

Leveraging Bystander Reports in Emergency Response Work: Framing Emergency Managers Social Media Use

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Abstract

This paper considers empirical data gathered on the use of social media and online bystander reports in operative emergency response work. Interviews with 12 emergency response professionals have been conducted in order to understand the role of social media, as we need to look at how professional actors use and make sense of this technology as part of their work. Focus is on the use, interpretation, and experiences of bystander reports in early phases of emergency events. The findings of a frame analysis suggest that bystander reports present both new opportunities and challenges to this time-critical work by providing information otherwise not available. These reports also change how emergencies are communicated. Leveraging bystander reports is not yet an organizational capability, but rather a technique used by individuals engaged in emerging practices. Textual information is often considered ambiguous and hard to interpret, while experienced professionals leverage visible information in photographs to make their own interpretations of ongoing emergency events.

1. Introduction

New forms of computer-mediated communication have during recent years introduced great changes in how emergency response actors relate to communication, coordination and collaboration. Studies have reported that a large amount of user-generated information is made commonly available on micro-blogging services, such as Twitter, Facebook, and Instagram, during large-scale emergency events [1, 2]. Crisis informatics research [1, 3-6] suggests that information collected from social media could be leveraged for more effective response work and coordination during emergency events. Qu, Wu and Wang [7] argue that although scholarly interest in grassroot response to disasters is increasing, the research is still in its early phase and most of the existing work is largely based on

anecdotal evidence. Hence, they claim, there is a need for more systematic studies rooted in empirical data. Although some papers have been published since their call (cf., [13, 16, 17, 27]), there is obviously a need for more work. The study presented in this paper aims to provide additional empirical data on current practices of social media use in emergency response work.

In this paper we argue that social media use [8], citizen journalism [9, 10] and other forms of bystander reporting has a beneficial effect on emergency response efforts by providing rich information in early phases the emergency event. An important aspect for both research and practice is thus to study how bystander reports shape emergency response work. Previous research efforts have primarily focused on the general public's use of social media [1, 5, 11], and the technology mediated social interactions taking place during these events [12, 13]. This research has to a large degree focused on large-scale events, including the 2005 terrorist attacks in London [9, 10, 14], Hurricane Katrina [15], the Red River Valley flooding [1, 6], and the 2011 earthquake and tsunami in Japan [16]. There also has been several strategies suggested to incorporate social media and user generated content into professional response work (e.g. [4, 17]). More recent studies has investigated how social media has been adopted by emergency managers [17, 18]. This paper presents empirical accounts regarding the framing of new technologies in an organizational perspective [19] and on smaller scale and everyday emergencies. The focus is on the work of emergency response managers, and their struggle to incorporate bystander reporting into the operational work practice.

2. Bystander Reporting in Crisis

The intersection of new and traditional media, in the form of citizen journalism, often make bystanders an important component in the communication of emergency events [9]. The camera phone and

networked society have changed how events are produced and shared amongst people. Okabe [20] states in an early study of camera phone use that “[t]hrough the capture and sharing of small but significant visual events in people’s lives, camera phones are contributing to a kind of everyday photojournalism, where people are attentive to images and events that might be interesting or newsworthy”. Harrison [21] argues that “everyday” photography is becoming a cultural and social documentary practice, and “photoblogging” is making real-world accounts widely available with little effort [15]. This technological and social turn has had large impact on how information is shared during emergency events, as on how we expect to find information during these events [5, 6, 22-24]. The 2005 London attacks made this evident, as “a considerable number of the most newsworthy images of what was happening were not taken by professionals, but rather by these individuals who happened to be in the wrong place at the right time” [10].

Interactions on social networking services have been found to take on specific characteristics during major emergency events, displaying signs of socially convergent online behavior [25, 26], large scale and distributed problem solving [5], citizen journalism [9, 10, 14], and distribution of on-topic situational updates [1, 6]. As of late, this process has also become highly organized through virtual online communities [4, 27]. Research has shown that valuable information is broadcasted by the public using various forms of social media services [1, 6] and through “eye-witness reports” for online news sites [10]. Formal emergency response organizations have as a result also made a turn towards social media, often because of the initiative of specific individuals [23]. Bergquist et al. [28] argue that decisions to use social media have already been made by the employees, and this choice will affect the organization regardless of management policies or strategies. Sutton [29] has however found that social media poses a large challenge for Public Information Officers’ in their media monitoring practices because of a lack of familiarity, a lack of resources, and the perception that large amounts of irrelevant information flow through social media. Plotnick et al [18] have also found that major barriers to managers to use social media are the lack of staff and skills, as well a lack of trust in the technology and the risk of information overload. Tapia [17] has however found “pockets of use”, where social media and other forms of bystander reports are used in large-scale events to both gather information regarding scale and urgency,

as well as continuously monitor developing events and spot possible threats. VOSTs (Virtual Operational Support Teams) [27] are a recent development that has been designed and applied in many events in order to increase the capacity and capability of the formal response organizations. VOSTs leverage trusted, and often professional, volunteers to process, curate and manage today’s increased flow of information. In this paper we study how emergency management professionals use, and make sense of, social media and bystander reports in their own organizations.

3. Analytical Lens

In order to understand the role of social media in emergency response work, we need to look at how professional emergency management actors make use of and reason about technology as part of their work, as meaning cannot be constructed in isolation. Orlikowski and Gash suggest *technological frames* [19] as an integral part of this sensemaking process, used to “make sense of and assign meaning” by providing implicit guidelines and principles to organize and shape interpretations of technologies. It is further argued, “that an understanding of people’s interpretation of a technology is critical to understand their interaction with it”. Technological frames are defined as the core set of assumptions, expectations, and knowledge of technology collectively held by a group or community to understand technology in an organization [19]. This understanding is not specific to the technology, but also includes “the specific conditions, applications and consequences of that technology in particular contexts” [19]. Frames are considered individually held, but often shared by communities. If frames consist of shared expectations and interpretations, they are considered congruent. Incongruence frames may exist when managers and users assume or experience different values from the same frame.

However, trying to understand the role and use of technology in this context can be a complex task because of the duality of sensemaking and technology use in operative response work. In this particular context, actors will be in the process of making sense of ongoing emergency events, while at the same time make sense of the technology used in this process. Sensemaking theory has been adopted in crisis management and emergency response research as it “provides us with a lens to observe and understand how information is processed within and among organizations” [30]. Weick, Sutcliffe and Obstfeld [31] state that “[t]o focus on sensemaking is

to portray organizing as the experience of being thrown into an on-going, unknowable, unpredictable stream of experience in search of answers to the question, ‘what’s the story?’”, and this perspective is much of what early phases of emergency response work is all about. Emergency events are socially constructed in efforts of organizing through communication, and it is the substance of the communication that constructs the temporary organization intended to manage the emergency event. Weick [32] states that “organizations are built, maintained, and activated through the medium of communication. If that communication is misunderstood, the existence of the organization itself becomes more tenuous”. The construction of the event is thus based on interpretations, and interpretations are “shaped by shared language, authority relationships that assign rights of interpretation, norms of communication, and communication” [32]. This paper thus intends to investigate how communication has changed, and what these changes infer to operative response work.

Technological frames theory is used in this paper as an analytical lens to address the duality of sensemaking for emergency managers in emergency events, and separate how these actors make sense of the technology and emergency events. The objective is to investigate how emergency response professionals’ use and interpret social media and bystander reports in operative response work, and not specifically how they make sense of ongoing emergency events. The technology use is the unit of analysis, and the management of emergency events is the context of use.

4. Research Approach

The research presented in this paper is based on a frame analysis [19] where data has been collected through interviews with emergency response professionals. Participants were selected from roles in management and coordination functions. These actors are activated in challenging events, ranging from small but serious, to large and catastrophic, specifically when coordination of available resources becomes complex. Coordination, sensemaking and resource management often become a great challenge without the access to first-hand information. These actors are then dependent on information provided from frontline teams to generate a “good-enough” situational overview in order to grasp the scale and scope of the emergency event so that the emergency system is prepared to handle the current situation as well as the day-to-day operations. Participants

represented the domains of Swedish emergency medical services (EMS), fire brigade, police, and, the civil security and risk mitigation office of the county administration board.

4.1. Data Collection

Semi-structured interviews [33] were conducted with twelve respondents. The respondents included four managers and two coordinators from six different emergency medical service organizations, two police communication and coordination managers, one emergency manager and one dispatcher from the fire brigades’ communication and coordination center, and two officers from the public safety office of the county administration board. Interviews were either conducted at the respondents’ workplace or via telephone. All interviews were based on the same script consisting of 15 questions, all being open-ended to allow for flexibility and mirroring [33]. The interviews focused on emerging practices and technology use in emergency response work and included three categories of questions; role and responsibility, experiences of social media and bystander reports, as well experiences and reflections of communication practices and technology use in the organizations. All interviews were recorded and notes were taken during the interview. Additional online data from events discussed was also collected when possible.

4.2 Analysis

The analysis followed an inductive approach as suggested by Orlikowski and Gash for identifying frames and frame domains [19]. Transcripts from the interviews were analyzed using conventional qualitative content analysis [34]. Labels, codes and themes were developed and identified through iterative coding of the transcripts. Further analysis of the themes focused on episodes that reflected assumptions, knowledge, and expectations relating to specific frame domains [19]. The final domains consist of descriptive examples and specific episodes reflecting on contexts and events, as the technological frame not only describes the technology “but also local understanding of the specific uses in a given setting” [19]. The resulting domains include *managing social media*, which regards the adaption and great shift in communication strategies in the organizations. The second domain, *communication of emergency events*, relates to how an event is perceived and made sense of depending on what and how information is made available. This

domain also stresses the need for multiple perspectives and interpretations of the event. *Interpreting bystander information* is the third domain, focusing on how bystander reports are interpreted in particular in emergency coordination settings, and how the information in the report reflects the emergency event.

5. Findings

Online public eyewitness communication is hereon referred to as bystander reports. Bystander reports are commonly disseminated through social media services, or via online news sites. Most respondents did not differentiate between the different delivery mechanisms of the information. This finding indicates that social media, with its unique features and characteristics, often is interpreted using existing technological frames [19], more related to well known technologies and practices, such as online news publishing and “eyewitness reports”. The major role of bystander reports for emergency responders in early phases of emergencies is to quickly provide actionable information, making many of the communicative features of social media less relevant. The major concern for the respondents was that the information had not been gathered through the formal channels and standard protocols and practices, making the information less reliable. The major impact of social media in relation to news media is that a new skill set is required in order to be aware of and locate information. The following sections present the frame domains and context of use in further detail.

5.1. Managing Social Media in Operational Emergency Response Work

The use of social media and bystander reports is not a standard operating procedure in operative emergency response work. Our interviewees stated that social media is mainly used by younger employees, while more veteran officers did not have much insight to the workings or possible benefits of using social media in their line of practice. The difference in acceptance and understanding of new technologies was often viewed as an issue, creating a tension between organizational levels, especially since people with many years in service occupy many high-level roles and is of a higher average age. Those that have experienced the use of bystander reports in operational work are however not as negative:

Our generation did not have all this from the beginning [...]. We shouldn't tell them how we use social media

in our organization. We should really listen to how they use social media. But I think it's great that younger generations come in and 'break' current practices and bring new views. How could we otherwise stay an effective organization? - Police Communication Officer

Although most interviewees did have some level of personal experiences from social media, only two had any direct experience of use in operative work. The personal use of social media is here considered relevant, as any experience with the technology is likely to have an important impact when framing the use in a professional setting. Several participants had experience of looking to bystander reports from other sources, mainly eyewitness reporting in online news outlets, and all were aware of instances where bystander reports and social media had changed how an emergency event had been communicated.

According to the interviewees, the current organizational use of social media presents several challenges. Chief amongst these was social media literacy, currently not viewed as a formal or needed skill in operative settings. The reported use of social media had mainly been on a “testing” basis, and still evolving. Organizational challenges related to issues of finding the right people with the skills and available time for the task in an often time-critical situation, but also to challenges of locating and presenting actionable information. Consequently, the social media skills currently vary significantly, and a more automated process of aggregating available information from online sources is called for:

If you would be able to aggregate from these [social media] sites in some structured format, then I believe that we rather quickly could get a good picture of what the event is about ... then we could identify the need of crisis and emergency support efforts - EMS Manager

The lack of time and skills available for using social media in the day-to-day work is another reported issue. The emergency dispatch operator is the first role that comes into contact with most cases, and they report that the initial phase of the event is very busy, where they have to interview or listen to on-going interviews, dispatch resources, communicate with response units, and to document all communications and decisions. They argue that there is little or no time available to spend on additional tasks such as accessing social media sites to search for posts about the event.

The time is not really available, there in the beginning, to look for that information... then you are really concentrated at dispatching units, update the status of the units in the dispatch system, and you also need to

plan one step ahead. If there are more alarms coming in, how are we then going to organize the work... – Command Center Operator

The issue is typically the same for each role that is activated in the emergency response organization. Activated roles and functions often become occupied with pre-defined tasks and responsibilities. Bystander reports have mainly been used as an information source either when there are roles in place to monitor the event at an early stage, typically by an information or communications officer, or when there have been extra resources assigned to the task. Current organizational arrangements do not make it possible for staff to use social media:

In that case you have to assign someone at an early stage to work with information gathering from social media, or on all open medias... the person who are in charge of the work has it up to his neck the first minutes. So you can't just go on Twitter [...] you have to find someone to assign the task to. – EMS Manager

The perceived usefulness of bystander reports combined with the knowledge of possible sources and time available determines the priority it will be given, and this priority is to a large degree determined by the current information needs. The frames presented by dispatchers, coordinators and managers are highly congruent, indicating that bystander reports may provide valuable and actionable information. However, the organizing of operative emergency response work is not currently designed to make bystander-reporting part of the operative work practices. There is also a highly incongruent frame on the perceived use and usefulness of bystander reports in operative work, specifically in terms of a tension between younger personnel accustomed to social media, and more experienced and senior personnel who has little or no experience of social media. The specific framing, as a recipient of information, and not as a participant in the online events, is also of interest in regard to the contradictory positioning to social media.

5.2. Communication of Emergency Events

Information dissemination and the work of generating situational overviews are non-trivial activities and key aspects of operative emergency response work. Making sense of and interpreting information gathered from an incident is normally an incremental process. As more information is received, and additional knowledge is gained, previously gathered information is reinterpreted as part of an ongoing process. During the early stages of

an incident, there are typically few formal sources available. Until official personnel has reached and established themselves on-site and made time available to report, there is often a time-period characterized by ambiguity regarding the developing situation. Instead of waiting for formal channels to provide news, our respondents tell us, they sometimes try to make use of bystander reports available online within minutes of the incident. Such information has the capacity to inform ongoing activities and provide specific information that adds to the situational overview:

Sometimes I have been able to see a photo of a traffic accident quite soon [online] before I have received a description of the incident scene from elsewhere. So if you [search] and pick up the biggest Internet sites, you'll get the pictures from the accident, from mobile phone cameras, as a decent ground for your decisions... – EMS Manager

The perception of bystander reports is however that it could not provide a complete picture of the event; the use is more about getting small pieces of the “big picture”, as well to gain insight on specific aspects of the situation. Our interviewees stress in particular the importance of photos. Photos from the incident site are perceived to provide visual information that increases the general understanding of the incident. A regional EMS manager explained this from an event where pictures from bystanders of a traffic incident were found on an online newspaper just minutes after the incident had happened:

I saw a bus accident, with a picture of the bus on the Internet [...] taken with a mobile phone camera. It gave me a good picture of what the site looked like, and what kind of damage the bus had. It enabled me to visualize the accident scene in a different way. A picture is pretty good, you realize the magnitude a little better, you get an understanding of what it looks like, so it can be very good to get a picture - EMS Manager

According to the respondents visual information such as photographs is often pursued. Images provide an important input for bringing together teams or groups of actors collaborating in the work. Pictures often aid the process of converging towards a shared interpretation of the event. Current communication standards and operating procedures are based on talk, either over radio, telephone or face-to-face. Images narrow the scope of possible interpretations and provide a mechanism for bringing teams together.

A tram collision, discussed by one interview participant, illustrates how bystander reports have changed communication around emergency events.

After being activated, information about the event was quickly communicated to a large number of staff members of the regional medical coordination center, making them aware that a serious event had taken place. When receiving the alarm, an off-duty EMS coordinator realized that bystanders and witnesses of the event may have made valuable information available online. Having the time available, and skills needed, he posts a question on his private Twitter account asking if anybody knows what has happened. The private account was used since he could not tell what would happen if the organizations official account was used. He also made the assumption that his own follower network would be more likely to provide information. With his frequent commuting on public transport being one of his main talking points on Twitter, he knew that other commuters was in his network of followers. He received several replies within minutes, containing images posted on both Twitter and Instagram. The tweets also included information about people on-site. The EMS coordinator compiled the images in an email addressed to the EMS coordination center where they were later used to complement the already gathered information.

[The photographs] added to the image of what had happened. How big, and ehmm, how serious it was. ... You could see that [the damage] was mainly in the front section of one carriage, it was not the whole tram.
- EMS Coordinator



Figure 1. Instagram photograph of tram incident in Gothenburg. Cross-posted and discovered on Twitter.

The images were perceived to provide important insight about the current event, and it also provided a reference in order to compare this event to similar previous events. The respondents explain that images are primarily used to provide good overviews and to help achieve the “big picture” of the event. Comparing the current event with previous

experiences develops a more holistic understanding and specific insights.

The general framing is congruent and suggests online bystander reporting have changed how incidents may be reported, but also that there is great value to early access of information. The most common framing of bystander reports is that it can provide early, and often visual information, which would otherwise not be available. Incongruent frames exist regarding how social media is approached and how information is located. The frames presented by more experienced users suggest that information may not easily be searched for, but that there may be a need to engage with the crowds, and ask for specific pieces of information.

5.3. Interpreting Bystander Reports

The issues of what the respondents referred to as “colored” or subjective information was brought up as a major concern. Two aspects were presented; firstly that of the often unknown frame of reference of the information provider, and, secondly, personal emotions or interpretations being reflected in the information provided. Useful interpretations of the information, or of the event, can be difficult to make when there are doubts regarding the quality of the information. Similar experiences have been made in existing practices where different emergency response actors use different language conventions for specific aspects of an emergency event:

If the police report about medical aspects of the event, they may say that there is a ‘severely injured patient’, often meaning that a patient has been taken to the hospital. For us, in the medical field, a severe injury means that the patient requires intensive care, so there some issues of interpreting each other, or we don’t really use the same definitions. - EMS Coordinator

Both language use and the personal experience may influence the content, making interpretation or assessment difficult. Tweets from the previously presented tram incident did not only contain images but also text describing the bystander’s personal experience of the event. One of the images, seen in Figure 1, contained the text message: *“Tram accident at Beväringsgatan. Six people injured. I was in the back. Was thrown to the floor.”* The tweet claim that six people were injured, a statement later proved wrong, as 38 people were transported to the hospital, all but two with minor injuries. Even though the tweet did indicate that there were injured people at the incident site, the textual information was not considered actionable by the coordinator and was subsequently not fed into the actor network. When it

came to specific details such as injuries or damages bystander's assessments were considered to be of little value. One of our respondents explains:

You have to do a professional assessment on site, and you cannot only retrieve information made available from the public, from unprofessional spectators - EMS Coordinator

The issue of interpretation has been described as a concern regarding the information collected through bystander reports, but the issue was mainly not considered as if the information was correct or not, but rather if it was meaningful, unambiguous and actionable. Information provided from bystanders can provide meaningful resources if it adds to and complements existing information and reports provided by trained experts:

I believe that you could use the layman observation, but preferably together with professional assessments. Then you would probably be able to get a quite good picture. But you shouldn't only rely on layman observations, and then it could get wrong. But on the other side, you would never only use that. In time we will have our own men on site. I don't believe that there is any great risk using the information coming from these sources. - EMS Manager

The matter of interpretation was further explained from an experience after the July 22 terrorist attack in Oslo. Initial reports published on Twitter and online news-sites contained vague information, such as observations and reports mainly stating "a big bomb in Oslo". The statement is difficult for emergency responders to interpret because it is ambiguous and provides little detail. One issue with the ambiguity is that tweets and Twitter profiles may provide little information about the source, making the frame of reference unknown and the message hard to interpret:

If somebody writes that there was a 'big bomb' it will be really subjective. Has this person been in similar situation earlier? Has he served in Afghanistan? [...] It's really what you would call the ethos in rhetorics. I mean, who is this person saying this? What's his background and experience? I don't know what experience he has based that statement on? - EMS Coordinator

Images however provide a basis for a professional assessment to estimate the scale and nature of the event. Our respondents said that images and videos are considered to be more objective, and similar images could be provided by a number of people independent of their personal experience:

The image is still less subjective, it would basically be the same image from whoever at the same location. [...] From the first impressions, like the text 'a bomb has gone off in Oslo', until you see the first images, there is a huge difference. - EMS Coordinator

Images are as well able to provide more and different cues about the event. Where textual information may be difficult to interpret and make sense of, pictures tell more of the story from a professional standpoint. The frames suggest that not all forms of bystander reports are equal, where photographs and other forms of visual communication could be easier to interpret while still being less subjective. Textual information is considered to often lack important cues required. The frames are to a large degree congruent, indicating that a general acceptance of bystander reports as valuable complements to formal incident reporting, specifically when professional assessments can be made from the information. In this case, images are perceived as more valuable than text.

6. Discussion

The findings suggest that the dominating technological frames are to a large degree congruent. The use of bystander reports in operative emergency response work introduces several opportunities, including 1) being a source of unique and valuable information to address early stage information dearth, 2) depicting the incidents scale and scope, and 3) provide information that could complement professional reports and enable better assessments. The analysis also shows that organizations involved in operative response work still have issues of including bystander reporting in the information gathering process.

However, the analysis also revealed two major incongruences. The major difference regards how social media and bystander reports are perceived in the context of operative emergency response work. Findings suggest that there is a significant gap between both practice and knowledge related to this emerging technology. Making sense of the technology in this specific context seems to be a major obstacle. The findings also indicate that there is not only an issue regarding the technology, but also of the communication that it enables. The second major incongruence regards the approach of acquiring information, where one perspective is that of social media as mainly an information source. This finding can be considered well aligned with the over-arching framing of social media currently interpreted

using *existing technological frames* [19] more related to online news publishing and citizen reporting. The other perspective and framing is that of social media as a platform for bi-directional communication and collaboration where actors interact with one another through built in features such as likes, comments and replies.

6.1. Importance of Early Information

Emergencies, and especially sudden-onset events, are characterized by initial information dearth, and a gradual interpretation of the event that over time makes more sense. Previous research on social media use during emergency events has found that there often is a great amount of incident-specific information available on social networking services [1, 6] as well in online newspapers [9, 10]. Leveraging information from publically available bystander reports have been promoted by the participants of this study as a fruitful pursuit in early stages of the event in order to get closer to the answer of what “the story” is. As events are constructed in organizations through communication, and communication constructs the temporary organization intended to manage the emergency event [32], rich information such as images from the incident can provide the leverage required to quickly construct the organization required to properly manage the emergency event. Most of the previous research on social media use in emergency events has however not focused on formal and operative response work, nor small-scale events, but rather on large-scale events where the impact of the event relates to large populations rather than limited amount of individuals. Previous research also highlights the issues of collecting, filtering and processing situation specific information and suggests machine automation and learning to deal with these issues [11, 35]. In contrast, the findings presented in this paper show that bystander reports in even small-scale events can 1) provide valuable information to address early stage information dearth, 2) present the incidents scale and scope, and 3) provide information that could complement professional reports and enable better assessments. The deliberate act of pursuing sources of bystander reports to gather incident specific information should therefore be considered an integral part of the sensemaking process.

6.2. Sensemaking and Bystander Reports

Emergency events are initially difficult to make sense of, hence organizations in time-critical context need to act on plausible interpretations and

categorizations of the event at an early stage. Early action also creates lead-time for later adjustments. Much of the findings relate to Weick’s [36] seven properties of sensemaking. The act of introducing bystander reports in the work of operational emergency management is part of an enactment process where participants create the environment in which they work to make sense of both the work and the emergency event. This action specifically relates to the choices made to search for bystander reports in order to gain further insights and about the event. The findings present several possible positive effects of using bystander reports to extract valuable cues, but a major question is that of identity in this public process. During the tram incident, the EMS coordinator decided to use his private account to ask for information, as there were several professional, ethical and moral considerations about asking bystanders to publish information about the incident online.

Identity construction here relates to how response actors could be perceived to work against their own goals if they were to ask the public to possibly inflict more harm to the victims of an incident by asking the public to broadcast their suffering online. The findings also present episodes where photographs provide valuable cues and reduce uncertainty. Sense is instilled to the current event by *leveraging retrospective sense*, experience, and knowledge of previous events. As reports and new information is introduced into the social context of the emergency management process, it becomes part of the *on-going work* of making sense of the event. Photos have been shown to provide multiple and valuable *extractable cues* about the on-going and developing situation. The findings suggest that these cues mainly relate to grasping the scale and scope of the event. These findings suggest that bystander reports could aid response efforts by providing the raw material needed to make *plausible interpretations* of the event even at an early stage. All these steps are part of a chain initiated by the thought or idea to use bystander reports to get a better sense of the emergency event.

6.3. Pictures as Sensemaking Devices

When bystanders use social media to report from accident sites and disaster areas, it has been argued that they do so in order to contribute valuable information to both authorities and the public [7]. There are also plenty of illustrations where bystander reports through social media have helped authorities in their work. However, we argue it is plausible to assume that bystanders’ information is primarily

targeting the set of Twitter followers and Facebook friends that are part of these users' social networks, and not intended for the crisis response agents. This is particularly the case in the early stages of emergency events – before these events scale and become of a more general interest. These bystanders report from a private/personal perspective about things and topics that amused, impressed, surprised or otherwise “wowed” them, and thus are likely to wow their friends. Many of the photos captured in the 2005 London bombings were for example taken to show why one was late for work [10]. In addition, common bystanders are not accustomed to emergencies and have typically no training in determining what is important information from a rescue perspective. Although bystanders pictures are likely to be taken with a wow-factor and broad appeal in mind [1] they contain much more information than a few lines of text. The old saying “A picture is worth a thousand words” certainly applies here. In addition, and perhaps more importantly, the photo often captures much more than the photographer has in focus. As told by our respondents, professional emergency responder get substantial information from a picture, probably more than what the photographer had in mind when taking the picture.

7. Summary and Conclusions

This paper presents the role and use of social media and bystander reports in the process of organizing and making sense of an emergency event. A frame analysis has provided insight into how social media is used and perceived, how bystander reports are interpreted, and how that interpretation impacts on practice. The study fills a void in current literature by reporting from operative work, which previously have received little attention. The rich insights generated by this empirical investigation provide a good starting point for further empirical research and technology development.

Our findings suggest a congruent framing of that bystander reports can play an important role in operative work by providing valuable and unique material for early-stage situational assessments, often by complementing formal reports. We also propose that the most important dimensions to distinguish the level of usefulness in bystander reports may be the information format. Photographs capture the whole scene, thus leaving the main interpretation of what is important to the viewer (i.e., the emergency response actor). This is thus the complete opposite in comparison to written text, where the creator (i.e., the bystander) must decide what subset of the scene to

describe. The emergency response actors' interpretations are based on expertise and experience, not in the trust of what is stated by an unknown person in a public online post. Bystander reports in the form of photographs offer valuable information when few other sources are available. These reports provide cues regarding the scale, scope and specific characteristics of the event. However, our findings also suggest that social media use is currently not an organizational capability and the practice, and methods for incorporating bystander reports in current work are yet to be established.

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