media to conduct bottom-up situation awareness.

Table 2. Check list for situational awareness use of social media

	Yes	No
Do you have a list of blogs, Facebook pages, and Twitter accounts of people who follow risks and crisis and who could help you gather information from the communities? Do you follow specific hash tags?		
Does your organisation regularly monitor social media for situational awareness? (Every hour? Day? Week?)		
Do you use metrics to monitor the number of visits on emergency services Web pages, social media pages so as to grasp a trend towards one particular focus on a given risk or crisis?		
Do you build methodology or tools to monitor the flow of information exchanged via social media on the internet?		
Do you encourage citizens to report during crisis using a social media (twitter, blog)?		
Do you train your staff to the use of social media as situational awareness tool?		
Does your organisation have the necessary human skills to use social media to conduct situational awareness?		
Do you integrate social media in emergency exercises?		
Do you use crisis mapping based on crowd sourced social media data?		
Do you have a partnership agreement with a volunteer technology community in case of a major emergency?		

Technical challenges remain, however, to be able to access and analyse data streams to conduct situational awareness. Ensuring interoperability of systems is not always easy when monitoring various social media platforms and tools. What could seem an anomaly in the flow of information and be interpreted as a digital smoke signal can be a false alarm due to sample bias or misinterpretation of the data. Nevertheless innovative initiatives are under way which could change the way emergency services can conduct situational awareness in the near future. The technological innovations could be complementary to traditional tools of situational awareness. In a February 2012 presentation on the topic of "Real-Time Awareness" (available online as a video), Craig Fugate, Administrator of FEMA, explained what it means for his agency to become a "*sophisticated user of information*. "In 2011, during a series of devastating tornadoes in the American mid-west, FEMA monitored Twitter and noticed an unusual number of different geographical locations being mentioned for tornado damage. Mr. Fugate proposed dispatching relief supplies to the long list of locations immediately and received pushback from his team who thought that they did not yet have an accurate estimate of the level of damage to send assistance. His challenge was to get the staff to understand that the priority should be one of changing outcomes, and thus even if half of the supplies dispatched were never used and sent

back later, there would be no chance of reaching communities in need if they were in fact suffering tornado damage already, without getting trucks out immediately. Mr. Fugate explains: "*if you're waiting to react to the aftermath of an event until you have a formal assessment, you're going to lose 12-to-24 hours…Perhaps we shouldn't be waiting for that. Perhaps we should make the assumption that if something bad happens, it's bad. Speed in response is the most perishable commodity you have…We looked at social media as the public telling us enough information to suggest this was worse than we thought and to make decisions to spend [taxpayer] money to get moving without waiting for formal request, without waiting for assessments, without waiting to know how bad because we needed to change that outcome*." Fugate also stressed that using social media to conduct situational awareness is not a precise science and the response is not going to be precise either. "*Disasters are like horseshoes, hand grenades and thermal nuclear devices; you just need to be close— preferably more than less*."

Top down: Using the social media as a communication tool towards the population

Social media can allow both spreading quickly massive warnings and at the same time for precisely targeting individual information sending, according to the type of target groups identified by the communication managers. Table 3 shows the most common steps in top down use of social media.

Table 3. Check list for top down communication use of social media

	Yes	No
Does your organisation have guidelines on the use of social media for the communication team? For the employees?		
Does your organisation have a RSS system on its webpage for people to follow it?		
Does your organisation have a twitter account?		
Does your organisation have a Facebook page?		
Does your organisation have a blog?		
Does your organisation have hidden webpages/twitter/Facebook page prepared to be launched in case of crises?		
Does the head of your organisation have a twitter account? A Facebook page? A blog?		
Does your organisation use social media to redirect people to its official website?		
Does your organisation use a variety of format (pictures, videos, etc.) to communicate on social media?		
Does your organisation regularly update its posts?		
Does your organisation regularly archive its social media messages?		
Does your organisation have a team dedicated to your social media communication?		
Does your organisation outsource its social media communication?		
Does your organisation have a fast track clearance approval process in place for social media strategy in times of crisis?		
Does your organisation have a list of your followers on the web and their profiles? Are you trying to build a subscriber base to extend your outreach via social media? Do you know who the key influencers are?		
Do you publicise your social media presence in press releases and place link towards your social media pages on your website?		
Do you have a strategy so that your social media network can grow? Which are your objectives in terms of growth in scope (Increase the age/ethnicity/gender/geographical range of Facebook fans, twitter followers, etc.)?		
Does your organisation have tried to use a social media to raise risk awareness sending tips of the week, what to do in case of thanks to twitter, or planning viral campaign on YouTube?		
Does your organisation monitor in real time the evolution of its social media communication and its audience profile?		
Does your organisation discriminate its communication according to the different social media format (Facebook, twitter, etc.)?		
Does your organisation have coordination mechanisms with other emergency or government services to ensure that consistent information are widely spread?		
Does your organisation share other services contents on its own pages?		

When using social media to communicate on risk and crisis, caution must be exercised. First it is crucial to ensure the security of sensitive information. Second a process of validation of the accurateness of the information must be followed and if false information is posted by mistake a very swift correction must be put in place. Most of the government agencies using social media have clear guidelines on how to communicate. When their social media communication is not mature and well developed, they only provide basic information such as weather warnings or real time information on an ongoing emergency.

Using the social media for two way communication and a platforms for dynamic interaction

Social media can ultimately be used as dynamic interaction platforms, mobilised for two way communication during crisis situation. If crises can cause an urgent need for the public to receive information, they also give raise to a strong wish to supply information to the authorities in charge as well. Using social media offers the possibility to include two way communication options and to react to demands of the public. Using two way communication tools also means it is possible to know if the message has reached the recipient or not, but in addition it allows the sender to know quickly if the recipient could understand it.

Table 4. Check list for two way use of social media

	Yes	No
Can your organisation receive and react to public input via social media?		
Does your organisation update regularly the Question and answer page of your website?		
Do you have a forum where you can exchange in real time with the population in case of emergency?		
Do you initiate online conversation and exchange with your audience through social media?		
Do you encourage feedback provision on your social media communication?		
Does your organisation participate on others 'social media to encourage exchanges? Does your organisation join in relevant online conversation?		
Can people use social media to identify as a survivor?		
Can people use social media to request assistance?		
Do you use GIS as a dialog tool enhancing the mapping of the disaster?		
Do you implement online interactive risk awareness campaign (interactive games, etc.)		
Do you integrate the different social media platforms you use with each other?		
Do you have partnerships for sharing methods of two ways communication (with private sectors, etc.)?		

The tables above provide guidance on a selection of the most common existing communication strategies relying on the social media. Each emergency service can then scan the available options to see how to adapt their communication strategies. The technical systems available are changing very quickly. New options could emerge in the coming year, which means that a permanent scanning of the new technologies must be done to be aware of the last available solution. Every social media strategy must be updated on a regular basis as the social media landscape is continually changing.

Conclusion: how to draft social media guidelines for risk and crisis communication?

Several countries (e.g. United Kingdom, Australia, New Zeeland), regions (e.g. Catalonia), cities (e.g. Seattle, New York) and agencies (e.g. US environmental protection agency) have already developed social media guidelines, but only few of them have specific documents for the use of social media in risk and crisis communication, and these include for example the American Red Cross, and FEMA. These guidelines exist in various forms. "High level guidance" exists for managers and decision makers to decide if their organisation should use social media or not. "Codes of conduct"

explains to the employees how to use social media, what the risks are and how to prevent them. "Social media training" can also be offered to public sector employees and managers. The objective is to study cases of mishap and success of social media use to learn from existing practices.

Major issues to be included in social media guidelines and trainings are the following.

Table 5. How to draft social media guidelines

A social media glossary	Explain the wording used in social media and the technical terms related to social media platforms (e.g. crowd-sourcing, data-mining, etc.)
A rule for private and public use of social media	Provide fundamental norms about how to communicate at work, but also in the private sphere about work.
A social media philosophy/strategy	Explain the objectives of the organisation when using social media to communicate. The goals are clearly stated (listen to the public expectation, communicate about what we do, enhance the reputation of the organisation, build a community, inspire volunteers, etc.). In addition it explains the resources available for the social media communication and the main steps to follow to reach the desired outcome.
A social media tactics	This part explains how the different social media will be used (twitter, Facebook, etc.), how the content will be developed and validated, how often the social media pages will be updated, what type of links or retweet practices you will have with partnering organisations, what type of content is to be solicited from followers, etc.
A "what to do in case of…"	This part explains what to do in case of problems such as spasm, negative comments, provision of false information by mistake, jamming, etc.

CONCLUSION

The use of social media in risk and crisis communication remains in its infancy. Tools are emerging to aggregate more and more data, so that meaning can be drawn from the flow of information exchange via the Web 2.0 during a crisis. Crowd sourcing risk and crisis relevant information from social media streams is a key area where technological innovation can be valuable for emergency services and authorities in charge. An increasing number of emergency officers, volunteer organisations, etc. are active online to enhance the resilience of their communities when a disaster strikes. While social media has enabled informal partnerships that enhance dialog capacity among various stakeholders, major challenges have been identified. Emergency services must clearly state to their audience what they can expect to receive through social media in terms of risk and crisis communication.

Public policies are needed to sustain and implement open data strategies, to regulate propagation of dangerous rumours, to assess the impact of the social media and to enable systematic national infrastructure to have long term storage capacity to incrementally learn from past crisis. The role of government uses of social media in risk and crisis communication presents three major options:

1. Fostering citizen-led social media use through Volunteer technology communities
2. Developing government-led social media strategies, or
3. Combining both approaches.

Social media have been used spontaneously by citizens to enhance resilience and solidarity in affected communities. There is an opportunity to tailor the current citizen-led initiatives to enhance collective intelligence in disasters and make sure the information provided is as reliable as possible. Different tools can be used, including publishing rules and guidelines on the use of social media during a crisis, producing leaflets and education materials. Developing government-led social media strategies at times of crisis, require introducing codes of practices at government level, training of officials in charge.

Moving towards greater government use of social media has implications, not only for external communication, but also working practices and changes in organisational culture, organisational structure, etc. The use of social media can alter a user's perception of lines between persons, functions and institutions, and impart a false sense of access to each that raises expectations. This needs to be taken into account when deciding to use social media in risk and crisis communication, with a need for adapting practice to meet expectations that are reasonable for the organisation to handle. Change management might be needed to develop its use.

Risk and crisis communication can help increase societal resilience in pre-crisis, crisis and post crisis phases:

- In pre-crisis phase, organisations can develop capacity to filter social media for monitoring and situation awareness. This includes developing key indicators about current situations, either by a dedicated team, volunteer scanners of social media, or a technological application that can grasp

trends and early warning signals. This also requires organising the crisis communication staff, establish clear validation procedures, pre messaging, and preventing crises by performing risk awareness social media campaign. Finally, institutions have to be positioned in the social media and blogosphere as trusted sources and identify who the other trusted sources are.

- In crisis phase, organisations need to provide real time objective facts to avoid keeping the public in the dark or relying on other non-reliable sources, and to mobilise IT volunteers via online technology community to improve crisis mappings and situational awareness. They have to mitigate rumours and misinformation as quickly as possible to avoid negative retweets, and to set priorities regarding targeted audiences according to available resources.
- In post crisis phase, an organisation can use the social media to communicate about recovery and reconstruction, to improve stress management and to contribute to lessons learned.

Greater uptake of social media in risk and crisis communication is not only a strategic decision, but also has to be done according to the means and resources available to an organisation. While not doing anything may not be an option any more, in a global an interconnected world, the report offers a step by step approach from the presence on the social media to communicate or analyse content to a full two way proactive and dynamic use. Still, the traditional media, such as sirens, wallpapers, radio and television, should not be forgotten, and their interaction with the social media also deserves consideration.

ANNEX

While the list below is not comprehensive, it provides an overview of the social media that are most used for risk and crisis communication.

Social media type	Short description
Facebook	It is a social utility that connects people with friends and others who work, study or live around them. People use it to keep up with friends and colleagues. 901 million monthly active users were reported at the end of March 2012.
Myspace	It is an online community that allow users to connect to interact and exchange information with those having the same interests. It is used to discover new artists, watch videos online, among others. Myspace has over 262 million users in 2012.
Friendster	It is a social gaming site launched in 2002. The service allows users to communicate with each other, share online content, etc. The site, at its peak, reached tens of millions of registered users; however, it has since lost its popularity.
YouTube	It is a user generated site that allows people to share videos and the view and comment on the uploaded videos of others.
Flickr	It is a user generated site that allows people to share pictures and to view pictures of others.
Vimeo	It is a user generated site that allows people to share videos and the view and comment on the uploaded videos of others.
Wikis	Wikis are website that everyone can update from his computer to share common content with others.
Forums and Message boards	Forums and message boards are online internet site where people can held a conversation through the form of posted messages.
Chats	Chats are online internet application to held conversation through real time instant text messages.
Podcasts	Web based audio and video content made available on the internet to download to a personal audio or video player.
Blogs on Blogger, WordPress, Tumblr	It is a type of website which is updated frequently. It contains regular entries of commentary, pictures, and other materials.
Microblogs on Twitter	With 140 million users, twitter is a platform for people who register to post and receive short messages to a network of followers. Top 5 countries in terms of Twitter accounts are the US, Brazil, Japan, UK, Indonesia (according to a study conducted by Semiocast in 2012)
-MAPPING COLLABORATION Crisis mappers OpenStreetMap Google map maker	Crisis mapping collaborative social media exist under various forms. Crisis Mappers leverage mobile & web-based applications, participatory maps & crowd sourced event data, aerial & satellite imagery, geospatial platforms, advanced visualization, live simulation, and computational & statistical models to power effective early warning for rapid response to complex humanitarian emergencies. OpenStreetMap provides free geographical data and mapping. Google map makers can be used to access and improve maps according to various needs.
-ONLINE AND ONSITE CRISIS CONTRIBUTION SOCIAL MEDIA Ushahidi Crisis commons Sahana foundation tools Geeks without bounds	Ushahidi is an open crowd-sourcing crisis information platform easily deployable to meet local needs. Crisis commons is an international network of professional which aggregate during crisis camps and work collaboratively online to enhance crisis management. Sahana foundation software is dedicated to saving lives by providing information management solution often relying on social media. Geeks without bounds are developing application to enhance the provision of humanitarian aid in disasters.
-PUBLIC-PRIVATE-PEOPLE PARTNERSHIP FOR SOCIAL MEDIA CRISIS COMMUNCATION Random Hacks of Kindness (with Google, Microsoft, Yahoo, NASA, World Bank)	RHoK organizes and hosts biannual two-day events where volunteer technology experts develop software solutions for risk and crisis management. They are developing new social media products for the risk and crisis communication of the future.

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